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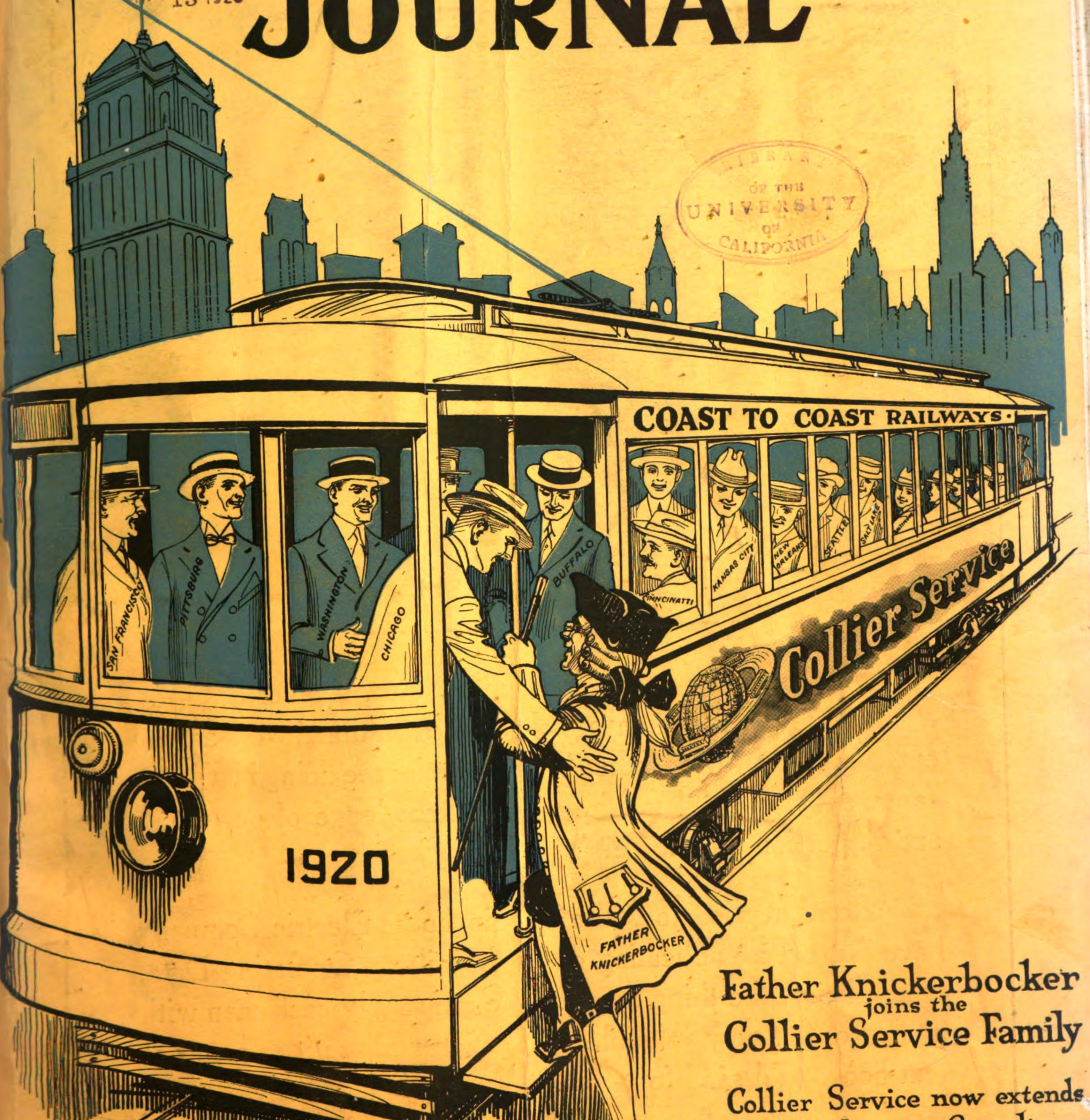
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Electric Railway Journal

Volume 56

July to December, 1920

UNIV. OF CALIFORNIA

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Instructions for Use of Index.

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, or to the state matters of any particular state. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the electric railway, city or state to which the article applies. Groupings are made under the name of the city in which the main office of the company is located, but an exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad. City or state affairs appear direct under the names of the city or state involved.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into thirteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index. As an example, if a reader wished to locate an article on special trackwork he would obviously look in the list under the general subject Track and under this caption, only special trackwork could apply to the article in question. The reader would therefore refer to this keyword under S in the body of the index.

In addition to the groups of articles covered by these headings the papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair shop equipment" and are not indexed alphabetically, because of the fact that there is a wide choice in most cases of the proper keyword to be used.

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Accidents (including wrecks)
Safety first

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UNIV. OF CALIFORNIA

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Attend the Ottawa Beach Meeting of the C. E. R. A.

IF ANY ONE is hesitating about whether he will attend the C. E. R. A. meeting at Ottawa Beach, Mich., July 8 and 9, we should like to assure him that he will find his time spent not only profitably but most pleasantly, for Ottawa Beach is a delightful summer convention spot. It has some of the attributes of Atlantic City as a convention place. The Hotel Ottawa and environs are isolated in a measure from outside attractions so that delegates will find a greater fraternizing than prevails where the convention is less unto itself. We feel confident, also, that the time spent traveling to the convention will be amply rewarded, though it may be a rather complicated journey in a few cases. In this connection, we might suggest that the easiest ways to go are either via Grand Rapids or Chicago—interurban from the former and boat from the latter direct to Ottawa Beach. Also, special interurban through cars are arranged from some points.

The Hotel Ottawa is situated on the beautiful Black Lake, but only a five-minute walk (in a bathing suit) to Lake Michigan's beautiful shore—sandy and clean. Just across the channel from Ottawa Beach is Macatawa Park, famous as a summer resort for cottagers. There are good boat trips to be had up Black Lake to Holland or down the shore of Lake Michigan to Saugatuck, and much scenery en route. All these places have proved so popular to resorters that we feel confident the convention at Ottawa Beach will be a close second if not superior to the customary boat trip, which had to be abandoned this year. And with John Collins as the big boss of the hotel, we feel sure things will be right and enjoyable there. Let's all go to Ottawa Beach for a good outing and a characteristically worth-while meeting.

A Friendly Bit of Advice Overheard from Part of the Public

ADVICE, impartial, absolutely unbiased and from a trustworthy source, is priceless. We have found a sample and are quoting it herewith. It is an editorial from *Printers Ink* (June 17), a paper for publishers and advertisers, expert critic of advertising. The editorial is not written to be directed toward the electric railway, but merely takes as an example the publicity which the Interborough Rapid Transit Company has been putting out through its *Subway Sun*, using this example in the discussion of negative and positive advertising.

> ### THE "NEGATIVE" ARGUMENT AGAIN
>
> Only in rare instances have negative arguments in advertising campaigns proved successful. As a general rule, it is the positive or affirmative presentation of a story that brings the response. Negative arguments too often work away from the advertiser's interest and fortify his legitimate prospects against him.
>
> As an illustration of this, the advertising campaign now being conducted by the Interborough Rapid Transit Company of New York to secure an increased fare may be examined with interest. The company has so far been unsuccessful in convincing the public that it should pay more than 5 cents for a ride on its cars. A bulletin called the *Subway Sun*, placed in the windows of its cars, is the advertising medium used. For successive weeks these bulletins have been telling the company's troubles to its patrons—how it will have to sell its real estate, that municipal ownership will not give the public any better service than the Interborough is giving now, how it will be unable to construct new lines for the growing city—and always adding to each appeal that the present 5-cent fare is inadequate.
>
> All these arguments are negative. The individual user of the company's cars is not interested in the company's troubles. He is interested in his own comfort and convenience before anything else.
>
> Here is where the use of affirmative or positive arguments would be more apt to enlist the interest of the public in helping to change the conditions. One such argument would be the improved service that an increased fare would make possible—less time to get from home to office—and less crowded cars. Another argument would be to tell the public how many cars are being run now for a 5-cent fare and how many more could be run for a higher fare. Also some of the improvements which could be put into effect just as soon as the increased fare takes effect—safety devices, new cars, lighting, ventilation, new lines.
>
> Then there is the story that could be told about the wonderful devices the company now has in use for the public's protection—the motorman's "dead man's handle," automatic signaling, block divisions, how the cars are cleaned, heated and the public's health and safety looked after all the while.
>
> Thousands of people pay 10 cents for a short trip on a Fifth Avenue bus and think nothing of it, because the bus company assures every passenger a seat and it has enough buses to do it. You can ride 20 miles on the subway for a nickel and nobody cares a whoop, because the subway does it grudgingly, complaining all the way about its own troubles.
>
> Many street railway companies in other cities have succeeded in securing increased fares by affirmative advertising of the kind referred to. Negative arguments often "sell" the negative condition. Positive, constructive, upbuilding arguments inspire a desire for the things they tell about.

We quote this not for the benefit of the Interborough Rapid Transit Company management, which has probably already seen it, but because many railway companies use similar methods of publicity and more and more is publicity of the right sort urged. Here we have caught, unawares, as it were, an intimate discussion of our methods from an observant and discriminating part of the public, doubly able to judge of the effects of our work, for they who discuss it are careful students of advertising methods.

We believe these suggestions and criticisms should be heeded. There is at least food for thought in them. They are certainly impartially made and they must be well taken, for they come from some of the very public we are trying to reach and are a part of their own family discussions, in which a piece of our work is used as an example from which to profit by avoiding. Here is a statement too not only *how not to do* a certain thing but also *how to do it*. We need more of that—not preaching, but real honest-to-goodness, heart-to-heart talk from the inside out by those who know.

Co-operation Between City and Company Urged in Philadelphia

AN OUTSTANDING feature of Director Twining's report, made public last week, is that, while he does not hesitate to criticise the local company for faults which he says he sees, he urges as the one solution to Philadelphia's problem whole-hearted and unselfish co-operation between city and company. Certain it is that a continued quarrel between a city and its transportation corporation merely makes more difficult the rendering of good transit facilities on a sound financial basis. It is not surprising that Mr. Twining favors this policy, and we believe the industry as a whole should feel encouraged that municipal officials are more and more supporting such programs of co-operation.

Costly Non-Revenue Car-Hours Have Effect on Labor Contracts

WORK being done by the new committee on economics of schedules of the American Electric Railway Transportation and Traffic Association in the way of standardizing time-table statistics of the various railway companies should be of considerable value to the industry and warrants serious discussion at the coming convention. At no time is the question of revenue and non-revenue car-hours of more importance than in the drafting of new labor contracts. Study and action on this subject should be of particular interest at a time when so many companies are engaged in negotiations with their platform employees.

Just what non-revenue hours mean to a railway company may be judged from the statement of one operator that his week-day schedules contain practically one-fifth of "dead" time, or time when cars are earning nothing for the management. With the growing demand on the part of labor organizations for an eight-hour day this burden is bound to become more serious. Similar hazards are contained in agreements providing for an eight or a nine hour minimum workday, because where it is not economical to keep cars in service that long a certain amount of "bonus" time must be added to the cost of operation.

The largest item contained in non-revenue hours in a railway schedule undoubtedly is that made up by terminal or layover time. The association committee can serve a useful purpose in educating the companies toward economy in this regard. A schedule maker, of course, must have in mind some standard for layover allowance when framing his time tables. This should depend largely on conditions existing on the individual routes, because car lines with steam railroad crossings at grade or with heavy vehicle traffic cannot be operated with such regularity as those where no such delays are to be encountered. However, even where due allowance is made for blockades it is a regrettable fact that many schedule makers allow too much "slack" in running time between terminals, and the result is a line of cars waiting at ends of a line. This not only is waste of good money but it has an unfortunate effect on the public mind, where the impression is given that the company has cars for storage purposes and not for service.

Contracts made with labor unions in recent years are being stretched to the point of unwarranted liberality in allowances for reporting time, turning-in time and meal reliefs. Combination of these items runs as high as sixty minutes per run with some companies, and where thousands of runs are to be paid for at $1.50 per crew-hour the cost in a year on a large property is a staggering factor. The result is even more burdensome on a system where overtime bears a penalty rate and where non-revenue hours are included in the items going to make up overtime.

While negotiating with the trainmen's union recently, a railway manager called attention to these heavy burdens borne by the company and said the men were receiving approximately 5 cents an hour as "bonus." The answer of the union officials was that this was not apparent to the men and they could not appreciate it. They were unwilling, however, to have any of these working conditions changed. Apropos of this point, we recall the recent ruling of an arbitrator that "bonus" time is never appreciated by the employee and should be added to the regular rate of pay.

Boards of arbitration have been slow to concede the eight-hour day to electric railway employees. They have been impressed with the fact that the traveling public demands maximum service at periods of the day separated by more than eight hours and that in this particular the transportation business differs from other industries. There are few railway companies in the United States where the eight-hour day prevails for platform employees, and even on these properties it has been found necessary to allow a certain percentage of the runs to cover a "spread" as high as fourteen hours.

Men who accept work as conductors or motormen must learn to appreciate wherein their industry differs from others and to value more highly the factor of continuous employment as against the limited number of working days in seasonal occupations. They will find, for instance, that hourly rates as high as $1.25 in the building trades do not mean as high an annual income as this figure would indicate. Also, while there has been considerable agitation for an eight-hour day, experience shows that many employees will pick runs allowing the greatest number of pay hours, and others who have a short workday will seek additional employment in their spare time so as to add to their daily earnings. Labor union officials would do well to consider these facts while negotiating for new agreements with employers.

How Much Freight Haulage Is Done at a Profit?

THE paper by W. K. Zinsmeister read at the convention of the New York Electric Railway Association last Saturday and published in abstract in this issue is the first attempt, so far as we can recall, to present a definite classification of accounts for electric railway freight operation. One of the aphorisms of the late Mr. Whitridge was that there was no profit in doing business at less than cost. This applies to the electric freight business as well as to the electric passenger business. Hence, it is most important for every electric railway which hauls freight to know how much this service is costing, and for this knowledge an accurate plan for determining the cost is essential.

There is great difference of opinion among electric railway managers as to the desirability of engaging in freight or express haulage. Some claim that if all the expenses properly chargeable to freight operation are included very few electric freight services in this country would be found profitable. Others believe that for most interurban roads and for many suburban roads which have not undertaken this business it presents great opportunities for profit, particularly at the higher rates warranted by the more rapid service given, as compared to that of the steam railroads.

To determine questions like this a correct and comprehensive method of allocating the expenses between the probable early increase in steam railroad rates, is essential. But when this has been done and a decision has been reached no manager should remain under the delusion that the conclusion reached will continue indefinitely to be correct. Such an analysis must be made not once but periodically, as the costs of operation are constantly changing.

We believe, with Mr. Zinsmeister, that the present condition of freight congestion on the steam roads, with the probable early increase in steam railroad rates, makes the topic of very live interest to electric roads at present. It is also true that the recent expansion of the auto trucking business has increased the competition, especially for short distances. Probably the effect of these two factors has been to increase both the maximum and the minimum limits of profitable electric railway haul. In other words, the tendency will be for the electric roads to give up more definitely to the auto truck some of the shorter hauls heretofore found profitable by them and to reach out for certain of the longer hauls which up to this time have been considered to be exclusively the province of the steam road. If this view of the situation is correct, it emphasizes still more the necessity for a systematic and careful analysis of the costs of electric freight haulage.

How About Goods Distribution in Urban Communities?

CAN the electric railway help solve the problem of freight and express distribution from urban trunk line or waterway terminals? We believe this question deserves more serious study than has so far been given to it. The Chicago tunnel has, of course, long performed a useful service and Chicago's Loop District surface traffic problems would long since have been more serious than they are today without this agency. But this is a special case. Our question relates to combined use for passengers and materials. The electric railway, surface or rapid transit, now serves as a distributer for passengers, why not for goods?

New York City now is in a terminal crisis, aggravated by a trucking strike. Other cities have similar physical problems. The delays and consequent cost of surface distribution of goods is mounting enormously. A. H. Smith, president of the New York Central Railroad, recently estimated New York's *daily* loss due to improper terminal facilities as close to a quarter million dollars. The electric railways have facilities which might be utilized for a worthy service here.

What study or trial, for example, has been given to a utilization of the subway facilities for distributing goods from terminals to subdistribution centers? Can the express tracks be used at nights, with cars run off on spurs for loading and unloading? Can New York's elevated tracks be used at nights likewise? How about Chicago's elevated roads at nights for similar service? And Philadelphia's subway and elevated? And Boston's? And main artery surface lines in every other city of appreciable size?

It may not pay. But who knows? Any previous attempts or studies are out of date in today's economic world. We have generally assumed the urban electric railway's field to be for passenger traffic, but why should it not also be for goods traffic? We believe this is one way in which the gross business, and probably the net, of some railways can be increased. Is it not worth the time of some one to see if this business cannot be obtained, or, to put it another way, to find out if the electric railway cannot perform this service to the community?

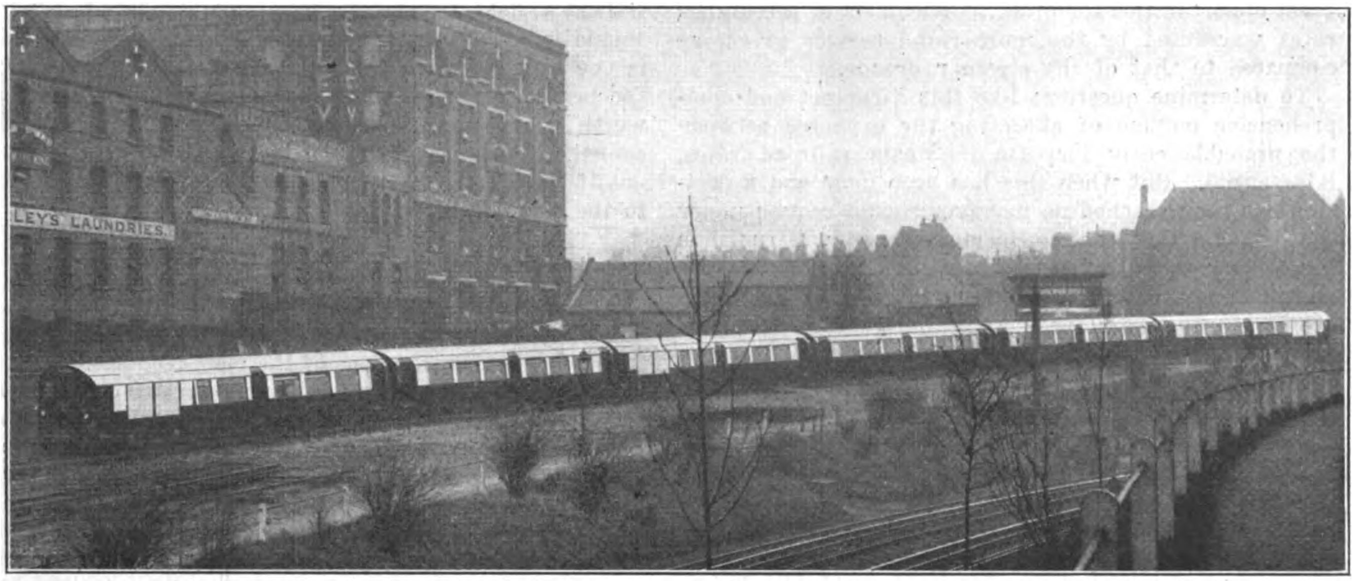
Making the Life of the Joint Equal That of the Rail

IT IS GENERALLY conceded that the problem of rail joint maintenance is one of the most troublesome with which the electric railway engineers have to contend. It is becoming more and more clearly recognized that the requirements of modern traffic, especially in paved streets, demand both mechanically and electrically a continuous rail. Many miles of track have been constructed or reconstructed with welded joints of one type or another, in order to provide as nearly as possible a continuous rail, and many improvements have been made in the various methods of welding rails. These have resulted in a material reduction in the percentage of failures and have overcome defects in the original processes which caused many of the initial failures.

In numerous cases, particularly on the smaller properties where the joints to be welded are comparatively few, the cost of welding by some of the processes is prohibitive because of the high cost of transporting the necessary equipment to and from the work and because of its interference with the operation of the cars. Often it is neither convenient nor practicable to utilize some of these processes for ordinary repair or maintenance, because the work would have to be done during such hours of the night as traffic was off the tracks, and the charges for delays and moving time quickly increase the cost per joint where only a few joints are to be repaired. It was the result of such considerations as these that led to the development of the several types of small portable electric arc welding machines now on the market.

It is extremely important that the continuity of the return circuit be maintained at as nearly 100 per cent efficiency as possible, and comparatively inexpensive equipment has placed the accomplishment of this much-desired condition within the reach of even the smallest companies. The actual methods by which the work is accomplished with any given machine are many and varied, and without doubt the results obtained are equally manifold. Only by experiments along this line, however, can it be hoped to reach perfection, and it is with this thought that we are glad to give space in the columns of this paper to any method which has been tried out long enough to indicate that it results in success and is an improvement over a former method.

In these days of high cost of both material and labor, coupled with comparative inefficiency on the part of that class of the latter which most street railway companies are able to secure, the engineer and maintenance men must work hard to keep this cost within the limits of the amount set aside for the purpose. Experiments in arc welding of rail joints, therefore, must be conducted not only with the idea of reaching a higher degree of perfection in the results obtained but also with consideration of the cost of the completed job. It might be possible to obtain marked success in the mechanical results, while the cost of installing or of repairing the joints would be so high as to make it cheaper to install or repair the joints a second time by some less costly process.



SIX-CAR ELECTRIC TRAIN FOR BAKERLOO-WATFORD SERVICE

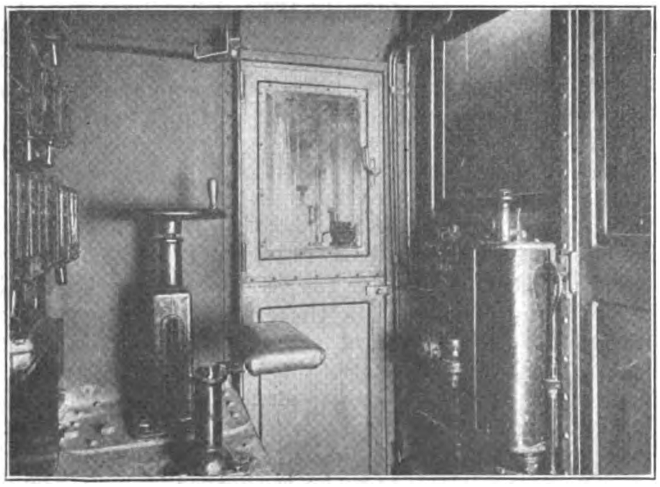
New Cars for the "Bakerloo" Line

The First Train for Joint Operation Over the Lines of the London (England) Electric and London & Northwestern Railways Has Been Placed in Service

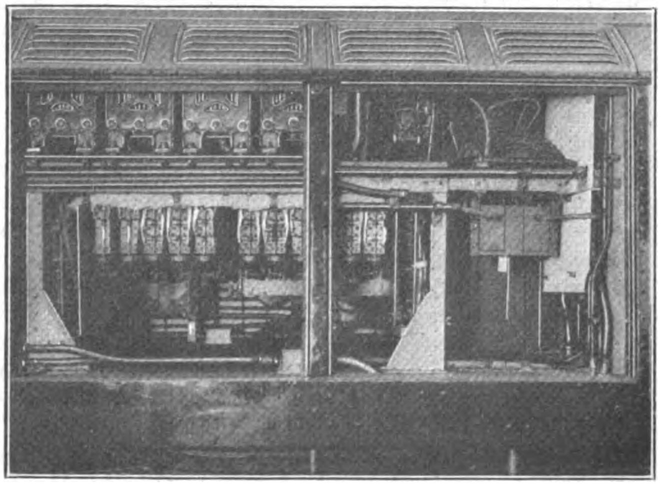
THE first train has now been delivered on the joint order of the London & Northwestern Railway and the London Electric Railway, out of a total of ten multiple-unit trains of this type ordered in 1914. Each train will consist of six cars and will be made up of three motors cars and three trailers. The section of these new cars is made to conform to the dimensions of the "tube" of the Baker Street & Waterloo Railway, as they will operate through this tunnel as well as out into the country over the surface tracks of the London & Northwestern Railway.

The Baker Street & Waterloo Railway belongs to the London Electric Railway and, for brevity, is commonly referred to as the "Bakerloo." This is an underground tunnel line some 6 miles long running from the Elephant and Castle in South London to a junction with the London & Northwestern Railway at Queen's Park, Willesden, in the northwest of London. Some little distance before reaching the tracks of the London & Northwestern Railway the tube line comes to the surface. This extension and the making of a physical connection with the London & Northwestern line were completed two or three years ago, when the newly electrified tracks of the Northwestern company were finished. The electrified tracks of this latter company run out into the country as far as Watford, and the distance which the through electric trains will run from the Elephant and Castle to Watford is twenty-one miles. Direct current at 600 volts, with third and fourth-rail conductors, is employed. When these new cars were ordered in 1914 it was realized that additional rolling stock would be necessary in order to meet the growing requirements, but owing to delay caused by the war these cars are only now being delivered.

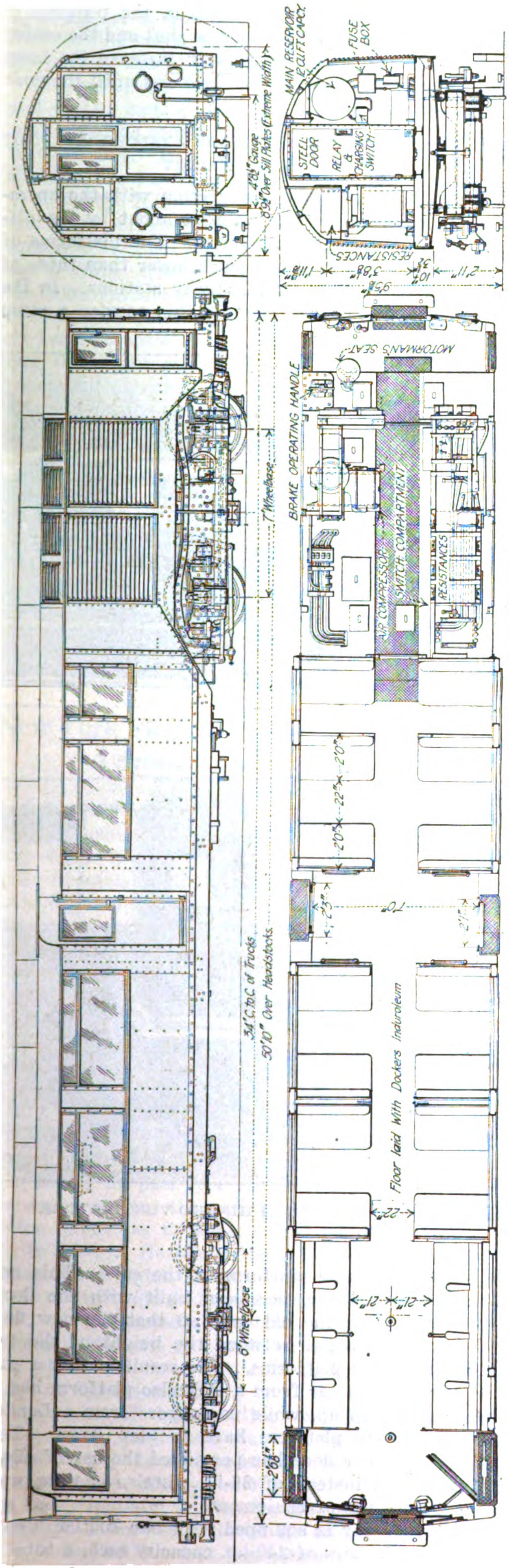
The new cars are being built by the Metropolitan Carriage, Wagon & Finance Company, Ltd., of Birmingham, and are entirely of steel. Both motor cars and trailers are painted with the standard London & Northwestern



VIEW OF MOTORMAN'S COMPARTMENT



CONTACTOR GROUP AND GRID RESISTOR INSTALLATION


MAIN RESERVOIR 12 CU. FT. CAPY.
FUSE BOX
STEEL DOOR
RELAY & CHARGING SWITCH
RESISTANCES
4'8½" Gauge
8'9½" Over Sill Plates (Extreme Width)
MOTORMAN'S SEAT
BRAKE OPERATING HANDLE
7' Wheelbase
AIR COMPRESSOR SWITCH COMPARTMENT
RESISTANCES
34' C. to C. of Trucks
50'10" Over Headstocks
Floor laid with Dockers Induroleum
6' Wheelbase

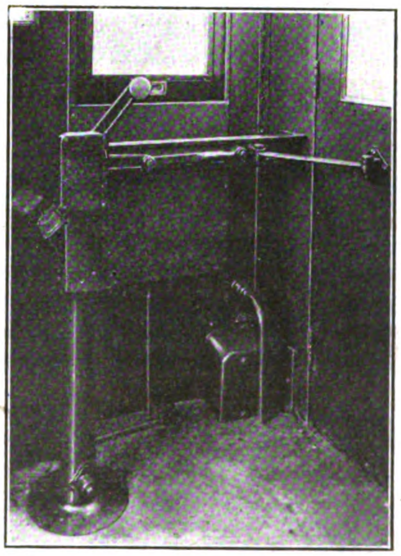
ELEVATION, PLAN AND SECTION OF MOTOR CAR

colors, brown and white. In the interior the steel panels are painted cream color and the roof is of white asbestos millboard. Following are some of the dimensions:

Length over all	50 ft. 10 in.
Width over body	8 ft. 8 in.
Total height from rail	9 ft. 5¼ in.
Distance center to center of trucks	34 ft.
Wheelbase, motor truck	7 ft.
Wheelbase, trailer truck	6 ft.
Diameter of motor driving wheels	42 in.
Diameter of trailer wheels	32 in.
Weight of six-car trains without passenger loads	161 tons

Each motor car seats thirty-six passengers and each trailer car forty-eight, which gives a seating accommodation of 252 passengers per train of three motor cars and three trailers. Ample floor space is also provided so that a large number of standing passengers can be carried when necessary. A combination of cross seats and longitudinal seats is used. The seats are very roomy and are upholstered in red and black.

As will be noted from the interior view of the car, no straps are provided for the accommodation of standing passengers. Near each end of the car two vertical rods run from the floor to the ceiling, one on each side of the door space. These give a hold for passengers standing near the vestibule. The cross seats, which are located a little farther along, are provided with grab handles at the aisle corners. At the center of the car there are short partitions on each side of the center doors and these are fitted with vertical rods, which passengers can grasp. It is believed that this arrangement will be much more comfortable for standing passengers than the strap-hanging arrangement previously used. The provision of hat or light-luggage racks is a novelty in tube car construction.



END DOOR CLOSING MECHANISM, WITH RED AND GREEN LAMPS ON PEDESTAL AT LEFT

HINGED DOORS ARE USED

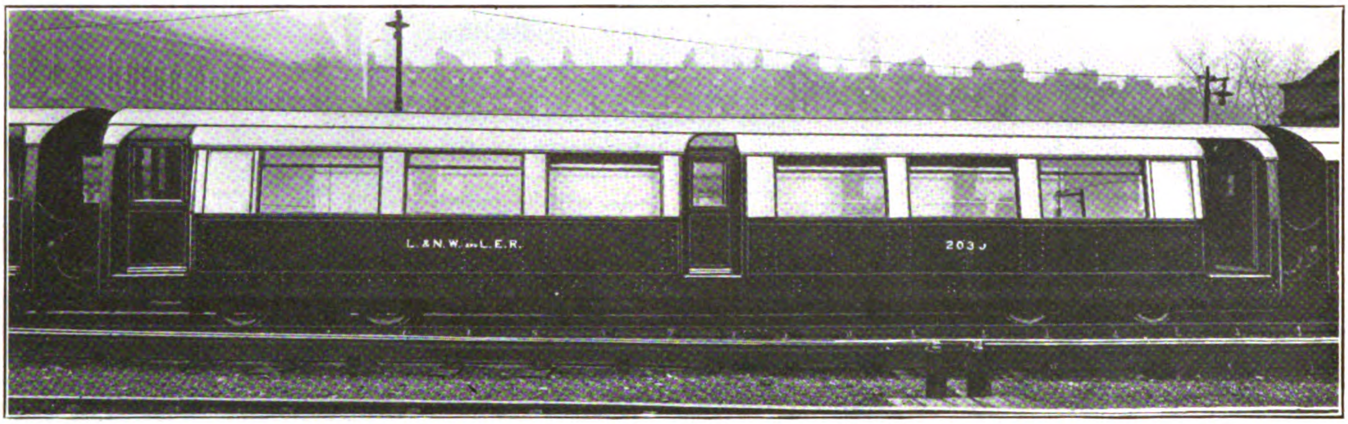
The subject of doors, which is always of importance, presents peculiar difficulties in the case of these cars. Owing to the shape of the upper part of the car body, which is necessary for clearance with the circular tunnel, it is impossible to have sliding doors unless they are placed inside at such distance as to leave a wide outside step. This would be a source of danger. It is necessary that the cars be constructed with no projections which might give a foothold for passengers, as they might get on this ledge while the train was standing at a station platform and as soon as the train started they would be instantly killed by striking the sides of the small tunnel, which begins immediately at the end of the station platform. For this reason previous tube rolling-stock, with one exception, has not been provided with center doors, and all loading and unloading of passengers has had to be done through the doors at the ends of the car. To expedite entrance and exit of passengers and cut down the length of stops the center-door arrangement adopted for these cars was devised for the original Bakerloo and Watford cars and it has been followed with improvements in this new rolling-stock.

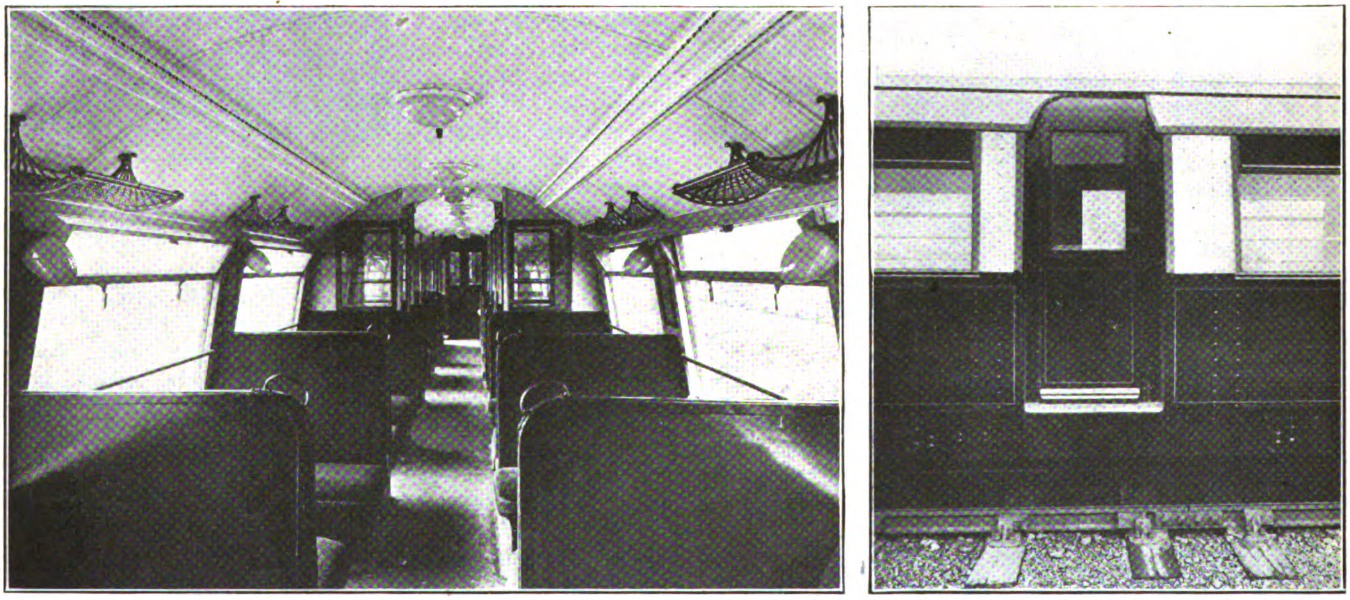
The shape of the car and the type of construction followed thus make it necessary for the doors to be hinged and they are hung to open inward. The end doors, which open onto a vestibuled platform, are worked by a gateman. The center doors cannot be opened unless the end doors are open, and when the latter are closed the center door is shut and locked. Thus the center door is completely under the control of the gateman. It is closed automatically by means of a spring under the car floor, but it is not locked until the end doors are closed. A signal lighting arrangement notifies the gateman when all doors are properly closed. Embodied in the pedestal which holds the mechanism for operating the end doors is a switch which controls the circuit governing the electric lock of the middle door. In this way when the gateman opens the end door he automatically unlocks the center door, and this fact is made plain by the lighting of a red lamp in the pedestal supporting the end-door mechanism. When the end door is again shut it closes the circuit which locks the middle door and a green lamp in the pedestal is illuminated. Should the end door be shut and the center door for any reason be not properly fastened the lamp in the pedestal will continue to show red until the door is properly locked.

STATION PLATFORMS OF THE TWO SYSTEMS ARE NOT OF THE SAME HEIGHT

An additional problem in connection with the operation of through trains was brought about by the different heights of station platforms. The platforms of the tube railway stations are much lower than those of the London & Northwestern Railway stations. In the cars which have hitherto been in this service a ramp was provided on the platform of the cars. This new rolling-stock, however, has been built with the floors 5 in. higher than the old cars, so that the new floor level is a compromise between the height of the two classes of station platforms. The result is that a passenger entering a car from a Bakerloo platform has to take a small step up, while passengers from a London & Northwestern platform have to step down. This raising of the car floor has permitted the use of 42-in. driving wheels instead of 36-in. wheels, as were used on previous types of equipment.

Each motor car is equipped with two British Thomson-Houston motors of 240-hp. capacity each, a total of





AT TOP, TRAILER CAR. DOOR ARRANGEMENT. AT LEFT, LARGE WINDOWS WITH HINGED VENTILATORS. AT RIGHT, CENTER DOOR CONSTRUCTION

1,440 hp. for a six-car train. The gearing provides for free running speeds of from 40 to 45 m.p.h. The trucks are built of steel plates and angles.

The particular type of Thomson-Houston multiple-unit control employed has not been used before in England except on some of the existing cars running on the Watford line. It is of the relay automatic type. In starting, the handle of the master controller is placed in either the full series or full parallel position and the contactors automatically notch up in their correct sequence to this position. A current-limit relay provides the notching arrangement and this operates whenever the motor current drops to a predetermined value. There is no bus line throughout the train, so that each motor car has a potential relay to drop off the contactors whenever the power circuit is opened. Westinghouse air-brakes with quick-action triple valves are used and the truck brakes are of the clasp type.

BOTH CENTER AND SIDE LAMPS ARE USED FOR LIGHTING

Special care has been given to the lighting and ventilating systems. The illumination for each trailer car is provided by nine opal-bowl ceiling lamps and eight small auxiliary lamps located along the sides between the windows. The motor cars have but six of each type of these lamps, as the total area to be lighted is smaller due to the space taken up by the motorman's compartment. A very satisfying light is thus provided which is both strong and diffused. The diffusion is increased by the reflection from the white roof and the cream-colored sides. Emergency lighting is also provided. Current for this is obtained from a small storage battery, which is automatically switched on should the main current fail. Ventilation is provided by the top sections of the windows opening inward on hinges and by a perforated air duct which runs the length of the car.

A further comfort which is not usual in tube railway rolling-stock in England is the use of electric heaters. The temperature of these tunnels even in cold winter weather is never very low, so that it has not been the practice to heat cars used in this service. These cars, however, will be required to make part of their journey in a warm tunnel and the remainder of it in the open country. This change of temperature during frosty weather is irritating to passengers. Electric heaters have therefore been placed under each seat and these can be switched on by the trainmen when the trains are in the open and turned off again, if desired, when they enter the tunnel.

Convention at Bluff Point

New York Electric Railway Association Holds Annual Meeting at Lake Champlain, with an Attendance of More Than Two Hundred—Expenses of Interurban Freight Service Analyzed and Discussed

THE thirty-eighth annual convention of the New York Electric Railway Association, held at Hotel Champlain, Bluff Point, N. Y., was confined to a morning session, with a banquet in the evening, but there was a large and representative attendance and a number of important topics were discussed. In the afternoon the delegates divided to engage in golf and the annual game of baseball between two nines representing respectively the railway men and the supply men, while the ladies participated in a bridge tournament. The annual banquet was held in the evening. The attendance numbered about 225.

The business and technical session of the Association was called to order at 10:30 a.m. by President E. H. Maher, Jr., who summed up the work of the association during the past year in a brief presidential address. He explained that the past twelve months had brought better conditions to some companies in the State, but not to others. He hoped that the situation as regards higher fares which had occurred in the northern part of the State would find a counterpart later in New York City. He expressed appreciation for the services performed during the past year by the executive committee, which had been unstinted in its devotion to the cause of the association.

The report of the executive committee, presented by the secretary, explained that the association had been represented at several legislative hearings during the past session at Albany, and while the association had not been successful in securing the reforms desired the executive committee believed its efforts had not been in vain and at the next legislative session some relief would be granted. The secretary and treasurer reported thirty-five active members, ninety allied members and seven associate members in the association. The receipts, including the balance on hand at the beginning of the year, were $14,372; disbursements, $9,840, and balance now on hand $4,532.

The committee on military operations, which had done good service during the war, was discharged with thanks.

The report of the committee on standards was presented by W. G. Gove. The committee included, besides Mr. Gove, W. J. Harvie, B. Penoyer and J. S. McWhirter. In his report, which was supplemented by a verbal statement, Mr. Gove said the committee was convinced that more could be accomplished by co-operation with the American Electric Railway Engineering Association and in an advisory way with the manufacturers than by independent action. He said that standardization has an important place in the economics of railway operation, but that the most favorable time to secure results was when apparatus was being developed rather than later. He cited the case of the safety car and commended the manufacturers for what had been done in the way of standardization with that design of car. He expressed his belief that the engineering association would be pleased during the coming year to co-operate in any way outlined. The report was accepted with thanks.

The same action was taken with the report of the committee on membership, presented by H. B. Weatherwax, giving the record of changes in membership during the year.

COLLECTION OF REVENUE

Thomas P. Whelly, cashier New York State Railways, Utica, read a paper on the methods followed by his company so far as regards practice in the cashier's office, receiver's office, etc.

All the revenue from Utica city lines, Rome & Little Falls line, city of Oneida, city of Rome, Herkimer, Mohawk, Ilion and Frankfort lines is counted in the Utica city office. Seven of the city lines in Utica have pay-as-you-enter bank box collection.

All pay-as-you-enter boxes are padlocked to the car and all banks in the boxes have a stenciled number on the cover. This number is visible through a slot in the door so the conductor can make up his record. The conductors on these cars are provided with a bank of $6 for change, $4 in nickels and $2 in pennies, and all conductors are provided with city tickets. Change stations are maintained at junction points where necessary.

The banks in these fare boxes are removed by the receiver at the stations every night, and an empty bank is placed in the fare box as each car completes its run. The receiver makes a report of the number on each bank which he removes from the car and also the number of the bank with which he replaces it. The banks can readily be checked from this report each morning. An additional check of the banks operated is made by the accounting department from the conductor's reports. The receivers at the stations inspect all bank-box collection cars every night and report each car, showing the cars that are in the shop for repairs and those that have not been in service during the day. The cash boxes containing the money are placed in the receiver's cage at the station until morning, when they are brought to the office by two armed men in an auto truck. They are checked and opened at the office, the tickets are sorted from the money and the money is put into a coin counter, where it is sorted, counted and wrapped ready for the bank. It requires three men to perform these operations.

The receipts from the other city lines and the Rome & Little Falls line, which are open collection, are turned in by conductors at stations, upon completion of their runs, to the receivers, who check the receipts and give the conductors receipts for their money. This money is made up into a deposit by the receiver and placed in a leather padlocked money bag and taken directly to the bank in the morning by the same truck which calls for the boxes. A duplicate deposit slip with a statement of each conductor's turn-in goes to the main office, and later in the day this duplicate slip is receipted by the teller at the bank and becomes a permanent record.

The receipts from the Rome city, Oneida city and Herkimer, Mohawk, Ilion and Frankfort lines, which are open collection, are placed in canvas bags by conductors at their respective stations and deposited in safes which are equipped with a hopper top. Each morning these bags are removed from the safe by the division superintendent, who checks the number of bags with the number of runs operated the previous day and places them in a locked box, which he chains to the brake handle in the front vestibule of a regular passenger car bound for Utica. At Utica these bags are taken to the main office and are checked by two tellers. Each box has a blank receipt calling for the number of remittances in the box, and this is receipted by the teller who opens the box.

All express and ticket office receipts are put up in sealed envelopes by the agent in charge of each station and are collected each day by an express messenger, who gives receipts to the agents for them. These envelopes are brought to the Utica office, where they are checked by tellers. This money is then made up into a deposit and taken to the bank.

In Syracuse the system of handling the money is the same as at Utica.

There was no discussion of Mr. Whelly's paper.

A brief paper, on which there was also no discussion, on the reduction of transfer abuse was then presented by Charles A. Coons, general superintendent United Traction Company, Albany. His company, Mr. Coons said, serves a population of about 300,000 in Albany, Troy and neighboring cities. Several years ago the company put into effect a transfer giving the direction and also showing a map, and the issuing conductor was instructed to punch the points where the passenger boarded the car, where he changed cars and the direction he desired to go. This transfer was good for thirty minutes after the time punched. In most cases this meant unnecessary time, offering opportunities to the passenger to abuse the transfer privilege.

About five months ago a line-for-line transfer was substituted for the direction transfer, with the time limit reduced from thirty to fifteen minutes. The name of the issuing line is printed on the face of the transfer and the transfer points are printed on the back for the information of passengers. A transfer instruction book was issued to the conductors for their guidance in issuing and receiving transfers. On several lines where it is possible for passengers to make a round trip for one fare conductors were instructed not to issue a transfer, but to advise passengers to board a car going in the opposite direction and transfer to the line they wish to ride on, where such a plan would make it impossible for a passenger to make a round trip for a single fare. The new system was well advertised and was put in service on June 6, 1920. So far it seems to be giving general satisfaction.

COST OF INTERURBAN FREIGHT SERVICE

A paper on this subject was then presented by W. K. Zinsmeister, auditor and treasurer Rochester and Syracuse Railroad. It outlined a proposed system of freight accounts and will be found in abstract elsewhere in this issue.

In the discussion which followed, R. C. Cram, Brooklyn, referred to the high expense for track maintenance often caused by the operation over track of heavy freight cars. He said that some time ago the Brooklyn Rapid Transit Company had a contract with the city of New York by which ashes were hauled over its tracks to dumping points in 40-ton cars, and it was found later that the tracks leading to these dumping points and other tracks used extensively by these cars deteriorated more rapidly than tracks used exclusively by passenger cars. Mr. Cram said that the tendency in passenger car construction now was toward lighter equipment and consequently toward lighter track construction. Hence, any rate set up for the use of tracks by freight cars should include allowance for such additional wear as would be caused by heavy cars.

NEW OFFICERS ELECTED AND OTHER BUSINESS

Edward F. Peck, chairman of the nominating committee, then reported the following nominations, which were unanimously confirmed:

President, T. C. Cherry, Syracuse.

First vice-president, W. O. Wood, New York.

Second vice-president, B. E. Tilton, Syracuse.

Secretary and treasurer, W. F. Stanton, Rochester.

Executive committee, the officers and George Keegan, New York; W. J. Harvie, Auburn; W. G. Gove, Brooklyn, and E. J. Dickson, Buffalo.

The newly elected president, Mr. Cherry, after being escorted to the chair, expressed his appreciation of the honor of his election and asked for the co-operation of the members in carrying out the purposes of the association.

Mr. Peck then presented a set of resolutions expressing the grief of the association at the death during the past year of Edgar S. Fassett, past president of the association.

The resolutions said, in part:

> The qualities of heart and mind, the genial, lovable personality which endeared him to all who knew him forbid that his memory should ever fade from our minds. The loss that we have sustained is irreparable, and by this memorial we record our sorrow at his demise and our appreciation of his services to this association and to the industry in New York State.

After the unanimous passage of this resolution and of one expressing the thanks of the association to the retiring officers for their services during the past year the meeting adjourned.

The Banquet

At the banquet in the evening two of the speakers who had been scheduled to present addresses were prevented at the last moment by circumstances beyond their control from attending, but sent letters which were read by the toastmaster.

One of these letters was from the Hon. John A. Barhite, a member of the Public Service Commission, Second District, State of New York, who explained that he was kept away by illness and then said, "My experience in the Public Service Commission for the past three years has made me deeply interested in the transportation systems of the country. We cannot do without them. Every citizen who has the future prosperity of the country in mind ought to recognize this fact and should be willing to lend a helping hand to promote the success of our steam and electric roads."

Hon. William B. Wilson, United States Secretary of Labor, who also hoped to have been in attendance, wrote, in part: "It would have been a source of very great pleasure and satisfaction for me to have been present at the banquet of the New York Electric Railway Association, because you gentlemen are engaged in one of the most important activities affecting the progress of civilization."

In spite of these absences a very acceptable program was provided and carried out. Retiring President E. A. Maher, Jr., acted as toastmaster and the two principal speakers were Douglas Malloch, president of the Chicago Press Club, and Senator Ashurst of Arizona. The address of the former contained many epigrams and hits on the foibles of the day. Senator Ashurst spoke of the basic nature, in our civilization, of transportation and the justice of rates which will yield a fair return to the investor. In this connection he said that the recent increase in fare in the city of Washington to 8 cents was not considered unreasonable there. The latter part of Senator Ashurst's address was an advocacy of a change in the Constitution of the United States by which future amendments to that instrument would have to be approved by popular vote.

Between the addresses of these two speakers Mr. Maher awarded the prizes for the athletic events of the afternoon. The golf prizes went to W. O. Wood and R. E. Hamilton, and a brown derby hat was given to Alex. Cameron as captain of the supply men's team, which won the baseball game in the afternoon.

Mr. Maher also read a telegram from the New England Street Railway Club inviting those present to join the outing of that club in Montreal on June 29-30. A similar invitation in behalf of the officers of the Montreal Tramways Company was warmly extended by A. Gaboury, superintendent Montreal Tramways and president Canadian Electric Railway Association, who was present at the banquet and urged those present to take this opportunity to visit Montreal.

A feature of the banquet was a number of choral selections given by a quartet made up of representatives of the United Traction Company of Albany, led by H. B. Weatherwax, vice-president of the company.

Report Issued on London Traffic

Needs for Centralized Regulation, Co-ordination and Better Fares Are Emphasized

THE Ministry of Transport, through its advisory committee on London traffic, has presented to Parliament a report which was adopted unanimously by the committee on March 18, 1920. The report first discusses work already accomplished in traffic control. The latter includes the special regulation of slow buses. Buses may no longer be hailed at any point but have four regular and two optional stopping places per mile. Efforts to reduce peak loads by staggering working hours have been inaugurated through the Treasury, the London Chamber of Commerce, the Early Closing Association and the National Union of Clerks. Pending the appointment of a permanent regulating body (traffic authority) by act of Parliament, the committee recommends the continued existence of an advisory committee, assisted by a technical committee, representing every interest.

PRESENT AND FUTURE NEEDS

Under this heading, the committee presented the accompanying table to show that London traffic has outgrown its facilities:

TABLE SHOWING LONDON TRAFFIC BY FORM OF TRANSIT

	Number of Passengers in Millions				Rides per Inhabitant
Form of Transit	1905	1914	1918	1919	1919
Tube railways	69	147	254	266	36
District railways	56	85	133	140	54
Other local railways	180	172	223	253	
Total local railways	305	404	610	659	
Street railways	478	844	992	1,053	143
Motor buses	291	757	682	861	117
Grand total	1,074	2,005	2.284	2,573	350
Population in thousands	6,858	7,420	6.784	7,357	. . .
Riding index	157	270	337	350	. . .

In addition, it is estimated that during 1919 the suburban traffic on trunk lines was 486,000,000, thereby increasing the number of rides per inhabitant per annum to 413.

It is admitted that further growth of the private London transportation systems is impossible today because they yield an inadequate return upon investment and in some cases they are not even meeting their operating expenses. Generally speaking, each undertaking ought to pay its own way. This has not been the case with the components of the London combine (tubes, buses and suburban tramways which are under one ownership), and such a policy may not always be practicable. Nevertheless, the issue is raised anew when the suggestion is put forward that fares should be substantially increased on a paying system in order to help a poorly paying member of the combine. The committee is convinced that with proper legal safeguards and better co-ordination of the several modes of transportation co-operative financing is justifiable.

When it comes to providing new money for transport schemes of admitted public importance but doubtful financial worth it may be necessary for the state or municipality to render some aid, as implied by Section 17 of the ministry of transport act.

CLEVELAND'S FRANCHISE MENTIONED

In discussing fares, the committee notes that the present laws specify the maximum rates permissible on railways and tramways, but the only curb on the motor bus is that imposed by the rates of its regulated competitors. Regarding fare regulations in general, the committee makes this significant statement: "We do not suggest that the traffic authority should have the power to fix or vary fares, for the obvious reason that these control the methods of operation, and any traffic authority claiming powers to settle the terms on which passengers are to be carried must be prepared to subsidize or, in case of need, to operate." However, the committee adds that when important variations are proposed the regulatory body should have the right and power to call for the production of all books and to require personal inspection of operating methods.

The committee then refers to the Cleveland service-at-cost franchise, including the arrangement for a city traffic commissioner, and says: "This franchise has become noteworthy in the United States, as other tramway undertakings have adopted it as a standard to which they look for a solution of the difficulties now besetting them, and it may be that, in time, we shall have to contemplate the adaptation of this principle to London."

The committee recommends that a bill be placed before the House of Commons by the Ministry of Transport to embody the following points as a basis for reaching a conclusion: (1) The present value of the share capital on which a reasonable rate of return should be paid; (2) rate of remuneration considered reasonable; (3) percentage of increase in fares necessary to attain a sound operating basis.

In conclusion, the committee suggests the character of personnel desirable for a regulatory body, practically along the lines of American public service commissions (a chairman and two commissioners). This body would not have to deal with most of the obstructive veto powers hitherto exercised by the London boroughs, but as a body with delegated powers would be subject only to the veto power of the Minister of Transport.

An appendix contains detailed statistics covering the traffic and finances of the larger transport undertakings in London, including the London County Council Tramways. A notable item in these reports is that the present replacement cost of rolling stock would be two and one-half to three times the original cost. This condition, which applies also to other items, is a hard blow to the reserve and depreciation funds which had been set up on the basis of pre-war costs.

Energy Output Statistics

THE figures of kilowatt-hour output of public utility plants in the United States for the first three months of 1920 have just been published by the United States Geological Survey. The figures are based on the returns of about 2,800 power plants of 100-kw. capacity or more engaged in public service, including central stations, electric railways and certain other plants which contribute to the public supply. The capacity of the plants submitting reports of their operations is about 90 per cent of the capacity of all plants listed. The average daily production of kilowatt-hours for the three months was as follows: January, 124,600,000; February, 119,800,000; March, 121,800,000.

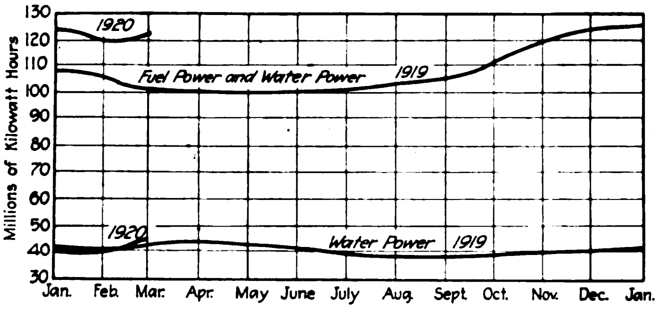


CHART SHOWING AVERAGE DAILY PRODUCTION OF KW.-HOURS BY PUBLIC UTILITY PLANTS IN THE UNITED STATES, 1919 AND 1920

The following figures relate to the year 1919: Total kilowatt-hours produced, 38,900,000,000, of which 37.9 per cent was produced by water power and 62.1 per cent by fuel. The total fuel consumption was: Coal, 35,000,000 short tons; oil, 11,050,000 bbl., and gas, 21,700,000 M. cu.ft.

Living Cost Doubled Since 1914

THE United States Department of Labor announced on May 2, 1920, that the cost of living in fourteen industrial cities of the country had more than doubled in the last five years, comparing the figures for December, 1919, with those for December, 1914. The highest percentage of increase was 107.87 for Detroit, with Norfolk second at 106.19. New York City ranked third with 103.81. Others in their order were Buffalo, 102.65; Jacksonville (Fla.), 102.14; Houston, 101.70; Chicago, 100.61; Savannah, 98.68; Baltimore, 98.40; Philadelphia, 96.49; Cleveland, 95.05; Mobile, 94.54; Boston, 92.30, and Portland (Me.), 91.59.

The accompanying table shows in detail the changes in New York year by year:

Items of Expenditure	Per Cent of Total Expenditure	Per Cent of Increase from Dec., 1914, to Dec., 1919				
		1915	1916	1917	1918	1919
Food	42.0	1.34	16.26	55.28	82.62	90.95
Clothing:						
Male	....	4.78	20.32	51.40	126.39	201.26
Female	....	4.87	24.73	57.63	137.15	234.97
Total	16.6	4.82	22.31	54.21	131.25	219.66
Housing	14.3	*0.10	*0.05	2.63	8.47	23.39
Fuel and light	4.3	*0.06	10.98	19.92	45.47	50.63
Furniture and furnishings	3.3	8.43	27.60	56.47	126.51	172.92
Miscellaneous	18.7	1.97	14.91	44.68	70.01	95.82
All items	....	1.97	14.91	44.68	77.28	103.81

* Decrease.

The Place of the Bus—V

Inherent Difficulties Concerning Satisfactory Motor Bus Regulation—Only Way Out Seems to Place Responsibility for All Mass Transportation Up to One Agency

BY WALTER JACKSON
Consulting Engineer

KNOXVILLE - DANDBRIDGE

A MOTOR BUS FOR CROSS-COUNTRY SERVICE

WE HAVE seen that more than fifteen years of motor bus operation in Great Britain has not yet led to legislation that places the electric car and the motor bus on the same plane of responsibility and taxation. It must not be assumed that this delay is due altogether to national inertia and that we Americans will settle our motor bus problems overnight. The fact is that the omnibus covers so wide a range, from the simple job of hacking from a railway station in connecting with each train to functioning exactly like a street railway, that adequate yet fair legislation is really difficult. A regulation concerning liability bonds, for example, might be absolutely fair and necessary to curb a city busman and at the same time be most unjust to the rustic operator who wants to give the public something better than two trains a day.

The fact that individuals can often run routes for less cost than a large organization discourages the formation of the latter, thus making regulation much harder. For example, a company with an established system of accounting could not readily deceive the municipality on so simple a matter as paying a fixed proportion of the gross receipts into the city treasury. On the other hand, it is impossible to supervise the doings of hundreds of individual operators, not only with regard to their earnings but with regard to their compliance with essential service and safety regulations. The individual ownership of the buses and the condition that they, at least temporarily, enhance the transportation service of the community also lead to a measure of public sympathy that makes motor bus legislation unpopular and its enforcement difficult.

Historically, of course, the bus is derived from the stage coach and the cab. In the old days all of these vehicles operated at fares and under conditions so different from those obtaining on horse and steam railways that no one thought of placing the two public services in the same category. But while the horse bus had to give way to the horse car, the wonderful improvement of the internal combustion engine, the development of the rubber tire and the advent of smooth, durable paving have made the line of enonomic demarcation between their power-driven successors much less distinct.

If, for example, the street car charges 5 cents and is available at five to twenty minute intervals for twenty hours a day it will suffer no harm whatever from a motor bus service which charges, say, 25 cents for a like distance and which is available only during hours that the operator himself selects. In this case it is clear enough that the busman is really a hackman and naturally is subject only to those demands concerning character, license and safety of vehicle that have been characteristic of stage operation.

Mark now the change in his status if he decides that it is more profitable to carry more passengers at the street railway rate. He is no longer a hackman, temporarily renting his vehicle for the exclusive use of the first patron or group of patrons. His vehicle becomes an omnibus—literally a *carryall*—whereby he not only cuts deeply into the earnings of the street railway but is also morally bound to accept the same obligations and burdens as the street railway.

The many novel problems involved in this transition, with its concurrent appeal to the public's appetite for low-cost service regardless of high-cost prices, are only now nearing solution in Great Britain. Yet the electric railways of Britain, so largely municipalized, did not have to meet the "Here's a chance to get square" tactics that are characteristic of conditions here. It simply has proved easier to control an industry which has a fixed track with some claims to right of way than one whose pathway is the common road.

The writer, of course, is aware of the mass of anti-jitney legislation that has been passed, amended and discarded since the coming of that jaunty vehicle in 1914. These anti-jitney ordinances, however, do not go so far usually as to be a real handicap to the operators of thirteen to twenty-four seat buses in good short-haul territory. They are drawn up primarily against the small touring car, which is generally put out of the running by a $5,000 to $10,000 liability bond; not so with larger buses taking in $30 a day or more. Also, clauses concerning reliability of service are not readily enforceable against individuals who have no time-table departments to spread before a censorious public service commission.

In spite of the commendable co-operation that has been manifested recently between electric railways and civic committees, notably in the cities served by the Eastern Massachusetts Street Railway, there is no reason to expect the permanent elimination of the competitive bus through any other tactics than the giving of headways that are short enough to wipe out the jitney driver's margin of profit.

Nevertheless, as there is an ever-growing field for the motor bus used legitimately and used advantageously, it behooves us to study the general trend of motor bus regulation with a view to seeing what impositions an electric railway would be likely to bear if it undertook to operate co-ordinating services. To this end there is presented a summary of motor bus and motor truck legislation, based partly upon direct research by the writer in connection with studies for clients and partly upon the recent state by state compilation of vehicle charges issued by the American Electric Railway Association.

GREAT VARIATION IN LICENSE RATES

The association circular indicates at a glance the total absence of any systematic or uniform state taxation. In South Dakota and Wyoming no registration at all is required, whereas neighbor Idaho has a scale reading: 30 hp. or less, $15; 31 to 40 hp., $20; 41 to 50 hp., $25; more than 50 hp., $40. One might look for more uniformity in the better-populated states where motor trucks and buses have been a factor for some time. Here we find that Maine is content with a flat charge of $10, that Massachusetts charges $5 for the first ton and $3 for each additional ton, that Vermont is kind to old customers by charging $1, 75 cents and 50 cents per horsepower for successive annual registrations, that New Jersey recognizes the existence of trailers and that Pennsylvania knows that a pneumatic-tired vehicle should be assessed less than one with solid tires. There is the widest diversity also in charging by the horsepower or by the ton. However, no matter what the method of charging, the assessments cannot be said to be onerous or in any likely proportion to the wear caused to the roadways if comparison be made with the British petrol tax and road upkeep charges (see Article II for details).

SOME STATE REGULATIONS IN DETAIL

A step forward in differentiation between passenger and freight motor buses is presented by the Maryland law which became effective July 1, 1918. Vehicles weighing between 3,000 lb. and 7,000 lb., inclusive, pay annually 1/16 cent per seat-mile operated, while those weighing more than 7,000 lb. are to pay 1/6 cent per seat-mile operated. Thus a fifteen-seat bus coming in the first category and making 30,000 miles per annum would pay practically $300 or $600 for two such buses. A single thirty-seater would weigh in excess of 7,000 lb. and on the basis of 1/6 cent per seat-mile would pay 30,000 multiplied by 5 or $1,500 per annum. This gives 5 cents per bus-mile for a thirty-seat vehicle, assignable largely to road upkeep, compared with less than 1 cent per mile for way and structure charges on one all-safety car system. On the same railway all taxes plus way and structure are still well below 5 cents per car-mile. So far as Maryland is concerned, therefore, large buses have little chance if in direct competition with modernized electric railways assuming worth while traffic density.

Reliability of service is also called for by specific co-operation between the Motor Vehicle Commission and the Public Service Commission. The latter authorizes operators to run over given routes and the former furnishes the necessary markers or plates. No deviation from the specified route or schedule is permitted unless authorized in writing by the Public Service Commission, a copy of the revised order going to the Motor Vehicle Commission, for the purpose of readjusting the charges. As previously observed, it is easier to enforce both of the Maryland regulations, namely, seat-mile charge and service responsibility, on a company than on the individual.

The freight motor bus law of Maryland says in effect that 1/5 cent per ton-mile shall be paid for vehicles weighing 3 tons or less, 1/10 cent per ton-mile for vehicles weighing 3 to 6 tons, inclusive, and 3/5 cent per ton-mile for vehicles weighing more than 6 tons, carrying capacity included in all cases.

Although Providence, R. I., has a well-organized bus company in competition with the Rhode Island Company, over the same streets, there is no state or municipal law to regulate its operation as a public utility or to demand proof that public necessity and convenience require bus service. The Rhode Island Omnibus Company annually pays $50 per bus to the city, $10 to the State as registration fee for a 22.2-hp. vehicle and $20 as a State tax on public service vehicles. This gives a total impost of $80 a year for a twenty-three-passenger vehicle. A. Luff, president of this company, told the writer that he would be perfectly willing to pay the city a fixed percentage of gross earnings if permitted a monopoly of bus business.

So far as the State laws are concerned, the following charges are set forth for 1919: Registration fees, $5 for automobiles up to 15 hp., $10 for more than 15 hp. to 30 hp., $15 for more than 30 hp. to 40 hp. and $25 for automobiles in excess of 40 hp. Motor trucks of 1 ton or less pay $7, of 1 to 2 tons $10, of more than 2 to 3 tons $13, of more than 3 to 4 tons $16, and so on up to $40 for motor trucks in excess of 9 tons carrying capacity. Special permits are issued for trailer operation, $10 being charged for vehicles over 2 tons and not more than 5 tons, $20 for vehicles over 5 tons and not more than 10 tons, and $30 for vehicles more than 10 tons, load included in each case. One important rule with regard to the safety of electric railway passengers is that a self-propelled vehicle must not pass a trolley car stopped to receive or discharge passengers on the side between the car and the curb.

CONNECTICUT STATE AND CITY PRACTICES

The motor vehicle laws of the State of Connecticut define a "public service motor vehicle" as including "any motor vehicle used for the purpose of soliciting and receiving passengers upon any public highway or carrying such passengers upon the payment of an individual fare, but shall not include omnibuses running regularly between railway stations or boat landings and hotels." The registration fee for a public service motor vehicle seating five persons or less is $15, plus $2 for each additional seat in excess of five and including twenty; $5 for each additional seat in excess of twenty and including forty, and $10 for each seat exceeding forty. However, almost all jitney buses used in Connecticut seat less than twenty. These fees are in addition to the usual motor vehicle registration fee of 50 cents per horsepower.

Those who desire to operate public service motor vehicles must procure a certificate from the local chief of police or first selectman before the State Commissioner of Motor Vehicles grants the special license required in such operation. While the applicant has the right to appeal to the Commissioner if this local permission is not granted, it would hardly help his health to do so. In practice, therefore, the municipality can exercise considerable control over bus operations, as in the case of Bridgeport. The personal State license of the operator of a public service vehicle is $5.

Another part of the law, "more honored in the breach than in the observance," states that: "No public service motor car shall carry any person upon the running boards, mud guards or hood, nor shall the total number of persons carried at any time exceed two persons more than the regular seating capacity." It would be almost unnecessary to impose any other form of taxation if the penalty of $25 per offence were really collected. The rather involved rule about refraining from passing a street car which has stopped to take on or discharge passengers is another legislators' ideal quite unenforceable in practice.

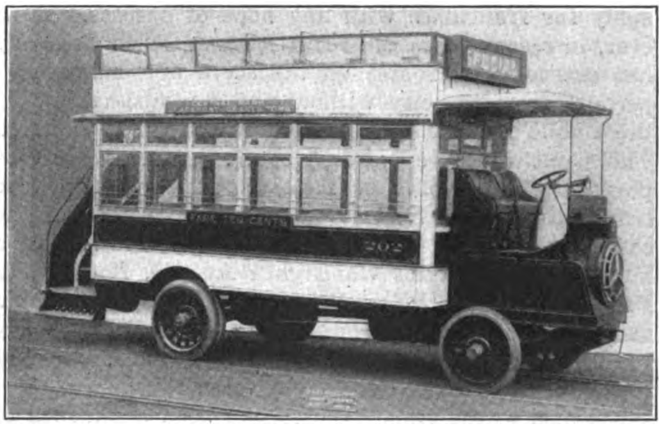
The Connecticut law does not permit towns, cities or boroughs to regulate the speed of motor vehicles, their lighting and their accessories. The powers remaining are those that relate to sanitation, stoppage of all vehicles in the case of processions, parades, etc., and the establishment and enforcement of ordinances fixing traffic routes and public stands for public service motor vehicles. The speed regulations prohibit vehicles from passing a standing street car at more than 10 m.p.h., and of running in thickly settled portions at more than a rate of 20 m.p.h. for a quarter of a mile.

Operators of public service vehicles must display a State sign to show that they are engaged in jitney or taxicab service, and if in the jitney service the standard fare must be shown. The first violation of this rule brings a fine of $25 and a second violation brings indeterminate suspension. These signs are independent of the route signs such as are supplied through the Police Department of Bridgeport. The liability bond to be taken out with an approved surety company varies from $5,000 to $10,000.

Because of the extraordinary traffic development in Bridgeport, the chief city of Connecticut, the Board of Police Commissioners of that city had to adopt heroic methods to minimize congestion. The great traffic center of Bridgeport for every kind of vehicle is the intersection of Main St. and Fairfield Ave., respectively 34 ft. and 33 ft. narrow. No public service vehicle may be operated without the consent of the board. The police may refuse to issue a permit on the simple ground that a given route is already overcrowded and it may, and does, oblige the bus operator to run from terminal to terminal of the routes over which bus operation is permitted. In fact, the more important routes have starters to maintain proper headways. These starters are paid by the drivers. An early evil was the tendency of drivers to cut back in the very center of the city in order to confine their operations to the fat side of a crosstown route, but this is no longer permitted.

Until late in 1919 an approved operator could purchase three standardized route signs from the Police Department at $1.25 each and was at liberty to change over any time to any of the routes for which he had a sign. At the instance of the older and more conscientious operators an ordinance was passed specifying that a driver may obtain only one sign at a time and must give twenty-four hours' notice of a desire to change to another route.

In addition to the effective traffic control under the direction of Capt. Charles A. Wheeler, the Police Department also warns the operators on such matters as exhaust whistles and muffler cutouts. The popularity of jitney service at Bridgeport must also be due in good measure to the close scrutiny over the doings of the bus operators. Captain Wheeler, for example, keeps a continuous inventory of every man and his route. Even their visits out of town are noted, as when some adventurous ones left to try their fortunes on Mayor Hylan's New York lines.


A FIFTH AVENUE DOUBLE-DECK BUS

MATTERS MIXED IN NEW YORK STATE AND CITY

Before adverting to the law surrounding de luxe and jitney motor bus operation in New York City a glance may be taken at a decision made by the Public Service Commission of the Second District (outside New York City) which vividly illustrates the dangers that must be faced by an electric railway because of the anomalous "is it a special service or is it a utility" position of the motor bus.

During the year 1916 a certificate of necessity and convenience to run a motor bus line was granted by the Public Service Commission to a realty organization in Albany known as the Woodlawn Improvement Association. In over-ruling the protest of the United Traction Company the commission said:

> "In the opinion of the commission, the consent of the city to the operation of a bus or stage route required by section 26 of the transportation corporations law is not the granting of a franchise within the meaning of section 37 of the second class cities law. It is more in the nature of a license, such as those issued to hackmen and others."

The railway had urged that the authority of the Common Council was not valid because the permit purported to be a franchise, and as such had not been sold at auction to the highest bidder as the law required.

The commission did not admit the railway's plea that this competition was unjust, because the proposed bus route was 2,500 to 4,000 ft. from the nearest street railway in a fast-growing residential section and because a street railway route for the same street had been urged in vain. Despite the fact that the bus route was to start at the Union Station, the city's traffic center, the commission would not take cognizance of the fact that the buses necessarily would pick up possible railway patrons who were not going to the locality for which this service was specifically desired. This is not mentioned in criticism of the commission but as a proof that electric railways cannot afford to let others do something that will cause the loss of short-haul riders when it can undertake co-ordination instead of competition.

The situation is decidedly confused as regards New York City. The original rights of the Fifth Avenue Coach Company were obtained as standard monopoly franchises granted jointly by the State and the city. Between 1900 and 1913 the State law was so worded that only previously existent companies (and the Fifth Avenue Coach Company was the only company) could apply for franchises with any hope of success. However, in recent years the Fifth Avenue Coach Company has extended its routes on the score of "emergency" permits from the city without the specified review by the Public Service Commission of the First District. This point was raised adroitly by W. P. Burr, when Corporation Counsel of New York City, in a hearing held before the Public Service Commission concerning the complaint of residents against the establishment of a municipal bus service via Eighth Avenue, Borough of Brooklyn. If the Fifth Avenue Coach Company could exceed an emergency permit (because of a Billy Sunday revival) by two years or more, he argued, the city itself surely had the same right when it came to serving people whose trolley routes had been abandoned or disrupted. A few weeks later the complaint was withdrawn.

The Fifth Avenue Coach Company pays a city tax of 5 per cent on its gross earnings, the local license tax of $20 per vehicle, the State license tax, income tax, property tax, etc. For the fiscal year ended June 30, 1919, taxes amounted to 6.02 cents per bus-mile. As the total earnings were 46.27 cents per bus-mile, taxes alone amounted to 13 per cent. It will be seen that the Fifth Avenue Coach Company has not been overlooked by city, State or nation.

In contrast we have the New York municipal buses. So far from paying anything into the State or city treasuries, they actually enjoy substantial subsidies. The Department of Plant and Structures, city of New York, which controls the service, furnishes the schedules, route signs, supervisory personnel, etc., without charge. The bus drivers carry no liability bond, nor does the city expect them to do so, because this scratch operation is confessedly temporary. The city on Friday, March 12, appropriated $1,140,000 for the purchase of 200 buses, so that the busmen can hardly be blamed for refusing to take out a bond costing close to $500. Responsibility for accidents lies definitely with the city.

Until jacked up by the Secretary of State, the municipal busmen had also refrained from paying anything to the State treasury. Under the New York law registration costs 25 cents per horsepower plus 40 cents for each $100 of original list price if the machine was made after Jan. 1, 1917. Grover A. Whalen, Commissioner of Plant and Structures, estimated on November 6, 1919, that the bus license costs would range from $15 for a five-passenger bus to $67.50 for a thirty-passenger bus. The driver's license would cost another $5.

California Sunshine Great Helf for Automotive Vehicles

The combination of a splendid climate and excellent roads has led to a most extraordinary development of public utility motor truck and motor bus services in California. As this development has also accelerated automotive legislation, some regulations can profitably be presented as indicative of legislative needs that will have to be met in other States. Fortunately, there is at hand for this purpose an article on "Passengers and Freight Carried More Cheaply by Motor Transport than by Railway," by K. Q. Volk, published March 18 in the *Engineering News-Record*. An abstract of part of Mr. Volk's article follows:

Under Chapter 213 of the Laws of 1917 the California State Railroad Commission received jurisdiction over all public utility motor vehicles operating between fixed termini, one or both of which are outside the incorporated limits of a city or town. The commission may fix rates, classifications and rules and regulate the accounts, service and safety of such companies, which jurisdiction shall supersede any conflicting jurisdiction exercised by municipal or county authorities. This act, amended in 1919, further provides that any one desiring to engage in stage or truck transportation between fixed termini must obtain a certificate of public convenience and necessity from the Railroad Commission. To secure such a certificate, the applicant must state the places and intermediate points between which he desires to operate, the proposed fares, rules and regulations covering service, copy of his proposed schedule, description of equipment to be used, name of company and its officials, name of line, steam railroads and electric railways operating between points he expects to serve and general conditions of operation and service upon which the applicant bases his justification for a certificate.

Holders of certificates are not limited by the commission, but may be locally, as to the amount of money they may borrow to develop business. The State demands no license fee for commercial motor carriers other than the annual registration fee demanded for all automobiles and trucks (40 cents per horsepower if pneumatically tired; solid tired vehicles less than 2 tons unloaded pay $5 more; 2 to 3 tons, $10 more; 3 to 5 tons, $15 more; more than 5 tons, $20 more).

The license fees charged by counties and municipalities vary from nothing to $200 a year for the initial vehicle and $25 for additional cars, the standard of the city of Ontario in the case of interurban service. Other communities base their rates on seating capacity, as Riverside, which charges $12.50 per seat per annum. Los Angeles charges interurban stages the following rates upon an annual basis (charges actually are made on a quarterly basis):

LOS ANGELES YEARLY CHARGES AGAINST INTERURBAN MOTOR BUSES

5 to 7 passengers	$27.00	16 to 20 passengers	$54.00
8 to 10 passengers	36.00	21 to 25 passengers	60.00
11 to 15 passengers	46.00	26 to 30 passengers	68.00

A quarterly rate of $1.50 per ton (annual rate of $6 per ton) or fraction thereof is charged for motor trucks operating as common carriers. The annual license fee for operating a ticket office and waiting room, as maintained by the larger companies, is $120.

Los Angeles County has adopted the following annual charge for each interurban stage and freight truck operated between fixed termini:

LOS ANGELES COUNTY CHARGES FOR STAGES AND TRUCKS

Interurban stages:		Freight trucks:	
Five seats or less........	$18.00	1-ton capacity or less....	$6.00
Five to twelve seats....	24.00	1 to 2-ton capacity......	9.00
Twelve to twenty seats..	30.00	2 to 3-ton capacity......	12.00
More than twenty seats..	36.00	More than 3 tons capacity.	15.00

There is also an almost uniform regulation in cities and counties which requires automobile stage companies to file an indemnity bond of $10,000 for each vehicle operated. The recovery under such a bond is usually limited to $5,000 for the injury or death of one person, $10,000 for the injury or death of two or more persons in the same accident and $1,000 for injury of or destruction to property. The rate for liability insurance on interurban stages varies from $150 to $216 a year according to seating capacity.

Mr. Volk says he cannot find that any money collected from licenses by cities or counties is returned to a road fund. All money received from license fees by the State goes into a motor vehicle fund. One-half the remainder of this fund after paying administrative expenses goes to the counties from which the money was collected for the purpose of road construction and maintenaance.

Mr. Volk notes that competition with the other carriers has led to a serious situation. All interurban stages are said to be giving quicker and more frequent service at lower rates than rail carriers. Routes up to 60 miles in length with sixteen to twenty-five-seat vehicles have proved the most satisfactory, and for still longer runs vehicles of nine to twelve seats are most popular. Most of the twelve-seaters are standard second-hand seven-seat passenger cars rebuilt and lengthened. It is stated that many of the interurban stage companies were not a success at first, owing to the competitive conditions, need for creating traffic and failure to use standard equipment. A table in Mr. Volk's article showing the principal stage companies operating out of Los Angeles and the rates of the railways with which they compete was published in the ELECTRIC RAILWAY JOURNAL for May 8, 1920.

Passenger transport has grown faster than freight despite the expenses enumerated. Late in 1918 the automotive interests formed the California Highway Association for general co-operative purposes, including encouragement of laws to put them on the same basis as other common carriers. Cost of membership is $10 a year for the first car and $3 a year for each additional car.

In Illinois motor vehicles may be registered locally. A motor bus can be run in the city of Chicago for an annual license fee of $30, but the bus company must first obtain a certificate of convenience and necessity from the Public Utility Commission of Illinois. In the case of the Chicago Motor Bus Company, permission to operate on the north side had to come also from the Commissioners of Lincoln Park because part of the run is over a parkway.

The total taxes paid by the Chicago Motor Bus Company have been on the order of 2 cents per bus-mile, as revealed by reports made during 1918 and 1919. This is equivalent to a range of 4 to 7 per cent of the gross earnings.

The latest de luxe 10-cent service is that of the St. Louis (or Missouri) Motor Bus Company, which inaugurated service on Feb. 10, 1920, with nine double-deck buses. The company agreed to pay the city a license fee of $25 per vehicle and 5 per cent of the gross earnings. The State registration fee ranges from $2 for motor vehicles of less than 12 hp. to $12 for motor vehicles exceeding 72 hp.

In addition to New York, Chicago and St. Louis, negotiations are under way with the municipalities of Newark, Philadelphia and other places for similar services. The ever-rising cost of labor and material as against the fixed 10-cent fare, however, is not encouraging to the development of supplementary services unless conducted by the existing electric railways.

The following and concluding article will be devoted entirely to costs—from the humble, second-hand one-man car to the imposing vehicles known to Fifth Avenue and the Lake Shore.

German Electric Tramways

AN EDITORIAL in a recent issue of the *Electrical Review*, London, summarizes the plight of electric tramways in Germany, stating that the situation with regard to many undertakings is now becoming desperate. The chairman of one of the principal manufacturing companies, which is also interested in a number of tramways, recently stated that nothing further could be gained by increasing fares. This statement is more than confirmed by the directors of a tramway in Rhineland. They point out that it has been necessary to have recourse to raising fares in order to meet the increase in working expenses, but in this respect they have been opposed by the local authorities, who have placed great difficulties in the way of introduction of higher fares. On the other hand, the municipal tramway fares have been advanced time after time, and in some cases the municipal councils have also increased the taxes in order to endeavor to relieve the tramways at the expense of the taxpayers in general.

It is now proposed to attempt to solve the question of fares by arbitration, as in the case of the fixing of charges for the supply of energy, but experience has shown lately that the increases in fares, far from yielding a larger revenue, are actually resulting in a decreased income.

Continuing, the editorial says that the new advances made in the prices of coal with the consequent rise in the prices of materials, etc., will further prejudicially affect the working of the tramways. The charge made for power before the war to tramways not owning their own generating stations ranged from 5 to 10 pfennigs per kilowatt-hour; it now amounts to from 40 to 50 pfennigs, and will further advance in the next few weeks. The introduction of minimum fares of 60, 70 or even 80 pfennigs has been discussed by a number of tramway managements, but these have been vetoed by municipal bodies on the ground of political consideration, recourse being again had to the indirect method of increased taxes. The price of tramway rails, which amounted to 139 marks per ton at the outbreak of the war, reached 300 marks in March, 1919, and is now 3,200 marks. Copper has risen from 1½ to 62 marks per kilogram, and the cost of a motor tramcar from 15,000 to 200,000 marks.

Super-Power Scheme for Holland

THE acute fuel situation in Europe is evidenced by the many electrification projects that are now being initiated. Holland, through a committee formed by the Society of Directors of Electricity Supply Undertakings in Holland, has been investigating a proposal for making a national electrical power supply for industrial and transportation uses in order to reduce the national consumption of fuel and the cost of power. The project is estimated to cost about $50,000,000 and much of the equipment must be purchased abroad.

The committee advocates the adoption of a minimum voltage of 50,000 and three-phase, 50-cycle current for the high-tension network. The network is to be supplied by power stations of 30,000 to 75,000 kw. capacity, using 15,000-kw. generators. It is estimated the country will need about fifty transformer substations, situated about 15 miles apart, feeding into 10,000 volt-distribution cables.

The scheme calls for state administration of the system and the taking over of existing plants. A stock company, with the government owning a large share of the stock, is one method advocated for carrying out the project.

The total load on the system is expected to be about 3,500,000 kw., with an annual output of about 1,000,000,000 kw.-hr., which will mean a power consumption of about 100 kw.-hr. per inhabitant per year, as against 40 at the present time.

The above figures are based on no electrification of the railroads or steam railways. It is estimated that an additional 200,000 kw. of station capacity will be needed in the next twenty years to carry this load. The road from Brussels to Antwerp is expected to be the first electrified.

At the present time the maximum load on the power stations is about 100,000 kw. with an annual output of 250,000,000 kw.-hr., so that the immediate development contemplates the expenditure of only about $16,000,000 to purchase and co-ordinate existing plants and construct some badly needed interconnected transmission lines. The future development also depends on the developments occurring in adjacent coal regions, such as in the South Limburg district, as it may be cheaper to use high-tension lines with power plants in the coal regions than to develop the scattered power plant scheme. The committee considers it cheaper at present to transport the fuel than to use transmission lines excepting in the case of very low-grade fuel.

Austrian State Railways to Electrify

THE Austrian Railway Ministry through its electrification division has recommended the electrification of 1,000 miles, or 40 per cent, of the state railroads.

Austria has an estimated undeveloped water power of 2,000,000 hp. and the electrification plan calls for the immediate electrification of roads near easily developed water powers and distant from the coal fields. The state hopes to have 400 miles completed in the next seven years, as the present state of exchange permits of obtaining labor at a very low rate and at the same time the electrification will afford an opportunity for employment during the period of national industrial stagnancy.

The fuel situation in Austria is very acute as the available coal is very poor in quality and constantly increasing in price. The state estimates a saving of 30 to 50 per cent in national fuel consumption, using the pre-war consumption as a basis for the estimate, through the projected water-power development.

The cost of the electrification contemplated during the next seven years is about $16,500,000 and financial assistance is being solicited from neighboring states, as Austria is in a desperate economic condition. It is estimated that if the construction were done in Switzerland the cost would be $80,000,000, due to the different labor and exchange conditions, so the Austrian government desires to take advantage of this situation to start work immediately.

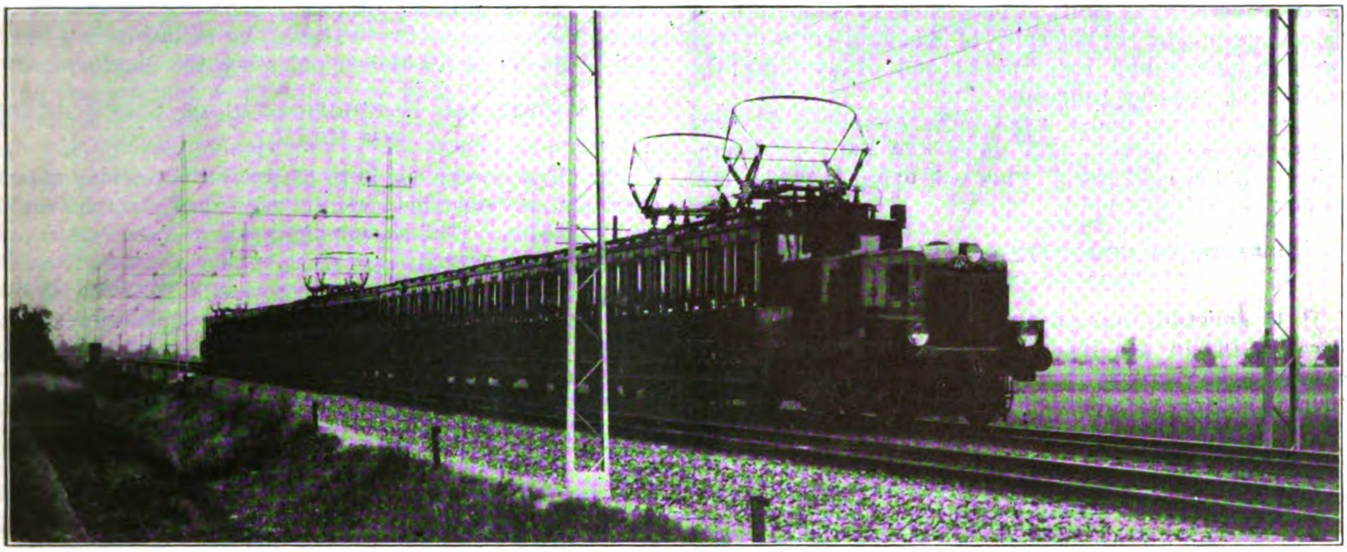
A. E. S. C. Activities

IN THE report of the meeting of the American Electric Railway Association executive committee, given in the June 26 issue of this paper, the statement was made that the association will apply for representation in the American Engineering Standards Committee. This fact makes it desirable that all members of the association should be familiar with the plan and scope of the work of this committee. Its organization and early progress were covered in the issues of the paper for March 1, 1919, page 407; May 3, page 859, and June 7, page 1,100. Since the last report was printed the committee has established offices at 29 West Thirty-ninth Street, New York City, in charge of Dr. P. G. Agnew, formerly of the staff of the United States Bureau of Standards, as secretary of the committee. During the spring of this year Dr. Agnew represented the committee at the Brussels (Belgium) meeting of the International Electrotechnical Commission. During his trip, covering eight weeks, he personally investigated the work of the foreign prototypes of the A. E. S. C. and has issued a report of his investigations to the members of the committee. These foreign bodies were as follows: Association Belge de Standardisation (Belgium); Commission Permanente de Standardization (France); Hoofdeomissie voor de Normalisati in Nederland (Holland); British Engineering Standards Association. Dr. Agnew reported that the national engineering society of Italy is also forming a national engineering standards organization.

Bulletins are now being issued from the New York office at frequent intervals. Recent ones show that:

1. The A. S. M. E. and the Society of Automotive Engineers have been requested to act as sponsors in the matter of international standardization of widths across flats on nuts and bolt heads, as proposed by the Swiss Standards Association.
2. A sectional committee on steel shapes was organized under the auspices of the A. E. S. C. at the instance of the Association of American Steel Manufacturers, which has formulated recommendations regarding Anglo-American practice regarding the rolling of angles, channels and beams.
3. The A. S. M. E. has been asked to act as sponsor in the standardization of pipe fittings and of shafting.
4. A sectional committee has been organized to undertake the standardization of plain, cylindrical gages for general engineering work, under the sponsorship of the A. S. M. E. and at the instance of the British Engineering Standards Association.

Besides the five founder societies (A. I. E. E., A. I. M. & M. E., A. S. C. E., A. S. M. E. and A. S. T. M.) the committee now includes representatives of the Electrical Manufacturers' Council, the Fire Protection Group, the National Electric Light Association, the National Safety Council and the Society of Automotive Engineers.



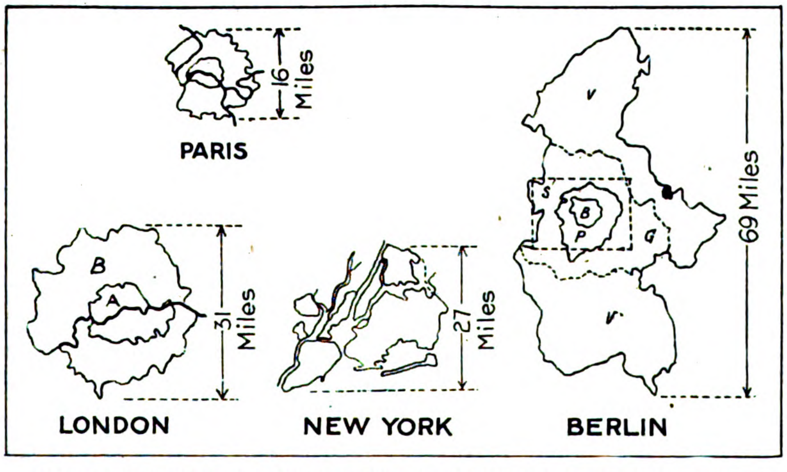
CAB-LESS SINGLE-PHASE LOCOMOTIVE, WITH CURRENT COLLECTORS, CONTROL EQUIPMENT AND MOTORMAN ON LEADING PASSENGER CAR, AS PROPOSED FOR BERLIN SUBURBAN AND CITY ELECTRIFICATION

Rapid Transit Development at Berlin

Electrification of City and Suburban Lines Contemplates Use of 15,000-Volt, Single-Phase, with Cab-less Locomotives and Power Generated from Gasified Fuel — Total Mileage Small in Comparison with New York and London — Enormous Increases in Fares to Meet Higher Costs

By Dr. E. C. Zehme
Privatdozent at the Technische Hochschule, Berlin

SINCE 1911 the metropolitan district of Berlin, Germany, has possessed a regulatory body known as Verband Gross Berlin, formed to secure joint action by the city of Berlin and contiguous municipalities with regard to regulation of housing, of public parks as acquired and of all forms of traffic on rails. This arrangement of the associated municipalities applies to a metropolitan district of 1,355 square miles (3,512 sq.km.), which, as will be seen from the accompanying comparative chart, constitutes the greatest metropolitan area in the world. The dotted rectangle *S*, covering 252 square miles (652 sq.km.), denotes the rapid transit (subway, elevated and surface) proportion of this area, excluding street railways, buses and all but the suburban divisions of trunk-line railroads.



METROPOLITAN AREAS OF PARIS, LONDON, NEW YORK AND BERLIN, DRAWN TO THE SAME SCALE

While the rapid transit area of Berlin's metropolitan district is greater than that of other cities, its population is less. London had 7,500,000 inhabitants in 1914, New York had 5,450,000 in 1913 and Berlin had 4,136,000 in 1914.

A second chart shows the growth of the several forms of transit used in Berlin in the period 1870-1917. It will be seen that the street railways still carry about one-half the traffic. The steam Stadt and Ringbahn (City and Belt Railways), opened in 1882 and 1872 respectively, total only 30.5 miles (49 km.). The Stadtbahn serves the older and more thickly peopled sections, but the Ringbahn traverses some areas still in part unimproved. The steam suburban lines show the imposing total of 230 miles (370 km.), but most of their traffic is twice-a-day riding between Berlin and the more distant, smaller communities.

The Municipal Rapid Transit Lines and the Berlin Elevated & Underground Railway form so trifling a part of the total mileage that one need not marvel at their small share of the total traffic. Their total route length was 6.3 miles (10.2 km.) in 1902, 7.9 miles (12.8 km.) in 1907, 11.5 miles (17.8 km.) from 1908 to 1912 and 23 miles (37.5 km.) from 1914 to 1917. This is shamefully small in comparison with New York. One reason for this small mileage is the policy of the Berlin Elevated & Underground Railway, which endeavored to monopolize rapid transit development from the time of its formation in 1902 by preventing competition and by refusing to build any mileage itself that would reduce the density of traffic on the pioneer route. A second reason was the unwillingness of the municipalities in the metropolitan district, because of political jealousies, to co-operate. A third reason was the difficulty of securing right-of-way through public and royal parks and of avoiding the yards of trunk-line railroads.

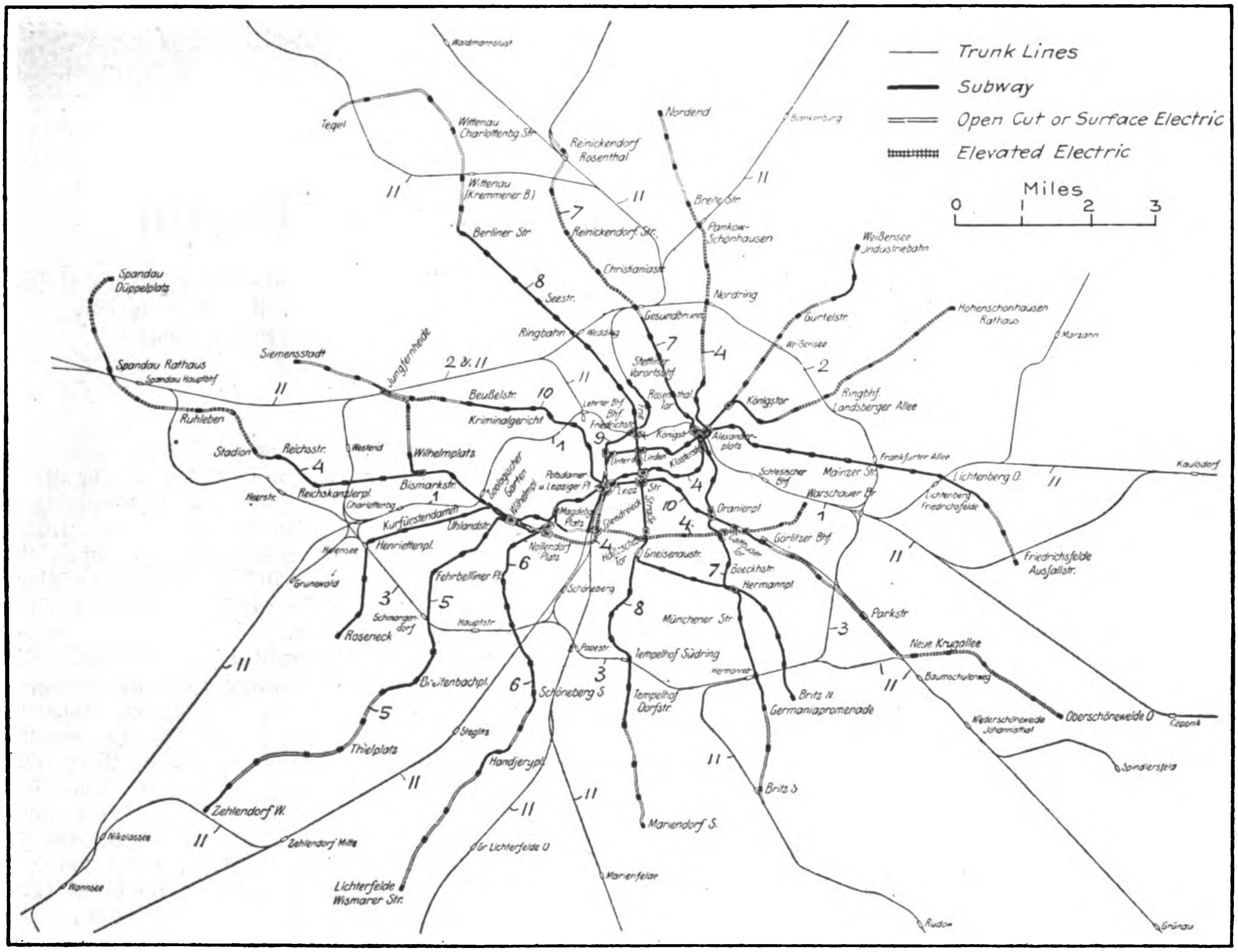
There are now under way—to be completed at some indeterminate period—12.5 miles (20 km.) of north-south rapid transit lines. This will bring Berlin's total to 35.5 miles (57.5 km.).

GREATER VALUE OF TIME MAKES MORE RAPID TRANSIT IMPERATIVE

It is generally agreed that the rapid transit facilities of Berlin are inadequate. As the struggle for existence has grown sharper during the past decade, there has come an increasing recognition of the value of time. The waste of time now involved in going to and from employment, in handling mail and in transacting other business is well-nigh incredible. The rapid transit system itself is none too rapid. This is due in part to the loss of time to passengers in purchasing one of the great variety of tickets on this zone-fare and two-class system and to a poor arrangement of ticket booths, which is the cause of frequent congestion. Whereas the American rider usually tries to tender exact change, the Berliner generally offers a large coin or bill, so that it is not uncommon for a person to see one or two trains go by before he has been able to purchase his ticket and reach the platform.

NEW ROUTES AND ELECTRIFICATION OF STEAM LINES THE REMEDY

The obvious way out is to electrify the present steam lines and to construct certain additional electric rapid transit routes. The accompanying map shows all rapid transit lines now in operation, under construction or planned. Of these lines it is noteworthy that the Stadtbahn reached the limit of its capacity two decades ago. As early as 1900 the Union Elektricitäts Gesellschaft, connected with the Thomson-Houston Company of the United States (General Electric Company successor), proposed the American plan of 500–600-volt direct-current third-rail operation with motor and trail cars. It is to be regretted that the government refused to approve this project despite the proof that similar electrification had been a success in the United States. The present attitude of the government in favor of high-tension single-phase is due to the fact that this system has been adopted as standard for the trunk-line service, and adherence to this system is considered desirable even in urban electrification. For all that, a direct-


Trunk Lines
Subway
Open Cut or Surface Electric
Elevated Electric
Miles
0
1
2
3
Waidmannslust
Tegel
Wittenau Charlottenbg Str
Reinickendorf Rosenthal
Nordend
Blankenburg
Wittenau (Kremmener B)
Berliner Str
Reinickendorf Str.
Breite Str
Pankow-Schönhausen
Weißensee Industriebahn
Christianiastr
Seestr.
Nordring
Spandau Düppelplatz
Ringbahn
Wedding
Gesundbrunnen
Gürtelstr.
Hohenschönhausen Rathaus
Marzahn
Weißensee
Siemensstadt
Jungfernheide
2 & 11
Stettiner Vorortsbhf
Spandau Rathaus
Spandau Hauptbhf
Beußelstr.
10
Lehrter Bhf
Bhf Friedrichstr
Rosenthal Tor
Königstor
Ringbhf Landsberger Allee
Ruhleben
Kriminalgericht
9
Königstr
Alexanderplatz
Stadion
Reichsstr.
Westend
Wilhelmplatz
Unter d. Linden
Klosterstr
Frankfurter Allee
Kaulsdorf
Zoologischer Garten Wilhelmpl
Potsdamer u. Leipziger Pl
Leipz Str
Schlesischer Bhf
Mainzer Str
Lichtenberg O.
Heerstr.
Reichskanzlerpl.
Bismarckstr.
Charlottenbg
Warschauer Br
Lichtenberg Friedrichsfelde
Kurfürstendamm
Uhlandstr.
Magdeburg Platz
Gleisdreieck
Straße
Oranienpl
Halensee
Henriettenpl.
Nollendorf Platz
Hallesches Tor
Gneisenaustr.
Görlitzer Bhf
Cottbuser Tor
Friedrichsfelde Ausfallstr.
Grunewald
Fehrbelliner Pl
Schöneberg
Boeckhstr.
Hermannpl.
Schmargendorf
Hauptstr
Münchener Str
Parkstr
Roseneck
Papestr.
Tempelhof Südring
Neue Krugallee
Hermannstr
Baumschulenweg
Breitenbachpl.
Schöneberg S
Tempelhof Dorfstr
Britz N.
Germaniapromenade
Oberschöneweide O
Cöpenick
Niederschöneweide Johannisthal
Thielplatz
Steglitz
Spindlersfeld
Handjerypl
Britz S
Zehlendorf W.
Mariendorf S.
Nikolassee
Zehlendorf Mitte
Gr. Lichterfelde O
Lichterfelde Wismarer Str.
Marienfelde
Wannsee
Rudow
Grünau
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8
11

MAP SHOWING STEAM RAILROADS AND EXISTING AND PROPOSED RAPID TRANSIT LINES IN BERLIN

1—Stadtbahn (steam).
2—North belt (steam).
3—South belt (steam).
4—Berlin Elevated & Underground Railway (electric).
5—Wilmersdorf-Dahlem (electric).
6—Schöneberg (electric).
7—Allgemeine Elektricitäts Gesellschaft (General Electric Company, electric).
8—City of Berlin (electric).
9—Potsdam-Stettin Railway Stations (electric).
10—Moabit-Treptow (Görlitz-Lehrt Railway Stations, electric).
11—Suburban Railways (steam).

current electrification of the year 1900 could have been readily converted to twice the original voltage with comparatively few substations regardless of the use of high-tension single-phase for the primary current. As a matter of fact, the Berlin urban and suburban network is entirely independent of the trunk line operation and could therefore use an entirely different system of distribution. Furthermore, no single system will give the power station the most economical load factor.

In 1913 the state railroads were authorized to spend up to 25,000,000 marks for work preparatory to the electrification of the Greater Berlin lines. The experimental work was to include studies in the gasification of coal, in the building of novel locomotives and in the development of new methods of transmission and distribution. Most of this appropriation was used up for these and other experiments, with no tangible results other than the structures erected for the work in coal gasification.

GAS ENGINES AND CAB-LESS SINGLE-PHASE LOCOMOTIVES

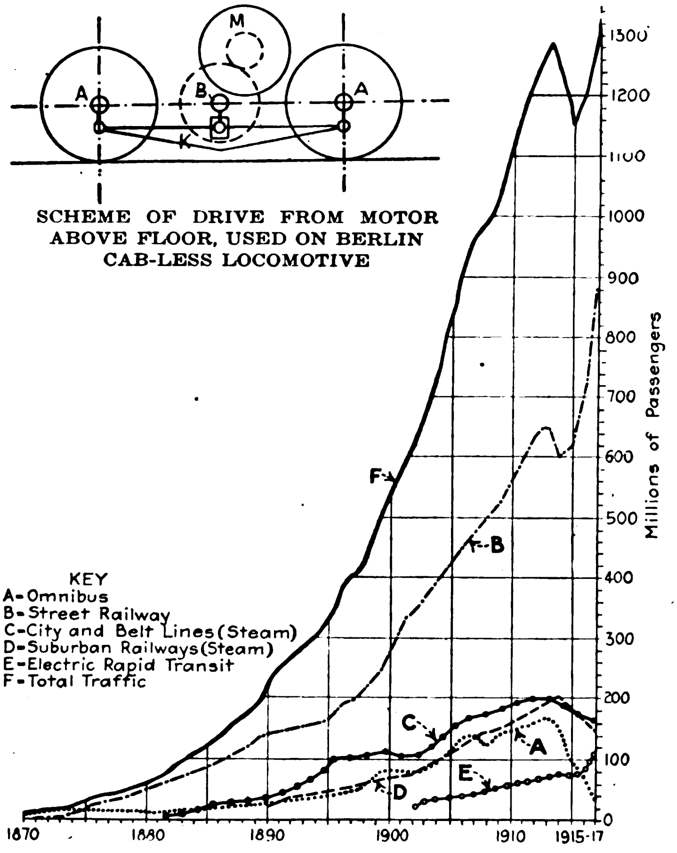
The power stations would use gasified lignite or peat, the gas driving engines being direct-coupled to generators. Part of the peak loads would be carried by steam turbo-generator sets fed from gas-heated boilers. The byproducts of the gasification process would be tar, fertilizer salts, fuel oil, lubricating oil, illuminating oil and pitch, while the exhaust of the gas engines would yield saltpeter (potassium nitrate). Pending the completion of these gas electric stations, of which two are under way, power will be purchased. The electrification of the Oranienburg and Bernau suburban lines lying north of Berlin is now in hand.

Locomotive drive will be used in order to retain the present rolling stock. These locomotives are of cab-less type, as the motorman and his control and current-collecting equipment are domiciled on the leading passenger car. There is to be one cab-less locomotive at each end of the train, as illustrated in the halftone engraving. During hours of light traffic trains would be split, the front locomotive acting as a puller and the rear locomotive as a pusher.

The advantages of this system, according to the railway management, are: (1) The retention of existing rolling stock; (2) simplification of transformer installation on vehicles; (3) less shock to the track because the motors, as shown at *M* in the diagram of motor drive, are mounted above the floor of the locomotive with jack-shaft *B* and side-rod *K* possessing a crank-to-link connection to transmit the motor drive to the driving axles *A*. Nevertheless, experience has shown that not only motor car trains but locomotives carrying heavy armatures on the axles have not suffered through any supposed lack of flexible suspension of the motors. Furthermore, corrugation cannot be due entirely to electric motor drive of any kind, inasmuch as corrugated rail has been found on track operated with steam equipment only.

The success of a cab-less, collector-less and controlless locomotive is very problematical, but the plan is to be carried out nevertheless. The cost of installation and operation will offset the saving in rolling stock. Since the tractive effort is confined only to the locomotives and since these are too light to attain a rate of acceleration of say 0.7 meters per second per second (1.56 m.p.h.p.s.), as used on other rapid transit lines, one must be satisfied with the low range of 0.25–0.3 meters per second per second (0.55–0.68 m.p.h.p.s.). This means that the number of trains per hour could not exceed thirty-five to thirty-seven, compared with forty-two motor car trains in the same period.

The locomotive outfit is also 54 metric tons heavier than a single-phase motor car train and 84 metric tons heavier than a direct-current multiple-unit outfit, which differences in weight will increase power expenditures by a sum equivalent to interest charges on an investment of 30,000,000 marks, assuming the use of single-phase, and to fixed charges of 50,000,000 marks as compared with direct-current multiple-unit operation. These figures are conservative. In practice, the disadvantage of the drive adopted would probably be greater still.



SCHEME OF DRIVE FROM MOTOR ABOVE FLOOR, USED ON BERLIN CAB-LESS LOCOMOTIVE

CHART SHOWING PASSENGERS BY VARIOUS FORMS OF TRANSIT IN BERLIN FOR THE PERIOD 1870-1917

RACK GEARING TRIED TO INCREASE ACCELERATION

In order to overcome the handicap of a very low rate of acceleration, with its limitation of headway to a maximum of thirty-seven trains an hour, the Ministry of Railways conceived the extraordinary plan of equipping the stations as rack railways with cog wheels on the locomotives, similar to the arrangement used on mountain railways with steep grades. About 1,000,000 marks were spent in experiments which are asserted to have been successful, but the idea was dropped because of the criticism which it aroused. However, the cab-less locomotive idea still lives, although it is obvious that with the rack expedient eliminated an economical rate of acceleration is out of the question. All that can be done now is to watch and wait upon the action of the Ministry. Probably the locomotives will be withdrawn from passenger service some day and placed in freight service elsewhere, whereupon the operation of the Berlin lines will be carried out uniformly with multiple-unit motor car and trailer combinations. The history of the Central London Railway will be repeated.

It is proposed to use Diesel locomotives on sections where the loads are heavy but where there is no great density of traffic. On the other hand, motor car trains are considered necessary for lines with highly fluctuating traffic. The greatest confusion of thought appears to exist in connection with all of these questions, although the rest of the world seems to be pretty clear as to what is best for city and suburban electrification. Within the last few weeks (early in 1920) the locomotives have been subjected to further experimentation. It has been suddenly discovered that some form of hydraulic transmission, as devised in Germany for automobiles, ought to be tried for transmitting the torque of the motor to the driving axles. Should this succeed the inventors hope that they can substitute for the present commutator-type single-phase motor an asynchronous single-phase motor whose stator would take the 15,000-volt line potential direct and at a higher periodicity. If a 50-cycle instead of a $16\frac{2}{3}$-cycle motor could be used special power-house equipment for railway purposes would be unnecessary. Experiments with this innovation, of which more particulars later, will assuredly cost a lot of money and delay electrification still further.

THE ELECTRIC RAPID TRANSIT LINES

The first of Berlin's electric rapid transit lines was opened in 1903 by the Berlin Elevated & Underground Railway. The parent line, indicated as "4" in the general map, runs west-east, with a branch midway leading north-west from Potsdamer Platz to Alexander Platz. This has always been a densely traveled and profitable route. By 1913 line 5 to Wilmersdorf and line 6 to Schöneberg, both westerly routes, had been added, while the original line had been extended from Alexander Platz as far as the North Belt of the steam system. All these routes run to Potsdamer Platz, the traffic center of Berlin.

A central north-south line is still lacking. The first proposition, as made by the Continental Company for Electrical Undertakings, associated with Schuckert-Nurnberg, contemplated the use of a suspended monorailway. The experimental section built proved the adaptability of this construction for narrow streets. The line was not constructed, however, owing to the opposition of the city authorities and the competitive project of the Allgemeine company, which had laid out exactly the same route as shown by line 7 in the map. Had the suspended railway been approved it could have been completed during the war and given service to eastern Berlin at very low fares. Instead, the Allgemeine company's plan, involving considerable subway work at about four times the cost, was accepted by the city. It was impossible to complete this during the war. Today it lies like a torso which can be completed only at an enormous cost which the contracting company is unwilling to undertake.

A second north-south line, 8 in the map, serving Friedrichstrasse, the busiest street of Berlin, was begun before the war by the municipality itself. This line is progressing slowly. Both the Allgemeine and municipal lines are very costly to construct because of heavy street traffic and sub-surface piping, aside from the increases in cost of material and labor over pre-war estimates. In view of the fact that the original rapid transit system is charging three times the pre-war rates of fare, the fares on the later and costlier lines may be expected to be exceptionally high.

In accordance with a recommendation of the Associated Municipalities, the preceding lines 4, 5, 6, 7 and 8 are to be lengthened as shown in the map. The board also suggests the construction of line 9 to connect the important Potsdam and Stettin railway stations and 10 to connect the Goerlitz and Lehrter railway stations.

The Associated Municipalities have laid down the following fundamentals with regard to rapid transit routes: (1) Lines must not be radial, but must run across the city from suburb to suburb; (2) the lines must follow the principal thoroughfares of the inner city; (3) routes must be evenly distributed within the residential areas; (4) branches within the central district are to be avoided; they are in place only in the suburban districts, where they can act as feeders to the trunk line. To aid in planning such projects, the Associated Municipalities have worked up considerable data regarding the density of population and riding characteristics of the different districts.

Curacao Antedates Ford

THE accompanying photograph shows a gasoline street car in a street of Curaçao, Dutch West Indies, a city which is of special interest because it is one of the places to which it was proposed to send the ex-Kaiser to spend his days in exile—far from Potsdam and his beloved wardrobe of brilliant uniforms. Possibly this railway line could supply valuable information in connection with Mr. Ford's proposal to equip interurban and city cars with gasoline motive-power equipment.

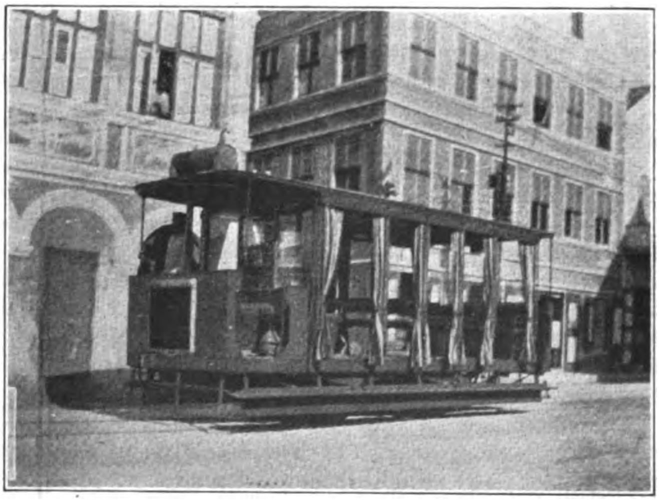


Photo by Dr. Pabst, supplied by International Film

GASOLINE-DRIVEN STREET CAR IN CURACAO, DUTCH WEST INDIES

Steam Railroad Electrification in Spain

E. N. CHASE of the Ohio Brass Company has spent the last two years in Spain electrifying a short steam road between Masef and Candes along the northern coast of Spain. Parts of the line run along the seacoast. The track is of 60-lb. rail, ballasted with hand-broken stone. The overhead is catenary construction, No. 0000 copper contact wire with $\frac{7}{16}$ steel massenger, suspended from pole brackets and cross spans. The cars are fitted with the bow trolley, the bodies being of local construction, but mounted on American trucks carrying American motors.

A.S.T.M. Holds Interesting Meeting

Many Specifications of Interest to Electric Railways Were Adopted and That for Quenched and Tempered Carbon-Steel Axles Is the Same as That of the A. E. R. E. A.

THE twenty-third annual meeting of the American Society for Testing Materials was held June 22-25 at Asbury Park, N. J. Covering as it does the general subject of specifications for all constructional materials and being made up of both producers and consumers, its standards are becoming quite generally recognized as authoritative and the proceedings of the society are of interest to electric railway engineers.

The question of the proper nomenclature of different alloys was reported on by the committee on non-ferrous metals and alloys. This committee has been working with the committee of the British Institute of Metals on this subject. They recommend that wherever possible the commercial names which have become established by long usage, such as brass, bronze and cupro-metal, should be retained.

The proposed nomenclature of non-ferrous alloys is as follows:

Brass—1. The term "yellow brass" shall be used for zinc-copper alloys only containing from 63 to 80 per cent copper and having a yellow or brass color.

2. The term "red brass" shall be used for zinc-copper alloys only containing more than 80 per cent copper in which the color varies from a golden to a copper red.

3. The term "yellow red brass" shall be used for zinc-copper alloys only containing from 55 to 63 per cent copper, in which range the brass has a yellowish red color.

4. Lead Brass. Brass containing more than 0.50 per cent of lead shall be known as lead yellow, red or yellow-red brass, according to the percentage of copper it contains.

5. Tin Brass. Brass containing more than 0.25 per cent tin shall be known as tin yellow, red or yellow-red brass, according to the percentage of copper it contains.

6. In cases where other metals are added these shall be designated by the use of the proper prefix or prefixes.

Bronze—7. The term "bronze" shall be used for tin-copper alloys only containing over 50 per cent copper. In cases where other metals are added these shall be designated by the proper prefix or prefixes.

Cupro-Nickel—8. The term "cupro-nickel" shall be used for nickel-copper alloys in which copper predominates.

Nickeline—9. The term "nickeline" shall be used for nickel-zinc copper alloys only.

These are the materials known generally as "German silvers," a false designation, for, as one member wittingly remarked in the discussion, "there are none of them silver and many are not German."

An interesting paper was presented on fatigue and impact fatigue tests of aluminum alloys, particularly "duralumin," in the summary of which the author states: "In comparing the fatigue-resisting properties of forged duralumin with those of the common grades of steel forgings the conclusion is drawn that for sections of equal size the aluminum alloys are equal to, if not superior to, forged steel.

The composition of "duralumin" is approximately: Copper, 3½ per cent; iron, ¾ per cent; silver, ½ per cent; magnesum, ½ per cent; manganese, ½ per cent.

One of the most important reports presented at the meeting was that of committee A-5 on "corrosion of iron and steel." This gives the results to date of the test which has been under way in Pittsburgh since Dec. 12, 1916. In this test sheets of varying compositions were exposed to the weather, standing vertically in fence fashion. The particular purpose of the test was to determine the relative resistance to corrosion of sheets having percentage of copper over 0.15 per cent (known as "copper bearing") compared to those having less than 0.15 per cent copper (non-copper bearing). While no conclusion is drawn by the committee, it is evident from the figures and photographs given that the copper-bearing sheets, no matter whether of iron or steel, are markedly superior to the non-copper-bearing sheets in their resistance to corrosion. While the test is not complete, it has progressed far enough to indicate this fact, and therefore this test may be considered of far-reaching importance. The committee now proposes to ascertain the effect of exposure to running water.

The committee A-2 on wrought iron presented a series of definitions for puddling, busheling, fagoting, muck bar or puddled bar, common iron, merchant bar iron, refined bar iron or refined wrought iron bars and double refined iron.

An exceedingly ingenious method of testing galvanized castings was the subject of a paper by Dr. Allerton S. Cushman. This "depends upon placing on the surface to be tested of a tinned iron ring properly shaped to fit any given surface, corrugated or otherwise. The ring is stoppered with a soft rubber stopper, thereby making a cell by means of which a hydrochloric acid, antimony-chloride solution can be run onto the surface and the resulting hydrogen which is formed by the reaction of the acid or the zinc can be collected and measured. A tight contact is preserved between the bottom of the metallic ring and the galvanized surface by using plastic modeling clay."

The advantage of the method is that it can be used in the field as well as in the laboratory and will determine the weight of the galvanized coating on the unit area regardless of the convolutions or corrugations, as, for instance, in a finished corrugated culvert, or roofing and sheathing metal.

An important feature of the society's work during the past year has been in connection with its membership in the American Engineering standards committee. The constitution of the committee has been revised (Aug. 16, 1919) to provide "for the admission of additional societies of national scope." A copy of the revised constitution is given in the report of the executive committee of the A. S. T. M.

Two A. S. T. M. standards were adopted as tentative American standards by the standards committee, *viz.:* Specifications and tests for portland cement and specifications for fire tests of materials of construction.

In addition to the foregoing, committee A-1 on steel recommended the following specifications to the executive committee of the A. S. T. M. for submission to the American Engineering standards committee as American standard: For carbon-steel and alloy steel blooms, for billets and slabs for forgings, for carbon-steel and alloy steel forgings, for quenched and tempered carbon-steel axles, shafts and other forgings for locomotives and cars, for quenched and tempered alloy-steel axles, shafts and other forgings for locomotives and cars, for carbon-steel forgings for locomotives, for carbon-steel car and tender axles, for cold-rolled steel axles, for cold-drawn bessemer steel automatic screw stock, for cold-drawn open-hearth steel automatic screw stocks.

The second item on this list, namely, that for quenched and tempered carbon-steel axles, will be of interest to electric railways in that this specification had its inception in one of the large Eastern traction systems and then became the standard of the American Electric Railway Engineering Association. In modified form it was later adopted by the American Society for Testing Materials, which now is about to recommend its adoption as American standard. This should be and properly is a matter of congratulation to the American Electric Railway Engineering Association on the probable adoption of a specification for which it is responsible as one of the first American standards.

Committee A-1, as usual, presented an elaborate report. Certain minor revisions were recommended and accepted by the convention and will be published as tentative for one year covering the following specifications:

1. For quenched high-carbon steel splice bars; 2, for quenched carbon-steel track bolts; 3, for quenched alloy-steel track bolts; 4, for steel screw spikes; 5, for structural steel for locomotives; 6, for structural steel for cars; 7, recommendations with respect to normalizing of cold-drawn rivet bars, affecting the following specifications: (a) structural steel for bridges, (b) structural nickel steel, (c) structural steel for buildings, (d) structural steel for cars, (e) rivet steel for ships, (f) boiler rivet steel; 8, for lap-welded and seamless steel boiler tubes for locomotives; 9, for welded steel pipe; 10, for automobile carbon and alloy steels.

The committee also recommended certain revisions in its tentative standards: 11. For steel tie plates. 12. For low-carbon steel track bolts. 13. For steel plates for forge welding. 14. For carbon tool steel. 15. For electric cast steel anchor chain.

It also presented a new specification for commercial bar steels. This specification is not intended to take the place of any of the other standard specifications, but is prepared simply so as to provide a specification to which a purchaser may order who does not need any particular requirements.

The committee has been co-operating "with the track commission of the American Railway Engineering Association to the extent of presenting extensions and recommendations concerning the specifications of that association for tracks, spikes, screw spikes and tie plates." It has not been found possible to establish formal co-operative relation with the A. R. E. A. rail committee in regard to revising rail specifications, and accordingly committee A-1 will take up during the coming year the revision of the A. S. T. M. specification.

STEEL CASTINGS FOR RAILROADS

A most important development in the study of specifications for steel castings for railroads was the formation in January, 1920, of a joint committee on steel castings for railroads, consisting of representation of the A. S. T. M., the Mechanical Section of the American Railroad Association and the United States Railroad Administration.

Committee A-1 also recommended that action be deferred till next year on the removal of the war note permitting an extra point of phosphorus in acid steels and of sulphur in all steels. This refers to those specifications on which the note was permitted to stand last year; some of the other specifications had the note removed at the last meeting.

The committee reported that the joint committee on investigation of phosphorus and sulphur requirements had been organized as follows: United States Bureau of Standards, American Railroad Association, A. S. T. M., American Association of Steel Manufacturers, United States War Department, United States Navy Department, Society of Automotive Engineers, Society of Naval Architects and Marine Engineers, Steel Founders Society of America, Engineering Division, National Research Council.

A comprehensive series of tests is planned by the joint committee and it has been determined to study first the effect of sulphur, inasmuch as that presents the most urgent problem economically.

RAIL FAILURES

An interesting paper was presented by J. E. Howard on "the shattered zones in certain steel rails, with notes on the interior origin of transverse fissures."

This paper is a continuation of the subject matter presented by Messrs. Warring and Hofamman at the last annual meeting of the society.

Committee D-7 on timber has recommended the following tentative specifications be advanced to standard: Southern yellow-pine timber to be creosoted, Southern yellow-pine piles and poles to be creosoted, wooden paving blocks for exposed pavements.

It also submitted a revised specification for structural Douglas fir.

Committee D-11 submitted a specification for adhesive insulating tape.

In Korea—The Land of Morning Calm

THE accompanying photograph shows one of the main entrances to the city of Seoul, Korea. The feature of this picture is the presence of modern trolley cars in the capital of this ancient country, installed there since the Japanese occupation of the kingdom. While there is a certain element of incongruity in this close juxtaposition of the old and the new, there is no question but that by giving the Koreans the benefit of modern transportation the Japanese are conferring upon them a real benefit.

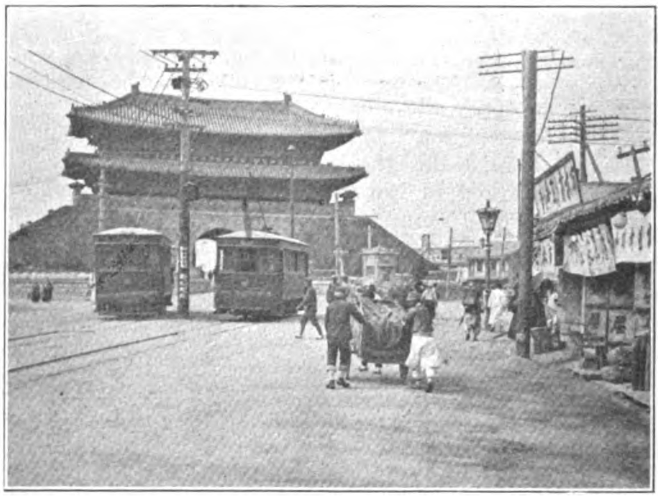


Photo by International Film.

MODERN TROLLEY CAR IN THE CAPITAL OF ANCIENT KOREA

Philadelphia Director of Transit Reports

W. S. Twining Says Continuation of Present Practices Means P. R. T. Bankruptcy—Complete Co-operation Between City and Company Necessary—Again Recommends Benefit Assessments to Finance City Rapid Transit Construction

THE Director of Rapid Transit of Philadelphia, William S. Twining, has just filed his report for the calendar year 1919. Coming, as it does, so closely on the heels of the report of Mayor Moore's commission,* though dated Jan. 1, 1920, it is of particular interest in the analysis of the electric railway problems of the Quaker City. Because this report forms the fourth and final under the administration of the retiring Mayor, Mr. Twining not only records the results attained during the year 1919, but also reviews some of the work accomplished during the four-year period and makes recommendations with regard to a final solution of the problem as he sees it.

The following abstract is of necessity brief, but gives some of the outstanding points of general interest:

ABSTRACT OF REPORT

During the year 1919 the department struggled to carry forward construction work upon the authorized high-speed system, but notwithstanding the use by the department of its best efforts to make real progress the year 1919 was a year of disappointments in transit development, as the transit department was again the victim of conditions beyond its control. At the very beginning of the year, Jan. 14, the Public Service Commission refused to approve the lease and contract which had been agreed upon between the city and the Philadelphia Rapid Transit Company in February of 1918. While it was acknowledged that that agreement was far from the ideal at which the city aimed when the decision was made to construct high-speed facilities, yet it was hoped that the commission would realize:

1. That no pronounced public sentiment for the municipal operation of the city's lines as a branch of the city's activities existed.
2. That the city's system was designed to function as a part of a unified system under the Philadelphia Rapid Transit Company's operation and management, and such use was understood by the public when the building of the system was decided upon.
3. That the Public Service Commission itself had previously approved of the construction by the city of a system of lines and the city at that time apprised the commission that the alternative of unified operation must be municipal operation with consequent competition with the Philadelphia Rapid Transit Company.
4. That if unified operation was to be secured the city and the company each had to consider and recognize the conditions existing and the limitations of the other, and the contract submitted was simply a compromise which was agreed "to be fair alike to the city and to the company."
5. That the matter of fare should, in fact, be secondary to service, and that six years had been consumed in reaching that agreement and the public would be injured more by a continuation of delay than by the acceptance of a contract which, while not ideal, would probably have provided good service, but at a cost somewhat higher than the ideal cost.

However, the refusal of the commission to approve the operating contract made the immediate redesigning of the city's system imperative, but the Legislature of 1919 adjourned without giving the city permission to hold a "referendum" on the system which the people authorized in 1916. A taxpayer's suit begun in August made it impossible to proceed with new contracts during the latter half of the year and work on older contracts has been much hampered by the insufficiency of funds.

The year 1919 closes with the outlook for progress during the coming year far from bright. The much-needed high-speed service for the entire city, which appeared so near at hand in 1916, now seems to be steadily receding and only by a realization that the effect of the same changes that have occurred since 1916 in all other lines of human activity must be faced in connection with transit matters also can any real progress be made toward securing the service which the city so sorely needs.

Expenditures made during 1919 total $2,665,958.84, and the total expenditures made by the department from the initiation of the transit investigation on May 27, 1912, to the end of 1919 are $11,600,518.23.

STATUS OF CITY'S LOANS FOR TRANSIT

The Legislature of 1919 adopted a revision to the city's charter intended to make illegal certain practices of the city in regard to paying current expenses by means of long-term loans. As the result of this legislation a taxpayer's suit was brought, resulting in a discussion by the Supreme Court that the unissued portion of transit and other authorized loans for capital use must be reenacted and readvertised in order to conform to the provisions of the new charter. The department has, therefore, been unable to start any new contracts since August.

In previous reports I have called attention to the dangerous situation liable to develop as the outgrowth of the plan of capitalizing the interest and sinking fund payments on transit loans. That my fears in regard to this have not been unfounded is shown by my letter to the comptroller (explaining the condition of affairs as of the end of this year), and I again urge that the financial features of the transit program be modified as soon as the necessary legislation can be secured, and that in the meantime Councils provide for these interest charges out of current funds until such time as it is fully demonstrated that the project will be at least partially self-supporting.

SERVICE RENDERED BY THE PHILADELPHIA RAPID TRANSIT COMPANY DURING THE YEAR

The service rendered by the company during the year has been far from adequate and appears to be growing far more inadequate with each passing month. The company, however, has endeavored to give the impression that the inadequacy of service has been due to the actions or rather inaction of the city.

Although the company's service was notoriously inadequate at the beginning of the year, yet the company did not increase its facilities to any appreciable extent. It is readily apparent that with the city's system in operation and carrying sufficient passengers to relieve the situation the company's income would be reduced to a point where its solvency would be seriously threatened. It is very evident, therefore, that the city's intention to construct a high-speed system to be operated by the company cannot be used as the basis for a claim that such intention warrants the company in furnishing inadequate service at the present time. The city's system, under the most favorable conditions, cannot be in full operation for several years and even when in full operation will not relieve the existing system enough to permit the existing number of cars to render adequate service. The company's claim, therefore, that the city's system is responsible for present conditions is wholly without foundation, and the claim is made for the purpose of directing attention away from the real cause of the inadequacy, namely, the company's inability to furnish adequate service and pay its present fixed charges out of the existing rates of fare.

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*See extensive abstract, ELECTRIC RAILWAY JOURNAL, June 5, 1920, page 1160.

This question of inadequacy of service is a matter connected with, but not dependent upon, the manner of operating the city's system. It is now coming to be regarded as the duty of the city to see that adequate transit service is provided the citizens, and the method by which that service shall be provided has been under discussion for several years and should be decided promptly and without unnecessary delay.

INCREASED NEED OF HIGH-SPEED SERVICE

Although the need of high-speed service was recognized years ago, the great growth in all kinds of street traffic, particularly during the last four years, has made the necessity of a speedy construction of a high-speed system absolutely imperative. This is the most prominently outstanding fact in the transit situation today.

The next most prominent fact is that the system as designed in 1913 and as authorized in 1916 is absolutely impracticable to build under present conditions and would be practically unleasable even if built. Developments of the past year, beginning with the rejection by the Public Service Commission of the agreement heretofore reached between the city and the company, and the submission by the company of an absurd proposal in October, furnish most conclusive proof that the supply of unified service by the company based on a flat 5-cent fare and the use of the full city system as now authorized would be practically impossible. Many of the reasons for this conclusion are set forth in the reports made Nov. 14 and 21 to the street railways and finance committees of Councils upon the company's latest proposal, to which the company's proposals were submitted for consideration.

CO-OPERATION

The previous reports of the department have pointed out that co-operation between the city and the Philadelphia Rapid Transit Company, which is the ideal desired by both the city and the company, will only become possible in case concessions can be made by both parties. In thus seeking each other's co-operation they are dealing as two public service corporations and each is seeking its own advantage, without a corresponding outlay—that is, each is trying to get more for its side than it gives or would have without such co-operation.

The condition held out to the public as an inducement for the city to construct the high-speed system was the ideal one, *i.e.*, that by so doing advantages could be secured without incurring corresponding obligations. The people were led to believe that if the high-speed system were constructed by the city out of city funds a unified system could be secured with universal free transfers, without adversely affecting either the tax rate or the carfare. Such a condition was not possible even at the time the promises were made and is absolutely impossible under present conditions. Although the company is adhering to the schedule of fares which has been in existence for many years, the service rendered by the company is so deplorably inadequate that additional facilities must certainly be supplied to meet not only present conditions, but to provide for the traffic anticipated for the immediate future. The company anticipates that the traffic within the next two years will require the transportation of upward of 3,000,000 passengers daily and to accomplish this with the surface car system now existing is not considered as physically possible. The point where facilities are most needed is in the business section, where the narrow streets and the great congestion make it impossible to operate any large number of cars in excess of those now operated. The company's earnings show a margin above the company's lease and other obligations far too small to warrant its assuming, under the present schedule of fares, the burden of the needed facilities. Therefore, the basis of co-operation between the city and the company must be entirely different from that which formed the basis of the proposed co-operation on which the city's system was authorized in 1916.

The testimony submitted to the Public Service Commission in justification of the rejected agreement between the city and the company showed that the present schedule of fares could not possibly meet the cost of service of the entire unified system as such cost was included in that agreement, and, as that contract was rejected by the commission as not being in the public interest, there seems to be no solution open except to start on a new basis which shall be radically different from the assumptions upon which the old one was based. It seems probable that the proper basis must be:

1. The valuation of the company's existing facilities used in the service of the public as the starting point for the capitalization to be supported.
2. A program of high-speed development suited to the city's financial abilities and the demands of the traffic.
3. A fare fixed by the Public Service Commission adequate to support unified service on the basis of 1 and 2.
4. A rental for the use of the city's system not contingent upon the company's dividend.
5. A liberal reward for good service to the end that management and labor shall thereafter work in the interest of the community and not to the exclusive interest of capital or the company.
6. A voice by the city in matters relating to service.

ASSESSMENT OF COST OF TRANSIT FACILITIES ON PROPERTY BENEFITED

As pointed out in my first report of March 29, 1916, the development of a city is dependent upon its transit facilities, and high-speed facilities built under the function of city government for the purpose of developing the city should be paid for in part at least by assessment of all or part of the cost upon the property benefited. For many years it has been deemed just to assess upon abutting properties the cost of opening streets and building sewers, laying water pipe, etc. At that time (1916) the city solicitor held that such method of assessment was impracticable and that no such act of the Legislature would be sustained as constitutional. As this matter is so vital to the city in connection with the development of adequate transit facilities for the city, I urge that the city take all the necessary steps to the end that the new State Constitution shall recognize the equity and justice of the principle underlying local assessment where local benefit can be clearly shown. The result of this method of paying for the cost of facilities would be to greatly lessen the interest charges and to keep the carfares low, which in these days of high prices is a matter affecting every citizen in the community.

FUTURE OUTLOOK FOR UNIFIED TRANSIT SERVICE

If financial impracticability of the entire transportation enterprise in Philadelphia during the coming years is to be avoided several very disagreeable remedies must be applied to Philadelphia's existing transportation enterprise and certain very radical modifications must be made in the city's program for adding an additional transit system with its own serious problems to the existing defective financial structure.

The service provided by the present transportation lines of Philadelphia is neither adequate nor satisfactory. This is largely the result of the tendency of the management to fight off the inevitable effect of the present era of high operating and construction costs by refusing to increase service on existing lines and by the virtual cessation of constructing extensions. The company has not increased its service during the past five or six years to keep pace with the increase in traffic. It has been in this way that the company has succeeded since 1916 in showing net earnings sufficient to meet its heavy capital charges.

War conditions provided an excuse for the failure to build extensions and to keep up service, but the war is now over and the time is at hand when it is imperative that the company build the extensions that have been long promised. It is necessary also for the company to run more cars on many of its lines which during the rush periods of the day are overcrowded.

The company has been required to make large and frequent increases in wages during the past year and the time is undoubtedly near when, if the company is to provide the service which the public has a right to expect, it will find it most difficult to continue to meet its present capital charges with the present fares.

It will then be necessary to either raise the fares or reduce the capital charges. The patrons of the lines will strongly object to paying higher fares while the company is overcapitalized. The company will endeavor to procure an advance in fares without a valuation of the property or will urge that the value of the property substantiates the fixed charges which are now paid.

The company has not, during several years past, increased the number of cars operated proportionately to the increase in its revenue; the number of passengers carried per car-mile has reached the highest point during the history of the company. The company is therefore several years behind in its provisions of cars. Besides which, when the new rapid transit lines are placed in operation the large surface car requirements for transfer lines will probably cut deeply into the number of cars which it has been estimated might be disposed of during the early years of high-speed operation.

As there is little prospect of a return to pre-war operating costs, the provision by the company of adequate service will in all likelihood bring it face to face with a financial crisis such as so many other companies have faced during the last two or three years. It will then be the company's problem to substantially increase its revenues and will apply to the Public Service Commission for permission to increase fares.

The welfare of the citizens demands that the city be prepared to meet this move on the part of the company with a well-defined statement of its policy.

CONCLUSION AND RECOMMENDATIONS

Before placing any contracts or beginning construction upon new rapid transit lines the new city administration should:

1. Adopt a definite policy as to the basis and extent upon which the city is willing to ally itself with the Philadelphia Rapid Transit Company in the joint supply of transit facilities and service in Philadelphia.
2. Arrange for such modification of the city's system as now authorized as will carry out that policy and along lines indicated in this report.

The completion of all outstanding subway contracts and the lack of any operating agreement between the city and the Philadelphia Rapid Transit Company leaves the matter of transit development in such shape that the city can readjust its program now more readily than at any other time since work was started in 1915, and the city should take advantage of this condition as a similar condition may not occur again.

On account of the importance of securing service on the Frankford Elevated Line as soon as possible, I recommend that the incoming administration arrange as soon as possible for the authorization and sale of a bond issue of say $4,000,000, such to be applied primarily to the purchase of cars and equipment for this line to Bridge Street, and any surplus remaining to be made applicable to any of the general uses of the department in connection with the development of the adopted plan. Inasmuch as the equipment contemplated to be purchased out of this money is of a more or less perishable nature and subject to more rapid deterioration than the subway and elevated structures heretofore contemplated, I recommend that these bonds be issued for a term not exceeding thirty years, and as the period of construction will be short, I recommend that the interest and sinking fund charges be not capitalized during the construction period.

On account of the urgency of the situation this matter should be taken up promptly by the new administration in order that no unnecessary delay may occur in putting this line in operation.

At the next session of the Legislature a determined effort should be made to secure passage of an act enabling the city to hold a referendum on any transit matter which may have been approved by public vote and which due to later knowledge or developments requires reconsideration in the public interest. The passage of such an act will do more than anything else to expedite the ultimate completion of the badly needed high-speed lines.

Experiments are being tried in the United States and in Italy with the burning of pulverized coal on steam locomotives, the increasing price and scarcity of high-grade coal having directed attention to the possibility of burning lignite and other low-grade fuels by means of the pulverized systems.

Interurban Freight Service*

A Classification of Operating Expense Accounts for Freight Service Is Suggested

BY W. K. ZINSMEISTER
Auditor and Treasurer Rochester & Syracuse Railroad

DURING the past few years a great deal of time has been spent in working out ways and means to increase passenger fares and to economize in operating expenses, but little attention has been paid by the interurban electric railway to inaugurate and to build up the electric freight business. The steam roads have just been turned back to their owners in such a deplorable condition that the time is ripe for the electric roads to get into this branch of the service, as municipal and other governing authorities are less apt, at this time, to place heavy restrictions on building of terminals and operation of freight cars in cities and villages.

Since I was asked to write a paper on the cost of operating the freight business, I have taken up this subject with the auditors of several of the larger interurban roads and was surprised to find that in nearly all cases no records are kept or reports compiled which would show whether the freight business is profitable.

I believe that if a study of the possible profits of the freight business, operated as an adjunct to the passenger, were made most of the interurban roads would find that there are great opportunities along this line.

This industry has been supplied by the Interstate Commerce Commission and by the Public Service Commission of this State with a uniform system of accounts for passenger service, but we have not as yet been supplied with any accounting system which will give us the cost of operation of freight service. I believe that this branch of the service should pay its proportion of expenses of maintenance of roadbed, track, overhead, etc., measured according to actual cost and use; also with all additional taxes and interest paid on account of operation of the freight service. Such a system must be simplified as much as possible, and I will, therefore, adhere to the uniform system of accounts as adopted by the New York State Public Service Commission. I will take up the operating expense accounts, which are distributed as follows:

WAY AND STRUCTURES

Maintenance of Track, Overhead, etc. (1-23)
This account shall include a proportion of the cost of maintenance, including supervision of roadway, track, bridges, signals, telephone lines, distribution system and all miscellaneous way and structures expenses as shown in the uniform system of accounts, numbered from 1 to 23 inclusive. This account shall be charged with the proportion that the freight car-miles bear to the total car-miles operated.

Buildings and Fixtures (24)
This account shall include the cost of labor and material used in repairing freight stations, platforms and all other freight structures; also a proportion of the cost of repairing jointly used carhouses, shops, offices and other buildings, same to be proportioned on use or car-mile basis.

Depreciation of Freight Buildings and Structures (25)
This account shall include the amount set aside to provide a reserve for the retirement of freight stations, platforms and other freight structures.

EQUIPMENT

Repairs to Freight Cars (31, 33)
This account shall include the cost of all labor and material used in repairing bodies, trucks and electrical equipment of freight cars.

Miscellaneous Shop Expenses (29, 36, 37, 39)
This account shall include a proportion of the cost of shop supervision, repairs to shop equipment, cost of heating shops and other miscellaneous shop expenses, same to be proportioned on use or car-mile basis.

Depreciation of Freight Equipment (40)
This account shall include the amount set aside to provide a reserve for the retirement of freight equipment.

POWER

Power Delivered to Cars (45-62)
This account shall include the total cost of power, including generating, converting or the amount paid for power purchased and all expenses incident to delivery of power to cars, same to be charged to this account at the cost of power per car-mile.

CONDUCTING TRANSPORTATION

Freight Trainmen (65)
This account shall include the wages for motormen, conductors and other trainmen engaged in freight service.

Station Employees and Expenses (68, 69)
This account shall include wages of agents, warehousemen and others employed in freight stations; also the cost of heating and lighting stations and other miscellaneous freight house expenses.

Freight Collection and Delivery (38, 76, 96)
This account shall include the wages of chauffeurs, drivers and helpers employed on wagons or other vehicles used for collection or delivery of freight. This account shall also include the cost of repairing wagons, harnesses, trucks and all garage and stable expenses incidental to maintenance of wagon or truck delivery service in connection with the freight business.

Loss and Damage (77)
This account shall include the expenses incurred for losses and damages to freight entrusted to the carrier for transportation; also cost of settling such claims.

Miscellaneous Transportation Expenses (63, 66, 67, 70-73, 78)
This account shall include a proportion of the cost of superintendence of transportation, car inspection, operation of signals and telephone lines and other miscellaneous car service and transportation expenses, same to be charged on the car-mile basis.

TRAFFIC

Solicitation of Freight (79)
This account shall include the salaries and expenses of freight solicitors and clerks.

Advertising (80)
This account shall include the salaries and expenses of advertising agents, the cost of printing and distributing timetables, folders, notices to shippers and all other freight advertising matter; also freight advertising in newspapers and magazines.

Miscellaneous Traffic Expenses (82)
This account shall include miscellaneous traffic expenses of the freight department.

GENERAL AND MISCELLANEOUS

Officers, Clerks and Miscellaneous General Expenses (83-91, 95)
This account shall include a proportion of the salaries and expenses of general officers and clerks, law expenses, stores expenses and miscellaneous general office supplies and expenses, the charge to be made on the car-mile basis.

Accidents and Damages (92)
This account shall be charged with salaries and expenses of claim agents and attorneys and amounts paid in settling claims of accidents arising from the operation of freight cars.

Insurance (93)
This account shall include premiums paid for insurance on freight buildings and equipment.

Stationery and Printing (94)
This account shall include the cost of printing freight bills, waybills, milk tickets and other freight printing; also the cost of stationery and postage used by the freight department.

Rent of Tracks and Facilities (97)
This account shall include the amounts paid for rent or use of tracks and facilities by the freight department.

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*Abstract of paper read at the annual meeting of the New York Electric Railway Association, Bluff Point, N. Y., June 26, 1920.

Rent of Equipment (98)

This account shall include the payments to other companies for rent or use of freight cars and equipment.

TAXES

This account shall include gross earnings and income taxes based upon the gross and net earnings of the freight department; also state, county, town, city, village, school and other miscellaneous taxes actually paid on freight structures and equipment.

INTEREST

Technically the freight department should be charged with its proportion of interest, taxes, insurance and depreciation of roadway, tracks, overhead, buildings, etc., but inasmuch as the freight business is operated as an adjunct to the passenger service, it is practical only to charge this account with interest on equipment and facilities used exclusively for the freight business, at the same ratio that the general mortgage or indebtedness bears to the total value of all the railroad property covered by the mortgage. For example: If the total value of the railroad as covered by the mortgage amounts to $15.000,000 and the mortgage amounts to $5,000,000 at 5 per cent and the value of the equipment used exclusively for freight is $100,000, interest at 5 per cent per annum should be charged on one-third of $100,000 as, in this case, the railroad property is mortgaged for one-third of its book value. This account should also be charged with interest on any loans made for the purchase of freight buildings or equipment not covered by the mortgage.

FREIGHT DEPARTMENT REPORT OF EARNINGS, EXPENSES AND STATISTICS

SUMMARY OF OPERATIONS

Month of Month of This year to Last year to

Earnings		
Freight (car load)		
Freight (less car load)		
Milk and cream		
Other revenue		
Gross Earnings		
Operating Expenses Accounts		(Note)
Way and structures:		
Maintenance of track, overhead, etc.	1–23	(B)
Maintenance of buildings and structures	24	(C)
Depreciation of freight buildings	25	(A)
Equipment:		
Repairs to freight cars	31, 33	(A)
Miscellaneous shop expenses	29,36, 37, 39	(B)
Depreciation freight equipment	40	(A)
Power:		
Power delivered to cars	45–62	(B)
Conducting transportation:		
Freight trainmen	65	(A)
Station employees and expenses	68, 69	(A)
Freight collection and delivery	38, 76, 96	(A)
Loss and damage	77	(A)
Miscellaneous transportation expenses	63, 66, 67, 70-73, 78	(B)
Traffic:		
Solicitation of freight	79	(A)
Advertising	80	(A)
Misc. traffic expenses	82	(A)
General and miscellaneous:		
Officers, clerks and misc. general expenses	83–91, 95	(B)
Accidents and damages	92	(A)
Insurance	93	(A)
Stationery and printing	94	(A)
Rent of tracks and facilities	97	(A)
Rent of equipment	98	(A)
Total operating expenses		
Taxes		
Income less operating expenses and taxes		
Interest		
NET INCOME		
Freight Statistics		
Car-miles—owned tracks		
Car-miles—leased tracks		
Car-miles—total		
Car-hours—total		
Weight—foreign equip. carload		
Weight less car load		
Weight total		
Gross earnings per car-mile		
Operating expenses per car-mile		
Net earnings per car-mile		
Gross earnings per 100 lb.		
Operating expenses per 100 lb.		
Net earnings per 100 lb.		

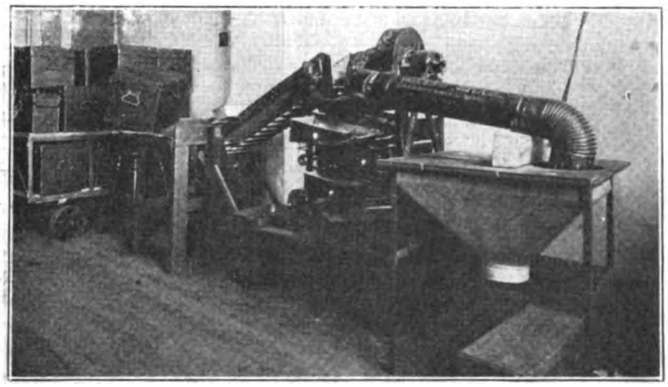
Note:
Proportioned
A = Actual, B = Car-mile basis, C = Part at A, part at B

The distribution of operating expenses, taxes and interest will not be exactly the same on all roads, but the fundamentals as set up in this system of accounts will give the cost of operation of the freight business, from which we can obtain valuable information. Most electric railroads have neglected this business and have failed to provide sufficient facilities for the business which they already have, and this information may be used to determine whether or not the business is profitable and whether or not it will pay to provide adequate equipment and facilities for the present business and further facilities for future growth.

Coin Counter at Kansas City

THE accompanying illustration shows the latest addition to the mechanical coin-counting equipment of the Kansas City (Mo.) Railways. This machine is a sorter and separator combined and is a development of several of the machines described in detail in the May 1 issue of the ELECTRIC RAILWAY JOURNAL.

The machine is a combination of a coin and ticket separator and a sorter of coins and tokens. The work which it does previously required two, and at times three, machines with operators. The new machine is operated by two people, one at the feed table and one at the tills. The contents of the fare boxes are emptied upon a revolving table, shown at the left of the picture. From this table they are fed onto a belt conveyor, and the conveyor deposits its contents in the first jogging compartment. While the jogging process, which causes the coins and tokens to pass through a screen, is in progress the paper tickets are removed from the mass by means of a vacuum suction nozzle and are delivered through a tube to a hopper, from which they are checked and weighed. The coins and tokens pass through a series of screens, each with apertures for one denomination. From the tills the coins and tokens are delivered to the standard counting machines. The reversible table at the feed end of the machine provides for a continuous supply of material, for while one box is being counted the contents of another are arranged for the operator.



NEW COIN AND TICKET SORTER USED BY KANSAS CITY RAILWAYS

Two $\frac{1}{12}$-hp. motors supply the power for the operation of the machine, one operating at 1,500 r.p.m. for driving the fan which produces the suction and the other operating at 1,700 r.p.m. for driving the conveyor belt and agitating the joggers. The machine has a capacity of 300,000 coins, tokens or tickets per hour. It is the work of a local mechanic in collaboration with L. M. Boschert, assistant treasurer of the railway company, under whose direction all tabulating of fare receipts is done.

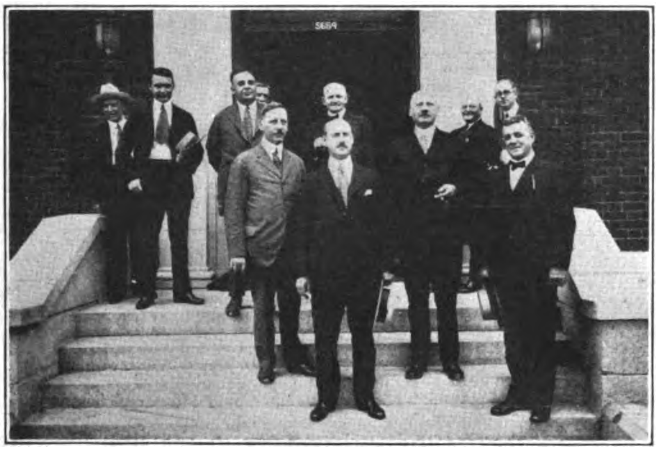
What is said to be the largest jet condenser yet built was recently completed by the Westinghouse Electric & Manufacturing Company for the Alabama Power Company. It is capable of passing 13,000,000 lb. of water per hour.

Outing at Montreal

New England Street Railway Club Enjoys Trip—Prominent Government Officials Speak at Banquet

MONTREAL good fellowship and hospitality will long be remembered by the members of the New England Street Railway Club who participated in the trip to that Canadian city this week. The party, about eighty in number when it left Boston on the evening of June 28, was increased by delegates who joined at points along the route. Montreal was reached on Tuesday morning. Here another contingent, made up of some of those who had been in attendance at the Bluff Point convention of the New York Electric Railway Association, and others who had motored to Montreal, joined the party.

The first day was spent in an inspection tour of the city and system of the Montreal Tramways, personally conducted by officials of that company. The start was made about 11 o'clock from the Windsor Hotel, the delegates traveling in the official parlor car and the two open sightseeing cars of the company. A train of two closed cars followed for use in case of rain, as the weather was threatening, but the services of this train were not required until during the last hour of the trip, when a short shower made this thoughtful provision of the hosts very acceptable.



OFFICIALS OF THE MONTREAL TRAMWAYS AND OF THE CLUB IN FRONT OF THE POINTE AUX TREMBLES SUBSTATION

After a tour around Mount Royal the party was taken to the new Pointe aux Trembles substation of the Montreal Tramways, where a bountiful lunch was served and the Montreal Tramways' band of thirty pieces played national and popular airs and cheers were given for Colonel Hutchinson, general manager; A. Gaboury, superintendent, and the other officials of the Montreal Tramways who had been so assiduous in looking after the comfort of the visitors. On the return trip the repair shops at Youville were visited.

While the members of the club were making this tour the visiting state officials who composed part of the party engaged in a game of golf at the Forest and Stream Club.

The banquet, held Tuesday evening in the Rose Room of the Windsor Hotel, was unique in that the guests included prominent state officials from each of the six New England states as well as leading Dominion and provincial officials. I. A. May, president of the club, presided and Hon. John N. Cole, Commissioner of Public Works, Massachusetts, acted as toastmaster.

The speaking was introduced by a toast to the King, offered by Mr. Cole, followed by another to the President of the United States, offered by E. A. Robert, president Montreal Tramways. Both toasts were drunk standing. The representatives of the New England states who later delivered addresses were Hon. Channing H. Cox, Lieutenant-Governor of the Commonwealth of Massachusetts; Hon. Clifford B. Wilson, Lieutenant-Governor of the State of Connecticut and also the Mayor of the city of Bridgeport; Hon. Leon F. Higgins, president of the Senate of the State of Maine; Hon. Emery J. Sans Souci, Lieutenant-Governor of the State of Rhode Island, and Hon. Mason S. Stone, Lieutenant-Governor of the State of Vermont. Speeches were also given by Hon. L. Athanase David, Secretary of the Province of Quebec; Alderman Dickson, who represented the Mayor of Montreal, and E. A. Robert, president, and Col. J. E. Hutchinson, manager of the Montreal Tramways.

Many references were made by the speakers from New England to the hospitality shown on the occasion of their visit, to the distinguished services rendered by Canada during the war, to the sterling qualities which had characterized the Canadians, mostly from the Province of Quebec, who had settled in New England in the past, and to the close ties of amity and economic interest which existed between these two neighboring countries of North America. With these sentiments the hope was voiced that these ties would become even stronger in the future. This expression of friendship was reciprocated by the speakers from Canada, who were most cordial in their greetings and in testifying to their pleasure in the selection of Montreal as the place for holding the annual outing of the club.

A feature of the dinner was the display of moving pictures of groups and incidents taken during the day's excursion.

On Wednesday afternoon the members of the club, accompanied by representatives of the Montreal Tramways, took a trip on the harbor of Montreal in a boat placed at their disposal by the Montreal Harbor Commission. The greatest interest was taken in the extensive system of docks, warehouses and terminal railways which have been constructed and are under construction by the Harbor Commission. After the return to the hotel Wednesday afternoon the delegates presented a piece of table silver to W. C. Bolt as a testimonial of their appreciation of his services as treasurer of the party. The club returned to Boston on Wednesday night.

New Features in Winding Machine

THE Comstock armature and field coil winding machine, embodying several new features, has recently been put on the market by the Diamond Manufacturing Company, Wyoming, Pa. The head of this machine, which carries the face plate, can be placed at any angle within 90 deg., thereby enabling the operator to wind a coil in any desired position. The machine is stopped and started by means of a pedal operating a cone clutch. It is driven through a worm gear and is equipped with a three-step cone pulley.

A hand wheel on the front of the machine is used to turn the face plate backward when desired. This wheel can also be removed and a form can be attached to the spindle for high-speed plain winding. The machine weighs approximately 350 lb.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Standards Exhibit Planned for Convention

THE American Electric Railway Engineering Association has sent a letter to members of its committees announcing that in the campaign for extending the use of the association standards an opportunity will be afforded at the 1920 convention for manufacturers to display the association standards. Arrangements will be made whereby all standards in each manufacturer's exhibit can be designated with appropriate cards.

In addition to this the association itself plans to have a complete and representative exhibition of standards in its own booth. Only one sample of each standard, however, will be shown in this booth. The manufacturer members of each committee have been requested to furnish for exhibition in the association's booth such of the standards as they can readily provide.

Program Committee of Engineering Association Meets

A TENTATIVE program for the Atlantic City convention was discussed at a meeting of the Engineering Association's committee on engineering subject matter held at 8 West Fortieth Street, New York, Monday, June 28, at 10 a.m.

Those present were President E. R. Hill of Gibbs & Hill, consulting engineers, New York, N. Y.; A. B. Stitzer (chairman), chief engineer Republic Engineers, Inc.. New York, N. Y.; C. S. Kimball, engineer Washington Railway & Electric Company, Washington, D. C.; K. A. Simmon, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

The committee hopes to equal, if not improve, the program of last year, as it has plenty of vital and live subject matter for discussion and an extended list of inspiring speakers from which to make a selection.

Meeting of American Association Fare Systems Committee

THE fare systems committee met Tuesday, June 29, in the Association headquarters at 8 West Fortieth Street, New York. Those present were: W. H. Sawyer, (chairman), vice-president E. W. Clark Management Corporation, Columbus, Ohio; L. H. Palmer, assistant to president, United Railways & Electric Company, Baltimore, Md.; Thomas Conway, Jr., Wharton School of Finance, University of Pennsylvania, Philadelphia, Pa.; J. K. Punderford, vice-president the Connecticut Company, New Haven, Conn.; R. F. Carbutt, Henry L. Doherty Company, New York; L. R. Nash, Stone & Webster, Boston, Mass.; Robert W. Feustel, president Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

Reports were read by several members relating to details of the committee program. This committee hopes to present a complete résumé of fare systems used during the past few years and deductions to be made from actual experience with these systems. The committee has a wealth of material and every member is working hard to produce something worth while for the consideration of the convention.

A Post-War Opportunity

THE association office has received a communication from Robert Kraudnoil, manager Salzburger (Austria) Railway & Tramway Company, containing a request that employees of electric railways in the United States assist their Austrian fellow-workers through the medium of food drafts. The substance of the letter follows:

> Owing to the high cost of living and the poor rate of exchange many Americans have been helping Austrians. Usually, however, packages are sent only to persons by relatives or acquaintances in the United States. There are many who have no such relatives or friends. To secure relief for such, and to eliminate profiteering, I take the liberty, as director of the Salzburger Eisenbahn und Tramway Gesellschaft, to ask whether you would place at the disposal of our employees a sum covering three hundred and forty-seven families at $3 per package as per the accompanying list. The total cost therefore would be $1,041. If each American electric railway employee will do what he can according to his will and strength, this amount would not be a hardship on these employees while helping ours to get through a difficult period.
>
> Please do not consider this request as an impertinence, but necessity drives us on to do what we can to obtain better conditions. Salzburg must be known to many a traveling American as the prettiest city of Europe.
>
> In case this request meets with your approval we shall ask the American auxiliary at Salzburg to arrange for the reception and distribution of these packages.

Valuation Committee Meets

THE American Association committee on valuation met on Wednesday, June 30, at the association headquarters in New York City. The following members were in attendance: Martin Schreiber, chief engineer Public Service Railway, Newark, N. J., vice-chairman; Prof. H. C. Anderson, Ann Arbor, Mich.; Cecil F. Elmes, of Sanderson & Porter, Chicago, Ill.; J. H. Hanna, vice-president of Capital Traction Company, Washington, D. C.; W. J. Harvie, general manager Auburn & Syracuse Electric Railroad Company, Auburn, N. Y., and W. H. Sawyer, vice-president E. W. Clark Management Corporation, Columbus, Ohio.

This meeting was largely an organization meeting at which the scope of the report to be made at the annual convention was finally and definitely fixed and progress made in determining its character. The committee members all reported that the 1919 report had, so far as they could learn, proved a really substantial forward step in valuation discussions and there was no sentiment to modify this report in the least.

Waterbury Entertains Section 7

PROMINENT business men of Waterbury and musical and dramatic talent recruited from the local division of the Connecticut Company instructed and entertained the 122 members and guests of company section No. 7 on June 3. There were four addresses on civic and general topics, some readings and a minstrel show. The usual dinner preceded the meeting.

Brown, Boveri & Company are reported to have made, a few weeks ago, some tests on a 1,200-volt d.c. rack railway, equipped with regenerative control, to determine the percentage of energy recovered on down grades. The maximum grades are 17.9 per cent. The locomotives carry two shunt-wound motors. The recovered energy was 53.8 per cent of that required to take the locomotive up hill, based on measurements at the locomotive, or 59 per cent as compared with the substation power supplied.

Recent Happenings in Great Britain

Extension of Central London Railway Completed—Tramway Wage Question Revived—London Tramways Plan Expansion

From Our Regular Correspondent

After long delay, mainly caused by the war, the Ealing extension of the Central London Railway is expected to be open for traffic on July 1. The extension is about 4 miles long. It runs from the present western terminus of the Central London Railway at Shepherd's Bush to the suburb of Ealing, on the extreme western outskirts of London. The total length of route from Ealing to Liverpool Street in the city of London is about 11 miles, of which 6 miles are in deep-level tube tunnels. All the extension is surface railway on its own right-of-way. There will be ten-minute service of trains each way. This will probably be increased later to seven and one-half minutes, and the time for the journey will be thirty-eight minutes.

THE additional rolling stock (multiple-unit trains) was delivered before the war, and as the railway was not ready for it it was utilized for the through service between the Baker Street & Waterloo Railway and Watford on the London & North Western Railway. New rolling stock for the service is now being delivered, so that the Central London Company's cars are freed for the Ealing service. There will now be three routes between Ealing and the city of London, namely, the Central London Railway, the Metropolitan District Railway, and the combined Great Western & Metropolitan Railways route. It is hoped that considerable relief will be given to the congestion during the rush hours on the District Railway. A peculiar feature is that the three stations in Ealing are alongside of one another, two being terminals and one a wayside station on the main line of the Great Western Railway.

On May 28 the tramway wage trouble broke out again. It will be recalled that the National Joint Industrial Council for the industry, after making an award of 6s. increase per week, which was not accepted in some districts, left each district council to try to settle matters locally according to existing conditions. Five district councils came to agreements, but the other four failed to do so. The National Council met on May 28 to try to settle the disputes, but was not successful. Meanwhile more trouble was threatening because the London omnibus men were, like the tramway men, pressing for an advance of 10s. a week. The Minister of Labor took up the matter and discussed it with the parties, and the final result, which was announced on June 4, was a settlement. The tramway men in the London area receive a flat rate increase of 9s. a week, the graded increase proposal being abandoned. For provincial districts the principle of the Lancashire settlement, namely a graded increase of 7s., 8s. and 9s., has been adopted. The London omnibus workers were thereafter granted an advance of 9s. The original demand was for a flat rate increase of 10s. a week for the whole country.

The National Wages Board on June 4 issued its award on the applications by railway (as distinguished from tramway) men for large increases of wages. The increases granted are much more modest. They range from 7s. per week downward. The increases will necessitate further raising of fares and freight rates.

Lord Ashfield, chairman of the underground railway group, and one of the greatest authorities on London traffic problems, has an interesting article in the May number of the *Nineteenth Century and After*. He regards present difficulties as mainly due to a lack of foresight which allowed London to grow to its present size without proper plan or co-ordination. High speed he regards as the basis on which a healthy metropolitan city can be reared. The present underground railways will have to be supplemented by additional high-speed railways with fewer stations. What is wanted, he concludes, is:

1. A general plan for the development of the whole metropolitan area.
2. A scheme of facilities for rapid communication carried into effect ahead of development.
3. A transfer of all transport agencies to private enterprise, subject to public control, with a pooling scheme for co-ordination.
4. A unification of control in the hands of a statutory authority.

A. F. Buxton, chairman of the finance committee of London County Council, estimates a deficit on the working of the Council's tramways for the current year of £462,000. The reserve fund has already been exhausted. The expenditure on salaries and wages now amounts to 12.36d. per car-mile against 4.5d. in 1914. A special committee is now inquiring into the general conditions under which the tramways are being operated with the object of putting them on a self-supporting basis. Meantime help from the local rates is contemplated.

The London County Council does not intend to allow present financial troubles to prevent it from going forward in the path of tramway progress. There is a strong determination among most of the councillors that the tramways must be put in a strong position and to see that no charge shall come on the rates in respect of them. The traffic is growing on the existing lines and some others are to be opened During 1919-20 there was an increase of 7.7 per cent in the number of passengers as compared with the previous year. Further increases will come with the development of housing schemes in the suburbs. A. L. C. Fell, the general manager, estimates that for the growth of traffic on existing routes 124 additional cars are required, while for new lines to be opened eighty more will be necessary. Out of the total, seventy-nine will be available from existing stock when material on order is delivered. The remaining 125 are to be ordered as soon as tenders can be obtained from builders, but in the present condition of industry delivery is not speedily expected. The type of car will be the same as that now in use, namely, a double-deck roof covered, eight-wheel bogie car seating seventy-eight passengers. The Council, however, is not satisfied that the last word in design has been reached, because it is offering a prize of £1,000 for the best design which can be put forward. Officers and other employees of the Council are not to be eligible to compete, but otherwise the competition will be open to the world.

Another town which is trying a new type of car is Sunderland. The main feature is the provision of doors at the front to be used for exit, so that less time may be spent in loading and unloading.

The tramways (temporary increase of charges) bill received the Royal assent on May 20. It is accordingly now an act of Parliament and law of the land. This, it may be recalled, is the measure which enables the Minister of Transport to issue orders enabling tramway undertakings to raise the fares above the present statutory maximum. This in most cases is a penny per mile. In the case of municipal tramways the increases are to be such as will enable the undertaking to be carried on without loss, while in the case of company-owned tramways the increases are to be sufficient to provide for interest on loan capital and a reasonable return on share capital. At the end of May a first step was taken under the act, the Ministry of Transport authorizing an increase of the minimum fare on the London United Tramway Company's system from 1d. to 1½d. The increases granted for the long-journey fares are relatively small.

The annual conference of the Tramways & Light Railways Association will be held in London on July 2.

The introduction of the token system for ¾d. fares, in lieu of the abolished ½d. fares, for short journeys on the Glasgow tramways has caused a great deal of work to the officials. The tokens, which in substance resemble celluloid, are purchasable at twelve for 9d. The passenger hands the conductor a token and gets a ticket in return. The tokens are obtainable from employers, shopkeepers, etc., as well as from the tramway offices. The whole arrangement is of some magnitude, as hitherto more than 6,000,000 passengers per week have been carried for stages not longer than those to which the ¾d. fares apply.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Sixty Cents in Rochester

Award Announced in New York State Railways Arbitration Proceeding —Nine-Hour Day

Sixty cents an hour as the rate of compensation and a basic nine-hour day are prescribed for motormen and conductors employed by the New York State Railways on its Rochester, Syracuse and Utica lines, in the award announced on June 28 by the Board of Arbitration before which the wage-and-hour dispute was argued between the company and its employees. The new wage scale represents an increase of 33⅓ per cent over the present scale of 45 cents an hour. The award is retroactive to May 1.

MEN'S REPRESENTATIVE DISSENTS

The award brings to a close the controversy which resulted in the three-day strike in Rochester, Syracuse and Utica early in May when the railway refused to grant demands for a 100 per cent increase in wages and an eight-hour day.

James H. Vahey, who represented the men on the board, dissented from the opinion of the majority, as constituted by former Supreme Court Judge Arthur E. Sutherland, neutral and presiding member of the board, and B. E. Tilton, vice-president of the railway. Mr. Vahey declared for a higher wage scale than 60 cents an hour and an eight-hour day.

The board expresses the opinion that it is not possible to give the men a living wage on the basis of an eight-hour day and at the same time give the public adequate service at a 7-cent fare. The majority of the board also declares that in consideration of the increases the men already have received, 60 cents an hour is a fair wage.

DETAILS OF WAGE SCALES

Revisions in the working agreement between the railway and the Rochester, Syracuse and Utica divisions of the Amalgamated, as arranged by the arbitrators, indicate the following scale for motormen and conductors: City lines, for first three months, 56 cents an hour; next nine months, 58 cents; after a year, 60 cents; interburban lines, 62 cents an hour. Employees on the third-rail Oneida line are to receive 65½ cents an hour. Men on express and baggage runs are to receive an additional 5 cents an hour. Miscellaneous shop employees, except those otherwise provided for, are to receive an increase of 33⅓ per cent upon their rate of wages and classification as of May 1. Emergency truck men are to be paid $175 a month.

Mr. Vahey declared that he was "hopelessly at variance with the views of Mr. Sutherland and Mr. Tilton." He says that he offered the arbitrators to join in an eight-hour award for the men at 62½ cents an hour. According to him, this would mean a daily wage of 40 cents less than that actually awarded, but the men would have accepted the sacrifice in order to get the shorter day.

Confiscation Cannot Be Justified Because of Past Fault

The Consolidated Gas Company, New York, N. Y., and six of its subsidiaries were granted a temporary injunction in the Federal District Court on June 29, effective July 1, on their application to restrain the State, County and Public Service Commission officials from enforcing the 80-cent gas law. The preliminary injunction permits the company to charge at the rate of $1 per 1,000 cu.ft. until the final settlement of the case by the higher courts. The Kings County Lighting Company also obtained an injunction with permission to charge a $1 rate.

Three separate opinions were handed down, one covering the case of the Consolidated Gas Company, one the Kings County Lighting Company, and one the six Consolidated subsidiaries taken together. With some slight modifications the three opinions were practically identical. The court held:

> The objections made would not deprive the companies of their rights to be protected against the present confiscation of their property.
>
> It would be impossible for the companies now to furnish the candle power they failed to furnish in the past and it will be well nigh impossible for the Mutual to divide with its then consumers its excess profits over 10 per cent that they were entitled to; besides the maxims relied on do not apply that he who comes into equity must come with clean hands and he who asks for equity must do equity.
>
> A plaintiff denied relief in equity it left to his remedy at law, but there is no such remedy as will enable these companies to collect their losses which they may sustain pending final hearing of the requirements if the act is held unconstitutional. Confiscation cannot be justified because of past fault. The affidavits satisfy us that the 80-cent gas rate is confiscatory and that a rate of $1 per 1000 cu.-ft. will be well within moderate return on the capital investments of the companies. The preliminary injunction prayed for is granted on condition that the companies deposit the amount collected above the statutory rate with a special master who shall deposit it and distribute same in accordance with the decree in a final hearing.

The plaintiffs alleged that the 80-cent gas rate was confiscatory. The defendants objected that the companies had not furnished candle power as required by law and in the case of the New York Mutual Gas Light Company, one of the subsidiaries of the Consolidated Company, it had not divided its excess profits over 10 per cent with its consumers as required by its charter.

Arbitration Decision Awaited

Davenport Awaiting Report on Request for $1 an Hour—Fare Injunction Continued

A board of arbitration is now attempting to settle the wage scale for the trainmen of the Tri-City Railway, Davenport, Ia. The board has been in session for more than three weeks without reaching a verdict. No immediate finding is expected, according to members of the board.

66 PER CENT INCREASE ASKED

Arbitration was provided for in the contract signed between the company and the trainmen a few weeks ago. The wage scale decided on will be retroactive to June 1. The men are asking $1 an hour maximum. The present scale provides for 60 cents an hour maximum.

A 7-cent fare is now charged on both the Iowa and Illinois lines of the company. In Iowa this fare is collected under an injunction secured by leading retail merchants to prevent the socialist city administration from insisting on collection of the 5-cent fare as provided in the old franchise.

The city administration has filed an answer to the injunction, but no final hearing will be held by the court for several months.

In the meantime the city is having an audit made of the traction company's books and on this audit a valuation will be fixed for the steam, gas and electric railway properties.

The city's bill for this audit will be approximately $25,000, Aldermen state. The appraisal work will be done by Burns & McDonnell, Kansas City, with whom the city has entered into a contract.

CITY QUESTIONS VALUATION

The city refused to accept the company's valuation figures and is going to considerable expense to procure valuations on which the socialists hope to found their argument for a 5-cent railway fare and a continuance of the present gas and electric rates before the courts. The Peoples Light Company, affiliated with the railway company, recently petitioned for an increase in the gas and electric rates. All these petitions for an increase will be held in abeyance until the audit is completed and valuations made.

A continuance of the 7-cent fare on the Illinois lines will be asked of the Public Utility Commission of Illinois. The petition will be submitted by J. G. Huntoon, general manager of the Tri-City Railway.

Many Angles to Detroit Affairs

Formal Statement Regarding Fares—Court Denies Company's Plea to Have Ouster Suit Dismissed

A formal statement has been issued by Judge Jayne of the Circuit Court of the agreement reached before him between the city and the Detroit United Railway regarding a temporary rate of fare. Both parties to the agreement, the city and the company, reserve all rights they have, and the agreement further sets forth that the company will at once permit an audit of its books and that a hearing will be held to determine the right of the court to determine the reasonableness of a universal rate of fare for the city. This can be revoked by either the city or the company at any time. It is agreed by representatives of the city and the company that the determination of the right of the Circuit Court to pass on the reasonableness of the rate of fare will give the contending parties a permanent forum for the adjustment of differences regarding fare.

THE arrangement whereby the city will build one track of a double-track line on Harper Avenue and allow the railway to construct the other is taken as evidence of an altered attitude of the municipal administration. It has met with favorable comment, especially among some of those who will be served by that extension.

The Detroit *Free Press*, while maintaining that the Detroit United Railway's total project stopped by the police would be more satisfactory, states that a half loaf is better than no loaf at all and perhaps the second half will be forthcoming later. The city, it is cited, should be as a whole encouraged as well as pleased, because it is justified in cherishing a hope that the arrangement regarding Harper Avenue is no mere sporadic concession to public interest, but that taken in connection with the recent fare adjustment it indicates the beginning of a definite reversal of policy in the city hall.

CITY PLANS BOND SALE

The sale of the first $300,000 of public utility bonds, part of the $15,000,000 issue, has been authorized by the Council. The bonds have been purchased by the city itself and are being sold by the treasurer. Although passed upon and approved by the bond expert to whom the issue was referred, the legality of the entire issue is being contested by the Detroit United Railway.

The company's motion to have the city's ouster suit dismissed was denied Monday by Judge Dingeman in the Wayne County Circuit Court. The ouster suit was instituted by the city in 1918, and, following Judge Dingeman's decision, the court will now proceed to try the city's suit to order the company off all streets on which its franchises have expired.

The Council passed a resolution in 1918 directing the Corporation Counsel to proceed to have the Detroit United Railway removed from the streets. This action was later confirmed by a resolution which went more into detail. Then with the passage of the Kronk ordinance fixing the fare at 5 cents on all franchise and non-franchise lines, the Detroit United Railway attacked the validity of the ordinance in the United States District Court. The Detroit United Railway appealed to the United States Supreme Court when its application for an injunction was denied by Judge Tuttle, and the Supreme Court ordered the District Court to hear the application for temporary injunction and to determine the case on its merits. The case was not pushed until last month, when the company asked that the suit be dismissed, arguing that the Council should have directed the suit by ordinance instead of by resolution.

That the State Constitution and the new City Charter gave the Council a general right to control the persons or corporations using the streets, and that this would include the right to control the use of the streets, was held in the judge's decision. Under the provisions quoted, the local authorities are held to have power to control within the use of their streets for any purpose whatsoever not inconsistent with the state law. The court held that the substance of the ouster resolution was administrative and therefore did not need to be by ordinance, since the resolution passed by the Council is considered to be merely a recital of the passed expiration of franchise rights.

There is serious doubt as to the validity of the Kronk ordinance. The intent of the Council in the ouster resolution was that steps be taken to terminate the company's rights in the streets where the franchises have expired and pending such action that proposed legal and reasonable restrictions be imposed, the decision recites. These restrictions the Council sought to impose through the Kronk ordinance.

It was further held that the Council had the right to assume that a year or more probably would elapse before such ouster proceedings, if begun immediately, could be heard and finally terminated in the courts, and it extended to the railway, whose rights in the streets had expired, the privilege of remaining there and operating its railway system, pending such determination of the contemplated proceedings, on the terms prescribed by the ordinance. There is nothing inconsistent in the position taken by the Council in this respect.

Toledo Ordinances Passed Again

Council Seeks to Insure Their Legality—Plans Being Made for Political Campaign

The members of the commission which formulated Toledo's twin municipal ownership ordinances for acquiring and constructing a transportation system for the city have resolved themselves into a committee to provide the nucleus for a summer campaign. They have planned to educate the people in favor of the public ownership plan before the primaries on Aug. 10. The Council passed the twin ordinances a second time last week to assure the legality of the special election. There is a conflict in state and city charter regulations providing for the referendum and the City Council was taking no chances. The last vote was fourteen to two in favor of submission.

THE campaign to be waged in behalf of the ordinances is to bring to the city Mayor Couzens of Detroit and many other exponents of the public ownership of street railways and to conduct open air meetings with local speakers in all parts of the city. The publicity of the campaign is being supported by only one of the three local newspapers. One afternoon paper, the *News-Bee*, a member of the Scripps-McRae league, is fighting for municipal ownership.

In offering an explanation as to the necessity for the two ordinances the commission gave out the following statement indicating its general plan:

> This commission did not wish to recommend the acquisition of a bus system to the entire exclusion of electric lines. Nor did it favor the purchase, bodily, of the present street railway system, to the exclusion of bus lines. The members wished the city to be in a position where it could establish the most modern kind of a transportation system possible. Such parts of the present system as are of modern design and necessary for a permanent transportation operation should be purchased from the company. Where present tracks must be rebuilt or new lines laid, the city would have the power to construct them. And where bus lines would be more economical or flexible the city should have the means to provide them.

For this reason the commission has designated $3,000,000 for acquiring buses and modern parts of the present street railway system and another $4,000,000 for replacing old tracks and constructing new lines.

The cost-of-service plan as finally agreed upon in all points except valuation was deposited with Judge John M. Killits of the Federal District Court by members of the commission which formulated it. This action was taken so that it might be revived at any time either the city or the company wished to open negotiations.

So far in the campaign the company has paid no attention to the efforts of those in charge of the municipal ownership campaign.

A noteworthy fact is the failure of the Doherty management to pay the interest and principal on the bonds of the Maumee Valley Railways & Light

Company, and also the interest on $1,500,000 first mortgage bonds of the Toledo & Western Railroad due on July 1. This would indicate that the company is relinquishing its hold on some of the poor-paying lines taken over at the same time the Toledo Railways & Light Company property was acquired.

TEN-CENT FARE MATTER PENDING

These two lines were assumed as a part of the inheritance of the old parts of the present Toledo system. The Maumee Valley lines could be made a part of the city system to take care of future up-river growth. The Toledo & Western is a distinct interurban operating into Adrian, Mich., and some smaller villages in the northwestern part of Ohio.

No definite action has been taken by the Rail-Light attorneys relative to bringing up for hearing the cross-bill providing for a 10-cent fare with 2-cent transfers which was filed early in the spring by the Doherty interests.

Temporary Injunction Granted

Denver Tramway Restrained from Reducing Wages or Otherwise Impairing Its Service

District Judge Whitford on June 26 granted the application of the city of Denver, Col., for a temporary injunction against the Denver Tramway. The court overruled the demurrer of the company and denied its motion to dismiss the proceedings on the grounds that the court has no jurisdiction. The order is very broad and sweeping. It restrains the company from reducing the higher wage scale established by a local board of arbitration on March 18, 1920, and from taking any other action which might interfere with continued railway service.

CITY NOT REQUIRED TO GIVE BOND

In the absence of any pleadings or arguments by the employees, Judge Whitford declined to make a ruling with regard to them although the city of Denver in its application of May 29 requested an injunction against the local branch of the Amalgamated Association prohibiting them from striking for any reason. The restraining order was entered on May 29. It was made against both the company and the association.

The direct application by the company that the city be requested to furnish adequate bond to cover the losses of the company of some $1,200 a day resulting from the injunction was denied.

The City Council on May 10, 1920, referred to popular vote during May, 1921, the 7-cent fare ordinance initiated by the company as an immediate means of relief in order to furnish the additional revenues required to meet the higher wage scales established by the arbitration board.

Short Strike in Toronto

Men Accept Compromise Offer After Being Out Four Days—Sixty-Cent Maximum Provided

Employees of the Toronto (Ont.) Railway, failing to receive the increase to 66 cents an hour demanded by them, went out on strike on June 23. After two or three conferences between representatives of the company, the men and the Ontario Railway & Municipal Board, the board made a proposition increasing the wages to 55, 57½ and 60 cents an hour, according to classification, and announced that if the men would accept these wages the board would enforce the agreement upon the railway.

MEN ACCEPT PROPOSAL

A mass meeting of the employees was held at midnight on June 26, when the proposal was accepted. Service was resumed on the morning of June 27.

The strike lasted four days, during which period a large number of jitneys operated under license from the city corporation, at a charge of 5 cents per mile.

On May 9 the employees at a mass meeting prepared draft of demands on the company with respect to hours, wages, etc. On May 26 a committee representing the men conferred with the officers of the company. On May 28 the bill which had been introduced into the Ontario Legislature permitting electric railway fares to be raised under certain circumstances was defeated by the Assembly. The Toronto Railway then, on May 30, applied for a board of conciliation and named William H. Moore, general manager of the Toronto & York Radial Railway.

On June 1 the employees selected John T. Vick, a prominent labor man of Toronto, as their representative. These two parties having failed to agree upon the third member, the Honorable Minister of Labor appointed Justice F. S. Maclennan, Montreal, who was also to act as chairman.

The conciliation board sat on June 9 and 10 and heard evidence submitted by both parties. On June 13 it brought in a unanimous report rejecting the employees' demands. These demands were an increase from the present maximum of 55 cents an hour to 85 cents and for an eight-hour day, as well as some minor changes in the present arrangement.

MEN WENT OUT ON SHORT NOTICE

The public announcement of the award created a very strong feeling of dissatisfaction among the men and on the next day Mr. Vick, the employees' representative on the Board of Conciliation, submitted a minority report declaring that he had signed the unanimous and joint report under a misapprehension. In his minority report he recommended that the present working conditions be continued until Aug. 31, 1921, which is the date of expiration of present franchise. He also recommended that the men should receive the same rates of pay as the employees of the Toronto Civic Railway, namely, 60 cents an hour for first three months, 63 cents an hour for next nine months and 66 cents an hour thereafter.

The employees' union called a special meeting on June 15, and it was decided that unless the Toronto Railway made the rate of pay equal to that paid by the city of Toronto to employees of the Municipal lines, a strike would be called on June 17.

The Toronto Railway directors were called together, but it was impossible to obtain a quorum. When this was announced on Thursday afternoon, the officials of the union called another mass meeting for midnight on Thursday. The men then decided to postpone the time for striking until June 23.

Twin City Men Less Insistent

Employees of the Twin City Rapid Transit Company have fallen in with the ideas advanced by a committee of citizens to give Minneapolis and St. Paul more time in which to define their positions with respect to the company. In consequence, the strike by the men which it had been said would take place on July 1 has been put off on the promise to arbitrate the differences. The understanding is that if increased fares are granted, the wage increase shall be retroactive to July 1. The one disturbing element appears to be the fact that the Twin City Company may not be able to pay the retroactive wage if the increase in fare is delayed.

Mayor J. E. Meyers of Minneapolis insisted that separate figures be presented for the two cities at the joint Council hearing in Minneapolis upon the request by President Horace Lowry for a 7-cent fare in each city and four tickets for a quarter. No action has been taken by the Aldermanic Council of either city.

In Minneapolis a 7-cent fare and a 6¼-cent ticket, according to the company, would produce $1,966,743 in 1920 for the improvement of service, an increase of wages and a return to investors. If the service of the company were put on the 1917 basis and the men paid 20 cents an hour more, without the overtime feature and the eight-hour day, a total of $1,955,000 would be required. In St. Paul on the same basis there would be a net deficit of $900,339.

The estimated net income for 1920 at a 5-cent fare is $870,743 in Minneapolis. On the same basis the deficit in St. Paul is estimated at $119,339.

On the present basis of operation with a 5-cent fare Minneapolis produced in the first four months of 1920 $870,743. In St. Paul the deficit for the same period is at $119,330. On Sept. 1, 1919, a wage increase was granted of 5 cents an hour. Thus the net income in Minneapolis for the last four months of 1919 was reduced to $294,448, while in St. Paul there was a deficit of $40,869. In neither case is the full effect of this shown because service had to be reduced.

New Rochester Proposal

Service-at-Cost Measure with Graduated Return to Railway Submitted on June 30

The service-at-cost contract which was negotiated by the New York State Railways and Corporation Counsel Charles L. Pierce, representing the city of Rochester, N. Y., was presented to the Common Council at a special meeting of that body on the evening of June 30. The contract was immediately referred to the law committee, and it was announced that a public hearing will be held on July 6 before definite action is taken. Assurance is given, however, that the new contract will be accepted or rejected by the Common Council before July 15, when the grant is scheduled to go into effect.

A 15,000-WORD CONTRACT

The service-at-cost plan as presented to the Council is embodied in a 15,000 word contract, divided into nineteen articles. The plan was accepted by the board of directors of the New York State Railways at a meeting held on June 29 in New York. The object of the contract, as specified in article 2, is "so to arrange their affairs that the company shall provide in the city of Rochester the very best service which it is possible to give under any system of careful, scientific and economical management and to secure to the company a proper return upon the value of the property used in service."

The contract if adopted by the Council will take effect on July 15 and is to continue in force until July 15, 1930. Within five days after its execution the Mayor of Rochester is instructed to designate a person to be known as "Commissioner of Railways," with a salary of $12,000 paid by the railway, whose duty shall be to administer the contract for and on behalf of the city. Three appraisers are to be appointed to determine the fair value of the property of the company.

Eight rates of fare are provided for, and rate E will be put in force at the beginning of operations. The rates are as follows:

Rate A—3 cents, or six tickets for 15 cents.
Rate B—4 cents, or seven tickets for 25 cents.
Rate C—5 cents, or ten tickets for 45 cents.
Rate D—6 cents, or nine tickets for 50 cents.
Rate E—7 cents, or ten tickets for 65 cents.
Rate F—8 cents, or ten tickets for 75 cents.
Rate G—9 cents, or twelve tickets for $1.
Rate H—10 cents, or eleven tickets for $1.

STABILIZING FUND PROVIDED

When the balancing fund provided for exceeds the sum of $300,000 by the sum of $200,000 on the first of any month, on the first day of the following month the fare will automatically change to the next lower rate, and will in the same manner by the same method continue to change to the next lower rate so long as the balancing fund shall, on being computed and determined on the first of each month, be found to equal or exceed the sum of $500,000. Likewise when the balancing fund on the first of any month is found to amount to less than $200,000 the fare on the first of the following month will automatically advance to the next higher rate.

The company is to receive as its sole income and compensation an annual return on the base value according to schedule. When the fare is 3 cents, for instance, the return will be at the rate of 8 per cent per annum; when 4 cents 7.5 per cent per annum; when 7 cents (as it will go into effect) at 6 per cent per annum; when 10 cents, 6 per cent per annum.

Dayton Men Reject Arbitration Offer

On June 28 the railways at Dayton, Ohio, made a proposition to arbitrate the wage question, which caused a strike of the employees some days previously. They stated that wages of platform men only would be submitted to arbitration. When the suggestion was presented to the men, they refused to consider it on the ground that several of the strikers were employed in other capacities. Furthermore, they asserted that any arbitration proceedings must include wages, hours of labor and general working conditions.

New Orleans Negotiations Progressing

There will be no strike of the trainmen of the New Orleans Railway & Light Company, New Orleans, La., if the efforts of Rufus Foster, Judge of the United States District Court, Receiver J. D. O'Keefe and J. B. Lawson, executive committeeman of the men's union, can prevent it.

Mayor Martin Behrman has been called into the conference with the view of learning whether the Commission Council would favorably receive a proposition to advance the car fare to 7 cents, a request which had previously been denied the receiver. While he was noncommittal in his answer the Mayor asked for time to learn the attitude of the business interests toward the increase in fare. He also wants to hear from the labor organizations. The Mayor suggested that whatever solution of the present difficulty was arrived at by the conferees, any new wage award should be made retroactive to July 1, when the old contract expired. There is a disposition to meet some of the demands of the men, but a feeling prevails that a less arbitrary attitude by the men themselves would be helpful to their cause.

A resolution has been adopted by the local Stock Exchange asking that investors in the securities of the company receive equal consideration with the company's employees in the settlement of wage differences. It was reported on June 28 that the men are asking for 53 cents an hour and an eight-hour day. This would mean an average wage of about $150 a month.

Jitneys Are Curbed

New London Decides That Buses Have Been Permitted to Run Unrestrained Too Long

With the jitney issue squarely before them the people of New London, Conn., have gone on record for reasonable regulation of the buses. First the local Council acted in the matter. Later, on appeal, the voters themselves backed up the restrictions which the Council sought to impose.

IDEAL JITNEY TERRITORY

New London is a mighty active little business place at all times. In the summer, however, it becomes the center of a very considerable shore colony with a greatly augmented population and a goodly number of excursionists. Heretofore the jitneys have run wild, particularly on Montauk Avenue, which extends from the center of the city to Ocean Beach. On this street the Shore Line Electric Railway operates. There are two parallel streets from the city to the beach that are free from trolley tracks.

After considerable deliberation the Council on June 7 passed an ordinance regulating motor traffic. Among other things, this measure ruled public autos designed to carry more than seven passengers off Golden, Green, Pearl and Tillery Streets, also Montauk Avenue from Bank Street to Lower Boulevard, to Pequot Avenue, in either direction, and in a southerly direction on Bank Street between State Street and Truman Street. Moreover, the measure provided that the operator of any such vehicle seeking to do business should file with the captain of police a statement showing among other data the route over which he intended to operate, a description of his vehicle and the fare to be charged. He was also required to carry such information upon the vehicles in the form of a placard. Failure to comply with any of the terms of the ordinance was made a misdemeanor punishable by a fine of from $5 to $30. Public notice is required to be given of any intended change in fare.

JITNEY MEN DEFEATED

The jitney men were quick to assert themselves. The city charter provides that within fifteen days of the passage of an ordinance the Mayor shall, if requested in writing by five members of the Court of Common Council and thirty other voters of the city, call a special meeting of the voters to pass upon the matter. The question of regulation was thus brought before the city on June 29. The jitney men retained counsel and solicited the electors personally. On the other hand the electric railway trainmen also appealed to the electors among their friends. When the vote was taken an overwhelming majority was cast for the regulatory measure. In consequence the ordinance will be continued in effect.

Shore Resort Employees Strike

The trainmen in the employ of the Atlantic Coast Electric Railway, Asbury Park, N. J., have returned to their jobs following a conference between officials of the company and a committee of the union. The company is to be allowed to continue its "open shop" policy in view of the peculiar circumstances existing at Asbury Park during the summer months. The men will receive 50 cents an hour for a ten-hour day, with a bonus of 5 cents an hour applicable during the summer. Overtime will be paid at the rate of time and a half. The men had asked for 65 cents an hour for a nine-hour day. The discharged men will not be reinstated.

The employees went on strike June 13 following the refusal of the company to reinstate six men who were discharged. Scott F. Hazelrigg, president of the company, declared that the men discharged were not dismissed because of their affiliation with the unions, but were laid off for "violation of company rules." Two of the discharged men do not belong to the union.

The men quit on the eve of the time set for an answer from the company to the demands for an increase of 25 cents an hour in pay and a nine-hour day. The company's answer to the demands was to have been an offer of 50 cents an hour with a 5-cent-an-hour bonus for faithful services throughout the summer. A ten-hour day was proposed. The company has an application before the Public Utility Commission for an increase in the rate of fare to 8 cents.

$639,464 Asked for War on Chicago Utility Rates

The finance committee of the City Council of Chicago, Ill., was appealed to during the week ended June 26 by Chester E. Cleveland, Mayor Thompson's chief traction lawyer, for an additional appropriation of $639,464 to carry out the fight against higher traction fares and telephone rates. The Council has already appropriated $323,858 for the traction and telephone litigation this year. Should this new request be granted, the total sum to be spent this year will be $963,322. This is in addition to the sum of $250,000 which the Council made available to the Mayor to evolve his "people's ownership plan." With this sum included the grand total involved amounts to more than $1,213,000.

The city having been rebuffed repeatedly in its attempt to reverse the decisions of the Illinois Public Utilities Commission, Mr. Cleveland's request states that appeals to the State Supreme Court and perhaps to the United States Supreme Court will probably be necessary in the surface railway, elevated and telephone cases.

Of the above new request for funds, $449,600 is asked for specifically for contesting the increase in elevated fares, which have not been attacked up to the present time. The city has never had any control over the elevated lines, since these are chartered under the state railroad law.

So the Foreign Born May Know

An information service for the benefit of employers of foreign born labor and for the workers themselves has been established by the Inter-Racial Council at the Woolworth Building, New York. The object of the service is to check the tendency of the foreign born to return to their native lands under the mistaken impression that prices are lower and living conditions better there than in America. This is done by circulating reports from the foreign language newspapers regarding actual conditions abroad and by reports from unbiased authorities, such as the Red Cross. There is no charge for this service. The information is designed for the use of editors of internal house organs, shop papers, etc., and may be adopted for use as shop bulletins, posters and pay envelope stuffers and similar publicity. The service is in line with the constant effort of the Inter-Racial Council for the welfare of the foreign born by promoting better relations between the various races in America and the native born.

Temporary Settlement Planned at Akron

City officials at Akron, Ohio, have had under consideration plans for allowing the Northern Ohio Traction & Light Company to establish a higher rate of fare temporarily, pending a final disposition of the proposed new franchise, in order that employees may be paid wages recently awarded by a board of arbitration. These officials are unwilling to grant a permanent franchise, containing an increase in the rate of fare, until an examination is made of the company's books and other investigations are completed.

The men voted on the question of an immediate walk-out on June 23 and 24 and it was lost by a very narrow margin. This insured continued operation of the cars until July 4, at least, and hope was expressed that by that date some step would be taken to make possible the payment of the new wage.

William Lemmon, of the Amalgamated Association, it is said, won a victory in the defeat of the strike movement. He stated that he was opposed to precipitate action as unfair to the public and for this reason he advised the defeat of any proposition that would result in a suspension without due notice.

Traction officials stated that they would pay the men the increased wage if it was possible to secure the funds. The men will receive the new wage from May 1, they said, as soon as the company receives additional revenue. The present rate is approximately 48 cents an hour for a ten-hour day, while the wage granted by the arbitrators is 65 cents an hour. The difference will be paid them as soon as it is made possible, according to the statements.

Jitneys Become Intolerable

Bridgeport, Conn., is to be called upon to choose between the electric railway and the jitney. Notification to this effect is said to have been given to Mayor Clifford B. Wilson. The notification states that unless something is done the trolleys may be withdrawn from service. According to one source of information the formal notice of the Connecticut Company's proposed withdrawal from Bridgeport was set to be presented on July 2. The date of the withdrawal was given as July 15. Morgan B. Brainard, Hartford, a trustee of the company, is reported to have said that the notice of discontinuance of service would be reasonable. Mr. Brainard is credited with the statement that after the Bridgeport matter has been settled the company will proceed to consider jitney competition in New Haven and Hartford. He is quoted as follows:

> Of course, we will not spring any sudden ultimatum upon Bridgeport and say, "tomorrow we will take away the trolleys," but will give ample warning so that there may be time for deliberation and well-considered choice. The trustees are agreed that the case of Salem, Mass., where the community was given the choice between the trolleys and the jitneys, is the only way effectively to deal with the competition between the two forms of transportation.
>
> If the community prefers jitney service, well and good. We have no feeling against such action, but will be governed accordingly and remove a form of transportation that is second choice. For three or four years jitney competition has caused the Connecticut Company serious loss and the trustees feel that it is only sane business to settle the issue with the communities involved.

Richard T. Higgins, chairman of the Public Service Commission, when questioned in regard to the suspension of service, said:

> Offhand, I would say that the factor of equity would greatly assist the company if it were able to show that its entire operation in Bridegport was done at a loss. In cases of this kind the technical legalities of the franchise requiring utilities to give continued service on all lines does not weigh against the factor of equity when the latter is clear and outstanding. No public utilities commission would care to stand out for a full enforcement of the requirements of the franchise if that would mean permanent and serious loss to the utility from causes not under the utility's control.

Franchise Allowances Increased

According to information published at Youngstown, Ohio, the board of arbitration which has been considering the application of the Youngstown Municipal Railway for an increase in allowances under the service-at-cost agreement has fixed the operating allowance at 34 cents per car mile and has added 1 cent per car mile to the maintenance allowance, making it 9 cents. This increase, it is said, will not make it necessary to increase the rate of fare, which is now 9 cents cash and six tickets for 50 cents.

The Board of Arbitration is said to have ordered more than $23,000, which had been put into a suspense fund, transferred to the stabilizing fund.

It was expected that the formal report of the board of arbitration would be completed and ready on June 28 for presentation to the Railway Commissioner, the company and the press.

People's Ownership Bill

Chicago Measure Provides Taxpayer Must Stand Deficit Under Mayor's Five-Cent Plan

The bill to be submitted to the State Legislature, which is designed to bring about ownership and operation of the electric railways of Chicago by the people, was made public by the Mayor's traction commission during the week ended June 26. The plan of the bill is to enable the voters to create a transportation district and elect five trustees to take over and operate the lines. One of the most interesting sections of the proposed bill is No. 10, which provides that the taxpayer will have to come to the rescue and pay the deficit if the Mayor is in error in his assertion that 5-cent fares would provide enough money to pay operating and maintenance charges.

This arrangement would virtually amount to a service-at-cost plan, except that the taxpayers, instead of only the car riders, would have to share in providing the necessary revenue. When the Mayor's request for $250,000 to work out his "people's ownership" idea was before the Council traction committee, Attorney Walter L. Fisher, who drafted the 1907 ordinances in Chicago, attempted to insert the words "service at cost" in the ordinance providing for the inquiry, but the Mayor and his friends stopped the move. It was pointed out at that time that "5-cent fares" is a better campaign slogan than "service at cost."

The bill authorizes any 5,000 voters of the proposed transportation district to start the ball rolling toward public ownership by filing a petition with the county judge. It is made his duty to form a commission to be composed of himself and two Circuit Court judges to decide on the boundaries of the district after public hearings. The question would then go on the ballot, and, if approved, trustees would be elected at the following general election.

The operation of the entire scheme is of course contingent on the passage of the bill by the State Legislature.

Ten-Cent Increase Awarded

There is to be an increase of 10 cents an hour in the wage scale of the motormen and conductors of the Portland (Me.) Railroad, included in the system of the Cumberland County Power & Light Company. This means an increase of about $180,000 in the company's payroll for the coming year. The increase means a wage scale of 50, 52½ and 55 cents an hour.

This account was written before formal announcement had been made of the award. When asked if these figures were not correct, Judge Joseph E. F. Connolly, who represented the railway on the arbitration board, said he might be quoted as not denying the figures. The figures decided upon by the arbitrators are approximately 10 cents less than the rates of 60, 62½ and 65 cents an hour demanded by the men. The scale just mentioned would have meant a total increase in the company's payroll of upward of $400,000. The decision of the board, composed of W. R. Pattangall, Judge Connolly and James E. Vahey, cuts this sum more than half.

The hour wage scale did not come into force with the local railroad employees until 1916, when the wages amounted to 26, 27, 28 and 29 cents an hour, according to service. In May, 1917, there was an increase of 3 cents an hour in the scale, and the following year, 1917, there was an increase of 4 cents. In November of the same year the War Labor Board gave the employees of the Cumberland County Power & Light Company an award amounting to an 8-cent increase. The two advances in salaries that year amounted to 12 cents an hour. The day's work is reckoned on a ten-hour basis.

Legislation Urged to Reduce Electrolysis

Among the resolutions adopted by the Natural Gas Conservation Congress held at Washington recently is the following which relates to electrolytic damage to gas piping systems:

> That the attention of the state authorities be called to the necessity, from a public interest, of establishing or enacting legislation and enforcing regulations to reduce and limit, and whenever possible prevent, the carrying of stray electric currents on underground gas transmission systems, because where such stray electric currents —that have leaked off of the grounded return of single-trolley electric railways— shunt around joints on the gas pipes or leave the gas pipes to go back into the soil, they must always remove a part of the metal, and thereby produce what is known as "electrolysis," which is a disintegration of the pipe that will ultimately produce a hole, and thereby increase the leakage, as well as a life and property hazard.

News Notes

Champaign Men Get More.—The Urbana & Champaign Railway, Gas & Electric Company, Champaign, Ill., has granted a 5-cent increase in pay to its trainmen, retroactive to May 1 and extending to May 1, 1921.

Maine Men Awarded Advance.—Employees of the Androscoggin & Kennebec Railway, Lewiston, Me., are granted an increase in wages by the award of a board of arbitrators made public on June 14. The new scale is 53 cents an hour, with 58 cents an hour for operators of one-man cars. The finding is retroactive to May 1.

Strikebreakers Go on Strike.—For the second time within a week service on the lines of the Fresno (Cal.) Traction Company was paralyzed on June 5 by a strike of strikebreakers themselves. About thirty-five men who had been imported to replace the regular employees walked out. As a result the company was able to muster only sufficient crews to man about ten cars. This comprises about one-half of the rolling stock utilized for service during normal times.

Protests Holding Referendum.—The Houston (Tex.) Electric Company, which is seeking a new franchise in Houston granting increased fares on a service-at-cost basis, has filed a petition with the City Council not to hold the referendum election on the new franchise. The election has been practically decided on, but not definitely ordered. The company claims that with the City Council divided on the proposition, the public may turn down the franchise. The negotiations leading up to the present proposal extended over many months.

Must Vacate Streets.—An ordinance has been passed by the City Council of Martins Ferry, Ohio, providing for the ousting of the Wheeling (W. Va.) Traction Company from the streets of that city, this action being taken as a result of the raising of the fare to and from Bellaire from 5 to 10 cents. Under the terms of the ordinance the company must remove all tracks, poles, wires and equipment from the city limits twenty days after the ordinance becomes effective.

Ashtabula Endeavors to Purchase Railway.—If the Ashtabula (Ohio) Rapid Transit Company will agree to take the entire amount of $350,000 of bonds authorized by the city in exchange for its property, the trade will soon be made. Recently the company agreed to accept $296,000 in bonds for the line, but no buyers have been found for the other $54,000 of the issue, which was the portion intended for extensions and new equipment. The city now asks the company to take the bonds for this purpose. Recent ordinances have put the jitneys out of business and the electric railway will have all the business, if taken over by the city.

Decision for Railway in Forfeiture Case.—The Supreme Court of Tennessee has decided the case of the City of Nashville vs. the Nashville Traction Company and Equitable Surety Company, in which the city was seeking to enforce the payment of $200,000 on a bond executed by the traction company, to which a franchise was granted in 1913, the condition of the bond being to protect the city from liability in damages for accidents incident to the construction and operation of the railway and so secure the expenditure of $500,000 in the construction of the system within two years. The construction of the system was abandoned after little work was done and the franchise was forfeited. The court held that the city was not entitled to any recovery on the bond because no special damages were averred or proved by the city, the bond being construed as one given for a penalty and not for liquidated damages, so that proof of special damages was necessary to any recovery thereon.

Financial and Corporate

Bankers Adopt Platform

Indeterminate Permits for Utilities and State Regulation by Appointed Officials Indorsed

The committee of the Investment Bankers' Association of America on public service securities, of which O. B. Willcox, Bonbright & Company, New York, is chairman, is sending out to 6,000 mayors, public utility commissioners and other public officials throughout the country a letter accompanied by a resolution passed by the board of governors of the association. The association has apparently sensed the need for placing itself on record in a definite way on the three important utility questions which have to do with the type of franchise, character of regulation and selection of public utility commissioners. The letter sent out by the bankers was as follows:

The enclosed copy of resolution passed at a meeting of the board of governors of the Investment Bankers' Association of America on May 8, 1920, reflects the opinion of representative investment bankers of the country with respect to three important subjects affecting the credit of public utilities and their ability to render adequate public service: the limited term franchise as compared with indeterminate permits; state regulation as compared with local regulation, and appointive commissioners as compared with elective commissioners.

SERVICE DEMAND CONTINUES

The operators of utilities throughout the country report that the demand for public utility service exceeds the available capacity and that there is great demand for the expansion of all classes of public service which contribute notably toward increased production and decreased production costs, so vital to our national welfare.

Expansion of public utility service requires capital which must be drawn from the free investment funds of the country by the sales of securities. The investment bankers of the country are security merchandisers; they cannot provide the large amounts of money required except through the sale to investors of securities in competition with other security offerings.

The re-establishment of the credit of public utility companies is therefore of prime importance and your attention is earnestly invited to the recommendation of the board of governors of the Investment Bankers' Association of America.

The resolution adopted by the association of bankers was as follows:

Whereas investment bankers are expected to purchase and distribute the securities of public utility companies which must be sold if utilities are adequately to supply the demands upon them for local transportation, light, heat, power and the transmission of messages; and

Whereas the credit of many of the public utility companies will not permit the sale and distribution of such securities, thus interfering with the development of many commercial enterprises, the welfare of many communities and the comfort and convenience of a great many people; and

Whereas the credit of the public utilities is largely dependent upon the attitude of the public as expressed through the various governing and regulatory bodies; it is hereby

Resolved, By the board of governors of the Investment Bankers' Association of America, that as steps in the restoration of the credit of the public utilities:

1. Term franchises should be superseded by indeterminate permits securing the right to operate under proper regulation during good behavior with provisions for equitable adjustment of rates from time to time, as tending to eliminate controversies which inevitably impair the public service, the credit of the companies involved and the value of their securities.
2. The power of regulation and control of public utilities should be vested in state commissions as tending toward standardization of regulation which is not possible under local regulation.
3. Members of state commissions should be appointed.

If commissioners are elected they are frequently embarrassed by political policies and platforms in the consideration of questions which should be decided only on sound economic and financial principles.

Interborough Met Interest Payments

Announcement was made on June 25 that the Interborough Rapid Transit Company, New York, N. Y., would pay interest, due July 1, on $160,585,000 first and refunding 5s, averting receivership on that date. Fixed charges and other obligations due on July 1 totaled $6,222,900, in addition to $1,100,000 taxes due at that time. To meet this liability of $7,322,900 the company had on deposit on May 15 $4,624,230. Net operating income and miscellaneous receipts brought this to approximately $7,424,230 by end of June.

Thus the company had enough cash to pay current accounts and fixed charges, but not sufficient funds to meet in full the $2,900,000 notes due June 30, although about half of this sum was realized from the sale of real estate pledged as part of collateral for the notes. This obligation was due to banking interests friendly to the company and no difficulty was experienced securing an extension.

In ten months to April 30, 1920, the daily average of passengers carried on the Interborough system, including subway and elevated lines, increased more than 400,000 over the same period of preceding fiscal year. The aggregate of passengers carried during the ten months was 789,167,629, an increase of 125,720,762. This increase in traffic reduced the operating deficit for the ten months to $1,979,817, compared with a deficit of $3,457,832 in ten months to April 30, 1919.

The Interborough's greatest burden at present is the elevated system. During the ten months ended April 30 the company received from subway operations net income amounting to $2,165,005, but during the same period the deficit on the elevated lines was $4,144,822, leaving a net deficit of $1,979,816.

North Shore Bonds Offered

An offering of $1,500,000 of Chicago, North Shore & Milwaukee Railroad ten-year 7 per cent secured sinking fund gold notes, Series A, is being made by Halsey, Stuart & Company, New York, at 92 and interest yielding 8.20 per cent.

Brooklyn $1,040,362 Behind

Comparative Figures for Both Surface and Rapid Transit Lines Made Public by Receiver

Carl M. Owen, counsel for Lindley M. Garrison, receiver of the Brooklyn (N. Y.) Rapid Transit Company, has prepared figures on the financial condition of the company which show that the system as a whole has gone from a surplus of $1,483,816 in 1918 to a deficit of $1,040,362 in 1919. On April 30 of the current year the deficit had grown to $1,891,995.

SURFACE LINES GO BEHIND

The company passed into the control of Mr. Garrison on Dec. 31, 1918, and on July 14, 1919, the surface lines of the company followed a similar course. Three tables are incorporated in the report showing the items comprised in the bookkeeping system of the company and covering gross and net operating and non-operating income, taxes and fixed charges. These tables disclose for the rapid transit lines a surplus of $425,385 for the calendar year 1918, a deficit of $775,508 for 1919 and a deficit for the ten months ended April 30, 1920, of $1,159,489.

For the same periods the surface lines show deficits of $646,141, $2,030,863 and $2,029,288 and for the B. R. T. System a surplus of $1,483,816 for 1918, a deficit of $1,040,362, for 1919, and a deficit of $1,891,995 for the ten months period.

THE FIGURES IN DETAIL

The following figures for the two full years, 1918 and 1919, show the variation in the items:

SURFACE LINES

	1918	1919
Gross oper. revenue	$15,860,182	$17,110,363
Operating expenses	11,509,661	14,540,030
Net oper. revenue	$4,350,521	$2,570,333
Taxes	1,044,991	1,031,354
Operating income	$3,305,530	$1,538,970
Non-oper. income	476,562	474,291
Gross income	$3,782,092	$2,013,270
Fixed charges	4,428,233	4,044,133
	*$646,141	*$2,030,863

RAPID TRANSIT LINES

	1918	1919
Gross oper. revenue	$14,359,819	$17,066,342
Operating expenses	9,200,110	12,787,479
Net oper. revenue	$5,159,709	$4,278,863
Taxes	844,833	916,813
Operating income	$4,314,876	$3,362,050
Non-oper. income	288,990	363,035
Gross income	$4,603,866	$3,725,085
Fixed charges	4,178,481	4,500,593
	†$425,385	*$775,508

B. R. T. SYSTEM

	1918	1919
Gross oper. revenue	$30,982,034	$35,065,704
Operating expenses	20,035,790	26,513,833
Net oper. revenue	$10,946,244	$8,551,871
Taxes	2,613,750	2,200,633
Operating income	$8,332,494	$6,351,238
Non-oper. income	414,566	751,396
Gross income	$8,747,060	$7,102,634
Fixed charges	7,263,244	8,142,996
	†$1,483,816	*$1,040,362

*Deficit. †Surplus.

Mr. Owen explained that it was difficult to present the comparison be-

tween the present time and pre-receivership periods, because of unadjusted claims, "and particularly those arising from the deplorable Malbone Street accident of November, 1918." He added, however, that sufficient comparable data are obtainable to indicate the trend of results now accruing and these have been assembled.

Mr. Owen also explained that in October, 1919, the Brooklyn City Railroad lease to the Brooklyn Rapid Transit Company was terminated, which explains some marked changes in the figures of the surface lines.

Mr. Owen said further:

> The figures presented do not reflect the currently excessive cost of maintenance met through charges to reserves prior to July, 1919, so far as the surface lines are concerned, or the excess outgo over charges as to rapid transit lines which the contract with the city requires shall be met from funds set aside on a tentative basis at the beginning of a year and revised at the end of the year. This item, it is estimated for the current fiscal year, will probably exceed $600,000, indicating a deficit on rapid transit lines of over $1,800,000.
>
> During the week ended November 21, 1918, the total payroll of the B. R. T. system amounted to $322,768, which was at the rate of $16,783,936, and for the week ended April 15, 1920, the payroll was $477,283, or at the rate of $24,818,716 a year, an increase of $8,034,780 annually, which is equivalent to an investment at 5 per cent. of $160,000,000 absorbed by labor.
>
> On the basis of the accounting called for under the city contract at the time of the receivership, Dec. 31, 1918, the amount of unearned preferential to which the company is entitled before the city gets any return on its investment was $2,328,589. On April 30, 1920, those figures reached the total of $5,664,194. The city's unearned charges on Dec. 31, 1918, were $8,820,087 and on April 30, 1920, $13,534,286.

Net Earnings of Chicago "L" Decline

The steadily declining financial condition of the Chicago Elevated Railways shown in the accompanying statement for April, 1920, points to the imperative need for an increase in revenue and explains the company's recent application for a 10-cent fare. Although the rate of fare in April, 1920, was higher than in April, 1918, the increase in gross revenue has not kept pace with the increase in operating expenses. In other words, a margin of $88,326 above operating expenses in April, 1918, has turned to a deficit of $45,817 for April, 1920. On the net earnings for April, 1920, the roads lost nearly 0.7 cent per passenger carried without any allowance for return to the stockholders. Beginning June 1, the operating expenses will take another jump owing to the new 82-cent maximum wage scale.

Gross earnings	$1,311,554
Total expenses	1,149,857
Balance for interest	$161,696
Fixed interest charges	207,513
Net deficit for April	$45,817
Payroll for April, 1920	$685,572
Per cent of operating expenses paid to labor	59.62
Total passengers carried in April, 1920	16,150,898
Average rate of fare per passenger	7.73 cents
Cost of carrying each passenger	8.40 cents
Loss per passenger carried	0.67 cents

Twelve Large Companies Compared

More Traffic Being Handled, but Operating Ratio Continues to Climb Steadily

Comparative statistics were presented in the ELECTRIC RAILWAY JOURNAL of March 29 of twelve of the largest electric railways—six being suburban lines and the others being companies which operate rapid transit lines, some of the latter in combination with surface lines. Operating figures from the same properties have again been collected for the last fiscal year and some interesting contrasts are shown. They reflect the increased rate of fare, growth of traffic and heavier operating costs. When studied in connection with data from the United States census report for 1917, abstracted in various issues of this paper, and with other figures published in the issue of June 12, the latest returns present a comprehensive picture of the changing railway situation.

FOR OBVIOUS reasons, the twelve properties included in this study cannot be identified. It may be stated, however, that each of them does an annual business of more than $6,000,000 and their average yearly receipts are more than $20,000,000. To show how large a part of the electric railway industry they represent, it may be stated that they operated one-seventh of the railway mileage of the United States and hauled about one-half of the total passenger traffic last year.

FARE DATA

As evidence of the changing fare situation it is interesting to note that of the companies under consideration five of them, in 1918, charged 5 cents, two 6 cents, one 8 cents, two had zone systems, one a 2-cent transfer plus a 5-cent fare, and one a 3-cent transfer charge, whereas during the past year, four had 5-cent fares, three had transfer charges ranging from 1 to 3 cents, one a 6-cent fare, one a 7-cent fare, two 8 cents, and one 10 cents.

GROSS INCREASING RAPIDLY

In the item of gross earnings, these six large surface companies showed an increase of 18.6 per cent over the previous year, while operating expenses including taxes increased 25.9 per cent. The six rapid transit companies showed a gain of 15.5 per cent in gross revenue and 27.9 per cent in operating costs. The operating ratio for the surface group averaged 83.06 per cent, ranging from 73.71 to 96.23, while the other companies averaged 74 per cent and ranged from 60.73 to 83.88 per cent. It should be explained in this connection that three out of the six rapid transit companies include a large percentage of surface mileage. To show the difference where only elevated or subway company figures are treated, the operating ratio for three such companies was 71.04 in 1919 as against 60.74 in 1918.

Having been retarded in the development of their properties during the war period it was not to be expected that the railways would be able to meet a sudden growth in traffic demand with an adequate increase in service. Therefore, while the revenue passengers on the surface lines increased 7.1 per cent the car mileage increased only 1.5 per cent. On the rapid transit lines the increases were 6.4 and 4.4 per cent respectively. There was practically the same proportionate increase in car hours. This meant that there was little change in the average speed on the properties studied. The benefits which were expected from skip-stop practice failed to materialize because these experiments were not permitted to continue long.

STATISTICS PER CAR MILE AND PER CAR HOUR ON TWELVE LARGE ROADS

	Six Surface Roads	Six Rapid Transit
Transportation revenue per car mile (average)	38.9 cents	33.1 cents
Expenses and taxes per car mile (average)	32.5 cents	25.9 cents
Transportation revenue per car hour (average)	$3.26	$4.21
Expenses and taxes per car hour (average)	2.75	3.25

USE OF ROLLING STOCK DECREASED

There was a decrease in the use of rolling stock as indicated in the item "annual miles operated per car." The average for surface companies was 35,406 and for rapid transit lines 39,231, as against 35,299 and 42,045, respectively, in the previous year.

Due to the fact that some of the companies considered do not keep account of transfer and free passengers, a true statement of "total passengers per mile of single track operated" cannot be given. However, taking the figures as they are presented—that is allowing for omissions principally on the rapid transit lines—there was an increase of 3.3 per cent for surface companies and a decrease of 5.8 per cent on rapid transit lines. The number in the former group ranged from 781,509 to 2,187,623, while for the latter they were from 1,105,778 to 2,901,571.

One of the best analyses of results on these large properties is shown in the accompanying table.

One factor which renders unfair a comparison of figures between these twelve properties is that the data from five of the companies are for the fiscal year ended June 30, 1919. With wages and other operating costs increasing constantly the properties whose figures covered the full calendar year naturally showed at a disadvantage in many items. On the other hand they had the advantage of larger revenues where fares were increased late in the year.

New York City Gross Increase

The July-September, 1919, quarterly summary of revenues and expenses of the surface and rapid transit electric railways operating in New York City has recently been issued by the Public Service Commission. The reports showed that passenger revenue had increased 14.78 per cent over the 1918 quarter, but that the net corporate income had decreased to such an extent that there was a deficit of $3,691,071, as against $633,888 in the 1918 quarter. This is due entirely to the fact that the operating ratio increased 12.25 per cent. Higher wages and cost of materials, together with 7,000,000 additional car-miles made necessary to handle an 11.6 per cent increase in traffic, caused the higher operating costs.

EARNINGS OF NEW YORK CITY COMPANIES

Quarter July-Sept.	1919	1918	Percentage +Inc. —Dec.
Passenger revenue	$28,070,136	$24,433,002	+14.78
Other transportation revenue	173,916	176,126	—1.25
Total revenue from transportation	$28,244,052	$24,609,128	+14.77
Other railway operating revenue	1,811,666	1,402,310	+29.15
Total railway operating revenue	$30,055,718	$26,011,438	+15.52
Operating expenses:			
Maintenance expended	$5,902,476	$4,402,511	34.0
Depreciation reserve	629,231	Cr. 272,238	331.9
Operation of power plant	3,809,425	3,210,332	18.7
Operation of cars	10,497,023	7,455,450	40.8
Inquiries and damages	817,373	849,067	—3.7
Traffic and general expenses	1,170,731	900,100	30.0
Total operating expenses	$22,826,259	$16,545,222	38.0
Net operating income	$7,229,459	$9,466,216	—23.6
Street railway taxes	1,896,531	2,269,310	16.5
Operating income	$5,332,928	$7,196,906	25.9
Non-operating income	1,105,016	1,006,124	9.8
Gross income	$6,437,944	$8,203,030	—21.6
Deductions:			
Interest	$5,459,702	$4,272,271	27.8
Rents	4,154,835	4,195,654	—1.0
Miscellaneous	514,478	366,903	40.4
Total deductions from gross income	$10,129,015	$8,834,828	14.7
Net corporate income	*$3,691,071	*631,798	—485.0

* Deficit.

TRAFFIC AND MISCELLANEOUS STATISTICS OF NEW YORK CITY COMPANIES

Quarter July-Sept.	1919	1918	Percentage +Inc. —Dec.
Miles of track, exclusive of storage and yard tracks	1,801.14	....	....
Average daily maximum number of cars operated (Sept.)	8,311	....	....
Passenger car miles (active)	86,032,020	....	....
Car seat miles	4,481,770,668	....	....
Total revenue car miles	87,614,867	80,597,918	+8.75
Passenger car hours	7,376,766	....	....
Ratio CM-CH (speed M.P.H.)	11.65	....	....
Revenue passengers	557,320,585	494,753,741	12.7
Revenue transfer passengers	17,741,499	....	....
Total revenue passengers	575,062,084	494,753,741	16.3
Free transfer passengers	63,448,080	77,456,688	—18.1
Total passengers	638,510,164	572,210,429	11.6
Operating ratio	75.95	63.70	12.25
Car mile statistics:			
Operating revenue (cents)	34.30	32.30	6.2
Operating expenses (cents)	26.05	20.50	27.1
Net income (cents)	*4.21	*0.784	—436.0
Passenger traffic (total)	7.42	7.11	4.4
Average seats per car mile	57.20	....	....
Car miles per revenue passengers	0.1542	0.1629	5.3
Seat miles per total passengers	0.702	....	....

* Deficit.

Dallas $516,214 Behind Permitted Return

Troubles of the Dallas (Tex.) Railway are being told to the public by the company in newspaper space. In the thirty-one months ended April 30, 1920, the company failed to earn the 7 per cent return on the money invested in the property by $516,214. This means that for the period mentioned the company is facing a deficit to this amount in its permitted return.

During 1917 the settlement of the railway situation was submitted to the voters for a full discussion and at an election on April 3 of that year a franchise was granted to the Dallas Railway. The total property value determined in the manner provided by the franchise was $8,857,045 at the close of business on April 30, 1920. This represents the amount of money invested in the property as agreed with the city. The authorized return of this is 7 per cent per annum, or for April, 1920, was $51,271. The gross income from all sources for April was $246,341. The operating expenses for the same month were $209,925. The balance earned was $36,415. As the authorized return as previously stated was $51,271, the shortage in the permitted return was $14,856. This represents the difference between the amount of money the city franchise says the company is permitted to earn and the actual amount of money that was earned.

The statement was published with the sanction of the board of directors of the company.

Option on Augusta Lines

$262,000 Needed to Secure Property with Present Value of About $10,000,000

James U. Jackson, former vice-president of the Augusta-Aiken Railway & Electric Company, Augusta, Ga., is of the opinion that the city would take a long step in the direction of progress if it should acquire the control of that company, and, through a commission named for the purpose, undertake to operate the railway and the power plant. The property is now in the hands of the J. G. White Management Corporation as operating managers, with J. Q. Brown, president, and J. H. Pardee and J. K. Choate as vice-presidents.

MR. JACKSON EXPLAINS HIS OPTION

Mr. Jackson says he has an option on 20,000 shares of the common stock of the company at $10 a share and on 2,500 shares of preferred stock at $25 a share, making the total cost to the city $262,500 for the control of a property that at present prices for material could not be duplicated for $10,000,000. He further explains that the company is not in default on any of its bonded obligations.

The total outstanding funded debt of the company and its subsidiaries is $6,539,000. There are also outstanding $2,250,000 of preferred stock and $2,250,000 of common stock. The preferred stock carries 6 per cent cumulative dividends. Dividends on the preferred were begun on Jan. 1, 1912, but were discontinued in July, 1914. The common has never paid any dividends.

SAVING POSSIBLE IF MANAGED LOCALLY

In concluding his statement Mr. Jackson said in part:

> Appreciating the importance of bringing about such negotiation as would place the city in absolute control of the situation I have secured an option on control of the stock of the Augusta-Aiken Company. This control will be 20,000 shares of common at $10 per share, and 2,500 shares of preferred, at $25 per share, making a total cost to the city of $262,500. To duplicate the Augusta-Aiken property today at present prices for material and labor would cost $10,000,000. If this amount was to be raised by a bond issue, the bonds to yield this amount of money would have to bear not less than 8 per cent. The present outstanding bonds on the property—about $6,000,000—bear 5 per cent, equal to a saving of $500,000 per annum.
>
> I appreciate the fact that the Augusta-Aiken property, like all public utilities, has suffered seriously financially, but it has managed to take care of its interest charges. If managed locally under the plan suggested a big saving would result from its operation.
>
> Some objection to the plan will be presented by those who oppose municipal ownership, or government control. As long as the governments—national, state and municipal—have the power of controlling all revenue, such as rates for passengers and freight, and also revenue from power companies, it is only a question of time when private control is sure to cease, and I believe Augusta, by this negotiation, will be the pioneer in solving a most serious problem now confronting our country, especially in all communities where conditions are like those in Augusta; viz., the municipality already owning a power plant and selling current to users of power. As Grover Cleveland once said in a message to Congress: "It is a condition which confronts us, not a theory."

Interest Not Paid

Company at Toledo Unable to Cope with Mounting Costs Under Limited Fares

Frank R. Coates, president of the Toledo & Western Railroad, notified the holders of the $1,500,000 of first mortgage 5 per cent gold bonds that the company would not be able to meet the interest payments due on July 1. This is the first time that an interest payment on this issue has been passed. There is a second mortgage of $500,000, the interest on which has not been paid for five years.

OPERATING PROBLEMS INSURMOUNTABLE

The road operates between Toledo and Pioneer with a branch to Adrian, Mich. The Doherty interests took it over in 1913. A statement of the company says:

> The gross revenue between the years 1914 and 1919 inclusive increased from $367,000 to $533,000. During the same period the operation and maintenance increased from $307,000 to $546,000. The interest charge for the two issues of bonds amounted to $75,000 a year, which has not at any time during this period been earned in full. In 1919 the road did not even earn enough to pay operating expenses by some $12,000. During the first five months of 1920 the road has not earned its operating expenses by about $34,000.

President Coates says that the company has made every possible effort to develop its business along profitable lines, but has been unable to cope with the problems of rapidly mounting costs of operation in the face of limited fares and rates for service. No early improvement is seen in the present outlook.

The Cleveland Trust Company is trustee under the terms of the indenture securing the first mortgage bonds on the property.

Approval of Reorganization Sought

Application has been made by the United Railroads, San Francisco, Cal., the Market Street Railway and by the reorganization committee of the United Railroads, headed by Frank B. Anderson, for approval of the reorganization plan of the United Railroads of San Francisco. The plan has been public for several months and the application is merely the formal presentation to the commission.

The application recites a gross value of the properties of $56,442,527. It also estimates the outstanding funded obligation and stock of the Market Street Railway, which is to take over all of the properties and franchises of the United Railroads, to be $47,973,000. Of this total $15,823,000 are Market Street Railway bonds and five-year notes. The remainder is divided as follows:

Preferred stock	$5,000,000
Second preferred stock	$4,700,000
Common stock	$10,700,000

The details of the reorganization plan have been referred to previously in the ELECTRIC RAILWAY JOURNAL. They have been modified slightly several times.

Court Orders Suspension of Interurban Line

Justice Wheeler in the Supreme Court at Buffalo, N. Y., on July 1 handed down a decision allowing the Buffalo & Lake Erie Traction Company to discontinue its lines within the State of New York. The application was made thus early by George S. Bullock, receiver for the railroad, in order that people along the line may become accustomed to the change and be given time to devise other means for transportation and for the shipping of freight. The order reads that the discontinuance will not take effect until Sept. 15. The request of the company that it be allowed to dismantle the road is denied. The court directs that the receiver advertise for bids for the property in full or in part and to report such bids to the court on Sept. 1. The line between Fredonia and Dunkirk is excepted from the order. The court believes this section of the road can be operated successfully.

Financial News Notes

New Director for Southern Road.—J. P. V. Davis, vice-president of the National City Company, New York, N. Y., has been elected a director of the Piedmont & Northern Railway, Charlotte, N. C.

Call for Bids for Transit Bonds.—Bids for the $4,000,000 city loan authorized recently by the Council of Philadelphia, Pa., for completing and equipping the Frankford elevated line will be opened on July 14 in the Mayor's office. The bonds will bear interest at 5 per cent per annum, the highest rate paid by the city for many years.

Must Borrow to Pay for Paving.—The Georgia Railway & Power Company, Atlanta, Ga., has filed a petition with the Railroad Commission asking permission to issue three notes to cover paving costs in North Marietta Street, Atlanta, assessed against the company by the city. The notes amount to a total of $37,340, the company stating in its petition that the notes are necessary as funds are not available to pay the paving costs at this time.

Grafton Sale Set for July 14.—The period of ten days has expired in which the creditors of the Grafton (W. Va.) Traction Company and the Grafton Light & Power Company could have appealed to the United States District Court from the action of the referee in bankruptcy, Attorney O. E. Wyckoff, in ordering the property of the two concerns to immediate sale. In consequence the trustee in bankruptcy, Dr. T. F. Lanham, has fixed July 14 as the day upon which he will offer all the properties at auction.

Arranging for Houston Loan.—Luke C. Bradley, district manager for Stone & Webster, left Houston, Tex., on June 4, to arrange to borrow $1,000,000 to finance the proposed extensions to the railway lines of the Houston Electric Company if the new franchise there is approved. He is quoted as follows: "We will of course not need the money if the franchise is not granted, but I want to make all arrangements so that we can carry out our part of the contract. On my return I will tell the people frankly whether we can get the money."

Consolidation Rumor Revived.—With a view of an early resumption of negotiations for the merger of the city lines of the Washington Water Power Company and the traction division of the Spokane & Southeastern Railway & Power Company in Tacoma, Wash., operating officials of the two systems have begun to revise plans, figures and estimates made two years ago, when the merger was actively under consideration. D. L. Huntington, president of the Washington Water Power Company, says it is planned to organize a new company to take over the local properties of the two companies. At one time the proposal was for the Washington Water Power Company to purchase the traction system.

New Successor Company Organized.—The trustees of Boston (Mass.) Elevated Railway have completed the organization of the Hyde Park Transportation District, which is a corporation created by recent act of the Legislature to take over and operate in behalf of the city of Boston the railway lines in Hyde Park district now operated by Eastern Massachusetts Street Railway. John F. Stevens, one of the trustees of Boston Elevated Railway, has been elected president of the new corporation. All preliminary steps required of trustees of the Boston Elevated Railway have now been taken, and they are in a position to take charge of the railway service in Hyde Park as soon as the act becomes operative under its terms.

Dissolutions and Reductions in Capital in Illinois.—Six companies included in the Illinois Traction System have filed notices of dissolution with the Secretary of State of Illinois and six other companies have filed notice of decreases in capital stock. The companies dissolved are as follows: Danville Street Railway; City Electric Railway, Ottawa; Springfield & Northeastern Railroad, Champaign; Peoria, Streator & Ottawa Railway, Champaign; and Springfield Belt Railway, Champaign. The companies decreasing capital stock are: Bloomington & Normal Railway, Electric & Heating Company, $60,000 to $5,000; Consumers' Heat & Electric Company, Bloomington, $125,000 to $5,000; Consumers' Light & Heat Company, Bloomington, $100,000 to $5,000; Decatur Light, Heat & Power Company, $250,000 to $5,000; and Decatur Traction & Electric Company, $250,000 to $5,000.

Traffic and Transportation

Fare Order Vacated

Circuit Court Judge Rules Commission Based Milwaukee Rates on Excessive Valuation

That there is no question as to the power of the State, acting through the instrumentality of its Railroad Commission, to change the rate of fare fixed in a franchise, was the opinion of Judge Stevens of the Dane County Circuit Court as expressed in a decision handed down June 21, 1920, in the case of City of Milwaukee vs. Railroad Commission of Wisconsin, the Milwaukee Electric Railway & Light Company, et al. Judge Stevens held, however, that the rates of fare fixed by the order of the commission of Oct. 30, 1919, and applying to the city and suburban areas of Milwaukee, were unreasonable because of claimed errors on the part of the commission in arriving at the valuation of the property of the Milwaukee Electric Railway & Light Company.

CITY APPEALS TO COURT

In June, 1918, the commission authorized the company to increase its rates of fare for the single fare area by discontinuing the sale of six tickets for 25 cents, making the fare 5 cents flat. A further increase to 7 cents cash, six tickets for 35 cents and eighteen tickets for $1 was authorized by the commission on Oct. 30, 1919. This was later modified to permit the sale of nine tickets for 50 cents.

There was a provision in the franchise of the company that the fare "shall be not to exceed 5 cents." The city of Milwaukee claimed that this constituted a contract and that the fare could therefore never be raised above the rate fixed by the franchise. It appealed both orders of the commission above referred to to the Dane County Circuit Court.

VALUATION REDUCED

While the case was before the Dane County Circuit Court, the question of a further increase in rates was again brought before the Railroad Commission because of the necessity of increasing the wages of the employees in the transportation department of the company and because of an increase in the cost of coal. In an order issued June 24, 1920, a further increase in fare was authorized by the commission. It pointed out, however, that it based the latest rates established for Milwaukee on a valuation of the company's property revised to conform with the opinion of Judge Stevens. The commission's decision is discussed at length elsewhere in this issue.

In his opinion in the case Judge Stevens points out that the commission not only fixed a value that equaled the cost of reproduction new, but allowed a depreciation reserve which was approximately $2,000,000 in excess of the amount needed to keep the investment intact and the plant in 100 per cent condition, had it been given the depreciated value which should have been given to it in view of the fact that it was in only 86 per cent condition. These findings of the commission, says Judge Stevens, led it in its order of Oct. 30, 1919, to fix a rate of fare which would yield more than a reasonable return upon the fair value of the property of the defendant company. The court says further:

> The rates here in question are all based upon the valuation made as of Jan. 1, 1914, with additions since that date. The fundamental error of the commission was in accepting the cost new as the fair value of the property, which was found by the commission to be in only 86 per cent condition * * * In arriving at the conclusion that the rate fixed by the order of Oct. 30, 1919, is unreasonable, the court has not overlooked the fact that the commission in accepting the cost of reproduction new as the fair value made no additional allowance for working capital or going value.

The court concludes that the matter must be returned to the commission for further consideration. It is reported that the commission will appeal the case to the higher courts.

Asks 7 Cents in Fort Wayne

The Indiana Service Corporation, Fort Wayne, Ind., has filed with the State Public Service Commission a petition for increased fares on the Fort Wayne city lines. A 7-cent cash fare with four tickets for 25 cents is asked. The petition states that the revenues for the year 1919 were only sufficient to pay a return of 2.9 per cent upon the valuation of the city lines.

Revenue from city operation during the year amounted to $691,342. Interurbans paid $39,467 for the use of the tracks, making the total revenue $730,809. Total expenses amounted to $649,482, leaving net available, on an investment of $2,780,000, the sum of $81,327. A total of 14,026,200 revenue passengers were carried during the year. Transfer passengers carried numbered 2,805,202.

With the petition the company submitted a detailed report of the traction situation in Fort Wayne which will be issued in pamphlet form and distributed to patrons. Robert M. Feustel, president of the company, sums up the case as follows:

> We are just as anxious as every one else to help reduce the cost of living. Our industry is necessary to the life of the community. We have not earned enough to maintain the property adequately and pay bond interest on the old rate of fare, and that fare has been increased only 18 per cent while the average wages and cost of materials has increased over 80 per cent. It requires no calculation to tell the answer. Every one of our patrons knows that the fares must be raised and they have known it for more than a year past.

Interurban Rates Up

Commission Allows Indiana Roads to Charge 3 Cents a Mile—Increase in Coal Cost

Three interurban systems operating in Indiana were granted increases in passenger rates by the State Public Service Commission on June 24, the increases to take effect July 1. The three companies are the Terre Haute, Indianapolis & Eastern Traction Company, the Union Traction Company of Indiana and the Indianapolis & Cincinnati Traction Company. Rates for traction lines in Indiana have been 2¾ cents a mile since Jan. 1, 1919. The new ruling gives the three roads authority to increase their rates to 3 cents a mile, the same rate prevailing on steam roads. The action places these roads on a parity with similar roads in Illinois, Michigan and Ohio.

VALUATION OF $32,000 A MILE

A valuation of $32,000 a mile in the case of all three companies was used as a rate basis by the commission, which held that such a valuation was conservative. Advanced cost of coal is stated as the principal cause of the necessity for fare readjustment, though the evidence revealed continued upward trend in the cost of all other items of maintenance and operation.

At hearings before the commission the evidence showed that coal which ten years ago cost traction companies from 30 to 80 cents a ton at the mines, according to market conditions, and that was transported on freight rates which ran from 50 to 65 cents a ton, according to destination, now is costing approximately $4 a ton delivered. Increased cost of coal, labor, materials and supplies used in the maintenance and operation of these utilities, as shown in the finding, would, if present rates were continued, reduce the earnings to approximately 3 per cent or less.

NEW RATES INADEQUATE

The commission's order further indicates that the advance from 2¾ cents a mile to 3 cents a mile will not offset entirely the increased cost of the upkeep of the roads. Estimates of the commission indicate that in the case of the Union Traction Company of Indiana the earnings under the new fare system will be only 5 per cent on the valuation of $32,000 a mile, with no allowance for depreciation.

In a similar estimate the earnings of the Terre Haute, Indianapolis & Eastern Traction Company would be 5.3 per cent, including 1 per cent for depreciation on equipment, and for the Indianapolis & Cincinnati Traction Company, 8.3 per cent with no allowance for depreciation. Officials of the various companies realize that these rates are inadequate, but they say that they cannot go beyond the fares of competing steam roads without largely cutting down their volume of business. It is planned to secure a further increase by an advance in freight rates.

Milwaukee Fares Again Advance

Commission Allows Company to Raise Ticket Rates to Meet Wage Increase—Valuation Reduced

An increase in fare within the single fare or city area of Milwaukee, Wis., is authorized by the Wisconsin Railroad Commission in a decision handed down June 24, 1920. The increase is intended to provide additional revenue with which to pay an increase in wages to the employees of the transportation department of the Milwaukee Electric Railway & Light Company, recently recommended by the State Board of Conciliation. The commission confirmed the wage award and now orders the company to make it effective. The fare increase is also partly intended to offset an increase in the cost of coal.

THE new rates of fare became effective June 27, and will remain in effect until Jan. 1, 1921, unless sooner modified by the commission. Outstanding tickets will be honored, however, until July 10, next, after which they will be redeemed. The fare increase is effected through a reduction in the number of tickets sold for 50 cents from nine to eight. The sale of six tickets for 35 cents is abolished. The cash fare is to remain at 7 cents as at present. The zone fares within the suburban area are also left unchanged. The wage increase ordered by the commission will, it is reported, amount to from 5 cents to 8 cents an hour.

THIRD RISE SINCE 1918

The present increase in fare is the third granted by the commission to the company since 1918. In June, 1918, the company was authorized to discontinue the sale of six tickets for 25 cents, making the fare 5 cents flat. On Oct. 30, 1919, the fare was further increased to 7 cents cash, six tickets for 35 cents or eighteen tickets for $1. This was modified in January, 1920, to permit the sale of nine tickets for 50 cents. An appeal from both of the above increases was taken by the city to the Dane County Circuit Court.

In a decision handed down June 21, 1920, Judge Stevens of the Dane County Circuit Court held the rates of fares established by the order of Oct. 30, 1920, that is the rates of fare just superseded, to be "unreasonable" because of claimed errors on the part of the commission in arriving at the fair value of the property. In commenting on its present order, the commission points out that the new rates established thereby are based on a valuation of the company's property revised to conform with the decision of Judge Stevens. Judge Stevens' decision is discussed at length elsewhere in this issue.

LABOR SHORTAGE ALLEGED

In its decision in the case the commission points out that the Board of Conciliation acting under Chapter 530 of the Laws of 1919 reported to it that increased wages were necessary "because at the prices now paid for labor by the Milwaukee Electric Railway & Light Company not enough labor is attracted to its service properly to conduct its operations to the satisfaction and accommodation of the public." The commission then points out that the act above referred to provides:

> That if the earnings of such public service business in which such employees are engaged are found to be sufficient to meet the cost of making the determination of said commission effective without depriving said corporation of a fair return upon the capital employed in such business as determined by the Railroad Commission, said Railroad Commission should order such public service corporation to make effective the wages, hours of labor and working conditions as determined by it to be fair, equitable and just. Otherwise, the commission shall provide for such a revision of the rates of such public service business as will enable it to meet such cost and yield a fair rate of return upon the capital employed therein.

OPERATING COSTS UP $900,000

Acting in accordance with the mandate of the act the commission says that it found that as a result of increased wages of employees and also increased coal costs there would be a total estimated increase in operating expenses per annum of approximately $900,000. It then considered the railway income account for the Milwaukee city and suburban lines for the six months ended April 30, 1920, which, as adjusted, it believes reflects substantially the net results of operation under its order of Oct. 30, 1919. It found that the net revenue available for return under the rates of fare established by the last named order (the rates of fare just superseded)

> would give an actual annual return on the basis of six months' earnings of 7.2 per cent on the lower valuation now used by this commission in accordance with the late opinion of the Circuit Court of Dane County. At present, public utilities of the highest class can secure funds only at rates of interest netting a cost of somewhere around 9 or 10 per cent. This company must secure funds for very heavy additions and extensions now being made and for new equipment which is being manufactured. The budget of capital expenditures for the year 1920 contemplates the expenditure of over $9,000,000 in new property, of which $2,560,631 is solely for the street railway department. It is perfectly evident, therefore, that the actual return earned by the company under the order of Oct. 30, 1919, is not unreasonably high from any point of view. In fact a rate of return somewhat in excess of 7½ per cent is not unreasonable under present interest rate conditions, and if large additions at present cost of capital are to be made, the higher interest rates for the additional capital expenditure must be allowed for. In this connection, also, it is to be borne in mind that not all of this actual return is available for distribution to security holders, as at least $140,000 a year has to be retained in the reserves.

On the subject of valuation the commission says that, by its order of Oct. 30, 1919, it found that the fair value of the railway property within the single fare and suburban area, inclusive of allowance for materials and supplies, was $17,508,732. It then states:

> The Circuit Court of Dane County has determined an appeal that the commission was in error in its treatment and use of depreciation in connection with the arrival at fair value. Pending final decision of the valuation matter, the commission will act in full compliance with the opinion of the Circuit Court of Dane County, and the order in this case will be based as nearly as possible upon the conclusions of the Circuit Court of Dane County on the valuation question. The condition of the property on Jan. 1, 1914, was found by the State Engineering Department to be 86 per cent. As we understand the opinion of the court, it was that this percentage of condition should be used in arriving at fair value at the present time.

On this basis and allowing for additions to property and $500,000 for going value, an item not previously included, the commission now finds a fair value of $16,020,057. Basing its calculations on this value, the commission came to the conclusion that in order to meet the estimated increase in operating expenses and at the same time to permit the utility to earn a fair return, an increase in revenue was needed. It therefore authorized the company to increase its fare by readjusting the ticket rate.

In conclusion the commission said:

> We have already called attention in several cases . . . to the great difficulty in estimating future operating expenses during the present time. Present conditions made it peculiarly difficult to adjust fares to a nicety to bring about a stated amount of income. A change in riding habit would affect the revenues one way or the other and many other elements may also enter into the situation. In view of this fact, it is deemed advisable by the commission to make the order herein a temporary order, the commission to pass upon the matter again after it has the benefit of the actual experience during the next few months.

City Attorney Williams of Milwaukee has announced that the city will appeal the fare increase decision immediately.

Chicago "L" Wants 10 Cents

Recent Wage Increase Is Important Factor—Higher Rate Would Yield Return of 4¼ Per Cent

Britton I. Budd, president of the Chicago (Ill.) Elevated Railways, has petitioned the Illinois Public Utilities Commission for permission to charge a 10-cent cash fare in Chicago between all stations south of Howard Street, the north city limits, a 6-cent cash fare north of Howard Street through Evanston and Wilmette, and 14 cents for an Evanston-Chicago ticket, instead of the present 12 cents. The rate of fare within the city at present is 8 cents cash or two tickets for 15 cents.

In his testimony before the commission, Mr. Budd estimated that the 10-cent fare would produce a gross revenue of $18,853,750 a year; that the total operating expenses would be $15,223,840, leaving $3,629,910 for net earnings. This would provide a return of about 4¼ per cent on the original cost of the system, which was fixed at $85,554,355. It was pointed out that under the 5-cent fare in 1918, the company's net earnings were $3,512,781.

$1,756,512 WAGE ADVANCE

The chief item in the bill of expenses presented by the company is the labor cost. The new wage scale which was recently granted, retroactive to June 1, and providing an increase of 15 cents an hour to nearly all employees, produces an estimated increase in the payroll of the 5,564 employees of $1,756,512 a year.

It was stated that on the present rate of fare the loss for the year would be about $2,000,000. In addition, the roads are now in debt about $2,000,000 and defaulted last July on interest payments. No dividends have been paid on stock since 1914. Last month, it cost 8.4 cents to carry each passenger. It was also claimed that the companies need $1,000,000 for improvements in order to lengthen platforms and put on eight-car trains. The following detailed statement during the consolidated income of the several elevated roads for February, March and April, this year, as submitted to the commission, follows:

Passenger revenue	$3,717,874
Other transportation revenue	159,165
Total	$3,877,040
Way and structure	456,580
Equipment	408,736
Power	426,295
Conducting transportation	1,547,284
Traffic	7,015
General and miscellaneous	177,536
Total operating expense	$3,023,450
Net operating revenue	853,589
Taxes, special assmts. and city compensation [est. accts.]	272,324
Operating income	$ 581,265
Non-operating income	24,547
Gross income	$ 605,821
Deduct rentals	76,372
Bal. for interest charges	529,440
Interest on funded and unfunded debt	617,872
Sinking fund [three months' accruals]	31,350
Total interest and sinking fund charges	649,122
Net loss	$ 119,681

Ten-Cent Fare in Seattle July 19

Mayor Hugh M. Caldwell of Seattle, Wash., has signed the ordinance providing for a 6¼-cent ticket fare and a 10-cent cash rate on the lines of the Seattle Municipal Railway. The bill will become effective on July 19. The new fare schedule provides for the following rates on city cars: 10-cent cash fare; 7½-cent cash fare for each of two persons riding together; 6¼-cent metal tokens, each good for one fare, to be sold on all cars in lots of four for 25 cents, eight for 50 cents, sixteen for $1, but not singly; free transfers with cash or token fares; 3-cent fares for school children, except that two may ride for a nickel; ten school tokens for 25 cents.

A supply of 2,000,000 metal tokens has been ordered, at a cost of $17,000.

In signing the ordinance, Mayor Caldwell said:

> This may not be just the best plan, but we need additional finances for the railway, and seven members of the Council have agreed upon it. I am willing to try it out.

P. R. T. Suspends New Rates

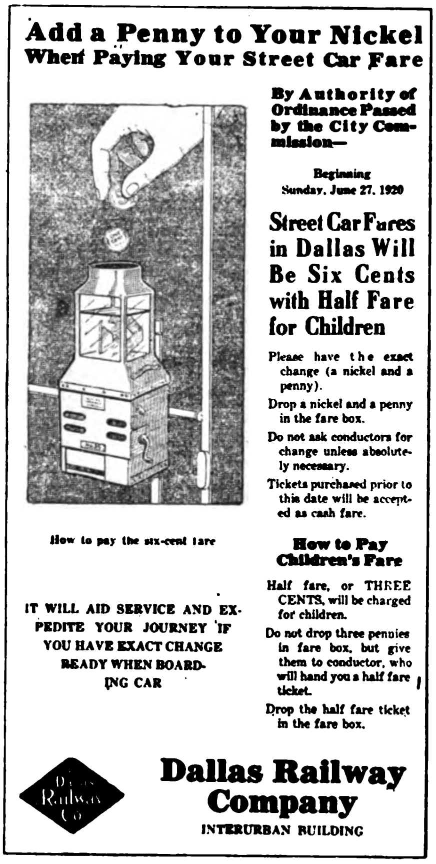
The Philadelphia (Pa.) Rapid Transit Company on June 30 suspended the schedule calling for a universal 3-cent transfer charge, which it had planned to install on July 1. This action was taken at the request of the State Public Service Commission pending further hearings to determine the system's need of an increase in revenue. It is reported that the company plans to withdraw the 3-cent transfer charge and to substitute therefor a zone fare.

Dallas Increase Effective

Company Begins Charging Six-Cent Fare—Riders Prepared for New Rate By Publicity Work

The Dallas (Tex.) Railway put a flat 6-cent fare into effect at midnight on June 26. The fare ordinance as passed by the City Commission authorized the new rates to become effective at midnight on June 26, but the company desired additional time to change its fare boxes so as to receive the pennies and also to conduct a campaign of education so that the people might learn how best to pay the new fares.

The fare boxes on all cars of the company were changed so as to receive and register pennies. The bottom of the boxes were taken out and false bottoms installed so that a large receptacle would thus be provided for receiving the pennies. For the present it is not possible to change all the fare boxes so that they will register pennies, according to Richard Meriwether, vice-president and general manager, and small boxes will be installed to receive the extra pennies. Mechanism for registering the 1-cent pieces has been ordered and should arrive in time to be installed in all fare boxes within six weeks.



Add a Penny to Your Nickel
When Paying Your Street Car Fare

By Authority of Ordinance Passed by the City Commission—

Beginning Sunday, June 27, 1920

Street Car Fares in Dallas Will Be Six Cents with Half Fare for Children

Please have the exact change (a nickel and a penny).

Drop a nickel and a penny in the fare box.

Do not ask conductors for change unless absolutely necessary.

Tickets purchased prior to this date will be accepted as cash fare.

How to pay the six-cent fare

IT WILL AID SERVICE AND EXPEDITE YOUR JOURNEY IF YOU HAVE EXACT CHANGE READY WHEN BOARDING CAR

How to Pay Children's Fare

Half fare, or THREE CENTS, will be charged for children.

Do not drop three pennies in fare box, but give them to conductor, who will hand you a half fare ticket.

Drop the half fare ticket in the fare box.

Dallas Railway Company
INTERURBAN BUILDING

THIS "AD" PAVED THE WAY

Mr. Meriwether estimates that the company will receive on an average of between 75,000 and 100,000 pennies each day under the new fares. No additional clerks will be needed to count these, since counting machines will be installed. The additional fare is expected to increase the company's receipts between $700 and $1,000 a day, Mr. Meriwether said.

PUBLICITY WORK EFFECTIVE

The smoothness with which the higher rate was placed in effect was due in a large measure to the advertising and publicity campaign that had been carried on by the company under the direction of its publicity department. Large display advertisements were carried in the Dallas newspapers as soon as the fare increase was granted, explaining graphically how fares should be paid. Car cards were also posted in all cars, and extra issues of *Trolleygrams*, the company's publication, was published and distributed to car patrons. The publicity work in paving the way for the increased fares was carried on under direction of Frank Baldwin, assistant director of publicity of the company.

Mr. Baldwin prepared a series of newspaper advertisements, one of which is herewith reproduced. As editor of *Trolleygrams*, Mr. Baldwin also had published 20,000 each of four special editions of this publication which were distributed on the cars.

Seven-Cent Fare for Dayton

To end the tie-up of electric railway service in Dayton, Ohio, resulting from a strike of the companies' employees, the Dayton City Commission has authorized the several roads operating the local lines to raise their fares from 5 cents to 7 cents. Eight tickets are to be sold for 50 cents. Children are to be carried at 4 cents each. Universal free transfers will be retained under the new plan.

The new rates are to go into effect on the date when the companies come to an agreement with their striking carmen. The companies have offered the men a scale of 60 cents an hour. The increase in fares affects the Dayton Street Railway, the City Railway, the Oakwood Street Railway, the Dayton, Springfield & Xenia Southern Railway and the People's Railway, which operate the local lines.

The railways are still paying their share of improvements made under the $1,000,000 bond issues that became effective under the regime of City Manager Henry E. Waite. Officials of the various roads have announced that the lines at the present moment are in need of new equipment that would mean an outlay of $760,000. The City Railway needs at least twenty new cars, the Oakwood Street Railway at least ten, and the Dayton Street Railway ten. The roads are also in need of other equipment.

Charts recently submitted to the city authorities show that expenses during the first three months of 1918 and of 1919 were greater than revenues, but that during the first three months of the present year revenues exceeded operating expenses.

Transportation News Notes

Merchants Favor Higher Fare.—The Retail Merchants' Association of Port Arthur, Texas, has indorsed the application of the Port Arthur Traction Company for an increase in fare from 5 cents to 8 cents. The resolution states that business men recognize the necessity for an increased fare, and that the traction company cannot continue to maintain efficient service on the present fare.

Rate Plea Follows Wage Rise.—The Atlantic Coast Electric Railway, Asbury Park, N. J., was given a hearing before the State Board of Public Utility Commissioners recently on its application to increase its fare from 6 to 8 cents. The company claims that it has to face an additional cost of $49,000 a year because of a raise in the wages of the employees. The company has paid no dividends on the capital stock since 1917.

Seven-Cent Fare, Skip-Stop Allowed.—The New Jersey Board of Public Utility Commissioners has authorized the Five-Mile Beach Electric Railway, Wildwood, to increase its fare from 6 to 7 cents and to install the skip-stop to facilitate service. The company stated that there was an increase of $14,500 in operating expenses for the present year. There was no opposition to the application from the municipalities in which the company operates.

Higher Fare vs. City Ownership.—The City Council of Danville, Va., has adopted a regulation providing for a thorough examination of the books of the Danville Traction & Power Company to determine if the company is in need of an increase in fare from 5 cents to 6 cents. An appraisal of the company's property is to be made by public accountants. In the event that the city and the company fail to agree on the 6-cent fare the resolution stipulates that the city shall make an offer to buy the railway system.

Mid-Day Fares Reduced.—The London County Council of London, England, put into operation on April 19 its new scheme of reduced fares in the middle of the day and at the same time increased fares began at other hours. Between 10 a.m. and 4 p.m. the fare is 2d. for any distance beyond the 1d. stage. So far as one can judge by casual observation, the cars do not seem to be much fuller during the slack hours than they were before. The hope is to develop a much greater mid-day traffic.

Downpour Causes Suspension of Subway Lines.—Service of the Fourth Avenue and Broadway lines of the Brooklyn Rapid Transit subway and on the Lexington Avenue line of the Interborough was suspended for six hours during the night of June 24 because of a heavy downpour. The sewers became overtaxed and the ventilator gratings of the subway systems served as drains. This resulted in flooding the subways. Pumps had to be used to check the rise in water. Service was restored in time for the morning rush hour.

Pay-Enter System in Los Angeles.—The pay-as-you-enter system is to be installed on all city lines of the Los Angeles (Cal.) Railway. The hand registers will be discarded. Lines running outside the city where the fare varies according to distance will retain the present system. The one-man safety cars, which are being delivered for service in the outlying districts, are equipped with the fare box which will be uniform throughout the system. The boxes are being delivered at the rate of 500 a month and some are now in use. The pay-as-you-enter system will be completed by the end of the year, according to present plans.

Asks Court to Bar Fare Rise.—Court action has been resorted to in an effort to set aside the recent order of the Shreveport (La.) City Commission granting the Shreveport Traction Company authority to charge a 6-cent fare. The order was passed by the commission after a referendum election in which a majority of the voters indorsed the higher fare. Huey P. Long, a member of the commission, has filed a petition in the State courts, seeking a restraining order against the City Commission and the Shreveport Traction Company to restrain both from enacting such an order and from putting the authorized increased fare into effect.

Jitney Routes Not Yet Decided.—The utilities committee of the City Council of Seattle, Wash., has indefinitely postponed the determination of the routes and schedules under which jitneys will be permitted to operate in the streets of the city. In the meantime, jitneys will be permitted to continue the use of their old routes. Members of the committee will make a study of the proposed schedules before announcing the routes to be followed. Two petitions, containing a total of 40,000 names, have been presented to the City Council by the jitney drivers, protesting against the proposed action to place the terminals for buses outside the central business district.

Rate Complaint Dismissed.—A complaint made by the commissioners of Stark County, Ohio, against rates charged by the Northern Ohio Traction & Light Company, Akron, Ohio, has been dismissed by the Ohio Public Utilities Commission. The county authorities charged the company with violating the terms of its Canton-Beach City and Canton-Massillon franchises by charging a higher rate to through passengers than it charged other riders. The commission held that the mere fact that a through rate, which is not fixed by franchise, exceeds the sum of fares between intermediate points, some of which are fixed by contract, does not warrant the commission in holding that the through rate is unreasonable or unjustly discriminatory and should be ordered discontinued.

Wants More in Oklahoma City.—Application has been made to the City Commission of Oklahoma City, Okla., by the Oklahoma Railway for permission to raise its fare from 5 cents to 7 cents and to sell tickets at the rate of four for 25 cents. The company's request will be submitted to a committee to be appointed by Mayor Walton, which will determine if the higher rate is necessary. In asking the increase John W. Shartel, general manager of the company, stated that the company is now hauling 80 per cent more passengers with the same number of cars than in 1916. In 1916 the revenue was 25 cents for each car mile, while the expenses were 16 cents for each car mile. At present revenue and operating expenses amount to 40 cents a car mile, so that the system is just breaking even.

Still Fighting Buffalo Rate.—Failing in their attempt to secure a reduction in the fares charged by the International Railway, the municipal authorities of Buffalo, N. Y., have announced their intention to appeal the case to the Supreme Court of the United States. The 7-cent fare, which was placed in effect on April 18, was to have reverted to 5 cents on June 1. The company, however, has continued to collect the higher rate. The City Council has been asked to direct Corporation Counsel Rann to take steps to protect the rights of car riders if the city wins its fight to have the 7-cent fare order of the Public Service Commission vacated. It is also planned to demand that the company furnish rebate slips and file a bond of $300,000 to guarantee repayments if it loses the case. The City Council has not yet acted formally in the matter.

Revokes Staten Island Franchise.—On the recommendation of Grover A. Whalen, Commissioner of Plant and Structures, the Board of Estimate of New York City has voted to revoke the franchise of the Richmond Light & Railroad Company, which operates in Staten Island. The company's fares were raised to 8 cents following the appointment of a receiver. Commissioner Whalen, in a report to the board, said the managers of the road had threatened "to compel the people to use the 8-cent cars by securing an injunction restraining the city from operating buses." Ten resolutions covering the termination of the franchise were passed by the board. Ninety days' notice was given the company in which to comply with conditions of the franchise, which, it is charged, were violated. At the same time it was voted to declare forfeited the company's agreement with the city through which it has been enjoying the use of the St. George viaduct.

Personal Mention

W. E. Riddle, superintendent of transportation of the Cleveland, Alliance & Mahoning Valley Railroad, Ravenna, Ohio, has been made general manager of the company, to succeed V. M. Loudon, who has resigned.

I. A. Cottingham, for twenty-eight years chief engineer of the lines of the Southern Pacific Company in Texas, has resigned to become chief engineer and assistant general manager of the Houston, Richmond & San Antonio Traction Company, Houston, Texas, which is building 225 miles of interurban line in Texas.

Howard A. Holmes, assistant electrical engineer of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, has resigned to accept a position with Morris Knowles, Inc., Pittsburgh, Pa. Mr. Holmes has been in the service of the Pennsylvania-Ohio Electric Company, formerly the Mahoning & Schenango Railway & Light Company for a number of years.

Robert H. Stevenson has recently been made chief clerk to the comptroller of the Connecticut Company, New Haven, Conn. For the past two years Mr. Stevenson has been special accountant in the comptroller's department. He is one of the accounting members of the committee on registration and collection of fares of the American Electric Railway Association.

Raymond G. Carroll, former general manager of the Savannah (Ga.) Electric Company, has arrived in Galveston, Texas, to assume his duties as manager of the Galveston Electric Company. Mr. Carroll succeeds W. E. Wood, who has been transferred to Houston, Texas, to become general manager of the Houston Electric Company and the Galveston-Houston interurban line.

J. G. Phillips has been made general superintendent of the Mobile Light & Railroad Company, Mobile, Ala. Mr. Phillips was formerly general manager of the Gary (Ind.) Street Railway. Previous to that connection he was engaged on valuation work with Ford, Bacon & Davis, engineers. He was at one time connected with the Hudson Valley Railway, Glens Falls, N. Y., as assistant general manager.

M. S. Wade has been made treasurer of the Pacific Electric Railway, Los Angeles, Cal., to succeed the late I. W. Hellman, who died some time ago. Mr. Wade has also been made treasurer of the Fresno Traction Company and the other subsidiaries of the Pacific Electric. He entered the service of the company in 1902. Three years later he was made cashier and in 1913 he became assistant treasurer.

Heads N. Y. E. R. A.

T. C. Cherry Chosen President of State Organization at Its Annual Meeting at Bluff Point

At the annual meeting of the New York Electric Railway Association, held at Bluff Point, on Lake Champlain, N. Y., on Saturday, June 24, T. C. Cherry, vice-president and general manager of the Rochester & Syracuse Railroad, Syracuse, was elected president for the coming year. Mr. Cherry has long had a prominent part in the work of the State body and his election as president comes as a recognition of his many services in behalf of that organization. During the past year he has served as vice-president of the New York association.

T. C. CHERRY

Mr. Cherry is known to electric railway men as one of the most efficient operators of the Empire State. In the opinion of those who have been most closely associated with him in his work, his success in the transportation field has largely been due to the possession of two qualities: his thoroughgoing knowledge of electric railway problems and his ability to get things done. Electric railway transportation has been practically his life work and he has made a study of every part and phase of it. The knowledge thus gained he has put to good use in his work as an organizer.

Mr. Cherry was born in 1876. In 1898, after spending four years at Syracuse University and at the Syracuse Law School, he entered railway work as timekeeper on construction and track work and as rodman with the engineering department of the Syracuse Rapid Transit Railway. Two years later he was made superintendent of track of that company. Still later in 1900 Mr. Cherry went to Lorain, Ohio, as superintendent of construction of lines and served as dispatcher of the Lorain Street Railway, and from August, 1901, to December, 1903, he was general manager of the company.

Later Mr. Cherry served as superintendent of the Saginaw Valley Traction, Light & Gas Company, and still later as general manager of the Ohio Central Traction Company. Subsequently he became connected with the Buffalo & Lake Erie Traction Company, as general superintendent, serving in this capacity for three years. In 1912 he was made superintendent of the Utica & Mohawk Valley Railway, resigning three years later to become general manager of the Schenectady traction system.

He resigned later in the same year to join Allen & Peck, and took charge as general manager of the Annapolis Short Line. In 1916 he joined the Auburn & Syracuse Railroad and in the following year was appointed general manager for the receiver of the Beebe lines, with the exception of the Auburn & Syracuse, which remained separate. Upon the discharge of the receiver Mr. Cherry was appointed vice-president and general manager of the Rochester & Syracuse Railroad, the position which he now holds. He is also vice-president of the Auburn & Syracuse Electric Railroad and president and general manager of the Syracuse & Northern Electric Railway. All three of these roads are under the management of the firm of Peck, Shannahan & Cherry, Inc., Syracuse, utility operators, of which he is a member.

R. H. Waldo, supervisor of equipment of the Eighth Avenue Railroad, New York, N. Y., has resigned.

G. M. Patterson, traffic manager and purchasing agent of the Fort Wayne & Northwestern Railway, Kendallville, Ind., has resigned.

B. F. Ross, chief clerk of the Eighth Avenue Railroad and the Ninth Avenue Railroad, New York, N. Y., has resigned.

George M. E. Vans has been made chief electrical engineer of the Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.

V. M. Loudon, general manager of the Cleveland, Alliance & Mahoning Valley Railroad, Ravenna, Ohio, has resigned.

E. R. Gordon has been appointed superintendent of the Union Depot Bridge & Terminal Company, Kansas City, Mo., to succeed O. S. Lamb, resigned.

A. M. Ginn has been appointed chief clerk of the Eighth Avenue Railroad and the Ninth Avenue Railroad, New York, N. Y., to succeed B. F. Ross, resigned.

William J. Boucher, whose appointment as assistant supervisor of way and structures of the Eighth Avenue Railroad and the Ninth Avenue Railroad, New York, N. Y., was recently announced, has been promoted to acting supervisor of equipment of these roads.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Stocks of Railway Type Lightning Arresters Good

Traction Companies Less Insistent on Protection of Safety Cars Than Those of Large Type

Light demand for the railway type of lightning arrester is causing good stocks to accumulate with distributers. Although thunderstorms are now a factor with which railways will have to reckon, orders at present are light; even during the past spring months, when most of the buying for this sort of material was to have been expected, sales were small as compared with other years.

One of the things bringing about this condition is the financial straits in which many electric railways find themselves, with a resultant tendency on their part to eliminate all expenditures but bare necessities. Consequently, lightning arresters are one of the first classes of equipment to suffer, as it is a gamble whether or not an installation will be put to actual use. Another feature of the slack market is the growing use of one-man cars, a much lower percentage of which are equipped with lightning arresters than the two-man type. Some manufacturers find that the traction companies are more willing to take a chance on equipping their safety cars without lightning arresters than their larger cars, because of the smaller loss at stake in the former case if lightning should injure the car.

Deliveries are fairly good compared with other railway material, averaging for this class of goods from one to six weeks. The market is firm, no price fluctuation having been recorded in some months.

Bare Copper Wire Shipments Longer

Labor and Material Shortage at Mills Reflected More in Finer Than Larger Sizes

Manufacturers differ on conditions of the bare copper-wire market. On one side it is declared that demand is rather quiet, with few orders for export coming in. Domestic demand, however, is fair, with little heavy construction work being undertaken. On the other side of the question it is asserted that the volume of orders is large, while at the factory there is under-production owing to a shortage of raw material and labor. It is stated that production could be increased 60 per cent if sufficient men for a night force could be obtained.

Finer sizes of copper wire are especially hard to obtain, and shipments take longer than for the coarser material. Large sizes average six to eight weeks, while the smaller stuff runs from four to six months.

The market has held steady for the past three or four months with no prospect of fluctuation in sight, but if any change occurs the probability seems to point to its being upward. Bare copper wire is averaging about 22 cents base. Manufacturers report very few cancellations of orders, and collections are fair, most customers paying within the thirty-day or sixty-day time limit.

Results of Standardization in Brake Shoes

Number of Patterns Has Been Reduced —Price of Reinforced Shoes Often Less Than That of Cast Iron

In discussing the market situation in brake shoes an official of a large manufacturer of brake shoes for steam and electric railroads recently expressed gratification at the results from standardizing brake shoes on electric cars. Ten years ago or so, when the movement toward standardization was begun, a large number of patterns had to be carried in stock. Now there are practically only four styles of shoes, two for motor wheels and two for pony wheels. Different widths of wheel thread still require different widths of shoes, so that practically the makers of brake shoes have to carry some sixteen active patterns of shoes. This, in the opinion of the speaker, could be reduced somewhat. About 75 per cent of the tonnage of brake shoes turned out by this company for electric railway properties east of the Mississippi River is of the standard patterns mentioned.

While an increase has occurred in the price for brake shoes of this company, it has not been proportional to the increase in cost of materials, according to the statement. Formerly reinforced shoes sold for from $40 to $50 per ton. Now, while the price has more than doubled, the ordinary cast-iron shoe, obtained from a local foundry, will often cost the purchaser over $100 a ton. Yet the ordinary cast-iron shoe will have possibly only one-third of the life of a reinforced shoe.

While production is not quite up to manufacturing capacity, the standard shoes can be shipped directly from stock. For orders requiring the manufacturer to make up other than standard shoes, these will be filled when an opportunity is given to do so. No encouragement is given to trade in other than standards.

Raw material stocks are not available in amounts formerly gathered. A six months' stock is considered good now, where heretofore sufficient for two years' business was available.

Good Outlook for Carbon Brush Supply

Better Deliveries Being Made and Electric Railways Are Well Stocked Up

Manufacturers of carbon brushes report the situation as being very favorable. Production has increased generally, and though only nominal stocks of finished brushes are on hand, stocks of unfinished material are in good shape to handle any orders likely to come in.

Deliveries are being made more promptly than heretofore, averaging from ten days to three weeks. Shipments of the standard railway type of carbon brush are a little slower because these orders are being placed in larger quantities. One local agent who recently returned from a tour of the country states that electric railways are quite heavily stocked up on brushes.

Demand is good, much of the ordering being for replacements as well as for the construction of new motors. The market has held steady for some months, and manufacturers say no fluctuation is in sight at present. Labor, however, is the chief item in the cost of carbon brushes, and because the labor market has been unsteady indications are that any price change would be upward.

Stocks of foreign brushes are in sufficient condition in this country to supply normal orders, while new material can be quoted on six weeks' delivery. French production is about 50 per cent above pre-war volume.

Banner Year Seen in Metal Culvert Industry

Increased Railway Demand and Prompt Deliveries Features of Strong Market

Manufacturers of culverts report an appreciable increase in buying on the part of the railways over the past few years. Although by far the largest percentage of culverts manufactured now go under highways rather than railways, demand on the part of traction companies has greatly increased over the war period. In fact, sales thus far indicate that this will probably be the biggest year in metal culvert history.

Conditions of culvert production vary considerably. Certain producers have an output that is above normal, while other producers declare that shortage of labor, freight troubles and the indisposition of workmen to speed up as formerly have greatly cut production. The common ground on which producers meet, however, is that more culverts could be used if available. Stocks of culverts are undergoing a rapid turnover. A number of mills have several months' supply on hand, or enough to fill reasonable orders from stock. Labor unrest is lengthening deliveries somewhat; particularly is a shortage of help making it difficult to receive and ship material. In spite of this condition, immediate shipments are the rule for such preferential customers as state highway departments and railways, other orders being quoted at from five to eight weeks.

Some shortage of raw material has been experienced by the mills, attributable to both an actual scarcity and to the freight tie-up. Prices have increased materially, one manufacturer reporting an advance of about 10 per cent last Jan. 1, and another increase of the same amount on April 1. The consensus of opinion seems to be that quotations have about reached their top level.

Cancellations are few, slowness of delivery being responsible for those that are made, but in general customers realize it is better to let orders stand, even with tardy shipments, rather than cancel and take a chance on still slower delivery elsewhere.

Collections in this line are on the whole considered good, bills being met on an average of sixty days.

Timber Owners Hesitate to Cut for Railway Ties

As if the car shortage alone were not sufficient to curtail the supply of wood ties, construction and repair work on rights of way are further hampered by conditions at the tie camps, which are seriously impeding production. Many owners of timber land think twice before cutting their trees for ties when the market is so strong for finished lumber at a much higher profit. And laborers will not work at tie camps when they can earn more money producing board lumber.

Consequently, although there is plenty of wood and plenty of labor, the wood tie situation does not offer much hope of improvement. Demand is holding strong and standard hewn ties of long leaf pine are being quoted around $1.50 each.

Rattan Car-Seat Market Fair

Material in Good Stock to Make Shipments in About Six Weeks

Although traction companies have not been ordering rattan car seatings in very heavy amounts this spring and summer, there have been inquiries which show that the matter is being given some thought. The tendency to make double seats into two single seats has effected savings in rattan in that only half the double seat has to be replaced to repair broken spots.

Shipments can be made in from four to eight weeks for standard width rattan, but for extra wide the quotations are running longer. Stocks in this country are fair and material is coming through from the Far East in good shape. At the same time freight rates are high and prices of the rattan at point of shipment are increasing. Further price changes up would not be unexpected, for the rates here have not changed to any great extent this year.

One feature tending to hold back shipments of finished rattan seats is the shortage of steel used in the underframe.

Pin and Bushing Deliveries Excellent

Volume of Sales Steady—Larger Output Can Be Absorbed—Higher Prices Unlikely

Deliveries from stock are being made at present on treated pins and bushings used in trucks and brake rigging, notwithstanding the burdensome conditions imposed upon many manufacturing interests by the inadequacy of rail transportation. From month to month the sales volume totals about the same as that of last year to this time, but looking at shorter periods sales are rather spasmodic. A representative maker of these products has about six months' raw material supply on hand, and this is proving a wonderful "shock absorber" in connection with the irregularities of railroad service. Cold-rolled steel bars are very difficult to procure, some orders having been placed six months ago without a sign of the material. Tubing comes through in about three weeks and gives relatively little trouble. Manufacturers are well caught up on orders for pins and bushings.

Notwithstanding the fact that manufacturing costs have been climbing upward of late, there has been no increase in the price of at least one well-known line of pins and bushings for eighteen months. Fuel oil, used in heat treating, now costs this producer 13 cents per gallon against a former price of 6 cents, and process heating costs something like $40,000 per year for oil alone. Certain chemicals used are obtained with no great difficulty and run to perhaps $1,200 per year.

Of late the fuel oil received in this plant has been so thick that it has been

NEW YORK METAL MARKET PRICES

	May 1, 1920	July 1, 1920
Copper, ingots, cents per lb	19.25	19.00
Copper wire base, cents per lb	23.00	22.50 to 23.00
Lead, cents per lb	9.25	8.00
Nickel, cents per lb	45.00	43.00
Zinc, cents per lb	8.45	7.95
Tin, cents per lb	61.50	49.00
Aluminum, 98 to 99 per cent, cents per lb	33.00	33.00

OLD METAL PRICES—NEW YORK

Heavy copper, cents per lb	16.50 to 16.75	15.00 to 15.50
Light copper, cents per lb	14.00 to 14.50	13.00 to 13.50
Heavy brass, cents per lb	10.25 to 10.50	9.00 to 10.00
Zinc, cents per lb	5.00 to 5.25	5.00 to 5.25
Yellow brass, cents per lb	9.00 to 9.50	7.00 to 7.25
Lead, heavy, cents per lb	7.25 to 7.75	7.00 to 7.25
Steel car axles, Chicago, per net ton	33.00 to 34.00	32.00 to 33.00
Old carwheels, Chicago, per gross ton	36.00 to 37.50	36.50 to 37.50
Steel rails (scrap), Chicago, per gross ton	29.00 to 30.00	27.50 to 28.00
Steel rails (relaying), Chicago, gross ton	31.50 to 32.50	31.50 to 32.50
Machine shop turnings, Chicago, net ton	12.50 to 13.00	9.50 to 10.00

ELECTRIC RAILWAY MATERIAL PRICES

Rubber-covered wire base, New York, cents per lb	28.00 to 30.00	28.00
Weatherproof wire (100 lb. lots), cents per lb	28.00	29.00
T rails (A.S. C. E. standard), per gross ton	55.00 to 57.00	58.00 to 65.00
T rails (A. S. C. E. standard), 20 to 500 ton lots, per gross ton	55.00 to 57.00	57.00 to 59.00
T rails (A. S. C. E. standard), 500 ton lots, per gross ton*	45.00 to 47.00	55.00 to 65.00
T rail, high (Shanghai), cents per lb	3.00	3.00
Rails, girder (grooved), cents per lb	3.00	3.00
Wire nails, Pittsburgh, cents per lb	4.00	4.00
Railroad spikes, drive, Pittsburgh base, cents per lb	3.00 to 5.00	3.85 to 4.25
Railroad spikes, screw, Pittsburgh base, cents per lb	7.50 to 9.00	7.50 to 9.00
Tie plates (flat type), cents per lb	3.00 to 4.00	3.00 to 5.00
Tie plates (brace type), cents per lb	3.00 to 4.00	3.00 to 5.00

ELECTRIC RAILWAY MATERIAL PRICES

	May 1, 1920	July 1, 1920
Tie rods, Pittsburgh base, cents per lb.		
Fish plates, cents per lb	3.00 to 4.00	3.75 to 4.75
Angle plates, cents per lb	3.00 to 4.00	3.75 to 4.75
Angle bars, cents per lb	2.45 to 4.00	3.75 to 4.75
Rail bolts and nuts, Pittsburgh base, cents per lb	4.50 to 6.50	6.00
Steel bars, Pittsburgh, cents per lb	3.75 to 4.00	4.25 to 4.75
Sheet iron, black (24 gage), Pittsburgh, cents per lb	5.00 to 8.00	4.20 to 6.35
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	6.00 to 8.00	5.25 to 8.05
Galvanized barbed wire, Pittsburgh, cents per lb	4.60	4.10 to 4.45
Galvanized wire, ordinary, Pittsburgh, cents per lb	4.20	3.70 to 3.95
Car window glass (single strength), first three brackets, A quality, New York, discount†	17%	17%
Car window glass (single strength), first three brackets, B quality, New York, discount	37%	37%
Car window glass (double strength, all sizes AA quality), New York, discount	79%	79%
Waste, wool (according to grade), cents per lb	24 to 29	21 to 24
Waste, cotton (100 lb. bale), cents per lb	18	16
Asphalt, hot (150 tons minimum), per ton delivered	....	....
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	32.00	32.00
Asphalt filler, per ton	30.00	30.00
Cement (carload lots), New York, per bbl	2.80	4.80
Cement (carload lots), Chicago, per bbl.	2.00	....
Linseed oil (raw, 5 bbl. lots), New York, per gal	1.90	1.63
Linseed oil (boiled, 5 bbl. lots), New York, per gal	1.92	1.65
White lead (100 lb. keg), New York, cents per lb	15¼	15¼
Turpentine (bbl. lots), New York, cents per gal	3.00 and upward	1.75

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* U. S. Steel Corp.

† These prices are f.o.b. works, with boxing charges extra

necessary to thin it with kerosene, costing 18 cents per gallon. Labor conditions are unusually good, however, in this establishment. It seems doubtful if prices of pins and bushings will go higher, and on some quotations there can be seen a tendency to shade former figures a little. If the railways come into the market well as the year goes on, giving the manufacturing interests plenty of work to do, it is highly probable that increased production will yield an output at unit costs which will permit the purchaser to secure material of this class without being obliged to pay more for it than present quotations imply.

Rolling Stock

Pacific Electric Railway Company, Los Angeles, Cal., has ordered new passenger equipment to the extent of $1,400,000, for delivery early this fall.

Dallas (Tex.) Railway Company, having just been granted permission to charge a 6-cent fare, is to purchase fifty new double-truck cars for immediate service.

Appalachian Power Company, Bluefield, W. Va., and Graham, Va., expects to purchase three city cars during the summer.

The Interstate Public Service Company, Indianapolis, Ind., has recently purchased an electric locomotive for use in handling freight trains between Jeffersonville, Ind., and Indianapolis. The cost of the locomotive, which is the first electric to be used in this section, will be about $24,000.

Burlington Traction Company, Burlington, Vt., has purchased two cars from the Emergency Fleet Corporation for immediate delivery. J. G. Brill Company is the maker.

The Louisville and Southern Indiana Traction Company, New Albany, Ind., lost a wire car recently in a head-on collision with a passenger car near Watson, Ind.

The Southern Pacific Company has completed arrangements for the purchase of twenty-two new Birney type safety cars for the San Jose Railroads. The St. Louis Car Company, builder, expects shipment the latter part of October.

Rochester, Lockport & Buffalo Railroad Corporation, Rochester, N. Y., has purchased for delivery the latter part of this year one double-end shear-nose snowplow and one new 20,000-lb. capacity express car.

Franchises

Central Texas Electric Railway, Waco, Texas.—The Central Texas Electric Railway will be granted a franchise by the Waco City Commission to permit the interurban line which it is now building from Waco to Temple to enter the city of Waco.

Track and Roadway

Connecticut Company, New Haven, Conn.—The Connecticut Company is making repairs on the Norwalk-Winnipank trolley line. The tracks have been torn up and will be re-laid level with the concrete.

Wichita-Walnut Valley Interurban Railway, Wichita, Kansas.—The charter for the Wichita-Walnut Valley Interurban Railway is about to be taken over by new interests. The road was organized with an initial capital stock of $1,000,000 in 1917 to construct an electric railway from Wichita through Butler County, a distance of about 35 miles. The actual right-of-way was secured and the contract was let for the construction, but the coming of the war prevented the carrying out of the undertaking. It is understood that the interests which originally promoted the road will retire entirely from the property. The affairs of the company at the present time are in the hands of A. H. Hill, vice-president.

Eastern Massachusetts Street Railway, Boston, Mass.—The Eastern Massachusetts Street Railway has received permission from the Quincy city authorities to alter the location of certain tracks and to re-locate its present tracks on Franklin, School and Hancock Streets.

Power Houses, Shops and Buildings

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway's passenger station at Playa del Rey was recently destroyed by fire. The damage is estimated at $3,500.

Cortland County Traction Company, Cortland, N. Y.—The Cortland County Traction Company has purchased one 1,500-kw. Curtis turbine and one 500-hp. Edgemore boiler.

Charlottesville & Albermarle Railway, Charlottesville, Va.—The Charlottesville & Albermarle Railway has purchased all the material for the rebuilding of its carhouse except the metal roofing.

Detroit (Mich.) United Railway.—The Detroit United Railway has received permission to lay a single-track line in Harper Avenue, Detroit.

Detroit (Mich.) Municipal Railway.—Bids are called for by the city of Detroit on approximately 20 miles of railway track comprising sections of the proposed $15,000,000 municipal electric railway system. The work will include excavating, concrete foundation, ties, rails and all track equipment.

Portland (Ore.).—A route for the proposed municipal electric railway line which is to connect the St. Johns line of the Portland Railway, Light & Power Company with the municipal terminal has been decided upon. Kellogg Street from its intersection with Fessender Street to the viaduct over the railroad tracks has been chosen.

Portland Railway Light & Power Company, Portland, Ore.—The Public Dock Commission will build an extension of the St. John's line of the Portland Railway, Light & Power Company to terminal No. 4. The line will be about 1 mile in length, and will cost approximately $40,000. Bids will be called for at an early date.

Trade Notes

The Chicago Pneumatic Tool Company, Chicago, Ill., announces the election of Allan E. Goodhue as vice-president in charge of sales.

The Power Plant Supply Company, 707 Canal Road, Cleveland, Ohio, has recently been organized to deal in power-plant equipment and pumping machinery. William E. Berrington is secretary and manager.

The National Railway Appliance Company has established a New England district office in the Little Building, 80 Boylston Street, Boston, Mass. W. C. Peters, New England department manager, will be in charge.

Chicago Fuse Manufacturing Company has now remodeled the plant which it acquired several months ago from the Otis Elevator Company on Fifteenth Street, Chicago, and is in much better position to market its products after thirty-one years of growth.

Theodore Malm, formerly electrical and traction engineer of the Toronto Railway Company, Canadian Northern Railway Company and various other interests under McKenzie & Mann management in Canada, has formed his own company under the name Theodore Malm & Company, with offices at 507 Fifth Avenue, New York City. It will deal exclusively in new and used car and station equipment and material.

The Electrical Manufacturers' Council met in its new office, 522 Fifth Avenue, New York, on June 18. Officers were elected for the ensuing year as follows: Chairman, S. L. Nicholson, Westinghouse Electric and Manufacturing Company; vice-chairman, Le Roy Clark, Safety Insulated Wire and Cable Company; treasurer, E. B. Hatch, Johns-Pratt Company. Frederic Nicholas was reappointed executive secretary.

The Electric Controller & Manufacturing Company, Cleveland, Ohio, has opened a new office at 208 North Broadway, St. Louis, Mo., in charge of R. J. Ehrhart.

New Advertising Literature

Motors for Crane and Hoist Service.—The General Electric Company, Schenectady, N. Y., has issued bulletin No. 48119.1, describing its alternating-current motors for crane and hoist service.

Belt Fastener.—Crescent Belt Fastener Company, New York City, has just prepared an illustrated circular, form N. Y. 227, on "modern scientific methods in belt joining."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
C. FRANCIS HARDING, Special Editorial Representative L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative
GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Asst. News Editor

Volume 56 New York, Saturday, July 10, 1920 *Number* 2

What We Are Trying to Do

WE ADMIT, or claim, a special purpose in the present issue. If possible, we want to arouse a little plainer talk in the industry which will bring about a better comprehension of the real rock-bottom problems confronting the electric railway industry today. We desire most of all to contribute our bit to leading a discussion of what concrete, actual, homely acts each of us individually and collectively may do to bring about a sound, safe business of satisfactory transportation service.

Speaking particularly of urban and interurban systems, we are very optimistic as to the ultimate outcome. But we believe that the goal cannot be reached until each and every one of us is fully conscious of his own obligation and duty and acts accordingly. Every extra effort brings the day of success nearer. This duty is not to be taken in the narrow sense, as meaning only day to day technical tasks, but also in the broadest sense of service to the industry. We must each realize our relation to the industry and the relation of the industry's success to our individual success, to put it selfishly.

We have therefore devoted a large part of this issue to a discussion of the outlook of the industry, but more particularly to a visualization of the obligation, and the opportunity to act in response to the obligation, of each of us in his own limited sphere and as a part of the whole.

Most of us were raised in the industry. It is our very life. We have followed it through the days when difficulties were mainly engineering and construction, rather than public relations and financial. And we have enjoyed a profitable and pleasant business.

Are we going to be any the less men of courage because the problems today are different? Are we going to allow to stand as justified the accusation of one prominent public utility commissioner that utility men come before commissions "with a whining voice and a suppliant attitude"? Are we ashamed of our business?

No! By the shades or living selves of Frank J. Sprague and Oscar T. Crosby and their mates, we believe this industry is still composed of men with backbone, men who will work and are capable of tackling any problem. The trouble is that some of us seem to have been gassed, and as we came to and saw the crowd going by have got in the habit of talking about what the other fellow can do to help us back on our feet.

What we need most is to help ourselves first. Without deprecating efforts at public appreciation of the situation, a most necessary work, we need more inside effort. We talk about wanting to be a business like other business, so let's start out and act that way. Now, the first principle of most business is to increase production, decrease expenses and sell the goods at a fair profit. On electric railways that means more riders at less cost and at adequate fares. Let's talk more about our side of this problem—not so much about what the public should do, but what we can do. If we handle our end of the problem correctly the American public will, by our very acts, be forced to take its right action.

No one is perfect, and this journal does not claim immunity from criticism in this regard. But in this issue we have tried to assemble some articles and statements, long and short, from various representative men of the industry, the public and the related interests, with these chief aims in mind, to start more "peppy" discussion, to get a little more inside the industry talk, to see how we can do our job better, to study our own obligation to the industry, to see how far the public actually has an obligation, to show how closely knit is our own individual success with that of the industry and, above all, to show how each of us can do things in our daily work and in our relations with the public to make for real progress.

Let's All Pull Together

LET'S get our shoulder to the wheel. We all say the railway must come out all right in the end, but the harder we work now the sooner will that resumed success be realized.

Did you ever see a gang of roustabouts doing a seemingly impossible human task? Hear their singsong, "Heave! heave! heave!" as they all pull at once, with only one purpose, to get that job done. No matter how hard the labor, it's a happy singing gang and the spirit is contagious.

We need a little more of that too. We need the best in each of us. Are we giving our best thought and efforts to the common problems of the industry or are we pulling each in his own direction? Are we doing all we can to lend courage and inspiration, to bring about unity of effort?

What are you going to do about it individually? Action is what is needed—your action—our action, and, most of all, concerted action.

We are all a little baffled that the various suggested remedies aren't made effective. Is it because we are waiting for the other fellow to make them effective? Let's get together with him and work with him. It's our problem, not the other fellow's. He's not interested, many times. What we must do is pull together for our own ultimate salvation.

What Can We Do?

YES, what does the industry need and what can we do are the practical questions. We hope some answers will be found in the following pages, or that, at least, some answers may result from these and subsequent discussion. The views expressed have been solicited by this paper and represent every branch of the industry. We believe that they are all constructive and furnish general and detailed suggestions of the ways in which each and all of us can help to put the industry back where it belongs.

Of course, we need the public's comprehension—not sympathy, for we aren't down yet, rather we're coming up—and we will get that comprehension as we deserve it and work for it. But fundamentally, our first line of attack is the business itself—more revenue from higher fares is necessary, but we must not forget that more revenue can come also from more sales and decreased cost by maximum operating efficiency. There are ways of doing these things and we can each help.

We can give definite acknowledgment of our own obligations.

We can express our confidence in the future of the industry.

We can each help sell the needs of the industry to our individual acquaintances and convince those that we meet that the prosperity of the community is bound up with a prosperous transportation system.

We can get behind big movements and utilize every instrument for better transportation.

Precedents are all right when they are good, but we must have courage to discard them when better ideas and methods are available.

The "Electric Railway Journal" wishes to acknowledge its own deep obligation, to put its shoulder to the wheel and do its share to work for the realization of the aims of the industry.

Wanted: A Handbook of Technical and Allied Organizations

THE number of technical, scientific and related societies is increasing so fast and their names are used so much that it is becoming ever more customary to use abbreviations in referring to them, as our English brethren have done for so long in the same field. It's a knowing engineer these days who can recognize all of the abbreviated titles, many of which are so similar as to invite confusion. In the railway field we have the A. R. A., the A. E. R. A., the A. R. E. A., the A. E. R. E. A., etc. The schools don't teach the alphabet any more, but it looks as if they would have to take it up again, at least for part of the population. And then the societies are changing names so rapidly that even the members have a hard time keeping up to date. At the recent A. R. A. convention we heard reference to the American Railway Association, the Master Mechanics' Association and the Master Car Builders' Association, all of which, now comprehended in the American Railroad Association, went out of existence in name but not in fact during the war-period régime.

All of this preamble is simply to point to the need, voiced recently to the writer by a prominent engineer, for some kind of a "Baedeker" for these societies. It would have to be an annual, if not a monthly, adequately to keep within speaking distance of accuracy. Possibly the new Federated American Engineering Societies will tackle the problem. Anyway, somebody ought to do it. Such a compilation should show, among other things, for each society, its history, purpose, plan and scope of work, organization, nature and requirements for membership, relation to other societies and government bureaus, publications and address of secretary.

A clear concept of the nature and field of each society on the part of all would prevent some of the duplication of work that well-meaning committees lay out for themselves, or have laid out for them, when similar work is being well done by pre-existing agencies.

The Coaches Can't Do It All

WHEN you see a football team on the field pushing its way toward the goal and victory you never think of the coach. It's the men on the team who must do the fighting at the showdown.

The railway industry has about 5,000 coaches and 300,000 players; isn't it about time for the teams to take the field? When it comes down to facts, every employee is interested in the railway industry, financially and morally, simply because it supports him and has done so for years, and now that the industry is up against it it's his duty to jump in and win the game.

It's difficult to predict what would occur if every employee in the railway industry, realizing his vital influence in molding public sentiment, became an active player and bucked the line with all his strength. Three hundred thousand boosters sifted among 100,000,000 neutrals and 50,000 knockers and demagogues could turn the tide of public sentiment in a hurry.

Why not institute a Railway Drive and pour out the truth about conditions? Every employee realizes conditions in the industry, but has not had brought home to him his selfish interest in getting improvements. Let's have teamplay in work and in publicity and a real game. Every player should "talk it up" and put "railway pep" into his conversation with the rooters.

Let the coaches remain on the side lines while the teams tear up the dirt of ignorance and prejudice.

Now Is a Good Time to Get Out of that Rut

THE engineer has often been characterized as a narrow specialist, necessary of course, but procurable at a very moderate wage. This was partly his own fault, because he often, maybe usually, allowed his interest in things and their laws to absorb him to the exclusion of people and their ways and whims. Now this condition is rapidly changing; the master mechanic and the civil engineer in the electric railway field are taking an active interest in car schedules, for example, while the power plant man is helping to save energy as well as produce it.

The writer was greatly pleased recently to find an eminent rolling-stock superintendent keenly alive to the problem of collecting a new fare involving several coins. Really, that's an engineering problem. At another point an engineer of power was applying analytical methods in studying car operation for maximum economy; also an engineering proposition. And this thing works the other way round, too. If the manager sees his engineers taking an interest in general transportation matters he will reciprocate, "vicey versey and the same," as a once well-known character in fiction was wont to say.

The hard sledding which the industry has experienced of late has caused all departments to pull together as never before. If anybody is still in a rut he ought to get out of it now or quit.

The Electric Locomotive Was Born Grown Up

THERE is an important element of difference between the development of the steam and the electric locomotive. The former grew up with transportation, the latter had to be designed and put into immediate competition with a rival perfected through decades of gradual evolution. The term "perfected" is used here, of course, in a "Pickwickian sense," for the steam locomotive has made some of its most remarkable progress during the past few years, and its rate of change in this regard is as rapid now as ever in its history. Mr. Basford's paper at the A. R. A. Mechanical Section convention furnishes convincing statements along this line. At present it is making up for lost time, like the boiler in the stationary steam power plant, and the lessons learned in power plant practice are being applied on this traveling power plant with great reduction in coal consumption. On the whole, however, progress has been slow and steady. On the other hand, the modern electric locomotive isn't more than fifteen years old.

These remarks are made because, as one hears of occasional trouble with this or that electric locomotive, he is apt to conclude hastily that this type of machine is not up to the job. Not so, however, for in spite of some high maintenance costs the machine as a class is performing splendid service, often overloaded beyond reason and each individual doing the work of several steam engines and doing it better. Just think where the electric locomotive would be today if it, too, could have started back in transportation year 1.

Chicago Is Grappling with the Automobile Problem

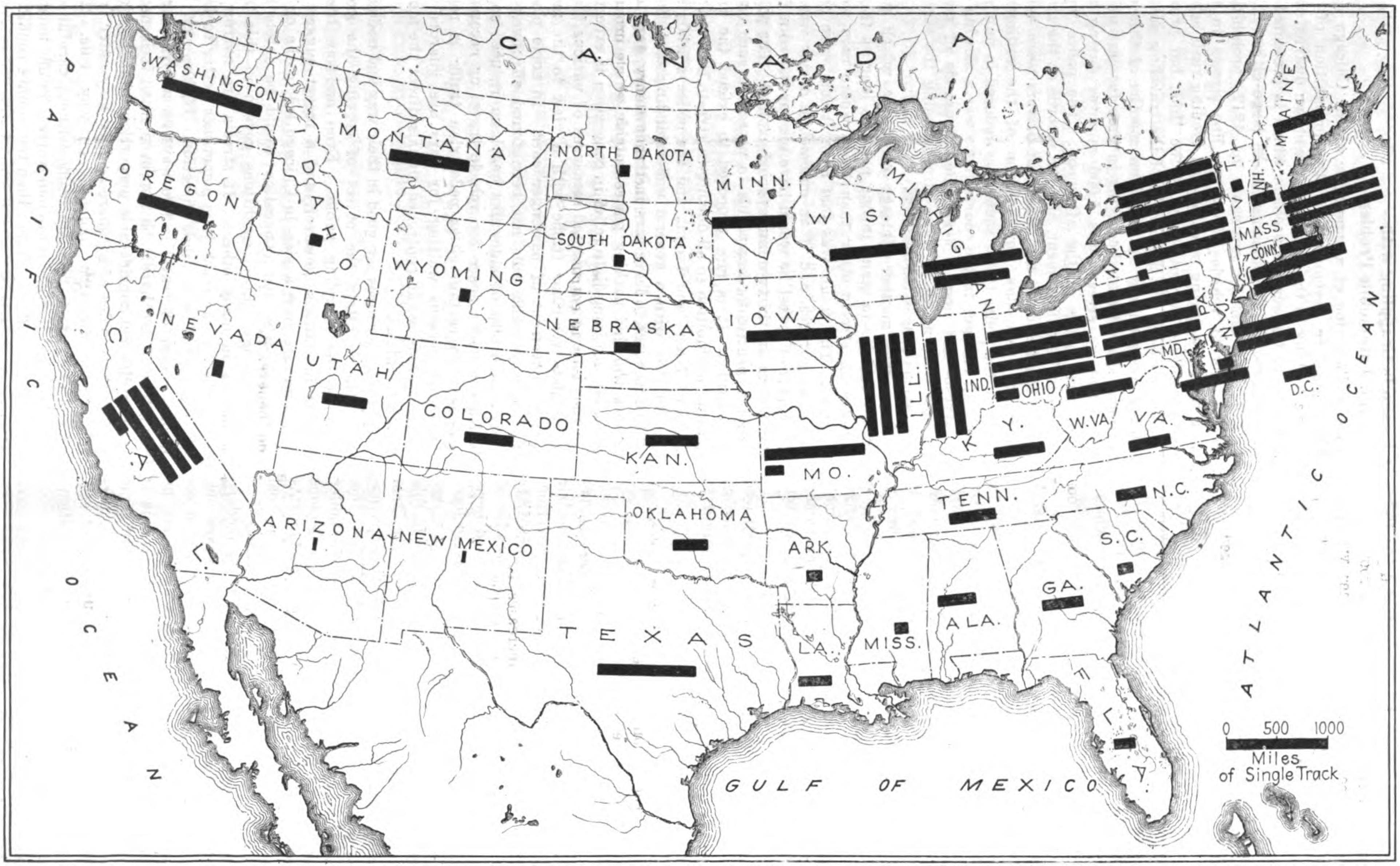
RECENT action of a committee of the Chicago City Council in recommending the prohibition of all vehicle parking in the congested downtown district calls attention to the serious problem which is presented to local transportation companies in all large cities. The Chicago anti-parking ordinance of 1917, prohibiting the parking of vehicles along car line streets in the Loop territory during morning and evening rush hours, was considered revolutionary at the time, but proved an ideal measure for the benefit of the traveling public. Studies made during the first few months of this experiment showed that the saving in time for cars using the downtown streets was 5,000 minutes during the three rush hours of the afternoon. The police were zealous in its enforcement, and the records of the automobile court showed that scores of drivers were being penalized every day for violation of the ordinance. Later on the police traffic squad was reduced in number, and with changes in the courts there was a slowing up in arrests and fines. Meanwhile, thousands of automobiles were added to those already using the streets and serious congestion resulted.

There was another Chicago ordinance which permitted vehicles to stand in one place as long as thirty minutes on streets other than those where cars were operated. The result was that such streets were used as public garages, and if an automobile owner was at all fearful of arrest he would have his car moved a few feet before the thirty-minute period expired. The police found it practically impossible to prosecute such cases successfully. It is now proposed to extend the anti-parking prohibition to all downtown streets between the hours of 7 a.m. and 7 p.m., and the police officials are hopeful that with a general understanding that there will be no place to leave cars in the downtown territory drivers will find parking places outside or use regular garages. An immediate relief in congestion is expected.

Other cities have adopted measures of various kinds to regulate vehicular traffic with a view to the more prompt movement of passenger cars. In some places the one-way traffic rule has been found effective. In others the width of sidewalks has been reduced so as to leave a wider space for vehicle travel or necessary parking. In certain cities pedestrian traffic is regulated and persons waiting for cars are guarded by safety islands, while controlled signals direct the movement of vehicles.

All these measures are good in their way and undoubtedly help to attain the object of serving the great mass of the traveling public. Even one-way traffic has its limitations, however, and a recent suggestion to inaugurate such a plan in Chicago led to the objection of experts that congestion would be intensified by the change. Local conditions govern in this particular as in many others. If streets are narrow or have only one car track it is sometimes better to have all traffic move in a single direction. If, however, the normal course of travel is two ways on a given street the situation can hardly be improved when it is necessary to direct a considerable proportion of the vehicles around three sides of a square so they may enter from the proper direction under a one-way rule. Haphazard attempts to regulate traffic without careful survey are bound to make confusion worse. Traffic must be made to fit conditions rather than try to have conditions adjusted to suit traffic.

How the Electric Railway Enters the Life of Each State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Miles of Single Track

The above map indicates graphically the single track electric railway mileage in the various states. Here is an industry which has in each state become an important part in the economic and social life, in many states a vital part. Is it conceivable that the men in and behind this industry can do else than succeed in the work of maintaining it as an essential service to the community and at the same time of obtaining from the public of the community a recognition of its true character and value?

Situation Is Fundamentally Sound

The Paramount Position of the Electric Railway in Local Transportation Service Has Been Unaffected by Bus Development—Commissions and Public Are Realizing the Necessity for Fair Treatment of Utilities—Advantages of Individual Action and Co-operation Through Association Are Presented

By JOHN H. PARDEE
President American Electric Railway Association

AFTER the distressing period from which the electric railway industry is emerging it is a pleasure to be able to strike a note of optimism as to its prospects. I believe that the future looms much brighter; that there is reason to take hope, and that our time of greatest gloom has passed away, not soon to return.

This impression comes, not from a study of the financial statements of the companies, which are still too liberally dotted with red to provide much encouragement, nor from a contemplation of the physical condition of the roads, which, due to the impossibility of securing new funds for rehabilitation, is in most cases deplorable, but it comes from a firm belief that the great public of the United States is coming to a better understanding of the electric railway problem as it affects itself and the companies and is disposed to enter into settlements which will continue the utility in a higher state of efficiency and will recognize the rights of those whose money is now being used and of those whose money is now being sought for the furnishing of an essential public service.

The situation has resolved itself into one in which the main object of both the public and the companies must be the restoration of electric railway credit. Except in a few isolated cases, municipal ownership and operation is not under serious consideration. The state operation of the Boston Elevated and the Massachusetts Eastern railways has brought increased and not decreased fares. The city of Seattle, which, rather than grant the necessary fare increases to a private company, purchased and began the operation of the city system, has been forced to a 10-cent base fare in order to cover the cost of the service. The people of San Francisco, where municipal operation is conducted under exceedingly favorable circumstances, are gradually awakening to the fact that there is no virtue in the slogan "Municipal Ownership" that enables operation at less than cost and that a low fare is there being maintained at the expense of reserves, which are necessary to the future welfare of the property. Detroit, pledging its credit for a $15,000,000 bond issue to secure a half-way municipal system, finds that service is no better and that something more than mere political expediency is necessary to the provision of local transportation. It is apparent to any one who will seriously consider the situation that electric railway transportation is still a necessity to all of our communities of any size and that it must be provided through the agency of private enterprise and private capital. The serious business of both the public and the companies is therefore the adjustment of the business of these utilities and their relations with the communities, so that the confidence of the investor will be reawakened and that flow of capital, without which public utilities in growing communities cannot long exist, will be resumed.

> **"The experience in those cities where jitneys are most prevalent is that the service as a whole has not been improved or extended, but that there is a surplus of service on certain routes and in certain sections, and an augmented dearth of service on other routes and in other sections."**

MOTOR VEHICLE NOT TO BE FEARED

I have no fear that the motor vehicle will intrude itself into the situation to an extent that will imperil the usefulness of electric transportation upon tracks. In this connection two recent occurrences stand out in bold relief. It is of the greatest significance that Mayor Couzens of Detroit, himself an automobile man, whose long term as general manager of the Ford Motor Company gave him a knowledge of the possibilities of the internal combustion engine and who has had wide experience with the extended use of the cheapest and most adaptable car on the market, totally and utterly rejected the motor bus as a means of providing transportation, although every interest dictated that he should adopt the best and cheapest method in his attempt to compete with the Detroit United Railway. Of equal significance is the fact that Henry Ford himself, while advocating a self-contained vehicle propelled by a gasoline engine for interurban use, clung to rails and refused to entrust his new device to rubber tires.

Nowhere in the United States is the motor vehicle giving a complete system of local transportation in any but the very small communities. Faced with the choice between street railways and the jitney, the Massachusetts cities served by the Eastern Massachusetts Street Railway have unanimously decided in favor of the former and have eliminated the latter from their streets. I have no doubt but that the city of Bridgeport will make a similar choice.

Those cities in which unrestricted jitney competition is now permitted must, in my opinion, soon make a similar choice. I do not believe that the electric railway can hamper the development of the motor vehicle. I do not believe that it should do so if it could. I do believe, however, that the motor vehicle has no greater rights than the electric car, and that it should not, and ultimately will not on its part, be permitted to interfere with electric railway development. There is almost unanimous opinion among those who are familiar with electric railway affairs, and I speak now not of the owners and operators of the properties but of those who represent the public in their regulation, that local transportation should be a strictly regulated monopoly. Only in this way can the communities receive that full and sufficient service to which they are entitled. To introduce into the situation the element of competition is to revolutionize the entire theory upon which the relations of the companies and the communities are based and to make necessary an entirely different policy in the treatment of all transportation utilities.

CO-OPERATION, NOT COMPETITION, OF RIVAL SYSTEMS

It is certain, from the public standpoint, that the motor vehicle can never properly perform its task so long as it is operated in competition and not in co-operation with the electric railway. The experience in those cities where jitneys are most prevalent is that the service as a whole has not been improved or extended, but that there is a surplus of service on certain routes and in certain sections and an augmented dearth of service on other routes and in other sections.

If no other rule is applied than that which has for many years been established in connection with the construction of new steam railroads, the managers of the electric railways will have little cause to fear jitney competition. In all states possessing modern systems of public utility regulation it is the "convenience and necessity" of the public that dictates whether or not a new steam line shall be built. Competition, ruinous alike to the owners and to the public, has taught the people a lesson in relation to steam road construction. The useless waste of funds involved in the setting up of competing lines where none were required and which finally resulted in bankruptcies and consolidation, adding to the capitalization upon which in some manner a return must be earned, has caused the states to be wary of transportation schemes which serve no useful purpose. From this lesson the communities must borrow wisdom and ultimately recognize, first, that the motor bus in local transportation is a common carrier, subject to all the duties of a common carrier, and, second, that only when the power lodged in the regulatory authorities is insufficient to force the rendering of adequate service by an existing carrier is it to the public interest to set up a competing carrier, the operation of which duplicates expense as well as service and in the long run will impose an unwarranted burden upon those who depend upon local transportation service in their business and social life.

These are fundamentals of the situation which must be thoroughly appreciated and understood if we are to speculate as to the future of the industry. The chaotic conditions which exist in many cities and in many towns are not conducive to dispassionate consideration, and they make it difficult to take a broad view of the field and to realize that ultimately the outcome will rest upon principles rather than upon merely local disturbances. Such a broad view establishes, to my mind, first, that the service performed by the electric railways is essential; second, that it cannot adequately be performed by any other known means of locomotion, and, third, that it must be performed by private enterprise and through the use of private capital.

If this be admitted, then the necessity of restoring electric railway credit is apparent, and it is equally apparent that such restoration can be accomplished only through the recognition by the people of the fact that private capital cannot be coerced, that it must be assured of fair treatment and a fair return, and that private enterprise will be serviceable to the public only if it be given latitude for the initiative which is its distinguishing feature and rewarded in accordance with the efficiency with which it performs its task.

IMPRESS THESE TRUTHS ON PUBLIC MIND

The real work before the electric railway industry today is that of impressing these truths upon the public mind. A start has been made. The attitude of the public toward the industry is more favorable today than it has ever before been in the history of the electric railway business. There is a keen realization that these companies are in distress and that they must be given relief. The position of the state commissions is in the main distinctly helpful. Many of these bodies have had completely to change their viewpoint in order to acquire a realization of the truth that their duty is as much to protect the companies from the effect of causes over which they have no control as it is to protect the public from any acts of the companies, but I think it may be safely stated that there are few public service commissions which do not now clearly see the necessity of building up and strengthening the companies in the public interest. The attitude of the city authorities is also becoming more favorable. It is not difficult to pick out numerous communities whose officers have yet to learn that the preservation of local transportation service and not the furthering of political ends is the thing most desired by the public. But to offset this deplorable state of affairs there are many gratifying instances where intelligent, helpful, public-spirited action has come from city councils and commissions and where there is earnest effort to arrive at an equitable and just basis of relationship.

"The public is willing to listen. It wants to understand and it is our business to make sure that the public shall understand. The great mass of information released through the deliberations of the Federal Railways Commission has had an effect which it is hard to overestimate. Unfortunately that commission has not yet reported its findings to the President of the United States, but even if it never reports, the industry will still be the gainer, because, through the publicity secured, the facts of a lamentable situation are now known, and the public has come to realize that the question is not one which concerns the owners and operators of the properties alone, but that it intimately concerns every man, woman and child in the entire country."

WHAT THE ASSOCIATION IS TRYING TO DO

In these circumstances the crying need is for a real understanding of the problem to be solved, both on the part of the railways and upon the part of the public.

The American Electric Railway Association does not and will not propose a universal panacea which is to cure all the ills that afflict the industry and which will prevent it from performing its full duty in the public interest. The case is too complex to make its cure possible by any one remedy. But through its deliberations and its investigations the subject has been greatly clarified and there has come into being a body of opinion within the industry which if it can be transmitted to the public and the public's representatives gives promises that the electric railway problem will be settled and will be settled correctly.

The association should lead the thought of the industry in this particular, as in many others. Through it there should be rendered available for every electric railway executive in the country the best thought of the industry. I am convinced that the association can perform no greater service than by frequently bringing together in conference the men whom we have all grown to regard as our leaders and by spreading before the country their conclusions as to the vexed problems before us.

The public is willing to listen. It wants to understand and it is our business to make sure that the public shall understand. The great mass of information released through the deliberations of the Federal Railways Commission has had an effect which it is hard to overestimate. Unfortunately that commission has not yet reported its findings to the President of the United States, but even if it never reports the industry will still be the gainer, because through the publicity secured the facts of a lamentable situation are now known and the public has come to realize that the question is not one which concerns the owners and operators of the properties alone, but that it intimately concerns every man, woman and child in the entire country.

Let us continue to extend, as we are now attempting to do, that process of public information. There are many channels open to us. The public utilities have had a prominent place upon the program of two successive conventions of the Chamber of Commerce of the United States. Other national organizations have welcomed speakers representing the industry and have given them sympathetic hearings. The opportunity for presenting our case is unlimited. The local manager who does not take advantage of the present frame of mind is remiss in his duty to his company. It is not necessary that he should be an orator. It is sufficient that he should be informed, that he should believe in his cause and that he should place the facts before his hearers.

This is not the time for pessimism. The discouragement and rebuffs of the past must not be allowed to interfere with our present task. The process of public misinformation has been a long one. That the electric railway situation is today so widely misunderstood is largely our own fault. That intangible something known as public good will is to be gained and kept only by continually keeping up the process of public information. It is hard, discouraging, many times a thankless task, but it is worth while.

MEMBERSHIP IN THE ASSOCIATION A PRIVILEGE AND A DUTY

The association can and should lead, but the association's usefulness depends upon the co-operation of the electric railways of the country, and it can be of no greater use than these railways make it. When it speaks for the industry it should speak for all the industry. When it acts for the industry it should act for all the industry. It has performed a great work, but it is capable of performing a much greater one. Whether it will do so depends upon the support that is given it, and for this reason and because the national aspect of the electric railway problem underlies all local questions, and because public sentiment spreads as the ripples on a millpond, I consider that membership in the association is not only a privilege but a duty for every electric railway in this country and in Canada.

The Industry Merits Our Best

Shun Expediency—Get Together—Do Not Bemoan Conditions, and Thereby Attract Mediocre Ability

By EDWARD DANA
General Manager Boston Elevated Railway Company, Boston, Mass.

THE industry with which we are identified is relatively young. It came into being because of an impelling necessity for its service.

That necessity was so fundamental that its early years were marked by unlimited optimism with regard to its future.

That optimism was responsible in large measure for the period of trials from which we are now surely emerging.

That optimism resulted in a disregard of sound economic laws, with the result that there was overexpansion of facilities and a price arbitrarily fixed for the commodity for all conditions and all places.

Those of us who have lived during the recent years' struggle appreciated the hopelessness of the situation as an effort was made to postpone the day of reckoning.

We cannot unmake the past, but now that the fallacies of the past are gradually being righted we can get together with both feet squarely on the ground and restore the industry to its rightful place in the eyes of those whom it serves.

The impelling necessity for street railway service exists today as never before. Its growth has created the arteries of transportation by which cities flourish and its service must continue no matter how many other means to the same end come into existence.

The industry has developed big men and given others opportunity and careers. The future success of those who have chosen it for their talent is dependent upon the future success of the industry itself.

If we belittle its importance, bemoan its past and despair of its future it will attract the mediocre, whereas it merits the best.

Above all, let us shun expediency as the solution of its every-day problems.

Whether it be the eight-hour day, request for service not justified by traffic offered or excessive payments for snow removal, paving, etc., let us talk the same language and stick to the facts and merits of the case, whether with the labor organizations, the utility commissions or local authorities.

The fundamentals are the same everywhere, and whenever these are disregarded for expediency we perpetuate the errors of the past which have been so harmful to the industry.

What Bankers Will Demand and How They Can Help the Industry

Assurance of No Reduction of Rates for Long Period; Safeguarding of Principal and Interest of Outstanding Securities—Bankers Can Teach Public Desirability of Healthy Utilities and Render Financial Aid in Temporary Emergencies

By F. H. RAWSON
President Union Trust Company, Chicago

THE unsatisfactory financial condition of many electric traction companies, as well as other utilities, is well known. Their unhappy condition is due to the very large and constantly recurring wage increases necessarily granted to all classes of employees and to the high cost of every kind of material, such as copper, steel, motors, etc., which enter into electric traction. Coal has also increased greatly in price. These advanced costs have not been met by a corresponding increase in the rate permitted to be charged, or, if a rate increase has been granted, it has been after long delay and in an amount insufficient to keep pace with the increase in wages and other costs. The result has been the inevitable. Companies have struggled bravely on until their expenses became greater than their revenue, with the result that a large number of well-managed properties have been thrown into the hands of receivers and others brought dangerously near the brink of financial disaster.

Several billion dollars of traction bonds, as well as those of other utilities, have been distributed to investors by the strongest banking houses in the United States and many millions of such bonds are held by banks. A few years ago such securities were in high favor and the men who had the courage and foresight to plan and build street car lines were acclaimed public benefactors and received the thanks of the community. All this has changed. A few of these companies were in the hands of unscrupulous promoters, and in some instances the companies and the cities in which they operated were exploited for the benefit of the promoters, so that for twenty years or more these few examples have been used by politicians for vote-getting and campaign purposes, and it has been the popular cry for them to denounce traction companies, telephone, electric light and gas companies, styling those operating them as enemies of the public. Politicians are constantly berating the companies and their service and holding out the inducement that, if elected, they will be able to reduce fares or rates. Many a mayor and alderman has ridden into office on this platform. The result is obvious. Investors have been scared away and the credit of the companies seriously impaired or ruined. The companies have been unable to interest capital and the service has naturally deteriorated. A great change in public opinion is now evident throughout the country. The first and best example of this is the intelligent and constructive legislation recently passed by Congress respecting steam railroads. The great experiment of government operation of railroads has clearly demonstrated to the public the futility of expecting good service or cheaper rates from companies politically operated. Public opinion, as reflected by newspaper editorials from every section, is rapidly coming to the conclusion that private operation under rigid and intelligent control is conducive to good service and reasonable rates. State utility commissions everywhere are listening with favor to petitions for much-needed rate increases, not only for electric car lines but also for telephones, electric light, gas, etc.

> **"One very necessary rule which I hope to see public utility commissions adopt is that when they grant an increase in rates they include in the announcement the statement that there will be no reduction in the rate for a period of at least two years. This would go farther than anything I can think of to make such securities attractive investments."**

As an evidence of the intelligent thought being given by public utility commissions, and their desire to safeguard not only the public but investors as well, I quote a few lines from the recent decision of the Public Utility Commission of Illinois in granting the petition of the Chicago Surface Lines for an 8-cent fare:

"The rates hereinafter authorized are just and reasonable rates and are no more than are necessary to enable the petitioners to earn a fair return upon the value of their property actually employed in the public service."

Before there can be much betterment of service the credit of these companies must be permanently restored, and this will take time. Investors must be shown that if they purchase utility securities issued to supply money for obtaining additional equipment or building trackage not only will their interest be earned, with a safe margin, but the principal also will be paid upon maturity, and that while they hold these securities they will not see them steadily decline in market value, due to the attacks of the politicians and newspapers. Investors will not hasten to purchase utility bonds until they are satisfied that the rate-making bodies will continue in force rates adequate thoroughly to rehabilitate the credit of these companies.

One very necessary rule which I hope to see public utility commissions adopt is that when they grant an increase in rates they include in the announcement the statement that there will be no reduction in the rate for a period of at least two years. This would go farther than anything I can think of to make such securities attractive investments. Wage agreements are made usually to cover one or two years and contracts for materials can be more advantageously made on a long time basis. Securities are issued to run for a period of years, and for these and many other reasons it is most important that the companies and investors be able to know a long time ahead what revenue they may expect.

Due to the nature of their business, bankers have a broad viewpoint of financial matters and are in a better position than the average business man to see ahead and correctly forecast conditions. Before bankers will again recommend these securities to the investing public, take them for collateral or make loans to the companies they are going to insist that the present outstanding securities and any additional bonds be safeguarded, both as to principal and interest, and that rate-making bodies allow a rate of return equal to that paid by other well-secured investments. Upon this point the Illinois commission well said, in its Chicago traction decision:

"......the most important and best thing bankers can do is to bring home to the public, by intelligent teaching, the fact that it is vitally interested in the proper maintenance of utility companies. Another and perhaps equally important thing that the up-to-date banker should do is to render financial assistance to these companies to tide them over temporary emergencies."

"A return which would have been regarded as reasonable under pre-war conditions is no longer reasonable under the economic conditions resulting from the world war."

At the present time the best and most attractive securities are selling to yield the investor anywhere from 7 to 8½ per cent and any utilities yielding less than these rates will not sell today in competition with other securities.

In addition, sufficient income must be assured to meet not only all operating expenses but also to enable the companies to set aside an adequate sinking fund to take care of the bonds when they mature, and, at all times, the revenue must be sufficient to maintain the property in the best of condition and to keep it free from obsolescence.

Municipal authorities and public utility commissions, when issuing franchises, have not paid much attention to the interests of the investor. They have given their attention largely to protecting the interests of the user of the utility and have not concerned themselves about those furnishing the money. Public utility commissions now recognize their dual duty in safeguarding investors as well as users of the properties and it is encouraging to note that this viewpoint is now being generally recognized. That the Illinois commission had this clearly in mind is shown by the following from a recent ruling:

"The commission in granting this relief at this time had in mind the restoration of the financial credit of these companies. The applicants, having been granted the full measure of relief sought by them, will be expected and required to furnish the people of Chicago adequate and sufficient service.

"The inevitable result of the continuance of the 6-cent fare will be the appointment of receivers for the property of the petitioners, the disruption of the unified service in Chicago and the great injury not only to the companies but to the public also. Obviously this will not insure the public welfare."

Good and adequate service goes hand in hand with the high credit of the companies. One cannot exist without the other and the commission fully recognized this, as evidenced by that part of its decision above quoted. The public is also becoming convinced that it is much more to its interest to have adequate and up-to-date service than the inferior quality which, of necessity, follows where the revenues are not sufficient.

The other question, "What can bankers do to help the industry?" I would answer by saying that to my mind the most important and best thing bankers can do is to bring home to the public, by intelligent teaching, the fact that it is vitally interested in the proper maintenance of utility companies. Heretofore the attitude of the people toward utilities has been one of indifference, largely brought about by lack of appreciation of what the public's needs are. The average man on the street thinks that if he can procure a street car ride for 5 cents, with a transfer thrown in, he does not have to concern himself as to whether or not the company is getting enough revenue from his nickel properly to maintain itself. A little thought on his part will bring him to the conclusion that if the revenue is not sufficient it will not be long before the service will reflect this condition; that he will not get about as quickly or as comfortably as he can in other cities which afford proper protection to the traction lines, and that it is only a matter of time before the service will be discontinued entirely, or seriously interrupted. This is equally true in the case of the electric light, gas and telephone companies.

The general public has concerned itself little about the financial condition of the companies, thinking always of the addition in the cost of the service and paying too little heed to what would happen if such service were cut off. If it were cut off for even a short time, with the prospect of its not being renewed, it would not be long before there would be a widespread business depression in that vicinity. Factories would of necessity close down, men would be out of employment and general chaos would follow. No one is in a better position to spread this propaganda than bankers.

OTHER THINGS THAT BANKERS CAN DO

Another, and perhaps equally important, thing that the up-to-date banker should do is to render financial assistance to these companies to tide them over temporary emergencies. In many instances during the past few years bankers, individually and collectively, have loaned money to these companies to tide them over emergencies. In many cases these loans would not pass muster if judged by the usual credit standards demanded in good banking practice, but the banks have looked at the question from the point of public policy more than as a credit risk, realizing the havoc and ruin that would follow the shutting off of street car, gas or electric service through lack of money. Many of these companies would have been on the verge of having to close down had not the banks come to their rescue with loans, enabling them to pay wages due and to pay for material, thus permitting them to continue to function.

The writer vividly remembers, a year or two back, of having been called to a meeting of representative bankers, called for the purpose of advancing money to help out a large utility company. The writer's bank had never enjoyed a deposit account or any business relation with that company, but, nevertheless, cheerfully entered into an arrangement whereby all the bankers present agreed, pro rata, according to their size, to advance the money necessary to keep the company going until its revenues were increased by order of the utility commission. Had this company been allowed to go to the wall no one could foresee the misery and loss which would have resulted, and in most cases it would have fallen heaviest on those least able to bear it. There have been many such instances as this and no banker should hesitate to loan a reasonable amount of money to these companies where there is a good chance of getting it back, realizing full well that if the bank does not, it might suffer a greater loss from the damage and panic which would ensue.

Bankers appreciate the high character of the men conducting public utilities and the many handicaps and great strain they have been laboring under since 1914. Rarely do these men receive from the public proper recognition or commendation, but signs everywhere point to better times ahead for traction lines and other public service corporations. Public sentiment is becoming more and more pronounced in favor of a square deal for them, and rate-making bodies are quick to reflect the public's changed attitude. Managers of utilities and investors therein have reason to expect from now on better treatment at the hands of the public and a return to something like their former prosperity. There can be no general prosperity in the country if the railroads and utilities are not permitted sufficient rates to enjoy a high credit and to give good service. When this condition is brought about one of the principal causes of the present unsettled condition of this country and Europe will be removed.

The Public Has a Moral Obligation

The Author Defines the Duty of the Public Concerning Public Utility Service, with Particular Reference to Street Railways—At No Time in Their History Has This Responsibility of the Public Been More Important

By RICHARD T. HIGGINS
Chairman Connecticut Public Utilities Commission

ANY general analysis of utility problems must be based upon a proper conception of utility service, its character, importance and necessity for the general public welfare.

The organization and operation of a public utility company and any exclusive or special privileges granted to it are primarily for the purpose of furnishing to the people, within the scope of its activities, a necessary public service at reasonable rates, rather than as a business enterprise for the purpose of speculation or large financial profits.

The success of a public utility accrues to the benefit of the general public, as well as to the officers and stockholders. The interested parties in a utility operation are the stockholders or investors, the officers and employees and the general public. A duty and a moral obligation devolve upon all of the parties for the successful operation of the enterprise, which can only be a success by their active co-operation in the faithful performance of their respective duties and obligations. If the parties are antagonistic to each other it is bound to operate to the detriment of the service and to the detriment of their individual and collective interest.

Active co-operation consists in something more than one party telling the other what it should do without defining and trying to fulfill its own proper task. There should be more constructive and less destructive criticism, more intelligent effort on the part of all to perform their respective duties and less tendency to transfer the blame to the other fellow.

The most important and active duties and obligations are naturally imposed upon the utility company, its officers and employees who are in immediate charge of its operation and upon whose efficient management and loyal service in a public enterprise its success must largely depend, and without which its failure is inevitable.

Business enterprises and particularly utility companies are today contending against abnormal conditions and are confronted with many new and perplexing problems requiring strong, broad-gage, business men, familiar with their duties, to shape the policies of the enterprise and direct its operation and, in the case of utility companies, having in mind at all times that the rendition of public service is the object for which the company exists.

It is my purpose in this paper to discuss briefly and informally the duty of the general public in connection with street railway operation. No line of utility service has been more seriously affected by recent conditions or is in a more precarious situation at the present time than street railways.

Space will not permit in this article of an extended diagnosis of all the street railway ills or a specific designation of the partic-

> **"It is therefore of first importance that state legislatures and municipalities granting street railway franchises enact remedial and protective legislation for the benefit of the great mass of people who use or would use street railways as a means of transportation.**
>
> **"Failure to give such protection reduces or entirely wipes out the value and importance of a utility franchise and nullifies the legislative intention in issuing the original grant."**

ular cause or causes producing the present unhealthy effect. We know that the street railway industry in this country generally is struggling for existence, and unless all parties unite in the co-operative performance of their respective duties many of the companies will be compelled to suspend operation, thereby depriving the people of that particular line of public service.

What are the duties of the general public? They may be summarized as follows: To realize that the operation of a public utility is for its particular benefit and that the rendition of adequate service at reasonable rates depends on its co-operation and patronage; to obtain intelligent information of the financial and other conditions of the utility, its needs and requirements for efficient operation; to afford protection against unwise and destructive competition and to afford relief from unjust and unnecessarily heavy legally imposed burdens, whether in the form of taxation or otherwise, and at all times to exhibit an active interest in the success of the utility as an integral and important part of its own general business.

"Every urban community will agree that street railways are a public necessity and that their suspension or abandonment, notwithstanding the automobile possibilities, would be a public calamity and every student and observer of street railway operation must agree that street railways cannot be successfully maintained if the public service automobile is permitted to operate as a free lance along its lines of road."

It is not reasonable to expect that the individual or unorganized public will voluntarily assume responsibilities or effectively perform meagerly understood collateral duties. The general public must act through its organized bodies, such as legislatures and their administrative branches, municipalities and civic, business and commercial organizations. The positive duty must be in, or the result of, a governmental act.

Street railways are operated by virtue and under authority of special grants and franchises issued by state and municipal governments for the benefit of the people. So long as the particular utility is an absolute public necessity the governmental agencies which created the utility corporation should enact such protective and remedial legislation as will enable it properly to perform its public duty.

The great and important motive power back of any enterprise, whether public or private, is finance; and a utility company without sufficient capital or unable to earn a fair return on the capital honestly invested and required for extensions and betterments, after paying operating, overhead and fixed charges, is not in a condition to render adequate service at reasonable rates.

It may be claimed that the logical conclusion is to increase the rates to a point necessary to produce the required revenues; but in the case of street railways the expensive collateral statutory burdens, the competition of unregulated and less burdened transportation agencies reducing the volume of street railway business and the more or less unresponsive attitude of the traveling public, such an increased rate is liable to become a prohibitive rate, resulting in decreased rather than increased revenues.

It is therefore of first importance that state legislatures and municipalities granting street railway franchises enact remedial and protective legislation for the benefit of the great mass of people who use or would use street railways as a means of transportation. The particular legislation would depend upon existing state and local conditions, but in general should involve relief from unnecessarily heavy taxation based upon corporate value or gross receipts without regard to net revenue; relief from the imposed duty, at present existing in many of the states and communities, requiring street railway companies to construct and maintain a large portion of the public highways and bridges for the special benefit of other users of the highway, including competitors, and protection against unfair and unauthorized competition in its occupied territory. Failure to give such protection reduces or entirely wipes out the value and importance of a utility franchise and nullifies the legislative intention in issuing the original grant.

The extent of protection and the restrictions, obligations and limitations imposed upon the competition must to a certain degree depend upon public sentiment and the public necessity for a continuance of street railway service. If street railways are no longer an absolute necessity it is because the automobile in its various forms and classifications has taken their place and is rendering or able to render short-haul passenger transportation service adequate for public needs, satisfactory in character and at reasonable rates, under all climatic conditions.

While privately owned automobiles have naturally affected the volume of street railway traffic, the only class that can be considered or controlled in connection with street railway problems is the jitney or automobile bus, carrying passengers for hire. This mode of conveyance is meeting with considerable popular favor and has become an important factor in both urban and suburban transportation.

MOTOR BUS HAS NO PLACE AS COMPETITOR OF STREET RAILWAY

I believe the jitney or automobile bus has a legitimate place in supplying public transportation service, but not on the lines and territories served by and in direct competition with street railways.

Every urban community will agree that street railways are a public necessity and that their suspension or abandonment, notwithstanding the automobile possibilities, would be a public calamity, and every student and observer of street railway operation must agree that street railways cannot be successfully maintained if the public service automobile is permitted to operate as a free lance along its lines of road.

The unrestricted and unlimited competition of automobile service would also have a tendency ultimately to destroy its own efficiency and self-supporting earning power.

Before throwing electric street railways into the discard by permitting gasoline street automobiles to usurp their place, the public should consider carefully the consequences and the adequacy, dependability and permanency of the substitute service. There is a constantly increasing demand and supply of electricity for power purposes, and if in the next few years the present reports of the limited supply of oil and gasoline should be fully realized we might find that gasoline in sufficient quantity could not be obtained, or its price might be so high as to prohibit its use as the motive power for public service automobiles.

If we permit or compel the discontinuance or abandonment of street railway service and later discover that we are without adequate or practical service to take its place it will take millions of dollars and years of time to rectify the mistake. It should be forestalled by proper legislation at this time.

The powers and discretion conferred upon public administrative tribunals should be so exercised as to assist as far as possible in maintaining the utility at its maximum efficiency. If necessary to increase rates the rates should be increased before the company becomes financially embarrassed and the property allowed to deteriorate. Deferring maintenance is not only an expensive but a dangerous policy to pursue.

Street railways, if they are to continue serving the public, need assistance, and that assistance cannot be rendered in the form of punishment or antagonism; they need the active, friendly and intelligent co-operation and assistance of the public through its business, commercial and civic organizations. It is incumbent upon these organizations to become informed upon this line of public transportation and its necessity, needs and means of relief. Public sentiment is a controlling element and public sentiment should be formed by intelligent information which these organizations can obtain and disseminate.

THE RESPONSIBILITY IS ON THE PUBLIC FOR THE MAINTENANCE OF GOOD SERVICE

If enlightened public sentiment demands jitney or automobile bus instead of street railway service it means the decline and ultimate abandonment of street railway service, excepting in large metropolitan centers, and a tremendous financial loss to present investors in street railway securities. This is a question the general public will have to decide, and it is extremely important that it decide correctly and with a full understanding of all the facts.

In any event I believe that automobiles carrying passengers for hire should come under public regulation as to rates, service and schedules, not only for the protection of the traveling public but for the protection of their own industry and investment.

There are many legitimate uses to which our public highways may be subjected, and it is essential that no one use be permitted to so dominate or congest the streets that other legitimate users will be debarred from access to or safe utilization of such streets.

At no time in the history of street railways has so important a responsibility rested upon the public—the responsibility of determining whether street railway service shall continue or terminate.

In conclusion, I will quote from a recent decision of the Public Utilities Commission of Connecticut: "From an analysis of the history and development of street railways the commission is led to the conclusion that even though the motive power may change, as it has in the past, the essential features of a street *rail* way will remain. For more than seventy-five years street railways have operated along a predetermined course, on *rails* or tracks, with every new form of motive power."

Hostility of Public Often Due to Misunderstanding

Claim Agents Are in an Excellent Position to Keep Informed of Public Feeling—Employees Should Be Taught to Boost

By R. E. McDOUGALL

General Manager New York & Harlem Railroad, Surface Lines, and Past-President American Electric Railway Claims Association

ELECTRIC railways have gone through some hard, lean years, and while other lines of business and the men connected with them have prospered financially, most of us find ourselves not as well off as we were five or ten years ago. It goes without saying that this is because of the financial condition of our respective companies. For years past it has been a popular game to knock the electric railway. All sorts of fiction concerning them has been circulated and allowed to go unchallenged.

No other public utility should be permitted to lead the electric railway in the community it serves, and if the company's employees are boosters for their company no other utility will lead. If the men who get their bread and butter from a company do not boost for it and try to make it popular and successful no one else will.

No employee of an electric railway is better informed as to how his company stands with the public than the claim agent and his representatives. If any soreness or grievances exist against his company the claim agent is sure to learn of it as quickly as any other. He and his men are in close contact with the public and complaints are continually being made to them by the road's patrons on all manner of subjects, such as service, equipment, conduct of employees and conditions in general. He has every opportunity to learn the reasons for any such feeling and usually finds that it is due to petty annoyances, such as service interruptions, incivility or discourtesy on the part of employees, failure of the company to fulfill promises regarding little things that have been called to its attention, etc.

From such contact with the public, the claim man sooner or later comes to the conclusion that the company's standing and many of its troubles are due largely to indifference of its employees, and many times of its officers, as to what the public thinks or wants. He finds that the people who are generally boosters for community advancement are often against the railways and take no interest in the electric railway situation and know very little about it. They are knockers because they have no knowledge of the facts. When acquainted with the actual conditions they are quick to grasp the situation and willingly stand up for the company and champion it when in the right.

The claim agent realizes that in the past company officials and employees were too busy with other matters to seek the good will of the public, and, in consequence, the public has become unfriendly. The good will of the public must be secured if electric railways are to take their proper place in the business life of each community served. This can only be done through the united effort of the railway men themselves.

The Interests of the Railways and of the Manufacturers Are Identical

Their Common Interest Should Lead to Co-operation—The Pendulum of Public Opinion Now Swings in the Proper Direction—Manufacturers and Railways Must Rise Together

By CALVERT TOWNLEY
Assistant to the President, Westinghouse Electric & Manufacturing Company

BECAUSE a large percentage of contact between street railways and the manufacturers has to do with the purchase and sale of apparatus, material and supplies, in which there is ever present the inevitable discussion of prices, an important fundamental fact is frequently forgotten, namely, that except in the matter of price for the manufacturer's product, the interests of the railways and of the manufacturers are identical in every respect. Prosperity to the railway means prosperity to the manufacturer. Adequate service from the railway means improved labor conditions for the manufacturer. A high standard of product from the manufacturer means reliability of service to the railway.

The electrical manufacturer is in general one of the substantial industries in his community and as there is always a trolley company serving that community their common interest should uniformly lead to co-operation which will frequently prove very effective.

A large per cent of the street railway troubles of the past have arisen from ignorance of or indifference to the street railway problems on the part of the public, where the active interest of even one prominent industry would have materially helped the situation. This sort of co-operation, local and direct, has not been availed of in the past as fully as it might have been. In fact, the opportunities for it have been more or less neglected in favor of general co-operation in national matters through our national organization, but the opportunities that offer are pregnant with possibilities.

> **"Prosperity to the railway means prosperity to the manufacturer. Adequate service from the railway means improved labor conditions for the manufacturer. A high standard of product from the manufacturer means reliability of service to the railway."**

The old saying that "it is always darkest just before dawn" has been again confirmed in the street railway industry, as might have been expected, and through long continued energetic effort the pendulum of public opinion now seems to be swinging in the opposite direction. It was natural that following the old horse car days the transformation to electric propulsion and the rapid expansion of city lines, coupled with the building of interurbans, focused public attention on the magnitude of the industry and on the large profits, real or imaginary, which the promoters of trolley transportation were making, while the accompanying benefits to the communities served were either minimized or, being taken as matters of course, were lost sight of. It has only been by the repeated presentation of many severe object lessons of actual or threatened discontinuance of service that the value of trolley transportation to a community has begun to be recognized, so that instead of having to go on the rocks or receiverships, there seems now to be a reasonable expectation that the companies will be allowed to earn sufficient revenue to pay their operating expenses and charges.

Speaking in the language of our golf enthusiasts, a big bunker was cleared when the street railways got away from the 5-cent fare, which at one time seemed to have been established about as firmly as the laws of the Medes and Persians. However, there is much yet to be done before the industry will again be on a sound basis, and there must be no letup in the united effort of all interested parties if we are to reach that goal. In the first place the deep-seated and erroneous impression held almost universally by the public that a franchise is a valuable asset contributed by the public must be dissipated. Under the conditions prevailing when the street railway industry was started, namely, perpetual franchises, no regulation, unrestricted issue of securities and fares fixed by the railways themselves, such franchises were assets of great value, but under the present condition, reversing all of these specifications, a franchise is a liability. Because an unprofitable street railway can neither move away nor shut up shop its franchise is a burden which a private industry does not have to bear, and as compensation for the assumption of such a burden by the utility there must be a counterbalancing asset if the business is to be economically sound. Just what form this asset should take is open to debate, but as the burden of liability caused by the franchise is one imposed by the public it would be reasonable to have the corresponding asset likewise supplied by the public and thus might take the form of definite laws which should clearly put upon the regulating commission the duty of establishing such fares as may be necessary to insure security for the present investment and to attract new capital when necessary.

Just as it has taken a long time to get away from the nickel fare so will it take a long time to eradicate the misleading ideas about the value of a franchise, and this only emphasizes the necessity for continued co-operation between railways and the manufacturers.

I am one of those who believe with Thomas Jefferson that "that nation is governed best which is governed least." I am distinctly opposed to paternalism and believe that the government should keep its hands off industry and allow the free play of the natural laws of trade. In confirmation of this view it is an interesting commentary to note that, during the past few years, when abnormal and in fact unexampled prosperity has prevailed throughout the land in all unregulated industries, our transportation corporations—regulated industries—have been starving to death. I therefore maintain it to be an obvious conclusion that while none of us expects the principle of regulating public service corporations to be abandoned, it is cowardly not to face the facts, and it must be admitted that as it has been practiced regulation has failed.

In discussing the possibilities of co-operation by the manufacturers, it is sometimes suggested that one form it might take is a reduction of the prices of their products. Looking at the matter from the standpoint of a street railway operator, it is my judgment that although this is a natural suggestion, it is a mistaken one born of a desire to economize and of the same parents as are the objections offered by municipalities to the payment of an adequate street railway fare. Any one who is familiar with large commercial enterprises and who investigates the matter will have to admit that the profits on electrical products are relatively small as compared with those of a major per cent of other comparable industries. To throttle the electrical manufacturers as the street railways have been throttled, by bringing pressure to bear to reduce their already moderate returns, would be to cramp development and encourage stagnation. If any change at all were to be made I believe it would operate to benefit the street railway companies if manufacturing profits could be increased, although under the prevailing severe competition it is quite unlikely that such an increase will occur—and so far as I know no one seriously expects it.

The writer began his connection with the manufacturing industry more than thirty-two years ago and during the intervening time hardly a year has gone by that it has not been proposed to "standardize" apparatus. Some one has announced that we have now reached a period when little further progress can be expected and therefore standardization is in order. The absurdity of such a policy will become evident to any one who will take the trouble to review the forward steps that have been made from year to year in the production of improved machinery and appliances, without which the street railway industry would today be in a very much worse condition than it is. Of course this does not mean that there should be no standards, but these should be limited to the dimensions of obviously essential parts and also to such electrical characteristics as methods of rating, of testing and other subjects such as are treated in the standards of the American Institute of Electrical Engineers. There should be the utmost freedom allowed in design so that the industry may reap the benefits of all advances in the art.

In general, it is fair to say that the trolley outlook has improved over what it was a year ago and the prospects for still further and greater improvement are encouraging provided that every effort possible be continued and that the closest and most efficient team work between the industry itself and the manufacturers be systematically promoted.

Stores Service Has Unrealized Possibilities

A Vital Element of an Operating Company, Generally Overlooked—Real Organization Allows Department to Function Properly and Be of Great Service

By M. T. MONTGOMERY

General Storekeeper for the Receivers, Pittsburgh Railways, Pittsburgh, Pa.

THE railway systems are up against it in every way and it is time every department and every man in the industry pulled together toward better conditions. Some of the departments have been forced to improve their methods because they were directly concerned with transportation and everybody was watching for a chance to jump on them, while we of the stores department have always been considered incidental.

Now is the time for the stores department to show what it can do—the whole industry is howling for materials, cost reductions and labor saving devices and our department, it seems to me, is the one that affords the transmission to make things go. In past years, with normal markets and easy money, it was not necessary to invest money in large stocks or worry about deliveries or material substitutes, but now—well, you know conditions without any more talk, and since purchases are based on stock on hand in our department we are always mixed up in the troubles.

Let's make up for lost time and show what our department means to the railway industry. The industry supports us, so it's only right for us to be selfish enough to help support it through efficient service.

Headwork and co-operative effort can accomplish a great deal, and in the line of head work we should start with a concise plan for our department by which to give service and regulate materials and supplies in spite of "no stock on hand," which, like the poor, we have always with us. We can measure our progress by the reduced number of refusals from material supply houses.

Locally our "Stores Department Calendar," shown below, is the concise plan by which we work, and with it and a pull together, we hope to accomplish wonders. Without going into detail I will outline a few "high spots" in our plan and its working.

Aim—Service

- Care and delivery of materials when and where required.
- Removal of all surplus materials and scrap
- Keeping tabs on progress through cost of operation.

A—STORING

- Location of stores and yards.
- Physical arrangement of stock. Consider.
    - Bin layout
    - Maximum visibility
    - Packaging
    - Proper piling
    - Cleanliness
- Division of stores into sections in charge of stockmen
- Responsibility concentrated
- Inventories
    - Monthly stock counting
- Short Cuts
- "Labor Savers"
    - Everything potentially on wheels
    - Steubing lifting trucks—Platforms
- Portable elevators
    - Sprague electric hoists on tracks
    - Barrel racks
    - Locomotive crane
    - Street crane
    - Gravity carrier — Roller coaster
    - Ballast ships
    - Cement sack baler
    - Counting scales

B—RECEIVING

- Individual receiving cars
- Description tags
- Testing—Rejections
- Material not O. K., put in "disposition room," pending adjustment
- Freight bills

Short Cuts

"Labor Savers"

- Stenciling machine
- Electric branding iron

C—ISSUING

- Car supply schedule
- Exchange sheets—one old for one new part
- Filling requisitions simultaneously
- Analysis of unfilled requisitions—daily
- Hurrying materials
- Following up hurries
- Manifesting
- Every shipment checked before delivery
- Issuing material over counter for shop use.

Short Cuts

"Labor Savers"

- Fanfold manifesting machine
- Color tabs for follow ups

"Stores"

D—ACCOUNTING

- Stock books — perpetual chart of performances
- Errors localized
- Price record
- Cost accounting
- Shop orders

Short Cut

- Accuracy

E—PICKUP

In conjunction with the operating department conduct semi-annual pickup trips to every point where material is handled and turn back into stock all usable or repairable materials. This activity is in charge of men representing the stores and operating departments. These pickup trips include the collection of scrap as well.

F — OBSOLESCENCE

Go over stock twice a year and dispose of items which became obsolete through change of design or equipment by sale or scrapping.

G—SCRAP

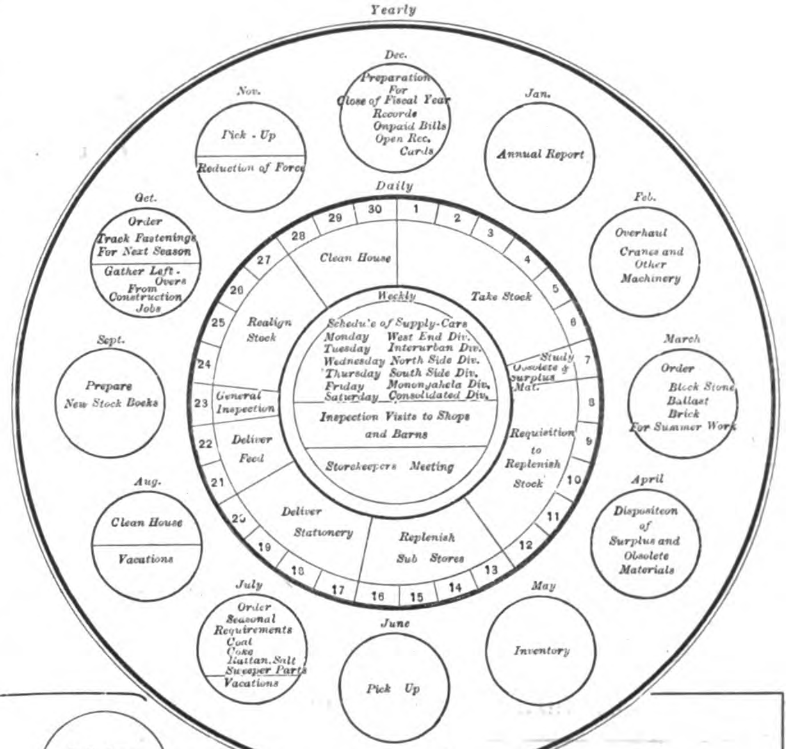
Put non-ferrous scrap in crucible shape. A scrap dock for ferrous scrap is located in our railroad yards.

Short cuts

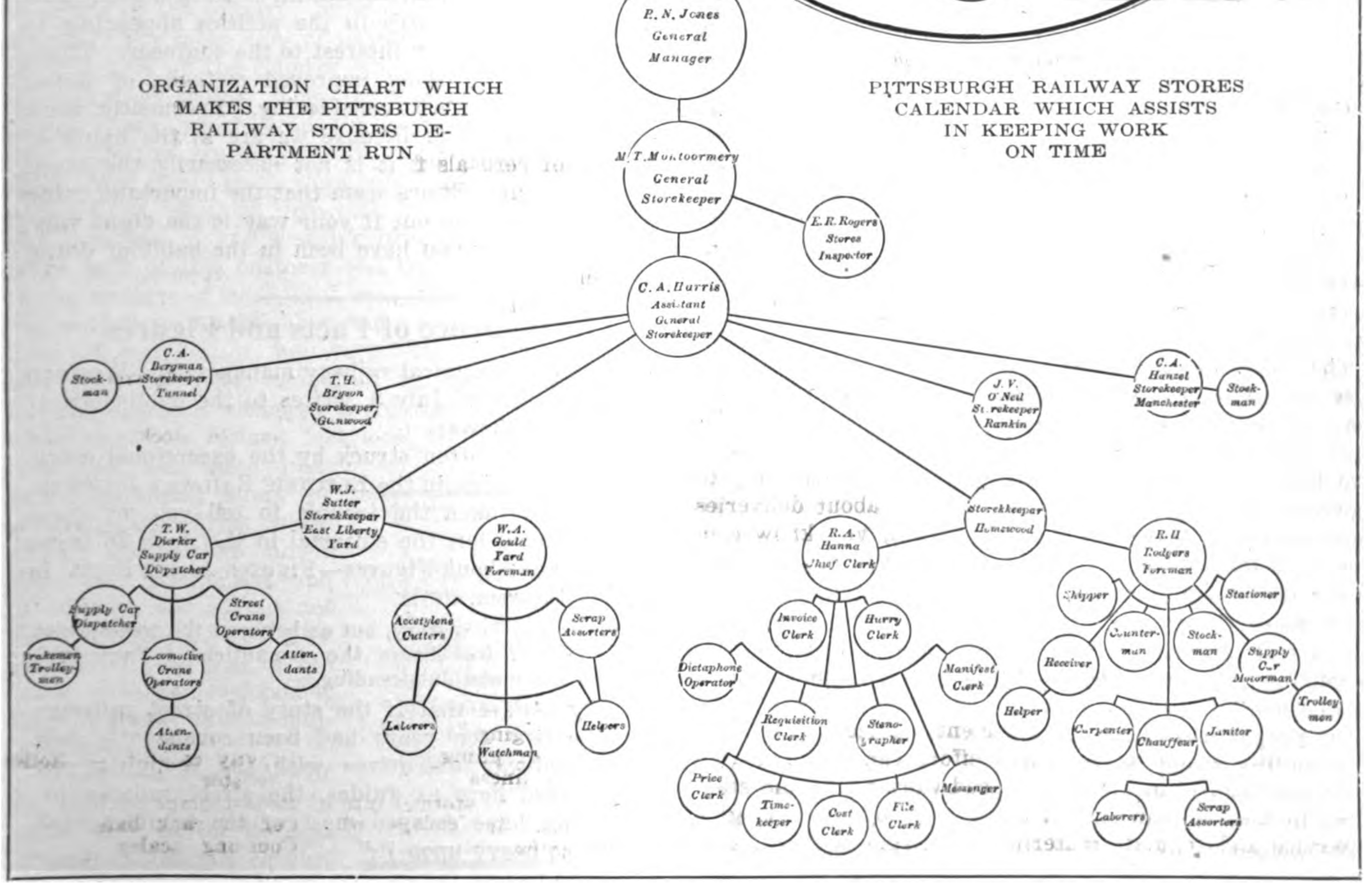
"Labor Savers"

- Scull cracker
- Alligator shears
- Oxyacetylene cutting outfit

While after all the success of any undertaking depends as much on the planning of the work as the headwork of those doing it, without co-operation success will not be achieved. We also groom our boys for bigger jobs, helping them to look ahead. We give them incentive to do just a bit more than they are paid for and we share our responsibilities with them. We look to them for suggestions and these are discussed. If credit belongs to any one of our force he gets it. Our organization—see chart herewith—is flexible. Merit is


Yearly
Dec.
Preparation For Close of Fiscal Year Records Onpaid Bills Open Rec. Cards
Jan.
Annual Report
Feb.
Overhaul Cranes and Other Machinery
March
Order Block Stone Ballast Brick For Summer Work
April
Dispositeon of Surplus and Obsolete Materials
May
Inventory
June
Pick Up
July
Order Seasonal Requirements Coal Coke Rattan. Salt Sweeper Parts
Vacations
Aug.
Clean House
Vacations
Sept.
Prepare New Stock Books
Oct.
Order Track Fastenings For Next Season
Gather Left-Overs From Construction Jobs
Nov.
Pick - Up
Reduction of Force
Daily
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Take Stock
Study Obsolete & Surplus Mat.
Requisition to Replenish Stock
Replenish Sub Stores
Deliver Stationery
Deliver Feed
General Inspection
Realign Stock
Clean House
Weekly
Schedule of Supply-Cars
Monday West End Div.
Tuesday Interurban Div.
Wednesday North Side Div.
Thursday South Side Div.
Friday Monongahela Div.
Saturday Consolidated Div.
Inspection Visits to Shops and Barns
Storekeepers Meeting

PITTSBURGH RAILWAY STORES CALENDAR WHICH ASSISTS IN KEEPING WORK ON TIME


P. N. Jones General Manager
M. T. Montgoomery General Storekeeper
E. R. Rogers Stores Inspector
C. A. Harris Assistant General Storekeeper
C. A. Bergman Storekeeper Tunnel
Stockman
T. H. Bryson Storekeeper Glenwood
W. J. Sutter Storekkeepar East Liberty Yard
T. W. Dierker Supply Car Dispatcher
Supply Car Dispatcher
Brakemen Trolleyman
Locomotive Crane Operators
Attendants
Street Crane Operators
Attendants
W. A. Gould Yard Foreman
Accetylene Cutters
Scrap Assorters
Laborers
Watchman
Helpers
J. V. O'Neil Storekeeper Rankin
C. A. Hanzel Storekeeper Manchester
Stockman
Storekkeepar Homewood
R. A. Hanna Chief Clerk
Invoice Clerk
Hurry Clerk
Dictaphone Operator
Manifest Clerk
Requisition Clerk
Stenographer
Price Clerk
Timekeeper
Cost Clerk
File Clerk
Messenger
R. H. Rodgers Foreman
Shipper
Stationer
Counterman
Stockman
Receiver
Supply Car Motorman
Trolleyman
Helper
Carpenter
Chauffeur
Janitor
Laborers
Scrap Assorters

ORGANIZATION CHART WHICH MAKES THE PITTSBURGH RAILWAY STORES DEPARTMENT RUN always recognized and the ambition of all those of our forces is fostered, helping them to achieve still better results. The stores department, being in close touch with all its brothers, needs co-operation. We found great help in exchange of ideas at storekeepers' meetings and daily shop visits. We aim to see each foreman and listen to his story. Personal touch is just as important in our line of business as in salesmanship. Our craft should get a boost through the proposed section of the A. E. R. A. and by exchanging ideas be mutually benefited.

Each road has its own problems and peculiarities, which are more or less details, but the main issue—the procuring and handling of materials—causes us in our properties perhaps less trouble than in most others, because we work according to a prearranged and concise plan and our stock books.

During these troublesome days, when shipments are overdue and the markets uncertain, it is more than ever necessary to have a record showing actual rather than theoretical conditions, based on ledger or card entries.

We find our stock books and calendar our panacea for all ills which may befall a storekeeper.

Let's Dig Ourselves Out

The Engineer Can Do Much More with His Tools—Engineers Must Also Exchange More Intimate and Detailed Experiences

By R. H. DALGLEISH
Chief Engineer the Capital Traction Company, Washington, D. C.

THE editorial in the June 19 issue of the ELECTRIC RAILWAY JOURNAL "We Are in Our Own Pit; We Must Dig Ourselves Out" expresses the condition confronting every engineer and equipment man in the electric railway field today.

Conditions generally have been bad and hard to master for some time, but now they are getting better and can only improve in proportion to our effort to improve them. There are several ways to improve conditions, but the most important way, in my opinion, is the use of labor-saving tools. A careful study made to determine where labor-saving tools can be used to the best advantage is one of the most important jobs for the engineer today.

The mere installation of labor-saving tools, however, does not complete the work of the engineer, but he must see that they are operated in such a way as to get the most out of them. I know of a few cases where expensive labor-saving tools have been installed and then so poorly handled that less than 50 per cent of what they were capable of doing was got out of them. It was quite true that this 50 per cent was better than had been done without labor-saving tools and seemed to satisfy the engineer in charge. Most of us have a few labor-saving tools and some of us are well equipped, but are we getting out of these tools all that it is possible to get out of them?

The proper use of labor-saving tools is as important as installing them, for there are few cases where a study has been made of these tools that it has not resulted in increased production.

The welded rail joint is another item that should not be overlooked by the maintenance man today. We all know the life of the track depends on the joints and with welded joints this life can be greatly increased. Loose joints are also eliminated, as is also the expense of continually tightening them. So much joint welding has been done in the past few years that there is considerable information available on this subject. I have found that regardless of the type of welded joint used the success of the joint depends almost entirely on the workmanship. It is therefore important that this work be carefully inspected before the paving is laid in order that the workmanship may be kept up to the high standard required for this class of work.

We do not find many engineers today who are reluctant to give information about the results obtained in their work, but sometimes they do not take the time to go into detail enough to make the information of the most value. Now is the time for the engineers to get together and find out what the other fellow is doing and tell him what you are doing.

There is an opportunity for the manufacturer, also, to help the equipment men by the standardization of the wearing parts of equipment. I fail to see the necessity for the absolute lack of interchangeability of the wearing parts of motors produced in the past few years. This one situation necessitates carrying in stock wearing parts for every type of motor used on any property, few of which can be used on any two types of motors even of the same horsepower.

We are told that standardization of motor parts will hinder the development of new motors. I do not agree with that, but feel that if a serious attempt were made to standardize much good would be accomplished. It would of course be necessary for the equipment men to use the standards and not require special apparatus built to meet their particular needs.

The ELECTRIC RAILWAY JOURNAL is doing a great deal of good for the industry in the articles appearing in each issue of particular interest to the engineer. These articles frequently show improved methods of doing work that is well worth considering. Frequently work is done a certain way because we are in the habit of doing it that way, but it is not necessarily the right way. It would therefore seem that the important thing to do today is to find out if your way is the right way, or merely the way you have been in the habit of doing things.

The Influence of Facts and Figures

A prominent electrical railway manager in a Western state, under date of July 3, writes to the publishers of this paper as follows:

"Though I am often struck by the exceptional merit of articles appearing in the ELECTRIC RAILWAY JOURNAL, I have seldom taken the trouble to tell you my good opinion of them, but the editorial in the June 26 issue entitled 'Facts About Figures—Figures About Facts' is really a little gem.

"'History may be history, but as between the romanticist and the realist, we choose the romanticist. Facts untouched by art make dull reading.'

"I really believe that if the story of street railways during the past ten years had been consistently told by street railway executives with the thoughts you have expressed here as guides, the street railway industry would have escaped most of the troubles that have been so heavy upon it."

The Future of the Electric Railway

Interurban Roads Must Develop the Maximum Freight Business—The City Public Must Determine for Itself If It Wants Low Fares or If It Will Continue to Pay Some of Its Taxes Through Railway Fares

By E. G. LEWIS
Chairman Indiana Public Service Commission

THE war and the disturbed financial and economic conditions which have followed in its wake have created a most trying condition for the public utilities. This is particularly true for (1) central-station heating plants, (2) interurban and street railways, and (3) gas utilities, in the order stated. The increased costs of coal and labor, if the upward trend continues, must result in a great number of central-station heating plants being abandoned. Three such in a total of seventeen have been abandoned in the State of Indiana during the last year and two more petitions for abandonment are now pending.

The gas situation has been made especially acute by the extension of the automotive industry, with the result that the owners and operators of 8,000,000 motor-driven vehicles, to say nothing of other gasoline and oil-driven engines, are bidding high prices for oils which are essential to the production of gas. This situation may be met without serious difficulty, although it calls for radical readjustments of rates for gas which even a year ago could not have been predicted.

It has been prophesied that similar readjustments will have to be made in water, electric and other utilities. This brings the consideration of serious conditions to the street and interurban railways.

Taking the interurban railways first, Indiana has been conspicuous as one of the important interurban railway districts of the country. It is difficult to forecast their future. The main lines of passenger and freight traffic in this part of the country were originally marked by the old stage routes. These were later paralleled by the steam roads, which gradually replaced the stage lines and primitive trucking facilities. In the period 1890-1905 these steam roads were paralleled by electric interurban lines, which in turn took the purely local passenger business of the steam railroads. Because of the large bulk of this business and the low operating costs in the matters of labor, coal, etc., the passenger business was sufficient to meet the revenue requirements on these lines of distribution, and very little, if any, attention was paid by these companies to the possibilities of freight business, although there was a development of what might be termed fast local freight and express. Now we see these lines being paralleled again by concrete and brick highways, constructed under state and federal aid, and in addition the advent not only of the passenger vehicle but also that of the truck, with its development from a single unit to multiple units.

It has been the theory of the Indiana commission, in which most of the Indiana interurban officials concur, that probably the greatest amount of revenue was to be obtained by keeping interurban passenger fares a fraction below the fares of the competing steam railroads; that is to say, while the steam roads have been operating on a 3-cent fare, the Indiana interurban roads have been content until very recently with the 2¾-cent fare. The coal shortage, which began with the miners' strike in November, 1919, and which was brought to a most acute stage in the spring of 1920 by the unauthorized but nevertheless far-reaching strike of the trainmen, forced the price of coal to unprecedented heights. This fact, together with the continued upward trend of wages, placed the Indiana interurban roads under the necessity of abandoning all ideas of continuing the original ratio of passenger fares. The result is that within the last two months a number of them have knocked at the door of the commission with a request to have fares placed on an equality with the competing steam railroads. Showings are such that the 3-cent fare will undoubtedly prevail generally. It is the opinion of interurban men and commissioners who have studied the interurban problem that such lines may not profitably exceed the competing steam railroad fare. If the latter remains at 3 cents and costs of coal and labor continue to mount, and at the same time local traffic, both passenger and freight, turns away from the interurbans to the new state and federal highways, certainly the future of the interurban railroads does not look promising.

There seems to be but one avenue open for development, that is increased freight business. This calls not only for aggressive policies on the part of interurban railroads, but in such large cities as Indianapolis, Evansville, Fort Wayne, etc., it calls also for certain reconstructions which will permit the hauling of longer and heavier freight trains into and out of cities. It remains to be seen whether the large terminal cities and the smaller ones through which interurbans pass will permit the development of such interurban traffic along freight lines as might be successfully carried out over a period of years. For example, there is before this commission the insistent demand on the part of buyers of live stock that the interurbans transport their hogs and cattle to stock yards. This, however, would necessitate the operation of live stock cars through some of the best residential districts of the terminal city and also through the residential and business streets of numerous towns and cities lying between the point of shipment and the stock yards. The same problem attaches itself, in lesser degree perhaps, to the operation of trains made up of box cars.

"The problem in this State is whether the time has not been reached when cities must decide, largely for themselves, whether they want low fares or not. The question is to be answered finally by the determination whether the street railway shall be subjected to the heavy costs of maintaining paved ~~streets or~~ whether this ~~burden shall be placed~~ on the taxpayers as a whole."

The unfavorable financial condition that confronts the whole electric railway industry is such that the companies themselves have not been able to feel certain of competent expenditures to meet the conditions herein set forth. If the interurban railroads are to engage also in extensive freight business there must be constructed enlarged terminal freight houses, a situation that is most acute in the city of Indianapolis, where the development of interurban freight business is now being hindered by the inadequacy of the loading and unloading facilities of the freight houses.

In dealing with the interurban problem local conditions have in general been discussed. However, Indiana problems must be typical of those in most interurban railway systems throughout the country.

The street railway situation, of course, presents one of the most critical utility problems that the country faces today. It is critical not merely from the single viewpoint of revenues but also because of the absolute necessity of cities having transportation facilities that are adequate to handle the masses of people. From coast to coast, speaking generally—though there are exceptions to the rule—the street railway industry is in the hands of a receiver or immediately at the door of receivership. Still the street railway must go on; it has to operate or cities die. It comes next to the water supply in the ranks of those utilities most vital to the public, with the possible exception of the central-station electric power plants which drive the wheels of industry.

It is possible that the last two or three years have seen the breaking down of the psychological opposition to a fare higher than 5 cents. There is, nevertheless, to be considered the economic condition that prevails in the matter of higher fares. The higher the fare the more certain will larger numbers of people, whose pocketbooks are cramped by increased cost of living, deprive the street railway of its most profitable business by walking short distances.

For several good reasons we have not been as close students of local street railway problems as some other commissions have been. Supplies of steam coal have been near at hand and other conditions have been very much in our favor. The result has been that the street railway problem in Indiana has not become so critical as in some other sections. The commission and the utilities have been able, therefore, to maintain the 5-cent fare pretty generally. In districts such as those bordering on Chicago and including the city of Gary it has been necessary to go to the 6-cent fare and to adopt certain zone systems. A 6-cent fare with a 5-cent ticket has been put into effect at Evansville. Otherwise the 5-cent fare prevails. The commission and the traction officials themselves have accomplished much in the way of financial rearrangements. This has been notably the case at Fort Wayne, Indianapolis and Evansville, where considerable amounts of securities which did not represent property investment were eliminated. In addition there have been set aside for temporary purposes certain sinking funds. This, however, has not been accomplished without providing that the money which was apportioned to sinking fund reserves represented expenditures for plant improvements, with the result that security holders have not been placed at a disadvantage.

The problem in this State is whether the time has not been reached when cities must decide, largely for themselves, whether they want low fares or not. The question is to be answered finally by the determination of whether the street railways shall be subjected to the heavy costs of maintaining paved streets or whether this burden shall be placed on the taxpayers as a whole. In some localities the vital question is that of gross income and the determination of what taxes, if any, shall be paid out of the earnings of the company to the city treasurer to relieve the general tax burden. It is probable that these matters may have to be brought to the attention of the Legislature before cities can assume such obligations, which, in the past era of street railway transportation, have been thought to be properly assessed against the street railway. The proposal has been made that the commission might continue the straight 5-cent fare under an agreement that the city pay out of its general fund ½ cent for each passenger carried, making the gross realization of the utility 5½ cents. It was thought that inasmuch as the patrons would pay only 5 cents it might result in as much increased revenue as a 6-cent fare would produce. This proposal was, however, found to be not in compliance with the state law.

"As for the future of the street railway, it is bound to go on. No matter what the fare may be, it must operate."

We have been especially fortunate, speaking in general terms, in improving the street railway conditions, particularly in Indianapolis, during the war and postwar periods; that is to say, the service in most cities is at least as good as it was before the war, and in some cities it has been improved and in a measure has kept up with the tremendous advance and growth in population.

The war has had one very beneficial effect that may have lasting financial results. The street railway companies have been liberalized to a very considerable degree in the matter of their attitude toward the public. With the changed attitude on the part of these public servants it is very probable that the general conditions, at least in this city, will materially improve and that the street railway managers as well as the public will have learned a great deal with regard to each other that they would not have appreciated had it not been for the ordeal of war.

As for the future of the street railway, it is bound to go on. No matter what the fare may be it must operate. It remains to be seen whether increased fares will result in municipal ownership of these street railways. The results in Seattle and other cities which have municipal street railways may be seized upon by both sides—those in favor of and those opposed to municipal ownership.

For the former there is the argument that the fare until recently was 5 cents. For the latter there is the argument that with a 5-cent fare the taxpayers of the city of Seattle last year paid approximately $500,000 for expenses that under private ownership and operation would fall to a much lower level.

The public has the choice of paying a higher fare directly or indirectly through increased taxes, but the economic condition is a fact and must be faced frankly if transportation is to be maintained.

Waiting for a Miracle to Happen?

The Problems of the Electric Railway Engineers—Need to Get Out of the Rut Well Pictured—Their Proper Attitude Toward the Industry, and Twelve Salient Suggestions for Constructive Action Set Forth

By EDWARD A. WEST
General Superintendent the Denver Tramway Company

TO THE man trained to build, improve and better things the present condition of the street railway apparently is a hopeless situation, a veritable "slough of despond."

In general, what the street railway engineer is confronted with is:

1. Inability to make necessary renewals.
2. Materials away out of sight; deliveries the same.
3. Labor high, dissatisfied, scarce, inefficient.
4. High cost of capital, and not available for additions or betterments.
5. Attacks on the ability of the profession by uninformed individuals.
6. Throttling of the industry by rigid rate structures.

That the physical condition of most street railway properties is gradually being lowered cannot be denied. Replacements, renewals and even certain items of ordinary maintenance have been deferred. Sensing this condition has had a bad psychological effect on the trained engineer.

Watching material costs soar and listening to excuses from manufacturers regarding failure to deliver demoralize work schedules and tax experience and judgment to the limit. When to buy and how much is a problem. Are costs going higher or coming down?

It has been stated that labor under normal conditions is only 66⅔ per cent efficient and that now its usefulness is only 50 per cent of normal, which means 33⅓ per cent with a cost of 100 per cent greater than normal. Add to this condition a defiant attitude, a deliberate and studied "don't care" position, continual presentation of grievances, real or imaginary, with a constant threat of a cessation of work, and you may know that the man trying to get things done is certainly handicapped.

The watchdog of the treasury trims every estimate, forces the adoption of substitutes and alternatives. Betterments a few years ago were approved upon a showing of 10 per cent saving. Today the engineer must show 25 per cent or better in order to get the wherewithal to do a job. "Build for permanency" has become a dead language and lies on the shelf with "What'll you have, gents?"

The foregoing troubles not being enough, the engineer has had to answer charges of "overvaluation," "excessive costs" and "past extravagances" brought by people trying to keep fares down to pre-war standards.

The engineer is requqired to explain to lawyers and investigating bodies, over and over again, the reasons certain things were done. He has to listen to hindsight critics tell how it could have been done differently, and on the witness stand is made to admit that certain things could have been done differently and at less cost. Before he can explain the reason for the thing as it is he is choked off by a smart-aleck lawyer.

The effect of a rigid rate-structure permeates the entire organization, but in the engineering department it probably finds greatest expression, for when the economy tension spring is tightened maintenance is the first to be squeezed.

In view of the above, and the many other unsatisfactory things daily confronting him, is it any wonder that the engineer looks upon the street railway situation as utterly hopeless?

Could a general in command of an army on a battle field do a good job of commanding if he was back of a rifle down in the trenches?

Can we help the general situation any by grumbling, grunting and gaffing?

That much-advertised and well-known law "supply and demand" has taken labor and material matters into secret session to which we are not admitted. We can guess what is going to happen and find little solace in such reflection.

We can sit around and condemn rate regulating authorities to the everlasting bow-wows; we can attend nice, orderly technical engineering meetings and resolute ourselves pink-eyed; we can explain away everything that happens. But does all this avail us anything, do we feel any happier with our lot, do we like our job any better?

Men, we will have to get out of the rut. Engineers are continually faced with impossibilities, failure was left out of the engineer's handbook. *It can be done.*

GENERAL ATTITUDE TOWARD ALL INDUSTRY

Complacent acquiescence with things as they are is much better than getting your mouth sore champing at the bit. We may be having our troubles these times, but there are mighty few industries of any kind that aren't. We see our trials and tribulations on the front page of our morning newspaper and go around the rest of the day believing every one down on us. We meet an acquaintance and he hands us a bunch about watered stock and overvaluation.

A short time ago a group of men were seated around a table discussing general subjects. There were present a retail florist, a manufacturer of white goods, a public official, a boiler works sales engineer, a realty agent and a public utility engineer. As usual the conversation covering general topics became a lively experience meeting. The whole gamut from the A. F. of L. to official Washington was disposed of. Then present day costs occupied the floor. The real estate man, a gay bachelor, started things by jumping on the florist for having increased the price of cut flowers, the florist jumped back with interest because the rent of the apartment he occupied had been raised more than 80 per cent. After much heated discussion the realtor and the florist buried the hatchet. Then the public official present said the real profiteers were the department store owners. The armistice was declared off, the hatchet exhumed. The manufacturer of white goods took the occasion to answer Mr. Public Official's charges. With the aid of a notebook full of statistics the manufacturer proved that dry goods merchants were the most philanthropic business men extant; that the net of department stores was only one-half what it was before the war. (He was talking percentages and not dollars and cents.) Each and every man present up to this time in the controversy proved conclusively, to his own satisfaction at least, that his skirts were clear and that his kind were a much-maligned lot. The discussion in all its details was of more than passing interest to the public utility engineer, and when the opportunity presented itself he ventured the remark "that his business was affected by the same economic questions as the business discussed."

Did he get a respectful and attentive audience? He did not. The florist, real estate man, manufacturer, public official, all except the boiler man, jumped on Mr. Engineer with gusto and éclat. "The utility business was different;" "it was a public service industry;" it operated under a franchise which fixed the rates to be charged." Vainly did the engineer try to reason; his arguments were overruled; the history of his company was common knowledge to all present (they admitted it). Hadn't the utility company some twenty years back advertised its tremendous profits in order to sell bonds? Hadn't it bought its own franchise (and incidentally the City Council)? Finally, after several attempts, the engineer got his story across and had the satisfaction of hearing one after another express their ignorance of the real facts. Each man present finally agreed that the same kind of disease was attacking all business and that knocking each other would not help matters any. The boiler man, who had listened attentively to the entire discussions, got up from his chair and said he was about to retire; before actually doing so he expressed himself as having been greatly interested in the evening's discussion, and added that it had been extremely instructive. As the boiler man said "Good night" he remarked that the entire discussion brought back to him the force of the old saying, "There is so much bad in the best," etc.

The boiler man is right. What's the use whining? The other fellow is having his troubles, only we don't know so much about the details of it as he thinks he does about ours.

WAITING FOR THE MIRACLE TO HAPPEN

Some of us lean back and sigh, then utter such startling and extraordinarily original statements as:

"The present conditions can't last, they've got to change."

"A panic would do the country good and it's bound to happen before long."

"Let's be patient until things return to normal."

"What's the use trying to do anything these days, with labor and material out of sight."

Etc., etc., *ad infinitum* and ditto, ditto.

Evidently we are waiting for an earthquake, thunderbolt or the bottom to suddenly drop out. Will it?

If there is one thing an engineer should know it is everything that the old saying "Rome was not built in a day" means. While our administrative officials are struggling with financial problems and our operating officials with labor troubles the engineers resignedly wait. Wait for what?

If we are waiting for a day to dawn with the tension absolutely removed we are doomed to a long, slow wait. Think it over. We can't build a bridge of any magnitude overnight; even the least experienced realize this. What will happen will occur so gradually that its start and finish will be as indistinguishable as the beginning and ending of $y = a_1 \sin x + a_2 \sin 2x + a_3 \sin 3x + \ldots\ldots\ldots$ to n terms.

The day will arrive when we will sense relief, construction and rehabilitation will be under way, long-deferred maintenance jobs will be behind us. Our operating brothers will again find fault with the snail's pace we pursue, and the administrating end will complain because work authorized tomorrow was not done yesterday, and we'll be back at the old problem of trying to determine the proper time for a renewal with at least two variables given, the investment needed and the expense of maintaining the old.

It will all transpire in so ordinary a manner and at such a uniform rate that before we are aware of it the miracle will have happened.

WHAT ATTITUDE SHOULD THE STREET RAILWAY ENGINEER TAKE?

It's simply out of the question to be indifferent, but why let our troubles worry us to the point of lessening our efficiency. The old pendulum must come back, and while it's playing around the end of its swing let's look around for something to do. We can't afford to lose our "pep." If we do the time is not far off when some fellow fed up on trouble will take our place. Let's change our attitude toward our troubles and call them problems. Then let's take our coats off and solve them. Let's include industrial difficulties among our engineering research work and systematically clean them up.

What do I suggest? Bless you, it's not subject to mathematical formulæ. Newton's law of action and reaction applies, but even this varies with the locality and size of company. I am later on going to cover a few suggestions, but here all I am attempting is to show the utter foolishness of a negative attitude, because such only aggravates the sore. Reach out and shake hands with what's before you and advise ways and means to make it serve a useful purpose.

We might view this situation from a self-preservation standpoint. The street railway can't be put out of business overnight, either through the process of deterioration or competition by some other method of transportation. It is here for some considerable time to come, it will have to be maintained, considerably reconstructed and renewed before it finally sees its Nemesis. This means much work ahead for the engineer. Work that will tax his capacity as much as original construction. With the foregoing in mind we are involved in this matter through strictly selfish motives and we must not let anything psychological jar our perspective.

This matter of self-interest can be spread. We can show how adequate street car transportation means business for local manufacturers, the butcher, baker and candlestick maker. We can appeal to all those with whom we come in business contact, requesting their support, not from altruistic reasons or as charity, but from the standpoint of benefit to themselves.

I find that few insurance men know that their companies hold street car securities of great magnitude, and when this fact is explained to them it becomes a matter of extreme self-interest. Of course many people not acquainted with national conditions believe the street railway trouble purely local. This class is greatly surprised when told differently, their viewpoint becomes broader and their attitude more tolerant, if not friendly.

Real estate men as a rule fight an increase in fares. Self-interest can be aroused if the menace of inadequate service is brought home to them.

I mention these matters not from an engineering standpoint, but as contact points wherein we can all aid in molding public opinion along right lines. Propaganda work falls in the province of the publicity agent. It's hard to hammer the self-interest nail into place through publicity. Our work brings us into daily contact with manufacturers, agents, contractors, real estate people, and we can talk cold facts in an unofficial way and leave impressions that will arouse self-interest.

Primarily our own individual success depends upon the success of the industry; this fact is paramount. We must strive for improved conditions generally and work industriously on the specific problems coming before us.

"UNDER NEW MANAGEMENT"

We have often seen this sign over the entrance of a restaurant that had once upon a time been popular but had for some reason or other lost favor with the eating public. In other words, it had got into a rut and new management was considered necessary to restore its lost prestige.

Let us put ourselves under new management. Somebody once said, "Do something different every day." When you go down to the office tomorrow morning look it over carefully, move the desk around, change the position of your chair; in other words, get a new slant on the old institution. If you can't do anything else, kick over the wastepaper basket, only do something that differentiates today from yesterday. Look over your own past. What was it that made for your advancement? It certainly was not letting a few obstacles bury you deep in a rut.

A short space back I mentioned the fact that there were certain specific problems confronting the street railway engineer which he could well be working on at this time. Before I list these I want you to ask yourselves whether you have experienced situations somewhat as follows:

A great mass of work is thrown on your shoulders suddenly and you have to devise ways and means to clear it up. An organization has to be recruited without having time carefully to select its members. Plans are approved for work that we have a sneaking feeling have not been given as much thought as needed and we wish we had time to study in detail. We know down deep if we had the time we could make changes that would result in better efficiency and greater economy. When such a rush period comes we always bemoan the fact that we are unable to give these matters the study we would like to.

With this example in mind, herewith are a few suggestions. If you run down the list some, hardly all, of the items will recall to your mind papers lying in the deep drawer of your desk waiting for the time when you would have an opportunity to put some thought on them.

1. Increasing the labor-hour output without increasing the payroll.
2. Bettering existing methods of estimating.
3. Improving design of tools and construction equipment.
4. Increasing foremanizing efficiency.
5. Enlarging the field of autogenous welding.
6. Salvaging recoverable scrap.
7. Working up with the auditor improved cost accounting methods.
8. Revising depreciation and renewal tables.
9. Working up valuation schedules and eliminating inherent defects in present valuation methods.
10. Revise drafting room standards.
11. Work up a maintenance program, taking into consideration the relative importance of the jobs to be done, and carefully detailing the methods to be followed in each case.
12. Study the other fellow's methods, with the idea of remedying certain defects in existing methods.

EACH SUGGESTION IS ANALYZED

1. *Increasing the labor-hour output without increasing the payroll.*—Science in management has much to offer in the way of scheduling and planning work. Insurance against idle labor can be had through a properly organized stores system. We have long waited the time when we could make a study of the supplies carried with the idea of reducing them to a minimum, taking into consideration the delivery situation. Such a study has paid for itself many times over through increased production and reduction in interest on the stock values. The manufacture of urban and interurban transportation is not much different than any manufacturing business if looked at in the right light. Certain shop efficiency methods can be applied to any industry.

2. *Better existing methods of estimating.*—Proper estimating is a gift that is fundamentally part of an engineer's mental equipment, and yet shunned by many. If we are agreed that before any job should be started somebody, at some time, must state what is to be used, where it is to be used, how it is to be used and when, we immediately appreciate the benefits that will be derived through a proper inclusion in every estimate of all detail possible. A consideration of these matters before a job is started, in conjunction with the engineering design, cannot help but make the work run smoother and relieve the engineer of considerable detail during the job's progress. It is impossible to make an estimate 100 per cent correct, but if we can increase the correctness of our present estimating 10, 15 or 20 per cent we will have put just that much grief behind us. It is a matter worth study and development. Anything gained therewith will increase the engineer's capacity.

3. *Improved Tools and Construction Equipment.*—Most construction equipment will stand a careful study. Do you remember the last job on which certain equipment was used, as you watched it working, you resolved that when the opportunity presented itself you were going to make changes that would reduce the labor required to operate it? You also planned on equipment improvements which would necessitate a certain rearrangement of work schedules, all to the end of reducing the amount of labor required. Is this not the time to study these things and get them finally behind us?

4. *Increasing Foremanizing Efficiency.*—We have all lost good foreman material the last few years and we sometimes feel that if it were not for a few old standbys we would be strictly up against it. There is good foreman material in your present working forces. A study of the personnel at this time and the introduction of schooling methods will dispense with much confusion and misunderstanding when your work program is in full swing. Now is the time to work up qualification

standards and standing orders covering the duties, responsibilities and order of work for foremen.

5. *Enlarging the Field of Autogenous Welding.*—We know that most of us have only hit the high spots in our welding practice. Every once in a while something happens that stirs up an idea wherein the welding field could be amplified and time and money savings result. On one property two men, with a Ford truck and a combined gas and electric welding outfit, are enabled to make a great variety of satisfactory repairs rapidly, economically and permanently. These men are experienced welders and receive a rate commensurate with that paid the most skilled mechanics. They are detailed to repair jobs on track, buildings or the power house. The need of a saw for cutting metals and a drill for boring has almost been eliminated. Welding men have become so expert in cutting metal that a saw is almost unnecessary, and the amount, kind and character of work that can be done is startling.

6. *Salvaging Recoverable Scrap.*—Materials are so costly today and deliveries so uncertain that we are forced to use material which a few years ago we discarded as scrap. How far we should go in the matter of recovering scrap must be left to the judgment of the individual concerned, yet it is remarkable how much old material can be reclaimed by welding. Worn-out assembled equipment and materials that are difficult to get from the manufacturer may be unscrambled and reassembled as good as new. Some companies have established, in conjunction with the stores department, a division that rejuvenates worn-out materials, turning these back to stores. The savings that can be made through reclaiming the waste products of the field and shop are worth looking into.

7. *Working Up with the Auditor Improved Cost Accounting Methods.*—The philosophy of costs has been hammered into us for many years, still there seems to be a great lack of uniformity and understanding among engineers and accountants concerning methods best suited to the conditions encountered in the various phases of our engineering activities. On some properties the engineering department handles all costs by its own organization. In others this function is carried out by the auditing department. It is often found that where conditions as cited above prevail there occurs a considerable amount of controversy and misunderstanding between auditor and the engineer. The best system of cost keeping is one where the cost records are part and parcel of the general books of the company, but detailed, arranged and kept so available that they serve all the purposes of the engineer. Mr. Engineer, take Mr. Auditor out to lunch some day and cultivate his acquaintance; tell him what you want; he has a lot of good ideas and 10 to 1 he will offer to help. We may consider him a lower form of animal life when it comes to engineering costs than ourselves, but if we can show him that bookkeeping and cost keeping are separate and distinct he is certainly in a better position than we are to maintain adequate, complete and comprehensive cost records. In passing, you are cautioned to be patient with the auditor. He is human; even though at first blush appearances do not bear this out. He can't fulfill your every wish in a day or a week; it will take months before the cost records as kept by him begin to suit you. They will come in time and you will have made a friend. Some engineers are prone to consider costs out of their bailiwick and pass the buck to the auditor or accountant, then raise h—— when cost reports don't tell the story. To such men the advice is given, go fifty-fifty on responsibility for costs, the results will tell their own story.

8. *Revising Depreciation and Renewal Tables.*—There are as many different ideas regarding depreciation rates as there are items to be depreciated. If we show depreciation on our books for renewal purposes, then who is better qualified to tabulate depreciation allowances than the engineer? Who knows better the lives of equipment and materials? We have all considered this matter and hoped for a time when we could sit down and give it some real thought. Let's try to work it out now.

9. *Working Up Valuation Schedules and Eliminating Inherent Defects in Present Valuation Methods.*—A great many properties today are being appraised. Some have engaged the services of outside engineers and others are doing the work with their own organization. Many companies intend to substitute "valuation records" for their present "property accounts." This means that valuation records will have to be perpetuated. There is a great deal to do in working up arrangements to cover the retirement and abandonment of property in order that the valuation records may at all times be correct. Several of the larger properties have gone into this matter with a great deal of pains and carefully removed from the property records each item retired. This matter is not strictly a dollars and cents proposition, but involves a complete descriptive record of the property retired in order that the inventory records will always be up to date and subject to the inspection of any rate-regulating authority. These records are of great value to an engineer, inasmuch as they will give him the life of any piece of property and he can therefore determine its economic value.

10. *Revise Drafting Room Standards.*—Drafting room standards can be revised and probably greatly reduced in number. The head draftsman has a number of ideas up his sleeve which he has been waiting for a long time to talk over with the chief. Call him into the office. The results of such a conference will be of great value for the future.

11. *Work Up a Maintenance Program, Taking Into Consideration the Relative Importance of the Jobs to Be Done and Carefully Detailing the Methods to Be Followed in Each Case.*—We all have lists of work necessary, but have we given these lists a careful consideration from the standpoint of the relative importance of the work and the kind of a job necessary? It goes without saying that a line with earnings of $6 per car-hour as compared with a line with car-hour earnings of only $2 should have first consideration on maintenance jobs, all things being equal. Have we placed a time limit on each job beyond which it will be unsafe to operate, and then taking into consideration all the jobs to be done, do we know how large a force we will have to have to complete them within the time limit set? Now is the time that we should be looking to the future and a review of each job scheduled will probably disclose good reasons for changes which will result in economy through a better assignment of foremen and gangs.

12. *Study the Other Fellow's Methods, with the Idea of Remedying Certain Defects in Existing Methods.*—In general we know that certain of our long-cherished methods could be revised in certain respects. The details of the revisions have been jotted down in our notebooks as a result of visits we made to the other fellow's property. We know of places where some of the

other fellow's ideas can be used and we have long waited for an opportunity to put some of them into effect. While things are returning to normal a golden opportunity to institute these changes presents itself.

CONCLUSION

"It is much easier to find fault and grumble than it is to do constructive work or help the other fellow who is trying with all the power within him to do such work." I don't know who wrote this, but it's worth framing.

Let's keep to fundamentals and not confuse them with unusual happenings of the long ago. Just as sure as tomorrow, will come a return to normal. In the meantime let's co-operate with the management and operating officials for an understanding that will make our work better and the outlook pleasanter. Let's co-operate with each other so that our working and playing time will be happier and filled with confidence. Criticise only when both sides of a question are thoroughly understood and we have made deductions therefrom which can be molded into constructive shape and disseminated.

Above all, let's stop waiting for a miracle to change today back to yesterday.

Get the Power Plant Into Line

A Specific Example Shows One Instance of Useful Engineering Activity

By E. H. SCOFIELD
Twin City Rapid Transit Company, Minneapolis, Minn.

WITH the demand for increased economy in the electric railway industry it is well for the one responsible for the operation of the power equipment to look to this job and to see that it can stand on its merits.

There is not a steam power plant in operation where practicable improvements in equipment and performance could not be introduced. One of the most vital features in such a plant, and the one most generally considered not easily improved because of limitations imposed by the original installation, is the boiler and furnace equipment.

As illustrating what may be done to overcome such limitations, the experience of a certain plant will be of interest.

A plant of twenty-four boilers, Babcock and Wilcox 556 hp. parallel drum, incline header, thirteen tube high, 540 sq.ft. of superheater was installed with header eight feet above floor line; a 14-ft. basement; two masonry stacks, 16-ft. x 225-ft. and to be served by an old type of underfeed stoker designed to operate the boiler, under test conditions with good fuel, at a maximum of 150 per cent of rating.

It was found necessary, however, to provide for burning any low-grade coal and inclined rocking grates were substituted. These proved inadequate for capacity and efficiency and objectionable on account of excessive smoke.

Chain grates were then installed, masonry stacks replaced by four steel stacks, 14 ft. x 265 ft., special provision made for supplying air to the furnace, four boilers added in the space formerly occupied by stack foundations; resulting in marked improvement. Various improvements were introduced, in arch construction, suspended arches, inclined arches, inclined grate with rear end dropped below floor line, receding bridge wall for increasing combustion chamber and increasing exposed tube surface, boiler raised 2 ft. in its setting, air jets and steam jets introduced to improve mixture of gases and complete combustion before entering tubes.

All these changes in turn resulted in improvement. However, with increased demand for steaming capacity it was found that the limits in capacity and efficiency were reached in this equipment at about 200 per cent rating.

Attention was then directed to the modern underfeed stoker and an equipment installed. The stoker floor line was lowered 2 ft. below the boiler room floor, the face of the stoker projected 4 ft. in front of the boiler face, a 4 ft. low arch filled this space, a vertical bridge wall in combination with the above left a comparatively small combustion chamber and a short exposure of tubes. The ashpit capacity was greatly reduced by the low stoker setting. It was found that this equipment when supplied with high grade, low ash coal would develop 300 per cent rating of the boiler, but the efficiency was low. However, when trying to burn coal with high ash and sulphur it was found impossible. Clinkers formed over the fire surface, anchoring to front, side and bridge walls and to the tuyeres and dump grates.

BURNING LOW-GRADE FUEL

To overcome these difficulties radical changes .were required. The stoker mechanism was modified to provide distribution of fuel in a bed of uniform thickness. Tuyeres and air control were changed to give more uniform air distribution, boiler was raised 2 ft. in its setting and the overhanging arch eliminated, water boxes installed, lining all sides of the furnace at fuel bed line. These afterward were replaced by inclined tuyere air boxes at side walls and at front wall displaced by the use of steam jets, installed for the purpose of mixing the gases. The bridge wall was moved 7 ft. back from the dump grate, eliminating the necessity for a water box and allowing a baffle plan which exposed the lower boiler tubes to the furnace heat for 85 per cent of their length. These changes eliminated as far as possible direct reflection of heat on the fuel bed and gave a combustion chamber of 1,400 cu.ft. for 110 sq.ft. of grate surface. Power operating mechanism for dump grates made possible frequent dumping.

Following these improvements it was found possible to operate successfully on any grade of fuel, including damaged coal heated in storage of less than 9,000 B.t.u. heat value, at 300 per cent boiler rating for hours. It was possible to bring the boilers from banked fires to this capacity inside of thirty minutes and to obtain high efficiency throughout a wide range of load with carbon losses under 12 per cent and CO_2 14 per cent to 15 per cent, complete combustion of gases before entering tubes, normal stack temperatures, comparatively low temperatures at surface of fuel bed with slight forming of clinkers and no trouble from clinkers anchoring to furnace walls or stoker or in dumping to ashpit.

As a result of the experience gained with this installation a complete new plan was developed, including a redesign of the mechanical features of the stoker. In this plan the stoker floor line is lowered 3 ft. below the boiler room floor, giving the effect of an 11 ft. setting without raising the boilers, the stoker face set flush with the boiler face, a combustion chamber of

1,300 cu.ft. obtained and a tube exposure of 85 per cent. New ashpits have a capacity of 600 cu.ft. each, without requiring change in the ash conveyor. Superheater surface is increased 50 per cent by replacing with longer tubes in the same headers.

The above is given as an illustration of what may be accomplished along any number of other lines toward making the most of the equipment and conditions prevailing. For example: The difficulty of obtaining skilled operators at reasonable expense for operating may be relieved by so organizing the work that a few skilled operators supervise the work of unskilled helpers. A study of the characteristics of main generating units and their auxiliaries will indicate the loading and choice of service which will result in the greatest economy. A complete and systematic set of records of performance is of the greatest importance in determining in what direction to attempt improvements.

The Corner Has Been Turned

We Are Making Satisfactory Progress, but We Have Still a Long Way to Go Before the Ultimate Goal Is Reached

By W. H. SAWYER
Vice-President E. W. Clark Management Corporation, Columbus, Ohio

THE struggle has been titanic in its immensity and at times the apparent results staring us in the face have closely approached the seriousness of the disaster which befell the good ship *Titanic.* "The corner has been turned," the worst is well behind us.

We have been saying right along that we believed in the good sense of the American people. We did believe in them, although at times our faith was almost shattered. I say "the corner has been turned" because now we are definitely to the point where the American people are saying in a positive voice that they need service, that they must have service. This public still has the natural human desire to want this service at a lower rate than is compatible with good service, but rates today are secondary.

When the public asked to keep confiscatory rates in force it did not appreciate that its unfair attitude meant that later it must pay an even higher price; it did not appreciate how loss of confidence affected cost of money; it did not appreciate that inability on the part of the street railways to borrow money meant higher operating expenses and poorer net results, which the public must ultimately pay for. Street railways today are in no position to borrow money for improvements, and every day they are unable to borrow money to make improvements which will lower operating expenses and increase net income makes the conditions worse and brings the price higher which the public must ultimately pay. We have not as of today the confidence of the investing public, and this means that the riding public must today pay a higher rate of fare than it would have had to pay if we had that confidence. A proper rate of fare for today's condition does not today restore that confidence, but once it is understood that the public really and honestly appreciates that it must have service and is willing to pay for it, even though grudgingly willing, we will have not only "turned the corner" but will be well on the road to a return of confidence. The manufacturers want production; the manufacturers, workmen and the public need transportation so that they may get this production.

"The corner has been turned," as, go where you will today, the predominant note is "we want service." The public may still be selfish, giving voice entirely to its own personal interest, but the question of street railway service is vital if other industries are to continue to function. That part of the public which really analyzes from the public good is not only asking for service but is demanding more service, more efficient service, and it is demanding this because it knows that it is vital to its business.

However, the main issue is still before us, if the public wants the service that it says it does and as I believe it does it must be brought to a full realization that we cannot give that service except as we are given a rate of fare which will enable us to take further steps toward restoring confidence to the investing public. We must compete with other industries for the cost of money to make improvements, to operate more efficiently. Due to the havoc and destruction which has been wrought by the public, it is necessary that it pay a higher rate of fare to enable us to borrow money than would have been true had we been treated fairly during the past.

The public today wants service; electric railway men of this country want to give that service, and the legislature, the public utility commission or the city council which does not appreciate this will take a responsibility of opposing increased rates with very different results than would have been the case two years ago. It was then believed to be politically wise and expedient to neglect the question of service. The "corner has been turned," the public wants service, and the politician who believes otherwise is only fooling himself. To give that service, demands for which are becoming more and more insistent, means today just what it has always meant, just what it would mean in any other business, namely, that we must have a rate of fare which will enable us by our records to restore confidence to the investors.

CO-OPERATION THE KEYNOTE OF THE FUTURE

From our past experience we should now draw conclusions as to what we of the electric railway fraternity should do in the future. My own thought is that we should continue along the same general lines under which we have been working. We must continue to be aggressive and constructive, and must above all things *co-operate.* While one man or one organization may be able to work out the problems of a local situation, the results can certainly be accomplished more efficiently and more satisfactorily by heeding the advice and experience of others. Our detailed problems only are local; the question is a national one, differing in different localities only in local details. We must continue our publicity; we know the facts as no one else does and we must tell the story in plain, truthful language, so that the people will understand that it is their problem fully as much as it is ours, and that our province is to try to work out the mutual problems to their satisfaction.

We must give even better support to the American Electric Railway Association, to our State association and to the ELECTRIC RAILWAY JOURNAL. We must work and give that we may receive. I fear not the ultimate outcome. Electric railways are more than an essential industry; they are an integral part of our civic communities, and the prosperity of one is absolutely dependent upon the prosperity of the other.

Maintenance and service are today below par because confiscatory rates have kept us from spending money which we could not secure. This condition still exists, but we cannot afford for the public good to be too pessimistic or unfairly pessimistic as to the future. We must tend to improve our maintenance and our service, even if past records do not justify this. In other words, let us go forward in so far as we may on the basis that we know that ultimately street railways are going to give the service required by the public and that the riding public is going to pay a rate of fare which will encourage an investing public to renew its faith in this vital necessity.

I have said in effect that the people, our customers, the public whom we serve, have changed their attitude and are beginning to appreciate the situation. A continuation of constructive, co-operative work on our part must ultimately bring them to a full realization of the mutuality of our interests. Continue as we have been doing, but let us profit by our experience; do not let our shots scatter so widely, and we will achieve success of which we may all be justly proud in that we have been a most important factor in saving from ruination and in restoring to proper functioning that civic necessity—the electric railway.

Sell What the Public Wants

If We Would Be Like Other Business in Theory, Let's Be So in Practice—Know the Public Intimately and on Good Terms—More Important Than Any Economies

By an ENGINEER

YOU have very kindly offered me the opportunity to take part in a symposium on the obligations and responsibilities of the rank and file of the electric railway industry in the present critical times. I appreciate and am grateful to you for the privilege and the compliment, but I feel that I cannot do justice to your plan because, frankly, I do not think it touches the real trouble. There is no question that in many cases practical things may be done to help the individual situation, but when we consider, on the one hand, the extent to which, in the past years, we have reduced the costs of operation—when measured on a common basis—and on the other hand the fact that with very few exceptions our electric railways range in condition from that of barely paying expenses down through varying degrees of financial distress to receiverships, cessation of operation, and in some cases sale as junk, it must be clear that there is something fundamentally wrong.

Certainly it is not because transportation has ceased to be essential, for business without regard to humanity and personal welfare without consideration of industry alike demand more and better carriage of men and materials. Neither is it because the electric railway is an out-of-date instrument, for while the jitney in the summer time may give a more rapid and convenient service, averaged through the year it falls decidedly short of the service of any fair trolley system. Why then does not the public buy the transportation offered by the electric railway to an extent which would at least carry the lines, if not yield a proper return?

The engineer who wrote this cryptic practical message is in touch with most of the problems of a large system. He believes his message is more telling if presented anonymously and states that it might be "undiplomatic, to say the least," to announce his identity.—Editors.

It seems to me we must look for light in the lines of industry which have proved profitable. At once you say, "but conditions are different; these industries can adjust their selling prices to the cost of production, while we are tied to a shrinking rather than even a fixed rate." Very true. But the public is not obliged to buy many of these products, yet it pays the price as it is increased, so long as it gets the article it wants. And in those last nine words is the whole story. Just now the public as a whole doesn't want what we are offering them as trolley service, and if we are really honest with ourselves they have at least some reasons for their position. Considered as a whole, our equipment is old and dirty, our roadbed rough as to both line and level, and our schedules fixed by the clock rather than by the convenience of the riders. Again you say, "If we cannot earn enough to make our securities attractive we cannot borrow money, and without money we cannot buy new or repair old equipment, nor can we maintain our tracks." True again. Yet how many great businesses have been built up by men who started with neither capital nor credit, how many of our own lines trace back to nothing but enthusiasm of the starters of the project? What have we done that we cannot today make good in spite of the discouraging conditions facing us? Let us look back for a moment to other industries. Success in an industry depends, outside of indomitable courage and unflagging energy, upon the production at a reasonable cost of an article which the public wants, either through a natural or a created desire, and upon merchandising that article so that it is kept sufficiently attractive to the public to insure that it is demanded in such amounts and ways as make its sale profitable. And, incidentally, the wise merchant brings out the shortcomings of his competitor, not by direct attack, which always breeds a sort of sympathy for the object of that attack, but by setting up the virtues of his product in such a way that the comparison is sure to be made by the desired customer. On the manufacturing side we have done fairly well; there is room for improvement, but we have steadily raised the efficiency of our processes until any really great gain can come only through some new development. On the merchandising end, however, we have not so much to our credit. In other lines the alert merchant advertises freely the desirability of his wares, the convenience of his store, the courtesy and attention of his selling force, and is untiring in his efforts to maintain and even exceed his promises; by co-operation with other merchants through national or divisional organizations he endeavors to keep in close touch with the desires of the public and the best general methods of meeting them; through active membership in local boards of trade and business men's associations he gets the "local color," and at the same time identifies himself with his city's affairs and establishes for his business a personal relationship, while by frequent staff meetings with his heads of departments he keeps them and himself in close touch and harmony, while frequent departmental conferences carry the spirit of "the old man" down the line.

Where does the electric railway industry stand on this internal work of merchandising? The American Electric Railway Association contains a very considerable part of the trolley mileage of this country; very valuable papers are presented at its semi-annual meetings, and its committees do splendid work. But how extensively are its recommendations and standards followed? How much of the committee work is availed of by the member companies? Locally how actively is the trolley represented in the Rotary and Kiwanis Clubs, the local Board of Trade, Men's Clubs and the like, not merely as being on the list of members, but as taking a real part in the work? And finally in the family circle, so to say, how closely is the organization kept in touch with the situation? How effectively is the company's loyalty maintained and supported—for loyalty demands a measure of confidence, both as its reward and its guide.

When we measure up the industry as a whole, are we not compelled in all honesty to admit we have at least fallen short of our duty here?

It is in the direct relation with the public, however, that the trolley fails to meet the modern idea of merchandising. In other lines of salesmanship times of stress are times for the most careful attention to quality of product and method of displaying it; advantage is taken of every opportunity to put a possible customer where the real product is shown; the latter is made as attractive as possible, and if there is competition, the weaknesses of the competitor's goods are brought out, not by attack on him, but by exhibiting the contrary in the seller's own stock. Last of all is there threat or sulking.

Yet with the example of years of selling are we not doing exactly that which in other lines of business would be certain suicide? Consider our attitude toward the jitney. Granted that it is an outrageous—indeed a criminal—competition. What do we do? We damn the jitney and demand its immediate suppression, thereby creating a feeling that we are picking on a little fellow, when a plea that it be called upon to share the paving and similar trolley burdens would get at least as much attention and if granted would be just as effective a stop as an ordinance to that effect. And when the public does not suppress the "jit," instead of making our service so attractive that we starve the other fellow out, we instead endeavor to bulldoze the public into riding with us by cutting down the service and making it less desirable!

And haven't we paved the way for the jitney competition and the serious losses we suffer through the one-time trolley riders who are now picked up by their auto-owning friends, or who ride in their own autos, by a pretty thorough disregard of their riding habits at a time when we could say "Ride, damn you, or stay at home" and get away with it?

I believe we have got to start fresh, shutting down a very considerable mileage, not with loud words of defiance, but in considerable humility and a frank admission—and one that will stand investigation without blowing up—that we haven't the money with which to run in competition, and that, too, without mud slinging at a competitor which, however much we may damn it, and—on paper—prove its unprofitableness, still remains a mighty unpleasant absorber of revenues we need the worst way.

Moreover, we have got to forget many of the "principles" of operation we have been following; we have got to make schedules to meet the convenience and wishes of the public, and we have got to make our service so attractive that the public will come to us for the same reason it goes to certain of our merchants in preference to others. That our competitors are not playing fair, that the public is not playing fair, is all beside the question. These are actual conditions we are up against. We must meet them and overcome them, or bust.

And because I sincerely believe this I do not feel justified in urging the men in my field of the industry to get busier in economies until these more fundamental matters, as I conceive them, receive their share of attention.

Coal Production Decreasing

THE weekly report on bituminous coal compiled by the Geological Survey shows a 3 per cent decrease in the coal production for the week ended June 19 as compared with the previous week. The total production for the year to that date was 201,170,000 net tons, an increase of 40,100,000 tons over the production of 1919, but a decrease of 24,250,000 tons as compared with the production in 1918.

The production up to March of this year almost equaled that of 1918, but the railroad and mine strikes during March and April lowered production to below normal.

The production of coal has been increasing very rapidly during May and June, but the recent walkout of switchmen is again causing a car shortage at the mines.

Optimistic reports are given out by the railroad executives as regards car shortages. They state that grain cars are now in the harvest district and coal cars in the mining district and the result should be a marked improvement in transportation conditions, providing no strike occurs to prevent car movement.

The Geological Survey report shows that the electric utilities in New England have more than five weeks' supply of coal on hand and the coal gas plants more than four weeks' supply, but that the total tonnage of bituminous coal has decreased from 567,831 on February 29 to 481,652 on May 31, or about 86,000 tons decrease for the month. This does not indicate an encouraging fuel situation in that stocks should be increasing.

Protection Against Shock in Indoor Substations*

Some Simple Principles and Precautions for the Mitigation of Accident Hazard on High-Tension and Low-Tension Circuits

By E. F. BRACKEN
General Inspector of Substations Commonwealth Edison Company, Chicago, Ill.

IN ALL substations the presence of electrical energy at high voltage introduces physical injury hazards, which must be reduced to a minimum by the use of suitable apparatus and safety devices and by the application of proper rules governing procedure in its operation and control. In the case of rotary converter and motor-generator units and other machinery having moving parts there are hazards which must be guarded against by means of suitable shields and rules of procedure.

Electrical energy is generally delivered to substations at from 4,500 up to 110,000 volts. High-voltage circuits in buildings should be so placed as to render physical contact with them difficult and to reduce the possibility of accidental contact with them practically to zero. This may be done by placing open and uncovered conductors up out of ordinary reach of substation attendants and workmen, or, if they must be placed at lower levels, by completely inclosing them in suitable structures.

High-tension manually operated air-break switches intended for opening circuits under load should be situated several feet higher than a man's head, remote from grounded iron work, and should always be operated by means of a long wooden pole. The pole should not be allowed to accumulate moisture, dirt or acid and, therefore, should never be put or kept near an open window or in a storage battery room or other place where it may be touched by acid vapors. As a further precaution, the operator of such switches should, while operating them, stand on an insulated stool and wear rubber or dry leather gloves.

Air-break disconnects in series with oil switches are not generally suitable for opening a circuit load, and any attempt to use them for this purpose is likely to produce a heavy arc sufficient to burn the operator. Such disconnectives should never be removed unless the oil switch in series with them is open. If the switch in series is open the removal of such disconnects while they are alive is not especially dangerous, provided proper precautions are taken to insulate the operator from earth. The operator should be thoroughly insulated from ground by an insulated platform or rubber mat and from the disconnectives themselves by means of a wooden stick or high-resistance device by which he manipulates the disconnectives.

In general no one should be allowed to attempt to work upon or in close proximity to live high-tension conductors or conductors which may become alive during the continuance of the work. For this reason all such conductors should be disconnected from all sources of high potential and measures should be taken to see that no person can restore any of the connections until the work is completed. The nature of the precaution against making conductors alive during the progress of the work will depend largely upon the number of persons who might be in a position to perform such an act. If no one but the workman himself could make them alive the precautions may be very simple. If several persons are in position to do so, it is desirable to use signs, warning signals or even locks to prevent such an act.

All structures which might be made alive as a result of a breakdown of the insulation of high-tension conductors should be carefully grounded. This applies to cores and cases of transformers, frames of high-tension generators and motors, starting compensators and frames of switchboards carrying high-tension conductors. The substation attendant must carefully bear in mind that high-tension current may cause injury both by burn and by shock. In general a person is not subject to electric shock unless some part of his body becomes a part of an electric circuit, and the danger of becoming a part of a possible circuit always must be considered and guarded against.

It is for this reason that rubber gloves, insulating stools, insulated sticks, wooden handles, insulated pliers, insulated screw drivers, wrenches, etc., are used in work on or near live conductors. Electric shock by high-tension current through a vital part of the body is liable to produce severe physical injury or even death. A nearby electric arc may burn the flesh even if an individual is so carefully insulated that he cannot become a part of an electric circuit. Therefore it is not sufficient merely to guard against becoming a part of an electric circuit, but no act should be performed which can possibly cause a heavy arc in close proximity to the body.

Moving machinery offers a type of physical injury hazard which is already quite well recognized. The precautions, safeguards and procedure are in general similar to those pertaining to other rotating machinery, such as is found in machine shops, factories, etc. Guards are used to prevent accidental contact with rotating parts and suitable rules of procedure are designed to prevent undue exposure where guards are impracticable.

Some types of rotary converters in railway work are subject to flashovers under conditions of severe short circuit. Such flashovers are liable to throw an arc quite a distance from the end of the machine, and to throw particles of burning metal still further. Fortunately such flashovers are rare, but they indicate that one end of a 600-volt railway rotary converter is not a good neighborhood for the operating attendant's desk or resting place. Proper installations and protective devices will do much to reduce the severity of such disturbances, but they have not yet made the zone at the commutator end of a railway rotary converter thoroughly desirable as a place in which to spend one's spare time. An operator should never undertake to make adjustments or even close inspections of direct-current brushes of railway rotary converters which have a tendency to flash over except when the unit is entirely disconnected from all sources of possible load.

"Low tension" is a term which has been very exactly defined, but in this discussion will be used to refer to electric pressures below 750 volts. Too many men have a feeling of immunity against injury by shock from circuits with potentials of 110 to 250 volts, and some have far too little respect for railway current at 600 volts. It should be remembered that while 110 volts will not ordinarily produce an unpleasant sensation of shock and to some persons 250 volts is only mildly unpleasant, yet it is a matter of record that men have been killed by 110 volts alternating current and others by 250 volts direct current. If men can be killed on 250 volts direct current substation attendants in railway substations should remember that the output is decidedly dangerous and is capable under some conditions of producing death by shock.

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*This article is adapted from a longer one appearing originally in the "Safety Bulletin" of the Commonwealth Edison Company.

Injury by burn as a result of an arc is to be guarded against and it is to be remembered that while a low-tension arc will not hold through such large distances as a high-tension arc, yet on account of the larger currents they are as a rule heavier and more destructive.

Inasmuch as practically all electric circuits show a potential difference between at least one conductor and ground and some between all conductors and ground, it is apparent that any one touching such a conductor will become a part of the electric circuit to ground if he is not properly insulated from the earth. Proper insulation varies with the voltage of the circuit. For 250-volt light and power and 600-volt railway work dry wooden platforms, wooden mats, rubber mats and dry battleship linoleum are satisfactory. If wood or linoleum is subjected to the ordinary floor scrubbing operations the use of strongly alkaline soaps is likely to reduce its insulating properties to some extent, especially while it is wet. It is possible also to use a commercial insulating compound which can be applied to a floor by means of a trowel, becomes hard in a few hours and which is not affected by moisture.

For high potential it is necessary to use much better insulation. The most common device is a dry wooden platform, either portable or stationary, mounted on high-tension insulators of a grade considerably better than is used for line work on the same voltage. In the use of such a platform there is practically no danger that the operator may become a part of a circuit to earth through the platform itself, but it may give him a false sense of security, especially in congested places, where high-tension, bus-carrying structures are placed close together.

Group Insurance for Employees

THE Lackawanna & Wyoming Valley Railroad (Laurel line), Scranton, Pa., has taken out accident liability group insurance for all of its employees. Each policy provides that in case of sickness or of accident incurred other than due to company work the employee shall receive weekly 50 per cent of his or her wages for a maximum of twenty-six weeks and effective after the first week. The company had already provided group life insurance for its employees, a policy in the amount of $500 being presented to each employee after six months of service. This is increased annually to a maximum of $1,000 at the end of five years of service.

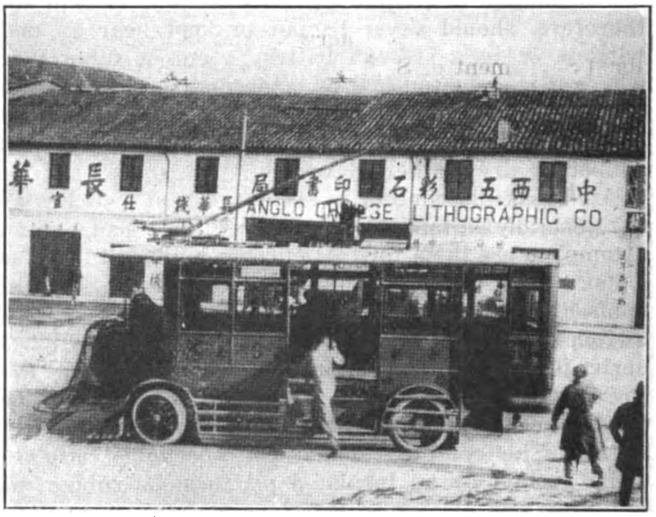
Plans for a local council of the National Safety Council for Chicago have been approved by the Association of Commerce and the heads of forty industries. Samuel Insull is one of the leading spirits of this movement.

Shanghai Tramways Are Prosperous

Short Trackless Trolley Line in Successful Use—Tramways Are Supported Largely by Chinese of Modest Means

THE recent visit to this country of David McColl, general manager of the Shanghai Electric Construction Company, Ltd., which operates the tramways in the International Settlement in Shanghai, China, renders timely a brief summary of the present status of rail transportation in that city. A man of extensive tramway experience in England, Mr. McColl took up the development of this property some ten years ago. It is today one of the more progressive companies of China, as is shown in the development of its shop and roadway equipment, track construction and car equipment, organization and system of "inspectors" designed to meet the peculiar local conditions in Shanghai. Mr. McColl is enthusiastic with respect to the property and is trying out a number of plans for extending its usefulness, including the use of rail-less trolley vehicles.

The rail-less trolley buses are of particular interest, with their special form of drive (a motor driving, through a worm and wheel with 7.25 to 1 reduction, a shaft, which in turn is connected through the differential to the rear wheels, as in standard automobile construction). The bodies, built in Shanghai, are special, with side entrances in order to provide for first and third class compartments. A special trolley pole, with two wheels making contact with the two overhead trolley wires, has been designed and made up by the tramway company and a special shoe, which is lowered and drags on the street rails to complete the electric circuit when the bus passes over the rail tramway (equipped with single trolley) from the carhouse to the trackless zone.



RAIL-LESS TROLLEY BUS IN SHANGHAI

A novel method has been used for saving power on this system. On the front end of each car is a small semaphore interlocked with the controller handle, so that the inspectors on the streets or in the shop windows can tell at any time by the position of the semaphore the position of the controller and whether the motorman has his controller in the proper position.

A great deal of attention is paid to personnel on the Shanghai property. The superintendents and inspectors are foreigners generally, the car crews are Chinese, the conductors having to speak English as well as Chinese. The men are treated well and are remarkably loyal to the company.

The situation in Shanghai was covered briefly in the recent report made by Frank Rhea, trade commissioner, to the Bureau of Foreign and Domestic Commerce of the Department of Commerce of the United States.*

Mr. Rhea points out that Shanghai contains three of the eight tramway lines in China (including two in Manchuria). These three tramways are, respectively, in the International Settlement of Shanghai, the French Concession of Shanghai and the native city of Shanghai. The lines of the Shanghai Electric Construction Company are located in the foreign settlement (except the French), or in what is otherwise known as the International Settlement of Shanghai. The total length of route is about 16.25 miles of rail line and one mile of rail-less trolley.

ONLY ONE TROLLEY POLE USED ON SHANGHAI RAIL-LESS BUS

The riding on tramways in the city is largely confined to the ordinary class of Chinese, as wealthy Chinese and foreigners as a rule travel in jinrikishas or other conveyances. There seems to be a growing tendency on the part of the less well-to-do class of foreigners to ride on the cars, but the proportion of foreign passengers on all lines is very small. Mr. Rhea states that the company's tracks are well constructed and maintained and that the rolling stock comprises ninety motor trolley cars, seventy trailers and seven rail-less trolley cars. Part of the power is generated in the company's own power house and part is purchased from outside.

First and third class fares are charged, but Chinese women ride first class on payment of third class fares. Practically all foreigners ride first class. The zone system of fare collection is used, the first class fare for each zone being three copper cents and the third class fare one-half of this. On payment of fare passengers are given numbered and colored identification slips, and "surprise" checkings by special inspectors are conducted at frequent intervals.

Practically all fares are collected in the form of Chinese copper cents or "small silver money" (both of which are at a substantial discount) and converted into Mexican dollars, at an average of about 125 copper cents to the dollar.

The rail-less trolley runs through a very congested district of the city. Service was first established in 1915 over a 0.7-mile route, and this was extended in 1916 to the present length of one mile. The Municipal Council has been considering a proposal for a 9-mile extension of this service. In a statement presented to the Council the claim was made that these cars occupy an area of 158 sq.ft., while twenty-eight jinrikishas carrying the same number of passengers would occupy 2,500 sq.ft. to permit of proper movement.

The average cost of the seven rail-less cars now in service was $12,850 Mexican for each complete equipment, and the actual cost of the present installation, including the double trolley, was $137,575 Mexican, including a contribution of $26,022 Mexican for street paving. Results for the latter half of 1916 showed a profit of about 15 per cent on the investment.

The head office of the Shanghai Electric Construction Company is located at 2 North Soochow Road. The following are the officers located in Shanghai: General manager, David McColl; deputy manager, J. G. Smeaton; traffic manager, E. Carroll; rolling-stock superintendent, J. L. Gordon; assistant rolling-stock superintendent, H. G. Sadler; line engineer, H. J. Blatchford; assistant line engineer, T. H. Brownlie; storekeeper, J. L. Stuart. The secretary of the company, L. W. Hawkins, is located in London.

Accident Situation Improves

ACCORDING to the 1917 census figures, relative to the number of accidents in the electric railway industry, which were recently issued, there is disclosed a decided improvement in the trend of the accident account. In 1902 1,218 persons were killed and 47,429 were injured in electric railway accidents. In 1907 2,411 persons were killed and 118,269 injured. In 1917 the number killed was 2,517 and those injured 141,854. In other words, while street car fatalities increased 100 per cent during the five years between 1902 and 1907, the increase during the ten years between 1907 and 1917 was only 8 per cent. Likewise, the non-fatal injuries increased approximately 150 per cent during the five-year period between 1902 and 1907, while the increase during the next ten years was 20 per cent.

The trend of accidents is perhaps shown in better light by noting that during 1919 3,086,319 passengers were carried on street cars per one person killed, while during 1917 the number of passengers carried per person killed was 4,393,572. Expressed in percentage, the electric railway accident hazard decreased approximately 33 per cent during 1917 as compared to 1907.

The good showing which appears to have been made in the accident account is largely attributable, no doubt, to the perfection and more extensive use of mechanical safety devices, to improved methods of operation, and to the safety-first work that has been done to train both employees and the general public in the exercise of precaution. If figures were available up to date, there is some misgiving on the part of men closely associated with the claims departments of street railways companies that they might show an increasing trend, owing to the enormous increase in the number of automobiles in use. This is now the principal source of accident in the electric railway field, as it is also in other activities.

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*Special Agent Series No. 180, entitled "Far Eastern Market for Railway Material, Equipment and Supplies."

Lehigh Valley's No-Accident Week

District in Pennsylvania Sets New Standard in Safety Drives and Reduces Accidents 90 per Cent

BY LOUIS RESNICK
Editor *National Safety News*

AT 1 O'CLOCK Monday afternoon, May 10, a shrill siren blast resounded throughout the Lehigh Valley of Pennsylvania and at that moment there was started the most comprehensive and most successful No-Accident Week thus far conducted by any community in America.

More than half a million people in twenty cities and towns answered the call of that siren. During the next seven days 170 safety talks were made, more than a million pieces of safety literature were distributed, thousands of safety essays, slogans and posters were prepared by the school children of those twenty cities, hundreds of plant safety meetings were held, safety sermons were preached in the churches, 100,000 letters on safety were written by the children of the district and as many safety pledges were signed by their parents, resuscitation demonstrations, fire drills and other first-aid contests were carried on in practically every community in the district, and at every turn throughout the week the half million people were confronted with safety signs, safety exhibits, safety movies, safety parades.

What were the results? Here are a few:

A reduction of 92 per cent in mining accidents.

A reduction of 80 per cent in electric railway accidents.

A reduction of 36 per cent in all public accidents.

A reduction of more than 90 per cent in accidents at the largest industrial plants in the district.

The Lehigh Valley produces 90 per cent of the world's output of slate and 60 per cent of the world's output of cement. In addition to its quota of these products, the district during the week of the drive produced thousands upon thousands of tons of steel, tens of thousands of tons of coal, thousands of tons of zinc and great quantities of silks and other products. And not a single fatality due to an industrial accident was recorded within that week.

Of far greater importance than the actual reduction of accidents during this particular week was the influence of the drive on the conglomerate population of the Lehigh Valley. This district employs as heterogeneous a lot of workmen as can be found anywhere in the world. Slavs, Hungarians, Poles, Italians, Spaniards, English, Scotch, Welsh and the rather famous native "Pennsylvania Dutch" predominate, but forty-nine other nationalities are well represented in the Lehigh Valley.

Think of 125,000 immigrants working in the steel mills, coal mines, slate quarries, cement, zinc and chemical plants of America an entire week without a single fatal accident. Better still, think of an eighth of a million men of this type working hand in hand with their employers, with the city, state and county authorities in a great community betterment movement. Practical Americanization, improved industrial relations and accident prevention, all in one.

Of greater importance than the saving of lives, limbs and dollars through the reduction of accidents during the week of the drive were:

First, the creation of a public sentiment among both the big business men and the workers for a permanent safety campaign; this will be carried on through the co-operation of the Lehigh Valley Division of the National Safety Council and the various chambers of commerce of the valley.

Second, the establishment of safety education as part of the curriculum of every public school in the district; pledges to this effect were given by school superintendents throughout the district even before the close of No-Accident Week.

Third, the real conversion to safety of many men, both plant managers and workmen, who before had looked upon it merely as a fad.

HOW THE DRIVE WAS CONDUCTED

Approximately a million pieces of safety literature were distributed during the drive. Through the school children 75,000 window cards reading "We have signed the safety pledge—be a booster" were placed in the homes. On the reverse side of each card facing the interior of the home was this message: "Is your home safe? Fathers and mothers are morally obligated to make their homes safe and to teach their children safety."

Then followed eight rules to make the home safe, covering such hazards as scalding, matches, nails, poisons, gasoline fume explosions, falls, dangerous stairways and a suggestion for the use of iodine to prevent infection.

On Monday, the week of the drive, the teacher in every schoolroom in the valley wrote a form safety letter on the blackboard and every child was instructed to make a copy of this letter in his or her own handwriting, addressed to the parents. These letters, together with pledge cards, were taken home by the children to be signed by the father, the mother and the pupil. Upon the return of the signed pledge a window card was given the child. Possibly the best indication of the seriousness with which the entire drive was taken is had in the fact that in every school more than 90 per cent of the pledge cards issued were returned signed, and in many of the schools the returns were 100 per cent.

Attached to the pledge card was a leaflet, to be detached by the parent after signing the pledge, containing on one side seventeen "fire don'ts" and on the reverse "safety don'ts" for the home and the street. An expert acrobat was hired to illustrate by hairbreadth escapes traffic hazards.

The Boy Scouts and the Campfire Girls of every city in the valley were enlisted in the drive, with very gratifying results. Through the co-operation of the Boy Scouts 10,000 windshield stickers, carrying on one side a safety message that could be read by the pedestrian and on the reverse side precautions for the driver of the automobile, were posted on the windshield of practically every automobile in the district. Ten thousand additional safety cards were hung on the radiators of automobiles and motor trucks.

Through the department stores, wholesale houses, public utilities and other places of business 150,000 safety circulars carrying nine specific messages on street and home safety were distributed.

Fifty thousand bulletins reading "We are helping to make this community safe" were posted, in addition to thousands of National Safety Council bulletins which were placed at strategic points in and about every industrial plant in the valley.

Street banners were supplied to every city and town and every available billboard and fence was decorated with a safety message during the week.

The business interests of the valley came into the drive with all the facilities at their disposal. Every letter that was mailed and every package that was delivered from a mercantile establishment in the Lehigh Valley during this week carried with it a message on safety. Community safety posters were displayed in the windows of every business house and many of the department stores set aside their best show windows for safety displays. To bring the people from the rural districts into the cities, where they could observe the drive in all its intensity, department stores throughout the valley put on special No-Accident sales and made genuine price reductions.

Mass meetings of school children were held in every city every day of the drive and each meeting was preceded by a parade of the children from the school to the Auditorium, where motion pictures were shown and short safety talks were made.

Garages and gasoline stations posted public safety bulletins throughout the week so that every time a motorist stopped for gas or grease he was reminded of the hazards involved in driving an automobile. The first day of the week of the drive was designated as "Safety Sunday" and from the pulpit of every church in the valley a safety sermon was delivered.

In the larger cities the pedestrian was literally confronted with safety slogans at every step, for on block after block of city pavement the Boy Scouts had stenciled on the walks outlines of the human foot in which were painted such messages as "Watch your step" and "Safety first."

Advertising Changes in Routing

How the Los Angeles Railway Placed the Facts in a Commission Report Before the Public

By J. G. Jeffery

Director of Public Relations Los Angeles Railway

A SAVING of 4,000,000 car-miles per year, reduction of power consumption by 13 per cent, with a general speeding up of all lines through an extensive rearrangement of traffic, is the program established by the Los Angeles Railway on May 9. The plan was developed with the basic idea of retaining the 5-cent carfare and still delivering adequate service.

Confronted by steadily increasing operating costs, the Los Angeles Railway put its case before the State Railroad Commission of California and the Public Utilities Board of Los Angeles with the request that a thorough survey of the system be made. As a result thirty of the leading engineers and traffic experts of the West co-operated with the state and city officials and executives of the railway company in a five months' investigation. In a general way, the report recommended shortening the running distance of several lines, a reduction of the number of cars passing through the congested business district and installation of a number of one-man safety cars, especially in the outlying districts, where shuttle lines were found practicable.

The rerouting was established so as to clear two through-town streets for automobile and pedestrian traffic exclusively. This was done on all of Eighth Street and on Third Street west of Main. As soon as autoists realized the advantages offered for faster movement a marked improvement resulted. Twenty-five per cent of the curves were eliminated, with consequent speeding up of traffic over the more direct routes. The most notable change in this respect was the ending of turns at Seventh Street and Broadway, which was the busiest intersection of the business district and formed a popular outlet for automobiles to the beach resort cities and other suburban points. Abandonment of a few short lines practically duplicating through-town routes was made on recommendation of the traffic experts, who decided no great inconvenience would result from such action.

Forty-five of the one-man cars have been ordered for some time, and it is expected they will be delivered and placed in service shortly. No attempt will be made to operate them through the business zone until patrons have become well acquainted with their mode of operation on the shuttle lines. It has further been demonstrated that there is a vital need for the larger capacity cars through the downtown section. All cars are being equipped with recording fare box. With the extensive changes in routing during the day, the owl cars were continued on the former runs, since they did not have the traffic problem to meet and served a wide territory. On most lines the rerouting permitted a faster schedule, especially through the downtown streets.

It was by no means an easy task to acquaint the public with the changes made in the rerouting. Advertisements of the new routes were published in all the Los Angeles newspapers with the suggestion that the information be clipped out for further reference. Added to this, sixteen-page folders giving the routes and explaining why the state and city officials had recommended the changes were placed on the cars. Many news stories were carried in the local papers.

The report leading up to the establishment of the rerouting system contained some pertinent facts about a street railway's share of street paving. In Los Angeles the company pays for the paving of 19 ft. in the center of double-tracked streets and 8 ft. on single-tracked streets. The State Railroad Commission report points out that from 8 to 10 per cent of the company's gross revenue is required to pay this paving bill. "This," the report says, "is unjust and it is not to the best interests of the city that this total paving expense should be paid by the car riders."

Track Maintenance Problem in Schuylkill, Pa.

THE Schuylkill Railway, Girardville, Pa., has purchased 400 tons of 70-lb. rail, to be used in replacing old rail along its lines. The labor situation is at present holding up the work. Through boroughs where the streets are paved it is intended to use steel ties. Twelve double sets of frogs and switches with 70-lb. rail have also been ordered to replace old layouts. In the track department of this company one of the most serious problems encountered is the undermining of the track structure by the coal mining interests. The track is continually settling without warning and has to be brought back to grade. In one point the track recently settled 4 ft. for a distance of 100 ft. This settlement is sometimes of gradual occurrence and sometimes is very abrupt.

Auto Carrier Competition in California

Heavy Burdens on Railways and Lack of Regulatory Measures on Auto Carriers Make Change Necessary—Legislative Action Probable

BY W. V. HILL
Manager California Electric Railway Association

COMMON carrier automobiles in both passenger and freight service have become an important factor in the transportation field in California. They are competing with electric railways to a serious extent despite the fact that railroad commission, electric railway men and even the auto operators themselves seem to agree that the auto carrier business is economically unsound and in many cases conducted at a loss. California's extensive system of good roads and a climate conducive to automobile travel throughout the entire year have an important bearing on the situation. Whether the electric railways would find it advantageous to use buses as feeders in certain cases may be an open question for some time, but if they do they would expect to give the public the same protection on buses as on cars. If the public wants the railway service continued, and it is granted that the operation of electric railways is an essential service, their investment must be safeguarded and they should be allowed to earn a reasonable return. The situation is summarized in the following:

There are not so many passenger bus companies operating now as there were a year ago, the larger companies absorbing the smaller ones when lack of capital or inefficient management has put them out of business, but the actual number of buses in interurban service is greater. Moreover, the growth of auto truck competition has been very rapid. The average life of the small bus company is short, but apparently new operators are ready to begin fast enough to balance the discontinuations. Through consolidation and extension of their territories some of the bus companies are now doing a gross business in excess of the smaller electric railways.

Operating out of San Diego there are now twenty-five freight trucks and 158 interurban passenger buses, although purely local jitneys are prohibited. In the territory served by the Pacific Electric Railway about two hundred passenger buses are now operating, carrying approximately 20,000 passengers daily. Most of these buses run from the two large bus terminals near the center of the business district. A large percentage of this business could, and in the absence of the buses would, doubtless, be handled by the railway. Of still greater importance is the fact that 1,035 auto trucks are handling freight in the Los Angeles territory, most of these in competition with the electric railway, though less than three dozen trucks have filed application for certificates with the Railroad Commission.

The auto buses have a decided advantage over the electric railways, both in taxation and operation. Aside from the State motor vehicle taxes and the local licenses imposed by some cities, the auto buses have free use of the highways and do not pay the State tax of 5¼ per cent of gross income which the electric railways bear. How serious a handicap the electric railway is under in this regard may be realized from the fact that including taxes, right-of-way, track, overhead construction and, within city limits, paving, it is not unusual for an electric railway to be paying 25 to 30 per cent of its gross income for a road on which to run its cars and the permission to run them there. Both of these the bus acquires for a small fraction of this percentage, so long as it can use gratis the highways built with the taxpayers' money.

Under these conditions and with the high current prices for construction material, it is natural that there would be consideration of whether the electric railway should, under certain conditions, go into the bus business. Particularly in the matter of new territory there is question as to whether service could not be rendered more economically by an auxiliary bus line than by an extension of the track and overhead. On the other hand, in the face of rising gasoline and rubber prices, where track and overhead are now in place, the matter should receive careful consideration before this investment is abandoned and auto buses are bought.

Of late there have been many ill-advised and short lived ventures in the auto carrier business. A goodly percentage of these are ascribed to the policy that automobile distributing houses are believed to have followed, the tendency seeming to have been to finance would-be auto carrier operators even though it was apparent at the outset that the venture involved considerable risk. Under present conditions the automobile manufacturer does not really suffer the whole burden of such losses, because they are charged off on the excess-profits tax, the government being the loser. Moreover, it is considered that there is a considerable advertising value in having a certain make of automobile used extensively in the utility business.

"ROBBING PETER TO PAY PAUL"

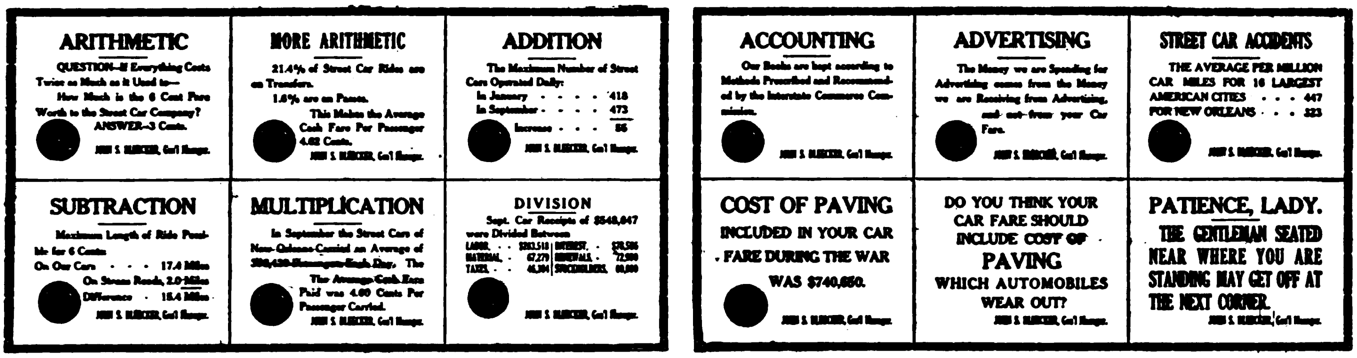
Automobiles serving communities that have no other means of transportation should receive every encouragement, but in all cases they should be charged with the same responsibilities required of other transportation utilities. There is an excellent example of robbing Peter to pay Paul in the present system of taking 5¼ per cent of the gross earnings from steam and electric lines for the support of the State and then to use State funds for building highways which the buses use gratis as a right of way on which to compete (free of the 5¼ per cent tax) with the railways.

The highways are being rapidly and seriously damaged by the large buses and trucks and no doubt the Highway Commission will soon be in need of funds to meet heavy maintenance charges. The logical and equitable thing to do would be to impose a special license on auto carriers that are using the highways, the fees collected to be added to the maintenance fund.

Most of the 500,000 automobile owners of California are taxpayers and they are beginning to ask what special rights have been accorded these large auto carriers. The number of accidents is rapidly increasing and the tendency of bus and truck drivers to "'hog the road" is such that many drivers of pleasure cars avoid, as much as possible, using roads where the buses run.

Uncalled for competition between interurban electric railways and auto carriers cannot continue. The impending gasoline shortage may help to settle the matter, but regardless of this a readjustment of present conditions cannot be long deferred. As matters stand now, one utility is carrying burdens from which its competitor is exempted. When a definite issue between electric railway and auto buses has been faced, as at Los Angeles, San Diego and Bakersfield, the elections showed a preference for the electric railway. The issue has now become statewide and legislative action at the next session of the Legislature is desirable and probable. Just what legislation will be passed is problematical, but at the recent meeting of the California Electric Railway Association, as reported on page 1104 of the ELECTRIC RAILWAY JOURNAL for May 29, the railways are working together on the matter through their association and are prepared to present their side of the question and ask for a square deal. The first step probably will be to show the public how serious the present situation is and that if it wants electric railway service continued relief must be given.

In San Francisco, where local jitneys are not prohibited, there were 438 in operation on June 1. These buses are not permitted to compete with the Municipal Railway, but the Board of Supervisors has made no effort to stop them from competing with the United Railroads. Long Beach is experimenting with a jitney company, having sold a fifteen-year franchise for $21,000, the grantee agreeing to pay the city 5 per cent of its gross receipts.



ARITHMETIC

QUESTION—If Everything Costs Twice as Much as it Used to— How Much is the 6 Cent Fare Worth to the Street Car Company? ANSWER—3 Cents.

JOHN S. BLEECKER, Gen'l Mangr.

MORE ARITHMETIC

21.4% of Street Car Rides are on Transfers.

1.8% are on Passes.

This Makes the Average Cash Fare Per Passenger 4.62 Cents.

JOHN S. BLEECKER, Gen'l Mangr.

ADDITION

The Maximum Number of Street Cars Operated Daily:

In January 418

In September 473

Increase 55

JOHN S. BLEECKER, Gen'l Mangr.

SUBTRACTION

Maximum Length of Ride Possible for 6 Cents:

On Our Cars . . . . 17.4 Miles

On Steam Roads, 2.0 Miles

Difference . 15.4 Miles

JOHN S. BLEECKER, Gen'l Mangr.

MULTIPLICATION

In September the Street Cars of New Orleans Carried an Average of ~~300,430 Passengers Each Day.~~ The ~~The Average Cash Fare~~ Paid was 4.60 Cents Per Passenger Carried.

JOHN S. BLEECKER, Gen'l Mangr.

DIVISION

Sept. Car Receipts of $548,047 were Divided Between

LABOR . .	$283,518	INTEREST . .	$78,586
MATERIAL .	67,279	RENEWALS .	72,500
TAXES . .	46,304	STOCKHOLDERS	00,000

JOHN S. BLEECKER, Gen'l Mangr.

ACCOUNTING

Our Books are kept according to Methods Prescribed and Recommended by the Interstate Commerce Commission.

JOHN S. BLEECKER, Gen'l Mangr.

ADVERTISING

The Money we are Spending for Advertising comes from the Money we are Receiving from Advertising, ~~and not from your Car Fare.~~

JOHN S. BLEECKER, Gen'l Mangr.

STREET CAR ACCIDENTS

THE AVERAGE PER MILLION CAR MILES FOR 16 LARGEST AMERICAN CITIES . . . 447

FOR NEW ORLEANS . . . 323

JOHN S. BLEECKER, Gen'l Mangr.

COST OF PAVING INCLUDED IN YOUR CAR FARE DURING THE WAR WAS $740,650.

JOHN S. BLEECKER, Gen'l Mangr.

DO YOU THINK YOUR CAR FARE SHOULD INCLUDE COST OF PAVING WHICH AUTOMOBILES WEAR OUT?

JOHN S. BLEECKER, Gen'l Mangr.

PATIENCE, LADY.

THE GENTLEMAN SEATED NEAR WHERE YOU ARE STANDING MAY GET OFF AT THE NEXT CORNER.

JOHN S. BLEECKER, Gen'l Mangr.

A GROUP OF THE BRIEF-MESSAGE CAR CARDS USED SO EFFECTIVELY IN NEW ORLEANS. ORIGINALLY EACH OF THESE TWELVE PIECES OF COPY WAS ON A LARGE CARD BY ITSELF

The Railroad Commission, though thus far unable to cope with the auto carrier situation throughout the State because of lack of legislative provisions, has nevertheless shown a very fair spirit. In refusing a recent application for a certificate to operate buses between Santa Rosa and Petaluma, two cities that are now connected both by steam and electric railways, one commission stated that it would "not jeopardize the welfare of a rail carrier unless it is clearly shown that there exists a real public necessity for the authorization of another transportation facility."

However, without explicit laws and ordinances and with no machinery for traffic policing, inspection or control, there are many ways in which the auto carrier can escape regulation. Los Angeles County has a regulatory ordinance that is not enforced; in some counties there is none in effect, and in others licenses costing up to $30 or $40 per annum are required. In the cities there is an almost equal lack of uniformity, some cities having no local licenses and others charging as much as $200 per annum. Thus it is apparent that state, county and city licenses and taxes should and doubtless will at this session of the Legislature be put on an equitable basis. Los Angeles requires a $10,000 indemnity bond on each car, costing $54 per annum. This is another measure in public protection which the railway provides and which the public has an equal right to expect from the auto bus.

Brief-Message Car Cards Prove Effective

New Orleans Company Has Had Excellent Success with a Very Simple but Unique Character of Publicity

ONE of the first things John S. Bleecker, general manager, set about doing when he took charge of the New Orleans Railway & Light Company for the receiver was to inform the public by "learn-the-truth" publicity just what the conditions were which the company faced. He fully appreciated that he could do nothing without the co-operation of the riding public, so a newspaper and car-card campaign was undertaken. This work came under the immediate direction of William J. Baldwin, who is publicity agent for the company but has the title of assistant to the general manager.

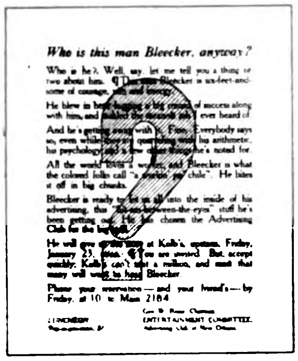
The first work done by Mr. Baldwin was to go to the three local newspapers and frankly seek their co-operation. It was gained on the straightforward basis of "selling" the papers on the policies and plans of the new management for improving the car service, and on the great assistance the papers could render by cooperating constructively with the company for the good of all. The destructive criticism of the papers thereby disappeared to a large extent or at least went on vacation until they could see whether the company would live up to its expressed principles.

Soon thereafter a liberal use of car cards and a small number of full-page newspaper advertisements were put to work. The newspaper advertisements were pretty much the same as have been run in many other cities, making capital, among other things, of the Washington hearings of the Federal Electric Railways Commission. But the car-card publicity used was quite original in character, as noted above. One of these full-page newspaper advertisements brought effectively before the people the improvements made in the service by giving data on the subject and quoting letters from ten prominent citizens who had commented upon the bettered service.

The car-card publicity got out by the New Orleans company has been built around the idea of putting forth just one thought so briefly stated as to be absorbed almost at a glance. In a good many pieces of copy this single thought was so set forth as to give rise to much further thinking. In other words, a simple pertinent statement was often made without drawing any conclusion, leaving it to the reader to make his own deduction. In some cases the answer was perfectly obvious and in others it puzzled the lay people and perhaps thereby added to the interest taken. Sometimes a bit of irony was used to good effect. An example of this is included among the cards reproduced herewith—the one having the heading "Patience, Lady."

The twelve samples of the New Orleans car-card advertisements reproduced with this article give a good idea of the character of the copy used. A natural criticism of it is that it seems to be without object, or that it gives rise to the questions in the mind of the car riders, "What is the company after? What is all this leading up to?" This is what occurred to the writer, and Mr. Bleecker answered the criticism by saying that it *was* without object so far as any propaganda to the public was concerned. But he explained that there was a real object involved, and that was to demonstrate to the receiver and board of directors and to reaffirm his own belief that the public would read publicity concerning the street railway, that it would take an interest in the transportation problem and that it wanted to learn the facts. Having made this demonstration, the way would be paved for a constant publicity program with a definite object in view, if occasion demanded an object.

At the time of this writing Mr. Bleecker's belief in good publicity had been amply satisfied, for there was evidence on every hand of an unusual interest in railway affairs, and further, a disposition to concede the difficulties of the situation and to give the company a fair chance to work out its problems. Perhaps the announcement of the local advertising club, sent out when Mr. Bleecker had an invitation to address the club, gives as good an idea of the impression made by the company's publicity as can be had. This is reproduced herewith.



Who is this man Bleecker, anyway?

Who is he?. Well, say, let me tell you a thing or two about him. ¶This man Bleecker is six-feet-and-some of courage, [illegible] and energy.

He blew in here lugging a big crate of success along with him, and [illegible] the [illegible] job I ever heard of.

And he's getting away with it. Fine. Everybody says so, even while they are questioning his arithmetic, his psychology and a few other things he's noted for.

All the world loves a worker, and Bleecker is what the colored folks call "a workin' [illegible] chile". He bites it off in big chunks.

Bleecker is ready to let us all into the inside of his advertising, this "hit-em-between-the-eyes" stuff he's been getting out. He has chosen the Advertising Club for the [illegible].

He will give [illegible] at Kolb's, upstairs, Friday, January 23, [illegible]. ¶You are invited. But, accept quickly. Kolb's can't seat a million, and most that many will want to hear Bleecker.

Phone your reservation—and your friend's—by Friday, at 10 to Main 2184.

LUNCHEON [illegible]

[illegible] Chairman
ENTERTAINMENT COMMITTEE
Advertising Club of New Orleans

THE ADVERTISING CLUB'S ANNOUNCEMENT CONCERNING MR. BLEECKER

OTHER PUBLICITY ACTIVITIES

There are several other interesting phases of the publicity work being done by the New Orleans company. Considerable copy has been devoted to courtesy and accident prevention. In promoting courtesy among the trainmen, a book of "Supplemental Rules" was got out for employees and later printed in pamphlet form and distributed to the car riders. This had a fine effect on both public and men, each thereby taking a share in the responsibility for courtesy, although all of the supplemental rules were addressed to the trainmen.

The publicity work was also carried to the movie theaters. The company had several films made up to bring out in an interesting manner many thoughts about the street-car system. These were written along much the same lines as the copy used on the car cards. Eight such films were arranged for and they were shown at practically all theaters during a thirteen-week period.

The daily printed bulletins covering the Federal Electric Railways Commission hearings were sent by the company to a selected mailing list of 840 citizens from all walks of life. After this had been going on for some time some one sent back the bulletin and asked that his name be taken off the mailing list. This gave rise to the idea to write to all persons on the mailing list and ask if they were interested in the news of the hearings and whether they would like to continue to receive the bulletin. About 300 replies came back and 95 per cent of them were favorable and showed a very encouraging interest in the traction problems.

In connection with the many calls upon a street railway company for donations to an endless number of charity endeavors, the New Orleans company has held to the fixed policy that the receiver cannot make any gifts of money, but the company is doing everything possible to co-operate through special car cards, etc., in making all such movements a success.

All of these publicity activities combined have created a very envious interest and understanding in the street railway problems in New Orleans. Mr. Bleecker summed up the results by saying, with knowing exaggeration and yet well illustrating the tendency, that it had given him 420,000 inspectors—that being the population of the city.

Canada Contemplates Increased Electrification

THE Hydro-Electric Power Commission of Canada contemplates the construction of several high-speed electric lines in the Toronto district.* One line would connect Toronto, Hamilton and Niagara Falls, using single track between Toronto and St. Catherines with the exception of two double-track sections, each of 6 miles, in the vicinity of Toronto and Hamilton.

In a report to the commission W. S. Murray, consulting engineer of New York, estimates the cost of the 73-mile line from Toronto to St. Catherines at $17,498,635, with an additional $4,800,000 to cover rolling stock and substations, or a total of $22,298,635. This line would parallel the Grand Trunk Railroad, but, according to Mr. Murray, will not cause duplication because the facilities and location of the present road are inadequate to handle the traffic. Mr. Murray points to the fact that eight American roads are in contact with Canada at this frontier and only one road is available on the Canadian side. He also compares the Washington and Baltimore line, which has about the same distance with parallel roads, six tracks of steam and two tracks of electric, and shows that the present Canadian roads carry a density of traffic three times as heavy as the American installation.

Another radial line from Toronto to Bowmanville is proposed, as well as one connecting Hamilton, Galt, Guelph and Elmira.

The recommended scheme is for high-speed traffic on these radial roads out of Toronto with a terminal in Toronto connected with the city lines. The commission has the power to modify lines in existence and purchase others so as to operate at high speed in city streets. The district touched by these radials has had a very heavy industrial and residential expansion and the lines are expected to furnish more adequate transportation facilities. The City of Toronto will take over and operate the existing city lines in December, 1921, and Mr. Murray recommends the purchase by the commission of other radial interurban lines out of Toronto in order that all development may follow a co-ordinated plan.

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*See ELECTRIC RAILWAY JOURNAL, April 24, page 864.

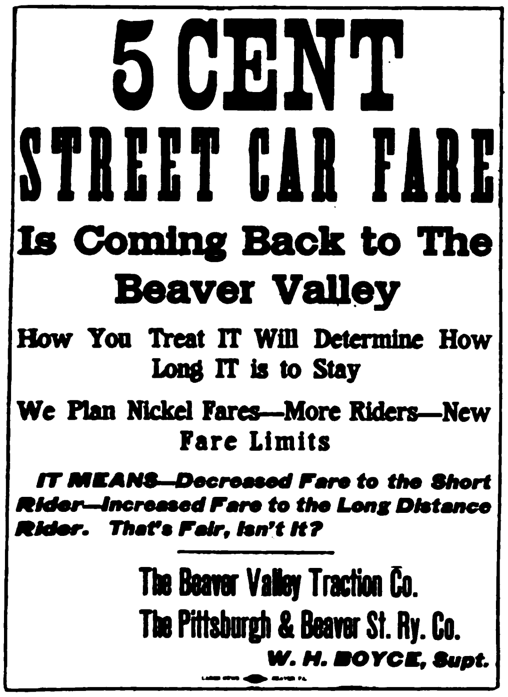
Merchandising Transportation

Attitude and Appearance of Employees an Important Item—Telephone a Direct Competitor of Electric Railway—Publicity an Essential Factor

By W. H. BOYCE
General Manager Beaver Valley Traction Company,
New Brighton, Pa.

TRANSPORTATION is a commodity and to merchandise transportation properly we must have satisfied customers. To this end we must have clean, courteous, obliging trainmen, operating clean, well-painted and well-maintained rolling stock over a comparatively smooth roadbed at intervals as frequently as experience proves the available traffic will warrant and at a speed as great as operating conditions will permit, "safety first" being considered.

At times, owing to conditions, our service has been so unsatisfactory that certain individuals were led to adopt other means of transportation, sometimes on account of the unreliability of the service, sometimes on account of the crowded condition of the cars, sometimes on account of improper maintenance of rolling stock or roadbed, discourtesy of trainmen or officials or increases in fare, which the short-distance rider was unwilling to pay but made necessary by changing conditions.



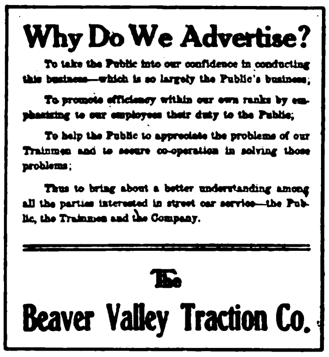
5 CENT
STREET CAR FARE
Is Coming Back to The Beaver Valley

How You Treat IT Will Determine How Long IT is to Stay

We Plan Nickel Fares—More Riders—New Fare Limits

IT MEANS—Decreased Fare to the Short Rider—Increased Fare to the Long Distance Rider. That's Fair, Isn't It?

The Beaver Valley Traction Co.
The Pittsburgh & Beaver St. Ry. Co.
W. H. BOYCE, Supt.



Why Do We Advertise?

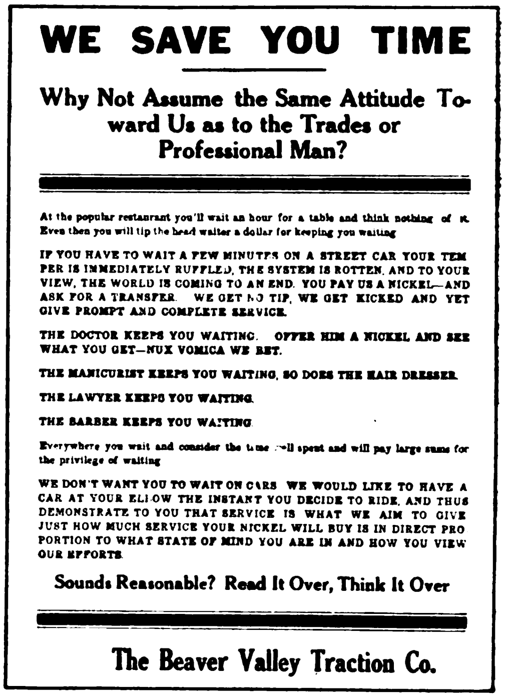
To take the Public into our confidence in conducting this business—which is so largely the Public's business;

To promote efficiency within our own ranks by emphasizing to our employees their duty to the Public;

To help the Public to appreciate the problems of our Trainmen and to secure co-operation in solving those problems;

Thus to bring about a better understanding among all the parties interested in street car service—the Public, the Trainmen and the Company.

The
Beaver Valley Traction Co.



WE SAVE YOU TIME

Why Not Assume the Same Attitude Toward Us as to the Trades or Professional Man?

At the popular restaurant you'll wait an hour for a table and think nothing of it. Even then you will tip the head waiter a dollar for keeping you waiting

IF YOU HAVE TO WAIT A FEW MINUTES ON A STREET CAR YOUR TEMPER IS IMMEDIATELY RUFFLED, THE SYSTEM IS ROTTEN, AND TO YOUR VIEW, THE WORLD IS COMING TO AN END. YOU PAY US A NICKEL—AND ASK FOR A TRANSFER. WE GET NO TIP, WE GET KICKED AND YET GIVE PROMPT AND COMPLETE SERVICE.

THE DOCTOR KEEPS YOU WAITING. OFFER HIM A NICKEL AND SEE WHAT YOU GET—NUX VOMICA WE BET.

THE MANICURIST KEEPS YOU WAITING, SO DOES THE HAIR DRESSER.

THE LAWYER KEEPS YOU WAITING.

THE BARBER KEEPS YOU WAITING.

Everywhere you wait and consider the time well spent and will pay large sums for the privilege of waiting

WE DON'T WANT YOU TO WAIT ON CARS. WE WOULD LIKE TO HAVE A CAR AT YOUR ELBOW THE INSTANT YOU DECIDE TO RIDE, AND THUS DEMONSTRATE TO YOU THAT SERVICE IS WHAT WE AIM TO GIVE. JUST HOW MUCH SERVICE YOUR NICKEL WILL BUY IS IN DIRECT PROPORTION TO WHAT STATE OF MIND YOU ARE IN AND HOW YOU VIEW OUR EFFORTS.

Sounds Reasonable? Read It Over, Think It Over

The Beaver Valley Traction Co.

SAMPLES OF ADVERTISING PUBLICITY USED BY BEAVER VALLEY TRACTION COMPANY

We have in the past overlooked many opportunities for keeping the patronage that we had and for increasing our patronage. We must merchandise our transportation after the manner of the merchandising of other commodities. This may be done by correcting as nearly as possible the existing evils already mentioned, by the use of newspaper and car-card advertising, by offering special rates for off-peak riding, which probably can be done in some localities in conjunction with motion-picture houses or mercantile establishments, etc. The zone system in some cases will bring results, the zones being made as short and the single-zone fare as low as possible, due regard being given to the difficulties of administering such a system and to the frequency of the fare collection.

We must also get closer to our customers. In the past it has been rather generally the practice to give our customers what we felt they needed, or what we could get away with. Now we must give them not only what they need but what they want and are willing to pay for. While conditions are not exactly comparable, there is much to be learned from the successful dry goods merchant, who has at the lingerie counter the type of garment that his class of trade demands, or from the catering of the motion picture proprietors to the tastes of their patrons. We can get closer to our customers in many ways—through the advertising already mentioned, through connection with civic movements of all kinds and through association with our customers in all places and under all conditions possible. It is highly important that we take an active interest in the work of chambers of commerce, rotary clubs and other organizations, civic, social and fraternal.

We must not overlook the fact that we are competing with the privately owned automobile, as well as the jitney, and with mail-order houses, telephone companies and all kinds of delivery systems. When a person sits down at home and writes an order to a mail-order house rather than go into the local market and make a purchase a potential street railway customer is lost. This is the case when the customer calls up a local dealer and orders his supplies by telephone. The business that is thus lost is considerable.

DATA INDICATE THAT TELEPHONE IS DIRECT COMPETITOR OF ELECTRIC RAILWAY

In December, 1919, the companies which I represent put into effect a zone system with shorter zones than those previously used. Formerly some of the zones had been as long as 6 miles, the minimum fare being 7 cents. At the time the change was made the territory was divided as evenly as possible into 2-mile zones, due consideration being given to local conditions, with the minimum fare reduced to 5 cents. A check made of what was actually occurring prior to the time of splitting up the zones showed that if patrons continued to ride as before, after the changing of the zones, the new rate of fare would produce an increase in revenue of approximately 20 per cent. Our December receipts actually showed an average daily increase of 6.22 per cent as compared with the November receipts; January as compared with December showed a decrease of 4.18 per cent; February as compared with January an increase of 0.35 per cent and March as compared with February an increase of 14.13 per cent.

The following inquiry addressed to the Bell Telephone Company under date of January 23 is of interest in this connection:

> From records that you keep would you be able to give me any information on the following:
>
> Does a change in the street car fare make any apparent difference in the number of telephone calls generally, or those to or from any particular firms?
>
> Aside from purchasing from grocery stores, meat markets, bakeries, etc., the daily necessities of life, is there any considerable quantity of telephone purchasing done, or do you have any means of determining that, either as a local specific case or from national data?
>
> I realize that you may not have any information directly along this line, but you can see what I am driving at, and if you have any information that will shed light on the relative positions of transportation and telephone companies when it comes to serving the shoppers, I would much appreciate having same.

This inquiry brought the following response from the Bell company:

> Replying to your letter of the 23d inst., I regret to advise that I am unable to furnish information requested.
>
> I might say, however, that the traffic load has increased very much during the past two months. We are unable to give any particular reason for this increase in telephone calls, as it does not apparently apply to any particular locality, but seems evenly distributed over the entire valley.

Inquiry under date of April 8 developed the fact that the telephone company experienced an increase of 35 per cent in traffic load, about evenly distributed among its local exchanges, for the months of December, January and February, while for the month of March the traffic load showed a decrease of 10 per cent. It will be recalled that in December, January and February we suffered a decrease in traffic, while in March our traffic increased materially. This would indicate direct competition between the railway and the telephone. This illustrates the fact that it would pay all of us to learn more of what is going on on the sidewalks and through the telephone exchanges and delivery systems, rather than to confine our inquiries solely to what is occurring on the car.

Our companies have for the past eight years done more or less advertising in the way of car cards and in the daily newspapers. This has, without a doubt, had an effect upon the merchandising of our transportation by reason of acquainting the public with the operating problems and difficulties which we must overcome. To these patrons would give little thought without having the facts called to their attention by the operating company. We have, through meetings with the trainmen, through letters sent to the trainmen and through our service code attempted and have accomplished some things in the way of making our trainmen realize that we are dependent wholly upon the good will and patronage of the public. A few extracts from our service code may serve to illustrate this:

> Increasing business on the street cars may sound funny to you, but it can be done. Every time you run past an intending passenger you create a feeling that results in his walking.
>
> Every time you are late, people walk.
>
> Every time you miss being at the depot stop when the train comes in people walk.
>
> Every fare we lose counts against you, as the fares pay your wages, and I get mine from the same source.

AMALGAMATED ASSOCIATION BELIEVES IN MERCHANDISING METHODS

We believe that the international officers of the Amalgamated Association of Street and Electric Railway Employees of America, too, now realize that there is something to the side of merchandising of transportation. In the November, 1919, issue of the *Motorman and Conductor* the following four paragraphs appeared on the editorial page:

> A merchant employs clerks to sell the line of goods in which the merchant is dealing. Not a very unlike employment to that of street car conductor.
>
> As a general proposition the salesmen on a street car whose business is to sell transportation gets better pay than the average store salesman. His craft is more effectively organized.
>
> What would be a street car conductor's opinion of a store clerk who refused to let him enter the store to make a purchase? Then can it occur to the conductor that this same opinion is formed of him in the minds of prospective passengers in whose face he shuts the door of his car?
>
> Let the street car conductor assume the role of a merchant whose clerks are inattentive to prospective patrons. What type of clerk would he presume he had? How long would he retain them in service? Assuredly, he employs them to sell his goods and not to drive prospective customers from his store. Yet the conductor holds a position identical with the store clerk. As a merchant, he would keep in his employ the live, efficient clerk.

Publicity stands alone in the question of merchandising. The type of publicity to be employed is the only thing necessary for consideration. Publicity itself is a necessity. Why not consider the advisability of a national campaign, setting forth the necessity for the street cars, their part in the community life and the benefits resulting to the community from their existence? Would this not be one way to help break down the present prejudice against public utilities? Would that not be a way to merchandise transportation? Why not a central bureau for the preparation of publicity material tending to set forth the advantages to the community of having an adequate street car service? The good to be accomplished by such a plan is unlimited.

A report from Japan states that a trackless electric car company has recently been organized at Osaka, for the purpose of providing trackless car service in various parts of the country. This is the first project of the kind in Japan.

Supplying Repair Parts to Shops

Canadian Railway Replaces Wornout Supply Car with Auto Truck—Sends Salvage Car Monthly Over Interurban Division

By W. G. Murrin
Assistant General Manager British Columbia Electric Railway, Vancouver

THE British Columbia Electric Railway operates 302 miles of city and interurban lines with a maximum distance between terminals of 80 miles. This includes three city systems, three connecting interurban lines and one long interurban line extending 64 miles eastward from New Westminster. The mileages of the various divisions are: Vancouver city division, 104; North Vancouver division, 10; New Westminster city, 18; first district intercity, 17; second district, 32; third district (Fraser Valley), 64; fourth district, 12; spurs, sidings and carhouse tracks, 45.

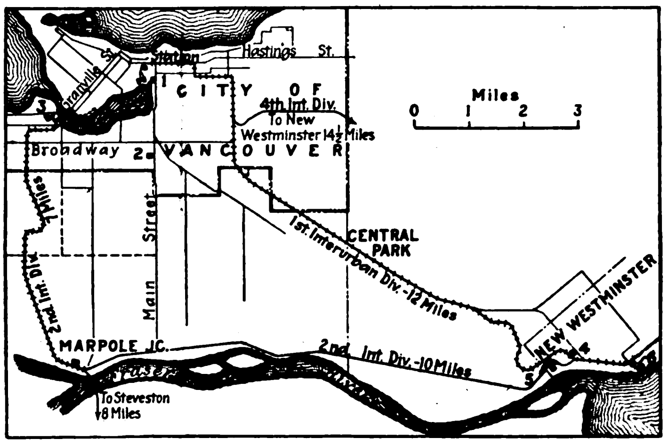
The accompanying map shows the Vancouver and New Westminster city divisions and two of the most important intercity lines of the interurban division. Some 11 miles of city line are in North Vancouver, across the harbor from Vancouver, and the 64-mile Fraser Valley division, with five interchange connections with transcontinental steam lines, begins at New Westminster. The bulk of the freight business is done in this section, called the third district, and in the section made up of the double-track line from Vancouver to Marpole, together with two single lines from that point, which constitute the second district.

The motive-power equipment for these lines consists of 880 cars of city and interurban passenger, express, locomotive and freight types. These, together with such freight cars from foreign lines as require attention, are maintained by the mechanical department. Motor equipment is distributed to seven carhouses. The Vancouver city division, with 220 cars, occupies the Prior Street and 13th Avenue shops; Kitsilano (also in Vancouver), takes care of fifteen cars operating on the second interurban district, and fifteen cars are at North Vancouver. The remainder of the equipment, with the exception of such trains as spend the night at Chilliwack, the eastern terminus of the third district, are looked after at New Westminster. At present there are in service 237 city passenger cars, sixty-one interurban passenger cars, eleven express cars, four locomotives and nineteen service motor cars. The freight equipment comprises 410 standard cars and a number of maintenance-of-way and construction units, all of which, together with a considerable and varying number of foreign cars, are scattered over the interurban lines.

FACILITIES FOR MAKING REPAIRS

Light repairs are made at the different change points and the overhauling and heavy repairs are done at the repair shops in New Westminster, where there is a large sorting yard. All freight equipment is handled under the American Railroad Association rules. The general repair shop and stores are at the Prior Street yard in Vancouver, which is centrally located. Daily and other periodical inspections, and light repairs, such as the replacing of armatures, bearings, trolley wheels, brakeshoes, control equipment, etc., are carried out at the other carhouses. Truck and wheel overhauling, body repairs, painting and general overhauling are all done at Vancouver, where suitable machinery is available. Many of the repair parts which can be made up in lots more economically at one time are made at Vancouver and supplied to the other shops as required, a subsidiary store being maintained at each carhouse. This system is made practicable by a regular weekly transfer of supplies between the general shop and the different carhouses, which was done until recently by a supply car. This car was of an old type with flat body which had ample room for shipments, but it reached a condition where repairs would have cost more than the car was worth. It was therefore retired and replaced by a 2-ton motor truck, good paved roads to all points being available. This supply truck leaves the Prior Street general shop every Thursday, calling in turn at 13th Avenue, Kitsilano and New Westminster, returning after a final call at the New Westminster freight shed, where materials for points along the Fraser Valley line are left to be taken by the regular express trains. Supplies for North Vancouver are taken by trucks by way of a ferry at intervals as necessary.

At each carhouse all defective or damaged material is collected and replacement parts are left, together with such other supplies as have been requisitioned by the foremen and are shipped from the general stores. Armatures are shipped in special boxes equipped for easy handling by slings and cranes. Each armature has a tag attached to it on which are indicated the defect found and the reason for sending it to the repair shop. After arrival at Vancouver the equipment is tested and repaired and it is then returned to the carhouse or another piece in good repair is substituted. The repair tag, with details of all repairs made, is forwarded to the car-record office at the head office. Other defective apparatus is accompanied by a "repair or replace" work order. The material to be repaired or replaced is distributed to the Vancouver shop and the original of the order, signed by the foreman originating it, is returned to the issuing foreman with the necessary material. No material is taken by the supply car unless accompanied by such work order or shipping bill. Thus, every piece of apparatus sent in by outside foremen is accounted for and either returned, repaired or turned in to the stores.



MAP OF BRITISH COLUMBIA ELECTRIC RAILWAY SYSTEM

1. General repair shop, Prior Street. 2. Vancouver carhouse, Thirteenth Avenue. 3. Interurban carhouse, Kitsilano. 4. Carhouse and shop at New Westminster. 5. Freight repair tracks.

SOME OF THE ADVANTAGES OF THE SYSTEM

One advantage of this plan is that it enables the foreman in each repair shop to accumulate pieces for repair until a man or machine can do the work in quantities and so reduce the unit cost. The saving as compared with doing this work at the outside shops in many cases is as much as 50 per cent. For example, at the freight repair track a large number of handhole covers, sill plates, steps, etc., are used. The manufacture of these formerly took most of the time of the blacksmith employed at the repair track, and when made they cost much more than when forged in quantities under a power-hammer with suitable dies at the general repair shop.

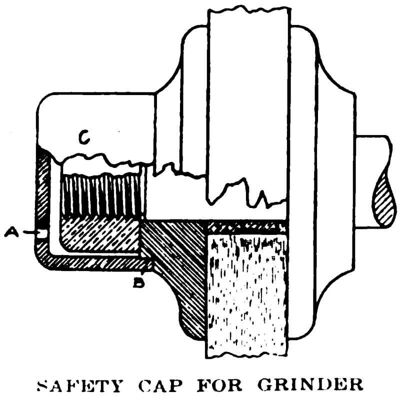
The foreman at each shop now knows that he can depend on getting his supplies regularly by the supply car and assembles the material which is to be returned, makes out his work orders and ships all equipment. At the same time he replenishes weekly his subsidiary stores, which are kept in sufficient quantities to insure efficiency without excessive stock. All material necessary for such emergency repairs as can be economically made at the outside shops is kept on hand. In case of serious breakdowns, when it would be necessary to return the car complete to Vancouver, the damaged material would of course be loaded on the car and forwarded with it.

Generally speaking, it has been found that this regular weekly distribution of supplies, with its simple but efficient system of ordering and receiving them without the work of making out way bills, as would be necessary if shipped by regular freight or express, has relieved the foreman of much unnecessary work and worry and has resulted in improved efficiency and economy.

A similar scheme is in effect on the interurban division, which has produced surprising results. For transporting the material, a car is attached to the way freight which makes trips once a month over each of the interurban lines. This gathers up all material lost or dropped along the right of way, such as brakeshoes, bolts, nuts, trolley poles, etc. Frequently, on inspection, something is found missing from a car, with no reports as to what became of it from the train crews. Later, the missing parts will come in on this "pick up" car. The aggregate value of material thus salvaged in a year more than repays the cost of operating this car.

Safety Cap for Grinder Nut

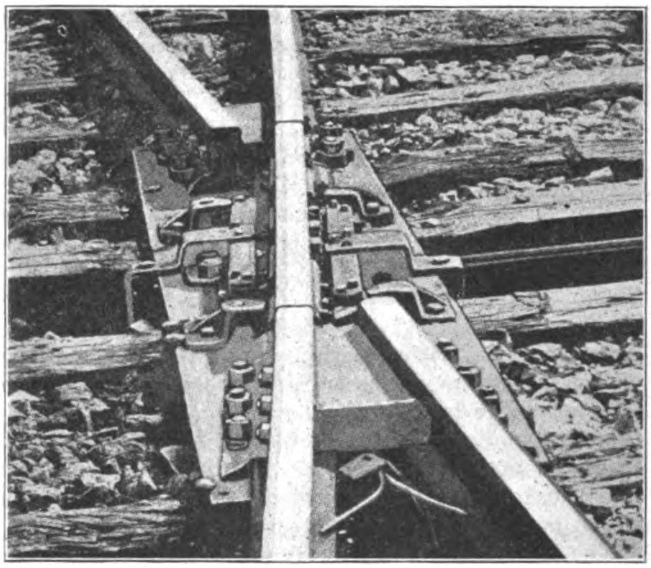
THE weekly news letter of the National Safety Council for May 10, 1920, gives a description of a cap for covering the nut on grinder spindles, as devised by C. R. Underhill of the Peerless Wire Fence Company, Adrian, Mich. In the accompanying illustration the cap *C* is fastened by a thread at *B*, which is cut in the washer on the spindle. This must be left hand or right hand, the same as on the spindle. A pair of holes are provided at *A* for the use of a spanner wrench in screwing the cap on or off. This should be valuable where the work must be done on the side of the wheel where the nut is located and where it is impossible to provide a hood with a side piece to cover the nut.



SAFETY CAP FOR GRINDER SPINDLE NUT

Frogless Switch Improved in Design

THE frogless switch made by the Walls Frogless Switch & Manufacturing Company, Kansas City, Mo., was pictured and described briefly in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 6, 1917, page 44. Since that time the design has been greatly improved to assure absolute certainty of setting. The operating mechanism has also been redesigned as seen in the accompanying illustration. As now constructed, the section of rail at the frog is either mechanically or electrically interlocked with the switch signal so that the clear signal cannot be given until the frog has been locked in one position or the other.



INSTALLATION OF FROGLESS SWITCH ON THE KANSAS CITY, CLAY COUNTY & ST. JOSEPH ELECTRIC RAILWAY AT NORTH KANSAS CITY, MO.

The operating mechanism now comprises a four-arm bell crank mounted underneath a ¾-in. x 20-in steel plate on which the frog is mounted. Two arms of this crank are connected to two rods from the switch stand or signal tower and the other two arms are connected to two slide bars, one on either side of the rail. These bars engage with two steel rollers in such a manner that as the bars slide along the rail, a cam or wedge action between bars and rollers causes the rail section to shift from one position to the other. It is claimed that the wear resulting from the shifting of the frog from one position to the other is exceedingly small, and that it can be taken up by the use of slightly larger rollers after long service if a certain amount of play develops.

Drum-Contactor Controllers

THE Westinghouse Electric & Manufacturing Company has perfected a design of manually operated drum-contactor controller which embodies practically the same principles of operation as its magnetic-contactor type controllers. They are used for starting and adjusting the speed of shunt, series compound-wound motor by cutting in or out resistance in series or parallel with the motor armature. The contactors are operated by cams mounted on the controller shaft and line contactors which open and close the main line circuit and are protected by magnetic blowouts.

Each contact element is complete in itself and can be removed as a unit. The stationary and moving contacts are identical and are interchangeable with those of the company's auto starters and magnetic-contactor controllers.

All controllers are drilled and tapped for both a horizontal and vertical handle and can be supplied with either. The controllers will operate when mounted in any position, as the contactors are spring-actuated and their operation is not affected by gravity. Controllers for use with crane hoists regulate the speed of the motor while lowering by dynamic or regenerative braking. They are also designed so that if there is not sufficient weight on the hook to rotate the motor and drum the motor will assist in lowering.

Machine for Filling Snow Sweeper Brushes

Machine Built in the Shops of Cleveland Railway Has Effected Marked Economy in the Filling of Rotary Brooms

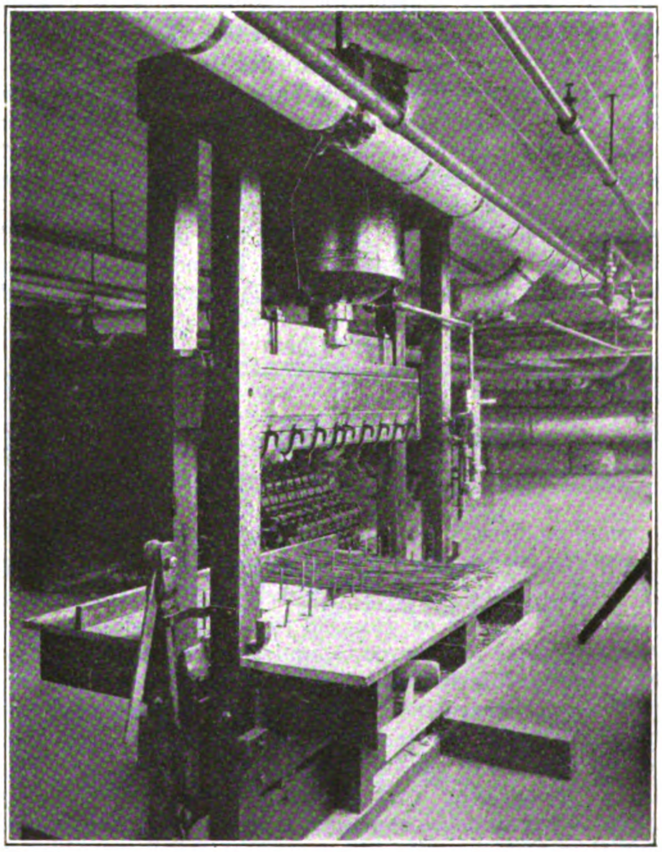
IT USED to take one man an hour and a half to put the rattan in a segment of the rotary brushes used on snow sweepers. Now the Cleveland Railway Company has designed and built a machine at the Harvard shops which makes it possible for one man to fill ten brush segments or more in an hour. The work which has made this economy and the ability of the shop to keep ahead of replacements during long snowstorms possible involved not only the design of the brush machine itself but also a redesign and rebuilding of the brush holders on the sweepers.

The brush machine consists of an air-operated press having a bed and beam designed especially for making these brush segments. A 20-in. x 20-in. cylinder, which was available, though its 7-ton capacity at 95-lb. air pressure probably is greater than needed, is bolted through the concrete floor above the basement where the machine is installed. A special wooden beam is attached to the piston and this may be raised and lowered by means of the shop air pressure controlled by an ordinary trainman's valve, two 4-in. x 4-in. oak timbers forming the vertical guides for the beam.

In the bed of the press is a groove of the proper size and shape to receive a galvanized pressed steel shell which forms the back of the completed brush segment. A layer of rattan of 30-in. lengths is then laid evenly across the bed of the press and, by means of a guide board at the back of the bed, centered over the shell.

Then a maple bar 2 in. wide at the top side, 1¼ in. wide at the bottom side and 2 in. deep, which has been fitted with ten cast brass hooks, is fastened to the bottom of the beam of the press and held in position by means of a short length of chain at either end. Air is then admitted to the cylinder, and as the beam comes down it forces the rattan down into the shell and turns the ends upward on either side of the maple bar. When the piston has traveled its full length downward the brass hooks on the bar spring over the rounded or rolled edges of the shell, engaging it and holding fast. Possibility of these hooks becoming disengaged from the shell is overcome by putting four large cotter pins behind the shell in holes in four of the hooks cast with a projection to extend through slots in the shell. This completes the making of one brush segment. If it sticks in the groove in the bed of the press the lever seen at the left of the accompanying photograph provides a cam action, one at either end of the groove, which very quickly pries the brush up and out.

Steel pins placed opposite each other along the groove in the bed of the press serve to separate the rattan so that there will be space for the hooks on the maple bar to move down through the rattan and engage the shell. It is claimed that there is less leakage of the rattan and that the brushes have a longer life when made with this machine than when made by hand, probably due to the elimination of malleting the rattan into place and to the fact that the bend in the rattan is not quite so sharp. The rattan is of course softened before it is made up into the segments by steaming it in a 30 in. diameter by 36-in. high cylinder connected to a steam hose. Another advantage of the machine is that it is possible to use up short pieces of rattan by mixing them in with the pieces of regular length.



PRESS FOR MAKING SWEEPER BRUSH SEGMENTS, SHOWING SHELL, BAR WITH BRASS HOOKS AND RATTAN IN PLACE READY FOR PRESSURE TO COMBINE INTO A BRUSH SEGMENT

The shell which forms the back of the brush segment is made out of one piece of sheet steel, except for the two ends, and bent into a U-shape with the edges rolled. The ends of the shell are filled in with brass castings on which there are three ears for riveting the end piece to the steel shell.

The brass hooks on the maple bar which forms the inner backbone of the brush are shaped in the form of a loop with the hooks extending out from the top side. These are put in place by slipping them over the end of the bar. Four of the ten hooks per bar also have a projection at the bottom which, as previously mentioned, extends through the shell and permits of the cotter pin or key being inserted to keep the shell and maple bar from separating.

In order to make use of this new type of brush segment it was necessary to provide a new means of fastening the segments onto the rotary brush holders. This was accomplished by substituting for the old holders three castings of similar but different design for holding the two ends and centers of the four brush segments making up a brush. The casting at the outer end of the brush provides four pockets into which the backs of the four segments fit. This casting has a flange which prevents the segments from shifting sideways and a rim which prevents them from flying out centrifugally as the brush revolves. The center casting provides simply four pockets in which the four segments rest, bracing them as the brush rotates against the snow, but this casting has no flange or rim. The casting at the inner end of the brush also provides four pockets for the brush segments and has a flange for preventing any lateral movement of the segments but no rim. At the center and inner-end casting a split band hinged at one side and bolted together at the other is used to clamp the four segments in place.

To remove a segment it is only necessary to remove the two bolts holding these two clamps, open the clamps and, with a radial pull at the inner end of a segment and a slight lateral movement toward this end, lift the segment out of the holder. A new segment is then inserted by first putting the outer end in place against the rim of the outer casting and by moving the other end toward the axis to its position in the center and inner-end casting.

Association News

I. C. C. Brief on Rates

AS CHAIRMAN of the committee on national relations of the American Electric Railway Association, Charles L. Henry on June 28 presented a statement to the Interstate Commerce Commission on the position of the electric interurban railway companies in connection with the proposed increase in rates, both passenger and freight, by all carriers coming within the provisions of section 15a of the interstate commerce act.

In the opening part of his statement, Mr. Henry pointed out that the commission has not yet determined whether electric railroads or any of them come within the provisions of this act, so he confined his arguments to the effect of rate increases of railroads in general on the electric railways. The apparent policy of the steam railroads at the present time, he said, is to increase their freight rates only, leaving their passenger rates without increase and absorbing by their freight increases a necessary and certain loss in passenger operation, but the establishment of this practice and the necessary inclusion of electric railways within it would be unfortunate for the latter. More than 60 per cent of the electric railways derive from 60 to 85 per cent of their revenue from passenger business, so that they cannot absorb in 15 per cent of their gross business substantial losses incurred in 85 per cent of it.

Mr. Henry called particular attention to the loss in the so-called suburban passenger business of many steam railroads, citing as an illustration the low rates at which the passenger business on the steam railroads in the Chicago territory was carried. On five of the principal steam railroads in this territory an investigation made in 1919 showed in 1918 a loss of $1,685,000, exclusive of operating expenses for the use of terminals and equipment, for taxes and for depreciation. With all legitimate items charged in, except depreciation and traffic expenses, the loss in 1918, according to Mr. Henry, was $5,800,000.

Electric railways, Mr. Henry said, are facing the problem of increased expenses, more particularly for labor and material, and, in his opinion, unless passenger as well as freight rates are increased the declared purpose of the transportation act will fail and one substantial branch of transportation in the United States will be forced into inefficiency and finally into insolvency.

Information Recently Compiled

THE following reports and compilations have been prepared by the bureau of information and service of the association:

Report on possibilities of increased fares and effect of other forms of competition.

Summary of power station costs per kilowatt-hour, segregated on the basis of fuel, labor and maintenance for a number of railway properties.

Life of railway motor wearing parts, a summary of replies to data sheet No. 199.

Experience of railway companies and equipment failures due to recent severe winter, a summary of replies to data sheet No. 202.

In addition, the standard compilations on wage rates of trainmen and cities having increased rates of fare have been brought up to date.

The report on cost of living studies will also be maintained up to date hereafter and will include the latest reports and index numbers of the various national agencies, showing the changes in cost of living and wholesale and retail prices of commodities.

Letter to the Editors

Infringement of Contactor Patents

NACHOD SIGNAL COMPANY, INC.
LOUISVILLE, KY., June 24, 1920.

To the Editors:

In a recent issue of your paper you published an article describing an overhead trolley contactor made by an electric railway for its own use in connection with the operation of a highway crossing signal. The contactor described is substantially like the contactor made by the Nachod Signal Company and covered by United States patents, dated May 18, 1909, and May 9, 1911.

Electric railway managers should know that the manufacture of a patented article by the railway itself, even for its own use, is illegal and constitutes infringement. In some cases manufacturers hesitate to institute suits on account of the good will of the customer and because the amounts involved are not large, but the duplication of patented articles is manifestly unfair to those who put their time, energy and resources into the development of such devices and it will retard their design and manufacture.

CARL P. NACHOD, President.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

New Orleans Men Strike

Went Out Just Before Holiday in Effort to Enforce Compliance with Their Demands

The trainmen of the New Orleans Railway & Light Company, New Orleans, La., went on strike on July 1. The men lost a great deal of public sympathy by their arbitrary action in voting to strike after the heads of the commercial bodies, financial institutions and labor organizations had appealed to them to remain at work until the pending difficulties could be looked into and measures of relief reached by the intervening business men.

RECEIVER THROUGH WITH UNION

The men even neglected to make answer to the communication of the business men appealing to them to defer taking drastic action until time had been given the public to look into the merits of the controversy, namely, a wage of at least $150 a month for platform men, an eight-hour day and six days' service a week. Subsequently, the men approached the citizens' committee with a proposition for a hearing, but the request was denied them unless the men voluntarily returned to their work and awaited the investigation that had been promised them by the committee. Receiver O'Keefe at this juncture announced that the men would be restored to their positions, quite cheerfully, if they had not given offense to the company and were competent, but they would have to make application as individuals. He was through with the union.

Then followed an order from Rufus E. Foster, Judge of the New Orleans District Court, in which he commanded the receiver to resume operation, laying down certain rules which would make for an adjustment of the trouble after resumption of traffic. In this order the union was not specifically mentioned.

Judge Foster on July 5 again advised the men to go back to work. He said they would be restored to duty by the receiver, no discrimination being made against the union. He added that he would recommend the receiver to apply to the Commission Council for an 8-cent fare. The Commission Council planned to meet on July 6, and it was expected that body would take the matter up for consideration provided the men had resumed work.

Judge Foster's efforts to settle the differences amicably have been disregarded by the union and the strike was still in progress on July 9. The men now are willing to drop the matter of a wage increase if given a contract at the old rate pending an investigation by a committee of citizens. The receivers, on the other hand, demand the men return to work by July 12 on threat of forfeiture of deposits and positions. It is alleged that the Central Trades and Labor Council will take up the matter of ignoring the union. Conditions are improving daily.

In 1915 the maximum wage paid the trainmen was 24½ cents an hour. Since then wages have been increased 73 per cent. The receiver offered an increase of 22 per cent, making a total of 108 per cent increase since 1915 with which to meet an increase of 93 per cent in living costs in the South, according to United States Government reports. The additional increase offered by the receiver was based on an increase in fare from 6 cents to 7 cents or 8 cents. A fare of 10 cents would be necessary to comply with the demands of the men.

$5,000 for a Car Design

Engineers and others possessing the requisite technical knowledge are invited by the County Council of London, England, to submit designs for a new type of electric car for its tramways. The competition is open to persons of any nationality. Whether or not you are a resident in Great Britain you may enter the competition. No person in the service of the Council will be eligible to compete.

The designs will be judged by A. L. C. Fell, general manager of the council's tramways, and an engineer nominated by the President of the Institution of Civil Engineers. The conditions of the competition provide for the award of a prize of £1,000 to the winner.

The designs accompanied by the necessary reports, specifications, etc., must be delivered at the competitor's own expense not earlier than Nov. 1 and not later than Nov. 30, 1920. Applications for conditions, plans, etc., relating to the competition should be addressed to the General Manager, London County Council Tramways, No. 23 Belvedere Road, London, S.E.I.

On the payment of a sum of two guineas competitors will be furnished with a general drawing of the type of car at present in use on the London tramways system and the more important particulars relating thereto. This amount will be returned to each competitor who submits a bona-fide design and does not subsequently withdraw the same and also to any person who, on the receipt of the conditions, etc., decides not to compete and returns the copy of the drawing, etc., within two weeks.

Ten-Cent Wage Increase

Men in Davenport Awarded Advance By Majority of Arbitration Board

Increased fares over the present 7-cent charge will be necessary to meet the increased labor cost saddled on the Tri-City Railway, Davenport, Ia., by a board of arbitration which returned a finding for a 16⅔ per cent increase in the wages of trainmen last week, President B. J. Denman of the traction lines states.

REPORT NOT UNANIMOUS

The arbiters were not able to return a unanimous report. A majority report signed by Charles Reagan, editor of the *Tri-City Labor Review*, and Franz Swanson, city sexton of Moline, Ill., held the men were entitled to a 16⅔ per cent, or 10-cent an hour, wage increase. The old maximum scale was 60 cents an hour. The new maximum is 70 cents an hour and retroactive to June 1.

The full scale calls for 60 cents the first six months, 65 cents the second six months and 70 cents for twelve months and over. The old scale was 54, 57 and 60 cents an hour. Three of the shop trades are also increased, curve and switch tenders from 44 to 50 cents, armature helpers from 48 to 50 cents, car placers from 49 to 50 cents an hour. Sixteen other shop and track crafts are left at the old scale.

The shop crafts that did not come in for the increase are asking a readjustment and it is possible that the total increase will be spread pro rata throughout the entire union membership. This is a matter for the union and not for the company to settle.

The 70-cent scale applies to both the city and interurban lines of the company. The men's original demands were for $1 an hour on the city lines and $1.05 an hour on the interurban lines.

THIRD MEMBER AGAINST INCREASE

The third member of the board of arbitration brought in a minority report which holds the trainmen not entitled to an increase unless one-man cars are installed, in which contingency he gives them a flat 5-cent an hour increase.

This minority report was submitted by C. E. White of Deere & Company, Moline, Ill., an experienced executive in manufacturing. He stated in his finding that there is no justice in "a course that will compel the people to pay this advance (in fares) whose yearly income is less than that of the men in question" (the trainmen).

Preparing for Toledo Vote

Brief Review of Traction History Leading Up to Vote Which Is to Be Held on Aug. 10

Citizens of Toledo, Ohio, are facing a municipal ownership plan of acquiring and building a new transportation system when they go to the polls on Aug. 10. This is the only solution that has been laid before the people since the famous "ouster" proceedings nearly a year ago brought the battle of a quarter century to the front as most important of Toledo's civic problems. A commission, appointed by Federal Judge John M. Killits, drew up the present municipal ownership plan, which was passed by Council in twin ordinances, one providing $3,000,000 with which to acquire and $4,000,000 with which to construct a transportation system.

THE plan of the commission, not written into the ordinances but freely circulated, is to use the proceeds from these bond issues to obtain an auxiliary motor bus system at first, then condemn the choice lines of the present railway system, tell the company to remove the others, and proceed to add extensions and build a new system.

General Credit Bonds Planned

The bonds are thirty-year 6 per cent general credit bonds having the entire taxing power of the city behind them. Council is authorized to spend the money, having more or less *carte blanche* authority granted by the ordinances.

A cost-of-service plan was also drawn to be submitted at the same time as municipal ownership, but the railway officials were unable to agree on valuation with the members of the commission. The completed ordinance was filed with Judge Killits. He may submit it to Council with a valuation agreeable to all parties this coming week. It cannot be voted upon at the same time as the municipal ownership measure if that action is taken.

The coming election will mark one of the possible terminations of a long struggle between the city and the Toledo Railways & Light Company. The Doherty interests took over the properties at Toledo in 1913 after a few of the franchises had expired. There had been other franchise negotiations on for some time in an attempt to get renewals of contracts. When all the grants had expired, the Toledo Council passed a 3-cent fare ordinance which the company failed to recognize. This later furnished the grounds by which the case was taken into Federal court and the company was authorized to collect adequate fare and the car riders were assured of service through a fund administered under the direction of the court. The court still maintains some of the jurisdiction held by the old case.

Railway Problems an Old Story

Several city administrations have promised to settle the railway controversy and provide extensions for the growing parts of the city. It was the ambition of Mayor Cornell Schrieber which brought on the famous "ouster" ordinance last November. At that time the people ratified an ordinance ordering the railway from the street. When the company obeyed the city asked to have the cars brought back.

Leading up to the vote on Aug. 10, at which time the municipal ownership ordinance will be submitted, the significant steps in the process of settlement may be summarized as follows:

During the operation of the ouster ordinance the company circulated petitions to initiate a Tayler-plan grant. They were freely signed, but the measure was never submitted.

Judge Killits appointed two commissions to submit to the people two plans—one a cost-of-service measure and the other providing for municipal ownership.

The railway lent to the city a fund of $25,000 with which a valuation might be made. Service Director Goodwillie with Messrs. Riggs and Ballard turned in a valuation of $7,111,336 based on 1914 prices and recommended the city to stand for this price on the property. The valuation they offered at present prices was in excess of $12,000,000.

In February the city attempted to have passed in the State Legislature a bill known as the Brach Bill granting to cities the specific right to use general credit bonds to purchase utilities. This was passed by the House sixty-seven to six, but was lost in the State Senate.

In March of the present year a test case was brought before the Supreme Court to determine if cities under their own charters had the privilege of issuing general credit bonds to buy transportation systems. The court decided that cities had the right, and the Toledo commission prepared to write an ordinance providing for municipal ownership of the street railway system.

Meanwhile the members of the cost-of-service commission had been hard at work and were jockeying with the price of power, valuation, maximum fare and other provisions. A tentative draft was objected to in writing by Mr. Doherty.

Road Offered by Owners for $11,000,000

Mr. Doherty offered to sell his lines to the city for $11,000,000 on a time payment plan, in answer to a request of the municipal ownership commissioners. He wanted 20 per cent in cash.

April 3 was the date of the second suspension of car service when a strike of employees tied up the system. The company had been collecting 6-cent fares with 2-cent transfers previous to this time. When the platform employees and electrical workers asked increases from 42, 44 and 46 cents an hour to 54, 56, and 60 cents an hour, the company replied that a fare increase was necessary. The cars were operating under the joint auspices of the federal court and the ordinance suspending the ouster. Council refused to grant fare increase. At the end of four days, Judge Killits ordered the cars to resume with 7-cent fare, 2-cent transfer, tree tickets for 20 cents and the increase for the employees. He provided the alternative of appointing a receiver and operating the lines himself. David Friday, of the University of Michigan, had audited the company's books and told the city that the increase was necessary.

An inquiry into the affairs of the Rail-Light was planned by the court, but neither the city nor the company made any application for a hearing.

On April 30, the last day for the cars to run under the agreement of Council and federal court, the company filed a cross-bill in the court asking for 10-cent fare, 2-cent transfer, and statement of the company's rights on the streets. This case has never been heard by the court. It may come up on thirty days' notice by the company. The petition says the property of the company is worth $15,000,000; it declares the Miller public utilities abandonment law of Ohio unconstitutional, and asks that the company be allowed to remove its equipment from the city if the 10-cent fare is not granted as asked.

Council immediately passed a $20,000 fund to hire legal and engineering advice in a fight against the 10-cent fares. Socialists in Council opposed the expenditure of any money in fighting the company.

The municipal ownership commission announced that it would recommend the purchase by the city of $2,000,000 of motor buses so that a system of transportation would be available in case the railway did cease to operate at any time.

Valuation was agreed to be the final issue in the cost-of-service plan. It never was agreed upon. Mr. Doherty offered to agree upon $8,400,000 if all other points were yielded and full support was given by all people. Otherwise he asked $9,000,000. The Milner commission would not go beyond $8,000,000. The disagreement was final and the ordinance was delivered over to Judge Killits, who appointed the commission.

The ordinances offered by the municipal ownership commission were submitted to Council and passed twice to conform with charter regulations and state statutes. They will go on the ballot Aug. 10.

The issue seems not to be for or against buying the present railway system. It appears to be the aim of the commissioners to put the Doherty interests out of business. They intend to buy only a small portion of present lines by condemnation and throw out the rest. The bus feature also tends to provide competition. The voters will be asked to hand over to the Council $7,000,000 to provide a transportation system.

Litigation Predicted

The generality of the ordinances and the piecemeal plan of condemnation of lines have led to predictions on the part of many of the leaders in both sides of the fight that the question will finally end in a multiplicity of litigations. There is not much doubt about the passage of the ordinances. The abstract question of municipal ownership of the railway passed before by a large majority and political sentiment has been increasing toward the public ownership view.

Duluth Abandons Wage Raise

Defeat of the 6-cent fare ordinance at the recent city election has obliged the Duluth (Minn.) Street Railway to abandon its plans to grant employees an increase of 10 per cent in their wages. Herbert Warren, vice-president and general manager of the company, has so informed the committee representing the Employees' Athletic & Protective Association, which demanded a 20 per cent increase.

The committee called attention to the fact that the wages of employees of the company were lower than those of men in other occupations in the city and in some instances lower than men in electric railway work were paid in other cities. Since the defeat of the 5-cent fare, many of the men have said they will have to seek other and more remunerative employment.

Mr. Warren stated that the company had fully expected to share with its employees any increase in revenue received as a result of the increase in fare. He stated that the officers of the company had gone so far as to agree, some days prior to the election, upon a definite plan of increase in wages to be announced in a bulletin and to become effective on July 1, in the event of the passage of the ordinance.

Twenty Per Cent Advance

Arbitrators at Scranton Award Trainmen Sixty-Cent Maximum Wage Scale

Under the award of the majority of the arbitrators chosen to pass on the wages and other working conditions of the employees of the Scranton (Pa.) Railway the maximum scale of pay for trainmen is fixed at 60 cents an hour. This is an increase of 20 per cent. Since the majority of the motormen and conductors have been in the company's service sufficiently long to come within the provisions of the maximum hourly scale, most of these men will get 60 cents an hour. The mechanical workers have been awarded a 12 per cent advance.

POINTS AT ISSUE STATED

The questions at issue before the board as explained in the award were:

> 1. What rate of wages should be awarded to motormen and conductors.
> 2. Whether or not time and one-half should be paid for all time worked on the following days: Decoration Day, Independence Day, Labor Day, Christmas Day and Sundays.
> 3. Whether or not eight hours should constitute a day's work for all motormen and conductors.
> 4. Whether or not any change should be made in the classification of employees in the shops of the company.
> 5. What rate of wages should be awarded to barnmen, shopmen, power house men, trackmen, and any other miscellaneous employees who are members of the association.
> 6. Whether or not the employees should be paid once a week, instead of semi-monthly as at present.
> 7. Whether or not eight hours should constitute a day's work on all work done in the track department.
> 8. What overtime rate should be paid to barnmen, shopmen, power house men, trackmen, and any other miscellaneous employees who are members of the association.

The wage award of the board follows:

> To motormen and conductors for the first three months of service, 50 cents an hour; for the next nine months of service, 55 cents an hour; after one year, 60 cents an hour.
>
> To all other employees, who are members of Division 168, Amalgamated Association, 12 per cent increase over their present wages, whether paid by the hour, day, week or month.
>
> Back pay of each class of employees shall be allowed on the basis of the wages awarded above from April 1, 1920, and on the basis of the actual earnings of the employees.
>
> The company shall be allowed ninety days from the date hereof for the payment of the back pay.
>
> In case of any disagreement as to the construction or application of this award the same shall be submitted to William J Tracey, chairman of this board, and both parties shall be bound to carry out his decision.

Relative to the demands other than that for increased wages the majority of the board states in part:

> We have not awarded the eight-hour day here, although we believe in it in principle, because it does not seem, under the peculiar conditions existing here, that an eight-hour day could be awarded at the present time.
>
> In awarding the employees a substantial increase in wages we have not seen fit to place any other additional burdens upon the company.
>
> CLASSIFICATIONS UNCHANGED
>
> We have not changed the classification of the barnmen, shopmen, power house men and trackmen, because there was not enough evidence before this board to enable us intelligently to do that. But, in view of the conflicting claims of the employees and the company with respect to these classifications, we earnestly recommend that they should themselves attempt to solve this question.
>
> We are not attempting in this award to pass upon the merits of any controversy between the company and anybody else except its employees, who are parties to the agreement for arbitration. But there has been a general tendency throughout the country in the last two years to recognize the fact that these companies must be helped and not hindered in their work, and we have before us evidence in many cities of the help of municipalities and states to street railway companies.

In its award the arbitrators deal at length with the claim of the men for increased wages so that they may be able better to make a winning fight against the high cost of living.

Akron Men Quit

The employees of the city lines of the Northern Ohio Traction & Light Company at Akron, Ohio, walked out on the morning of July 6. Interurban cars continued to operate, but they passed through the streets of the city with doors closed.

A board of arbitration recently granted the men an increase in wages on condition that the city make the rate of fare sufficiently large to cover the additional expense. The men at once urged that steps be taken to make it possible for them to receive the increased wage.

A compromise offer was made by the city and considered at a conference between officials of the company and the public utilities committee of the Council on July 3, but nothing was accomplished at that time.

Akron has had plenty of time to consider an increased rate of fare. The company asked and was granted a rate of 6 cents two years ago by the City Council, but the legislation was defeated in a referendum vote. Since then the company has been endeavoring to secure a rate that will enable it to pay its men higher wages.

Two months ago the men asked for an increase in wages. The company refused on the ground that its income was not sufficient to pay higher wages. Finally the company and the men agreed to submit the matter to arbitration. The three men selected to render a decision fixed a material increase in wages, but said that their award could not go into effect until the city had granted a higher rate of fare.

The Council of Akron adopted a resolution on the evening of July 7 giving the company thirty-six hours to put cars into operation. Court action was threatened in case of failure to resume service. Manager Blinn said the company was trying to induce the men to resume work at the present scale pending the granting of a new rate of fare by the city. The city offered a sliding rate of fare beginning with 5 cents for the first six months and increasing 1 cent each six months until the revenue was sufficient to pay expenses. The company said a ticket fare of 7 cents or a cash fare of 8 cents was necessary at once.

At Massillon forty men struck when the City Council on July 3 informed the company that it would not grant a 10-cent fare. The fare situation at Canton is referred to elsewhere in this issue.

Long Fight in Rochester

Service-at-Cost Arrangement Likely to End Controversy in Which Public Has Suffered

The service-at-cost franchise presented to the Council of Rochester, N. Y., on June 30 is the culmination of a long controversy between the city and the New York State Railways over the existing 5-cent fare. For several years the railway sought to have the rate of fare raised, so as to meet a proportionate increase in the cost of maintenance. The city opposed the move.

PUBLIC OPINION AROUSED

The railway claimed that it could not provide good service at a 5-cent fare. The city's demands for better service continued. Meanwhile public opinion became aroused and the newspapers launched into a fight for better service. One newspaper intimated that the city was seeking better service regardless of whether it would entail expense by the railway which could not be met. A demand was made that the Mayor act at once.

The case was taken before the Public Service Commission and the city presented a plea to compel the company to improve service. In its decision handed down in April, 1920, the Public Service Commission rejected the demands of the city and declared that the railway could not provide better service with a 5-cent fare. It was suggested that a temporary agreement be drawn up, pending the determination of a fair rate for the railway.

On April 27 Mayor Edgerton recommended that the Common Council enter into a new agreement with the New York State Railways for a service-at-cost plan. The Council was requested to make an investigation at once, and if it deemed such an agreement advisable, to direct the preparation and execution of a service-at-cost contract. This it subsequently did.

FARE CASE COMPLICATES MATTERS

Meanwhile another controversy between the city and the railway was being waged in the Supreme Court. For years the rate of fare from Rochester to Charlotte, which up to 1918 was a town about 3 miles from Rochester, was 10 cents. When Charlotte was annexed to the city, officials declared that the original franchise provided that the fare should be reduced to 5 cents, as Charlotte had become a part of Rochester. This the railway refused to do, however, and the case was taken to the Supreme Court. Thousands of rebate slips were issued to patrons over the Charlotte line, in the event of a decision against the company.

Now that the service-at-cost plan has been drawn up, however, the fight has been dropped, as a decision that the rate of fare should be 5 cents, would mean that the city would have to take the money out of its own treasury to pay the railway patrons. The new franchise will provide for an initial fare of 7 cents in Rochester and to Charlotte.

Philadelphia Hearing Begun

Public Service Commission, Sitting in Philadelphia, Hears Transfer-Charge Plea

Six of the seven members of the Public Service Commission of Pennsylvania sat in judgment on July 6 on the tariff filed by the Philadelphia Rapid Transit Company calling for a universal 3-cent transfer charge. The principal witness was W. C. Dunbar, financial vice-president of the company. He told the commissioners that the change was merely an experiment. He estimated the company was faced with a deficit of $1,904,058 in the event that the fare was not raised. The officers felt it advisable to ask for a higher fare at this time. R. H. Horton, traffic engineer, believed the schedule which the company had filed was the best means of getting increased fares. The transfer passengers cost more to carry than any others and it was a matter of justice that they should pay the increased fare.

PRESIDENT MITTEN TESTIFIES

President Mitten was the witness on July 7. He said that if Philadelphia expected to have high-speed lines the city would have to pay a rate of fare considerably higher than the present figure. He said that a high-fare policy would have to be instituted in Philadelphia if the deficit that has accumulated continued to pile up while the commission made an extended study of the local situation. The company had resorted to every known method of increasing revenue and decreasing costs. There had always been complaint because of the discrimination of the transfer system. The Stotesbury-Mitten management, if it meant anything, functioned first for the interest of the public it served, then for the men it employed, and lastly for the stockholders of the company.

The free transfer system was uneconomical and wrong in that it was a part of human nature to be wasteful of that which was free. One of the greatest troubles in Philadelphia has been the lack of continuity in carrying negotiations between the company and the city to a proper conclusion. Every time a new city administration comes into power, the company is required to start over.

Fail to Agree on Umpire

Employees of the International Railway, Buffalo, N. Y., are greatly disappointed as the result of the failure of the arbitrator named by the Buffalo local of the Amalgamated and the company's representative to agree on an umpire for the board which proposed to settle the wage question and other grievances between the International and its employees.

The company's arbitrator is C. J. Joyce, Philadelphia, representing the Mitten interests. The employees' representative is James H. Vahey, counsel for the Amalgamated. Charles B. Hill, chairman of the Public Service Commission for the Second District proposed by the railway as the umpire, has refused to serve. No other names have been suggested.

When the arbitration was agreed upon three months ago the platform men and other employees were given to understand that whatever wage award should be made would be retroactive to May 1. Platform men now are receiving 60 cents an hour. They ask 88 cents an hour. The company also insists upon an open shop. While not demanding a closed shop contract, the men ask a renewal of their agreement as in the past.

Mediation in Twin Cities

Trainmen There Prepare for Arbitration of Wage Demands—Had Threatened Strike

Through the mediation of business men the threatened strike of trainmen of the Twin City Rapid Transit Company in Minneapolis, St. Paul and suburbs set for July 1 was obviated. The men in both cities voted agreement to the plan and have appointed their representatives on the boards of the two cities. These boards will consist of four members for the company, four for the trainmen, four for the citizens and the Mayor.

The men demanded 70 cents an hour maximum, and eight-hour day and time and a half for sundays, overtime and holidays. The company announced it could not grant these demands without a 7-cent fare in both cities. A strike vote had been taken when a plan of arbitration was formed and presented to the men. The matter is now up to the arbitration board. This body has begun hearings as to the justification of the demands. Each city will name experts to go over the company's books to determine whether the fare advance is justified in each city.

The citizens' arbitration plan adopted by the trainmen reads:

> 1. That the committee is unanimous in its opinion that the employees of the railway are entitled to an increase in wages; that the railway is entitled to an increase in fare, and that this desirable result can best be obtained by means of an agreement between the three parties interested—namely, the people of Minneapolis, as represented by the City Council, the owners of the railway and the employees of that company.
>
> 2. As a means to that end, it is concluded that this may best be done by the creation of a board of investigation and arbitration to consider as fully as may be necessary the claims made by the railway for an increase in fare and by its employees for increased wages and better working conditions, and the extent to which those claims are consistent with the public interest.
>
> 3. It is the belief of the Mayor's committee that this board may properly be selected in the following manner:
>
> The railway employees to select four men. The railway to select four men and five citizens not financially interested in the railway, of whom Mayor J. E. Meyers shall be one to be selected by the Mayor's committee and that this board as selected shall act as speedily and as efficiently as possible to determine all matters in controversy.
>
> The management of the railway has agreed in case such board is constituted to accept and abide by its decision and the acceptance of this plan by the employees must of necessity commit them also to the acceptance of its conclusions.
>
> The management of the railway has further agreed that the rate of wages which is determined by this board shall be made retroactive for a period not exceeding thirty days prior to the date when an ordinance or resolution of the City Council granting the necessary increased fare becomes effective; in any event not prior to July 1, 1920.
>
> Provided, this plan is accepted by the employees of the railway, the Mayor's committee of citizens pledges its best efforts to obtain a speedy settlement of this matter by the City Council.

Under instruction of the arbitration board an analysis is under way of the financial statement which has been submitted by the Minneapolis Street Railway. The work is being done by H. B. Warren, head of the bookkeeping department of the Cream of Wheat Company, released temporarily for the purpose. Milo Roy Maltbie, New York, consulting engineer, is expected to arrive on July 15 to go over Mr. Warren's findings. Mr. Maltbie has represented the city before. In St. Paul the arbitration board has been appointed. It is a representative body drawn from all walks of business life.

Tacoma Fare Negotiations Fail

Negotiations between the city of Tacoma and the Tacoma Railway & Power Company have been broken off, following a failure to reach an agreement. In a report to the Council City Attorney Harmon declares the company desires a fare that will return from 4 to 8 per cent on its valuation of $6,000,000. He declares the valuation is excessive, and that it would avail nothing to continue the negotiations for a new franchise.

The City Council has gone on record, in line with suggestions of Mr. Harmon, that an increase in the present 7-cent fare should not be permitted, and that profits for the company should not be guaranteed. Some members of the City Commission believe that a 10-cent fare is inevitable. Mayor C. M. Riddell and other members of the Council believe a 10-cent fare will result in a loss to the company and will encourage jitneys in the city.

Aldermen Defeat City Ownership

The Board of Aldermen of New York voted no on President F. H. La Guardia's proposal to appropriate $300,000 in special revenue bonds for the purchase of trolley cars by the city to be operated by the city over tracks of the Midland Railway on Staten Island. The resolution was lost by a vote of fifty-one for and fourteen against, fifty-five votes being required for approval of the bonds. The fourteen adverse votes were registered solely on the ground of opposition to the principle of municipal ownership of railways.

Mr. La Guardia in support of his resolution said:

> The plea that the city does not want to go into municipal ownership is about fifteen years behind time. The city already owns millions of dollars worth of subways. The present question is not one of municipal ownership of the traction lines, but of the traction companies owning the municipality. Of course the traction interests are fighting it. Their plan is first to get the buses off the streets and then shut down certain of the larger feeder lines in order to force an increased fare.

Dayton Strike Settled

The strike of the trainmen on the railways at Dayton, Ohio, has been settled. The men will receive 58, 60 and 62 cents for three, six and twelve months' service respectively. The companies have been granted a 7-cent fare with eight tickets for 50 cents. The strike has been long drawn out. At one stage the City Commissioners authorized a rate of fare of 7 cents, but afterward this was withdrawn.

Along about July 1 the situation assumed a serious aspect. The city commissioners ordered operation to be resumed at once. The companies on July 1 demanded police protection for the cars. Later the companies tried to swear in a sufficient number of special policemen to protect their property.

The companies conceded that the demands of the men were in a large measure just and expressed their willingness to treat with the men on condition that the city fix a new rate of fare that would cover the additional expense involved in any wage advance.

News Notes

Wages Being Negotiated at Albany.—A new wage contract retroactive to July 1 is being negotiated between the United Traction Company, Albany, N. Y., and the local division of the Amalgamated Association..

Scholarships for Sons of Employees.—Henry L. Doherty and Frank Frueauff of the Cities Service Company, New York, N. Y., have offered to assist the sons of Doherty employees to secure technical training by creating scholarships in some of the leading technical schools and universities in the country. Employees receiving $200 a month or less who desire to give their sons such a training may avail themselves of this most generous opportunity.

Eastern Massachusetts Wage Hearing Begun.—The wage hearing in the case of the Eastern Massachusetts Street Railway was begun at the State House, Boston, Mass., on June 29. The present maximum rate is 51 cents an hour and the schedule of wage demands presented calls for a maximum of 75 cents an hour, one day off in fifteen with pay and overtime pay at the rate of time and one-half for all work performed on Sundays and holidays, effective May 1, 1920.

Wage Advance for West Penn Men.—The West Penn Railways has announced to its employees at McKeesport that it will increase wages of carmen in keeping with the schedule adopted recently for the trainmen of the Pittsburgh Railways, the maximum being 70 cents an hour. Several thousand employees of the company in McKeesport, Irwin, Greensburg, Connellsville and Uniontown are affected by the wage increase, which becomes effective at once.

Plan to Rent Elevated from City.—T. E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, has replied to Mayor Moore, saying he will recommend to the board of directors, and through them to the stockholders, that the Philadelphia Rapid Transit enter into a lease with the city, for a term of years to be agreed upon, to operate the Frankford "L" as a part of its street railway system, paying annually to the city of Philadelphia as rental a sum equivalent to 5 per cent of the entire investment of the city therein.

Presentation to Chairman Walker.—In recognition of the work done by A. F. Walker as chairman of the committee of the New England Street Railway Club in charge of the outing to Montreal the members of the club presented to him while in that city a gold watch chain and pendant. The presentation was made at a luncheon on June 30 given to Col. J. E. Hutcheson at the Ritz-Carlton Hotel by the members of the club, in recognition of the many courtesies extended by Colonel Hutcheson and his staff to the members of the club while on their trip.

Charter Change Provides for Municipal Ownership.—Wider control over public utilities with the power to purchase, hire, construct, own, maintain and operate or lease them, as well as to prescribe the form of and audit the accounts and records of such utilities, is given the city of Atlanta in the proposed new charter which will be considered by the State Legislature now in session. The charter will make many changes in the present form of Atlanta's city government. If passed by the State Legislature, the measure will be voted upon at the polls some time in July.

Advisory Members for Power Survey.—The American Electric Railway Association and the National Electric Light Association have been requested by the Secretary of the Interior to designate representatives on the advisory board which is being formed in connection with a governmental survey of the power resources of the north Atlantic seaboard. This advisory board will work in close co-operation with the engineering staff which is headed by William S. Murray. The survey was authorized at the last session of Congress. It is being conducted under the direction of the U. S. Geological Survey.

Seek Release from Wage Contract.—C. G. Bookman and the executive committee of the union waited on Thomas S. Wheelwright, president of the Virginia Railway & Power Company, Richmond, Va., recently to ask release from the yearly wage contract with the company. Mr. Wheelwright refused to grant the request of the men. It was learned after the conference that members of the union held a meeting not long ago and voted to abrogate their contract and give the company sixty days' notice to increase their wages, or strike. Through the action of President Bookman, the executive committee and the older men in the union, another meeting was called and the vote reconsidered.

Court Overrules Track Relocation Decree.—The Supreme Court of Errors of Connecticut has found an error in an opinion of Judge Webb of the Superior Court of Fairfield County, which affirmed an order of the Public Utilities Commission directing the Connecticut Company to relocate its tracks in Hope Street, Stamford. The Supreme Court directs the Superior Court to reverse its judgment, thereby sustaining the appeal of the Connecticut Company. The court says that from the standpoint of public interest and expense involved the Connecticut Company should not be required to relocate its tracks, the cost of which would be $28,000. The Public Utilities Commission order was made upon appeal of the Selectmen of Stamford.

Pittsburgh Men Sign Wage Agreement.—Representatives of the motormen and conductors of the Pittsburgh (Pa.) Railways have formally ratified the agreement recently reached by which the men are to receive a maximum rate of 70 cents an hour for a year. The trainmen demanded a maximum hourly wage of 91 cents an hour. This the receivers explained they were unable to pay on account of the financial status of the company. A strike was narrowly averted by the arrival in Pittsburgh of W. J. Fitzgerald, international vice-president of the Amalgamated Association, who ordered the trainmen to do one of three things: Consider a just compromise, submit to arbitration or forfeit their charter in the international organization. An agreement on a 70-cent-an-hour basis followed.

Six Dollars a Day for Line Car Men.—The utilities committee of the City Council of Seattle, Wash., has recommended that a daily wage of $6 be approved for line car operators of the municipal railway. D. W. Henderson, general superintendent, states that this wage has been paid to line car men up to this time, but the Civil Service Commission recently informed him it was in violation of the city ordinance fixing the rate of pay for motormen at $5 a day. Agreement had been made, according to Mr. Henderson, by former Superintendent Thomas F. Murphine to pay these men the $6 wage, and after looking into the matter, the civil service commission declared this to be a proper remuneration considering the type of work these employees perform. They operate service cars in the repair of tracks and of cars when the latter are out of commission.

Financial and Corporate

Foreclosure Suit Started

Hearing of Bill to Dispose of Some of Underlying Properties of Pittsburgh Railways

The hearing on the bill to foreclose the mortgage of the Southern Traction Company, a unit of the Pittsburgh (Pa.) Railways, and on the answer thereto of Receivers Charles A. Fagan, S. L. Tone and W. D. George was begun recently in the federal court of the district of Western Pennsylvania, at Pittsburgh, before Judge Charles P. Orr.

Just what portion of the holdings of the Southern Traction Company is covered by the mortgage will be determined by the court when all the evidence is in, so that the property affected by the decree of sale, which is expected to be handed down later, can be enumerated.

About one year ago, after the bondholders of the mortgage of the Southern Traction Company began proceedings to foreclose because of the failure of the parent concern to pay the interest as it fell due, the receivers opposed the suit. Their opposition was based upon the legality of one unit of the railway system foreclosing on a mortgage in face of the danger of disrupting the unified system.

Arguments and claims of the receivers were set forth in an answer to the bill. Judge Orr, before whom the proceedings were held at that time, handed down an opinion declaring it proper for the bondholders to bring such action as a unit of the system. This opinion was subsequently upheld by the federal Circuit Court of Appeals for the Third District.

The court is expected to determine what will be embodied in the decree of sale, and also will probably determine the lowest, or "upset," price which will be accepted.

Interurban Would Abandon City Lines

The Toledo, Bowling Green & Southern Traction Company, has asked the City Council of Findlay, Ohio, for permission to abandon its lines operated in that city. The Council has referred the request to its committee on railways. Charles F. Smith, general manager of the company, said:

> Our loss was $2,830 in 1917 from the city railway, $9,182 in 1918, and $14,068 in 1919. This does not include bond interest or taxes, which items in 1919 amounted to $19,166, making a total loss of $33,235 for 1919. Future losses will be greater.

Mr. Smith explained that the city was now enjoying the lowest fares of any city he knows. The company averages 4¼ cents from each passenger carried due to the sale of tickets at six for 25 cents and twenty-five for $1. He explained that a higher fare would have reduced the business to such an extent that there would have been no economy in it. He said the directors of the company wished to take similar action a year ago, but declared he had persuaded them to forestall such action.

Dallas Carries More Passengers

Approximately 150,000 more persons were transported by the Dallas (Tex.) Railway during May than were carried during April. A total of 5,681,000 passengers was carried during May, of which number 13 per cent were transfer passengers.

The gross income of the company for May amounted to $261,300 and total expenditures $225,502, leaving net revenue for the month of $35,798. This is at the rate of 4.85 per cent on the valuation of the company's properties.

Of the total amount of expenditures, $60.354.38 went for maintenance.

Cars in Dallas traveled a total of 626,812 car miles during the month, maintaining an average speed of 9.1 m.p.h. An average of nine persons per car mile was transported.

Operating Ratio 84.8 Per Cent

Only One Operating Company in Connecticut Paid a Dividend—225,000,000 Passengers Carried

The eighth annual report of the Conneticut Public Utilities Commission for the fiscal year ended Sept. 30, 1919, has recently been issued. This report also contains financial reports of all public service companies for the calendar year 1918 as well as statistical tables relating thereto.

Abstracts are herewith given covering such information as pertains to electric railway operations within the State.

There are nineteen electric railway companies reporting to the commission, fifteen of which are in operation. In reality there are only twelve operating companies as three of those in operation are leased.

The results of electric railway operations, excluding all figures relating to the Rhode Island company, which runs the great bulk of its lines in Rhode Island, show a net revenue from operations of $724,138 less than such revenue the year previous. Operating revenues decreased $94 308, while operating expense increased $629,830. The decrease in operating revenue was practically all in passenger revenue,

SUMMARY OF CONNECTICUT OPERATIONS

	1918	1917	Percentage Change
Number of companies reporting	21	19	10.52
Number of operating companies	12	9	25.00
Assets:			
Investment in road and equipment	$98,099,999	$97,473,668	6.43
Other investments	3,035,456	2,785,034	8.97
Current assets	3,399,994	2,290,759	48.50
Deferred assets	59,638	77,441	—23.00
Unadjusted debits	1,620,825	1,581,366	2.49
Total assets	$106,215,912	$104,208,268	1.93
Liabilities:			
Capital stock	$61,774'440	$61,774,400	......
Long term debt	27,158,032	27,193,408	—0.13
Current liabilities	6,500,014	4,019,914	61.80
Deferred liabilities	21,894	20,283	7.95
Unadjusted credits	7,398,334	7,339,539	0.80
Appropriated surplus	1,218,754	1,092,695	11.52
Profit and loss	2,144,484	2,768,029	—22.50
Total liabilities	$106,215,912	$104,208,268	1.92
Operating revenues:			
Revenue from transportation	$12,259,622	$12,341,064	— 0.7
Other railway operations	174,448	187,314	— 6.9
Total operating revenue	$12,434,070	$12,528,378	— 0.8
Operating expenses:			
Way and structures	$1,442,847	$1,677,925	—14.0
Equipment	1,306,353	983,875	32.8
Power	2,514,660	2,529,114	— 0.6
Conducting transportation	3,988,526	3,458,965	15.3
Traffic (Credit)	2,189	3,960	44.8
General and miscellaneous	1,296,121	1,270,569	2.0
Total operating expenses	$10,546,318	$9,916,488	6.4
Net revenue railway operations	1,887,752	2,611,890	—27.8
Net revenue auxiliary operations	107,790	98,294	9.7
Net operating revenue	$1,995,542	2,710,184	—26.4
Taxes assignable to railway operations	660,952	682,995	— 3.2
Operating income	$1,334,590	$2,027,189	—33.8
Non-operating income	1,722,609	1,684,025	2.3
Gross income	$3,057,199	3,711,214	—17.7
Deductions from gross income:			
Rent for leased roads	$1,340,359	$1,339,208	0.09
Miscellaneous rents	7,847	7,978	— 1.6
Miscellaneous taxes	100	289	—65.5
Interest on funded debt	1,055,172	1,054,423	0.07
Interest on unfunded debt	154,577	57,638	168.2
Amortization of discount on funded debt	1,905	1,920	— 0.8
Income transferred to other companies	6,645	10,939	—39.4
Maintenance of organization—lessor companies	4,746	5,368	—11.6
Miscellaneous deductions	4,981	24,726	—80.0
Total deductions from gross income	$2,576,332	$2,502,489	3.0
Net income transferred to profit and loss	$480,867	$1,208,725	—60.3

other decreases amounting to a little more than $2,000.

The greatest increase in cost in operations was for conducting transportation. The amount charged for salaries and wages was $616,384 more than in 1917, and this amount is practically the net increased cost of operating expenses, although there was an increase in cost of maintenance of equipment of $322,478. This increase in the cost of maintenance of equipment was offset by the decreased amount expended in maintenance of way and structures.

The total operating revenue was $12,434,070, while the operating expenses were $10,546,318, leaving a net revenue from railway operations of $1,887,752.

The net revenue from auxiliary operations of $107,790 is the result of the general electric operations carried on by the Shore Line Electric Railway, the Bristol & Plainville Tramway and such operations in addition to conducting miscellaneous park and amusement places by the Danbury & Bethel Street Railway.

PROFIT AND LOSS ACCOUNT—CONNECTICUT COMPANIES

	1918	1917	Percentage Change
Credits:			
Balance at beginning of year	$2,768,029	$2,769,374	— 0.05
Balance transferred from income account	480,867	1,208,725	—60.3
Miscellaneous credits	29,140	27,701	5.2
Total credits	$3,278,036	$4,005,800	—18.2
Debits:			
Dividend appropriations	833,909	805,373	3.5
Miscellaneous debits	299,643	432,398	—30.8
Total debits	$1,133,552	$1,237,771	— 8.3
Balance at close of year	$2,144,484	$2,768,029	—22.6

STATISTICAL INFORMATION—CONNECTICUT COMPANIES

	1918	1917	Percentage Change
Passenger car-mileage	34,049,713	37,167,625	— 8.3
Freight, mail and express car-mileage	854,844	977,450	—12.6
Total revenue car-miles	34,904,557	38,145,075	— 8.5
Passenger car-hours	3,642,845	4,017,360	— 9.2
Freight, mail and express car-hours	128,806	90,753	41.8
Total revenue car-hours	3,771,651	4,108,113	— 8.2
Ratio CM to CH (passenger cars)	9.34	9.26	0.06
Passenger traffic:			
Regular fare passengers	188,162,078	215,822,889	—12.7
Free transfer passengers	35,263,246	40,724,467	—13.5
Other free passengers	1,952,560	3,033,998	—35.6
Total passengers carried	225,377,884	259,581,354	—13.2
Passenger revenue	$11,501,927	$11,593,981	— 0.8
Average fare per revenue passenger (cents)	6.12	5.47	11.9
Operating ratio (per cent)	84.8	79.1	8.5
Car-mile statistics:			
Operating revenue (cents)	35.68	32.90	8.2
Operating expenses (cents)	30.2	25.98	16.2
Net income (cents)	1.37	3.16	—56.6
Passenger traffic (total)	6.62	6.99	— 4.2
Car-miles per revenue passenger	0.181	0.126	43.6
Car-hour statistics:			
Operating revenue	$3.30	$3.06	7.9
Operating expenses	$2.80	$2.41	16.2
Net income	$0.127	$0.294	—56.8
Passenger traffic (total)	62.0	53.7	15.2
Taxes—per cent of gross revenue	5.31	5.46	— 2.7
Per cent of net operating revenue	33.08	25.20	31.3
Return earned on stock outstanding	0.78	1.96	—60.2
Mileage statistics:			
Miles of road	861.477	861.345	(*d*)
Miles of second main tracks	218.283	217.038	(*d*)
Miles of sidings and turnouts	42.305	42.538	(*d*)
Miles of tracks in car houses, shops, etc	3.753	3.753	....
Total track mileage	1,125.818	1,124.674	(*d*)
Rolling stock owned:			
Closed passenger cars	998	1040	— 4.0
Open passenger cars	782	865	— 9.5
Combination closed and open passenger cars	42	42	....
Total passenger cars	(*a*) 1822	(*a*) 1947	— 6.3
Freight cars	52	79	—34.2
Express cars	34	32	6.2
Combination cars	9	5	80.0
Work cars	132	110	20.0
Snow plows	91	96	— 5.2
Snow sweepers	26	26	....
Miscellaneous	74	97	—23.7
Electric locomotives	2	2	....
Total equipment—all classes	(*b*) 2242	(*c*) 2393	— 6.1
Employment statistics:			
Aggregate salaries and wages paid	$6,065,031	$5,448,647	11.4
Number of general officers	41	48	—10.4
Number of general office clerks	373	304	22.8
Number of employees maintenance of way and structures	783	823	— 4.8
Number of employees maintenance of equipment	466	434	7.4
Number of employees power departments	345	434	—20.5
Number of employees transportation department	3549	3782	— 6.3
Total—all employees	5557	5825	— 4.6
Average yearly wage paid per employee	$1092	$935	16.9

(*a*) Includes 7 cars without electrical equipment.
(*b*) Includes 85 cars without electrical equipment.
(*c*) Includes 125 cars without electrical equipment.
(*d*) Less than one-tenth per cent change.

The amount paid in dividends for all companies was $833,909, an increase of $28,536 over the previous year. Only one operating company, the Bristol & Plainville Tramway, paid dividends during the year. All other dividends paid were by lessor companies.

Power Companies Absorbed

Bird and Chisholm Holdings Taken Over By Central Maine Power Company —Planning for Future

Acquisition of a majority of the stock issues of the public utilities controlled by Maynard S. Bird, Portland, Me., and Hugh J. Chisholm, New York, by the Central Maine Power Company has recently been announced by the Public Utilities Commission of Maine.

Three Companies Included

The companies involved include the Oxford Electric Company, furnishing light and power in Norway and South Paris, and Androscoggin Electric Company operating the electric railway between Augusta and Lewiston and the light and power company serving Rockland, Thomaston and nearby towns. They have deposited their certificates of stock, for which they have received in exchange share for share in the Central Maine Power Company.

There was no opposition when the plan was presented to the Public Utilities Commission. A petition for authority to increase the stock of the Central Maine Power Company was included in the petition to the commission and was granted.

The only change that will be made in the Androscoggin Electric Company is that it will be called the Androscoggin Corporation and the management and treasureship will be handled at Augusta. The Central Maine Power Company has recently harnessed the Kennebec River at Skowhegan. By this latest crusade, the company will more than double its water developed horsepower and reduce its operating expenses of steam power plants by some $92,000 a year in addition to furnishing more power to Maine industries ready to buy it and new industries to come.

Realizing a Vision

The Central Maine's Skowhegan development will ultimately produce more than 20,000 h.p., one of the biggest power developments in the State. The work now being done is costing about $800,000 and will be financed by the sale of the company's 7 per cent preferred stock. This is being offered at the present time at $107.50 a share.

The coal shortage has assumed serious proportions and has driven many industries to look forward to the day when they must either move their plants to points where they can get hydro-electric power or go out of business. The vision of those pioneers in Maine history who could see the rushing of the water transformed into heat, light and power is coming true. The first big steps are being made by the Central Maine Power Company.

$1,907,766 Shore Line Value

The appraisal of the property of the Shore Line Electric Railway, Norwich, Conn., was filed in the office of the Superior Court in Norwich recently. It shows a total valuation of $1,907,766. Most of the company's lines are appraised on the scrap basis, but the Westerly-Groton line and Old Mystic line are figured on a reproduction basis.

The appraisers were William R. Dunham, Jr. and Shepherd B. Palmer. The appraisal was filed by Receiver Robert W. Perkins.

A summary of the appraisal of the various lines, cars and other properties follows:

New Haven to Guilford (scrap)..	$73,444
Guilford to Stony Creek (scrap)..	48,930
Guilford to Saybrook (scrap)....	81,368
Saybrook to Chester (scrap)....	152,705
Ferry Road Junction to Flanders (scrap)	65,248
Saybrook Power House (scrap)...	47,787
Flanders Corner to Crescent Beach (scrap)	24,484
Flanders Corner to New London (scrap) $301,779	71,991
Norwich to Hallville (scrap) $214,854	41,700
Fort Point Branch (scrap) $20,463	3,807
Hallville to State Line (scrap)...	104,662
Westerly to Groton (reproduction basis)	784,056
Old Mystic Line (reproduction basis)	78,867
Groton-Stonington cars	61,400
Other cars, not included above...	147,600
Material and supplies, real estate etc.	119,717
Total......................	$1,907,766

Where properties were not being operated and where petitions for abandonment of service were before the court the appraisal was made at scrap value. Where these properties were still being operated, with reasonable expectation of operations being continued the properties were also appraised on the basis of reproduction cost less depreciation. It is the belief of the appraisers that where the two values are given the property may be made to realize a value somewhere between these two extremes.

Preferred Stock Offered Direct to Investors

Seven per cent cumulative preferred stock of the Alabama Power Company, Sheffield, Ala., is being offered direct to the public by the company. The proceeds are to be used for development and extensions. A statement by the company follows in part:

Terms of payment are as follows:

On cash basis: As many shares as are desired or the company may have to offer at $93 per share plus the accrued dividend to date of payment.

On partial payment: Any number of shares, up to twenty-five, paying $10 per share down and $5 per share each month until the purchase price is paid; to the final payment $3 is to be added to the accrued dividend from the last preceding dividend date.

This privilege is extended subscribers on the partial payment plan:

Should partial payment purchasers at any time or for any reason desire to withdraw before completing their purchase, money paid in can be withdrawn in full with interest at 6 per cent per annum upon ten days' notice to the company at any time prior to the date of final payment. On the other hand, purchasers may pay for their stock in full at any time and secure stock certificate.

Dividends are payable four times a year, Jan. 1, April 1, July 1 and Oct. 1.

The Alabama Power Company has been in successful operation for seven years. It serves directly an indirectly a population conservatively estimated at over 550,000, located in central and northern Alabama. The company is now extending its lines to Selma, and is furnishing power for one of the Montgomery utilities. Directly or indirectly the company does the electric light and power business in forty cities, and the railway business in three cities. It furnishes the power distributed throughout Greater Birmingham and Bessemer by the Birmingham Railway, Light & Power Company, and that distributed by the Montgomery Light & Water Power Company.

Security Values Shrink

Traction Bonds Have Declined More Than Any Other Class on New York Exchange

More traction securities are in default of interest now than at any other time in history. As a whole they show the largest decline of any class listed on the New York Stock Exchange. The *Wall Street Journal* says that default in nearly every case was due to the fact that the companies were unable to meet fixed charges because of the restricted 5-cent fare. Quite a number of these bonds are selling at prices that not only discount defaulted interest, but also a drastic reorganization. A compilation of traction bonds listed on the New York Stock Exchange showing high prices reached in 1917, high and low levels during 1920, and closing or last prices on June 21, 1920, with income return, is presented in the accompanying table.

Issue	1917 High	1920 High	1920 Low	1920 June 21	Yield
Brooklyn Rapid Transit 5s, '45	101⅞	33¾	21	21	†...
Convertible 4s, 2002	77½	28	21½	23½	†...
3-yr. 7% notes, '21	*97	50	38	41	†...
Brooklyn City Railroad cons 5s, '41	101¼	66	66	66	8.50
Brooklyn Union Elevated 5s, '50	101½	64	60	62	8.44
Broadway & Seventh Ave. 5s, '43	100	67½	40	40	12.13
Chicago Railways 1st 5s, '27	97¾	70	57½	62	13.31
Columbus & Ninth Avenue 5s, '93	100	40	21	21	†...
Connecticut Railway & Lighting Co. 4½s, '51	101⅞	60	60	60	8.03
Detroit United 4½s, '32	86½	69	60	60	10.22
Hudson & Manhattan ref. 5s, '57	69⅞	60	54	57	8.95
Adj. income 5s, '57	25⅞	23	13	19⅛	‡...
Interborough-Metropolitan 4½s, '56	73⅝	19¾	13½	15	†...
Interborough Rapid Transit 5s, '66	99⅞	58	48	51½	9.63
Kings Co. Elev. 4s, '49	86¼	60	50	53	8.19
Lexington Avenue & Pavonia 5s, '93	99½	42	40	40	†...
Manhattan Ry 4s, '90	94	60	51	53	7.36
Milwaukee Electric Railway & Light 5s, '26	103	94½	92	92	6.64
Ref. and ext. 4½s, '31	93	77	77	77	7.63
Nassau Electric Railroad 4s, '51	74⅜	28	23	23	†...
New York & Jersey 5s, '32	100⅜	78	73	78	7.87
New York Railways ref. 4s, '42	71⅞	32	20	22⅛	†...
Adj. income 5s, '42	47⅞	7¾	5	5	‡...
New York State Railway 4½s, '62	87½	55	50	51⅜	8.76
Portland Railway 5s, '30	88⅜	64⅞	64⅞	64⅞	10.69
St. Paul City Railway 5s, '37	102⅜	80	80	80	7.04
Third Ave. ref. 4s, '60	80⅞	51¾	40	41	9.35
Adj. income 5s, '60	73⅜	31	21½	23¼	‡...
Third Ave. Railway 5s, '37	108	84	75	75	7.66
Tri-City Railway & Light 5s, '23	101	92	87⅞	87⅞	9.76
United Railways Investment 5s, '26	70	75½	66	66⅝	13.09
United Railways St. Louis 4s, '34	61⅜	47⅜	47⅜	47⅝	10.55
United Railroad San Francisco 4s, '27	42	30	20⅝	23⅝	†...
Virginia Railway & P ref. 5s, '34	93⅜	70	63	69	8.93

*Exchanged for 5% notes due July 1, 1918, at about 97.
†Interest in default.
‡Interest on these income bonds not earned or paid.

While no interest has been paid on United Railroads of San Francisco general first 4s, 1927, since Oct. 1, 1916, the company is not in the hands of a receiver. Interest has been earned on these bonds with the exception of one year, when a small deficit was reported. A protective committee for these bonds has agreed upon a plan of reorganization, which provides for taking care of all maturing obligations; paying off notes, and scaling down capitalization.

Direct Public Offering Successful

An extension of the tracks of the Springfield (Mass.) Street Railway in the eastern section of Springfield is assured by the successful campaign of citizens of that municipality to raise $300,000 for the purchase of street railway bonds. Clark V. Wood, president of the railway, announced on June 27 that more than two-thirds of the amount had been pledged. The work which the bond drive guarantees is to be started early in July. The proposed extension will provide two direct routes from East Springfield, which in the past six years has had a tremendous industrial expansion, to the center of the city.

The campaign for the sale of the bonds marks a new phase in the financing of electric railway extensions in the Connecticut Valley. The company very frankly stated earrly in the year that it could not provide the desired extension of the lines before 1921 unless the public furnished the money. The Springfield Chamber of Commerce co-operated in the campaign. The company has received permision from the Public Service Commission to issue $5,000,000 of bonds for rehabilitation of its property and payment of indebtedness.

Formal Notice of Foreclosure

The Farmers' Loan & Trust Company, New York, N. Y., has filed a formal notice of foreclosure in the United States District Court on the New York Railways 1912 issue of mortgage bonds, of which $30,616,000 is outstanding. It is explained that the notice is a legal formality to preserve the trust company's rights in the reseivership.

Financial News Notes

Suspension of Service Approved.—A petition of the Savannah (Ga.) Electric Company to abandon service on the Whitaker Street line in Savannah has been granted by the Railroad Commission.

City Selects Appraisers.—Harry Barker and George W. Fuller, New York, N. Y., have been named by the City Commission of Grand Rapids, Mich., to appraise the property of the Grand Rapids Railway for the city.

Operating Allowances Increased.—An increase of 5 cents per car mile in the operating allowance and 1 cent per car mile in the maintenance allowance of the Cleveland (Ohio) Railway has been approved by the City Council.

Replacement Issue Authorized.—The Arkansas Corporation Commission has authorized the Fort Smith Light & Traction Company, Fort Smith, Ark., to issue $200,000 of first mortgage bonds to replace a previous issue of second mortgage bonds.

Car Trust Certificates Sold.—A block of $875,000 car trust certificates of the United Railways & Electric Company, Baltimore, Md., was disposed of on June 30 by a syndicate which was headed by Alexander Brown & Sons and participated in by several other Baltimore bankers.

Towns Contribute to Support Road.—The towns of Norwood, Westwood and Walpole have jointly appropriated $6,500 to continue the operation of cars of Eastern Massachusetts Street Railway in those towns. The sum of $4,000 has been appropriated by the town of Braintree, on condition that a like amount be appropriated by the town of Randolph.

Plans To Resume Lockport Service.—The city of Lockport, N. Y., has accepted the tentative franchise offered by the International Railway for the resumption of traffic on the Grand and Gooding Street lines. The company abandoned the lines last summer rather than pay expenses of paving. The city dropped the paving plan and now will work with the railway to improve the street. The franchise is for ten years.

Interurban Reduces Dividends.—The directors of the Washington, Baltimore & Annapolis Electric Railway, Washington, D. C., announced on June 23 that at a meeting on June 21 the preferred dividend was placed on a basis of 6 per cent and the common reduced from 13½ per cent, as of 1918, and the 7½ per cent, as of 1919, to 1 per cent quarterly. Since the war there has been a great loss in traffic on the line.

Surface Lines Protective Committee.—A protective committee composed of C. Robert Adams, Frank Coenan, G. E. Warren, vice-president of Columbia Trust Company; Frank D. Pavey, as counsel, Arthur N. Hazeltine as secretary and the Columbia Trust Company as depositary has been formed to represent the holders of first mortgage 5 per cent bonds of the Columbus & Ninth Avenue Railroad Company, New York, N. Y.

Discontinuance of Shuttle Authorized.—Job E. Hedges, receiver of the New York (N. Y.) Railways, has been authorized by Federal Judge Mayer to discontinue the shuttle car service from West 106th Street and Amsterdam Avenue to West 110th Street and Columbus Avenue and the operation of cars through West 145th Street to the Hudson River. The court also authorized Mr. Hedges to sell for scrap value 188 old electric cars not worth the expense of storing.

Court Authorizes Payment for Improvements.—The Toledo Railways & Light Company, Toledo, Ohio, was permitted to withdraw $35,770 from the Craig fund by Federal Judge John M. Killits to provide for the payment of a balance due on a large amount of repairs to tracks, lines and special work at carhouses this summer. The fund was started by the court to provide for improvements to service when fare increases were granted three years ago. Six per cent of the net receipts are placed in the fund by the company in weekly installments.

Boston Elevated Would Use Subway Fund.—The Department of Public Utilities of Massachusetts has approved the petition of the Boston Elevated Railway for permission to use a portion of the funds received from the Commonwealth through the purchase of the Cambridge subway. The elevated petitioned the commission for the use of $1,000,000 for the improvement of the Forest Hills station; $267,754 for the payment of floating debt incurred for improvements to the property, and $1,581,000 for the payment of bonds of the West End Street Railway.

Court Directs Loan Be Extended.—Judge Julius M. Mayer of the Federal District Court, on the petition of the Interborough Rapid Transit Company, New York, N. Y., has directed James I. Sheffield, receiver in bankruptcy for the Interborough Consolidated Corporation, to extend until Dec. 31 next the time for the payment of a loan made to the Interborough Rapid Transit Company. Several months ago when a receivership threatened the Interborough Rapid Transit Company the Interborough Consolidated loaned the company $1,000,000 until July 1. The loan was secured by notes.

$800,000 of Notes Offered.—Stone & Webster, Boston, Mass., and the Guaranty Trust Company, New York, N. Y., are offering for subscription at 96 and interest, to yield about 8 per cent, $800,000 of five-year 7 per cent gold notes of the El Paso (Tex.) Electric Company. The notes are to be direct obligations of the company and are to be secured by pledge of all the bonds, notes and stocks of the subsidiary operating companies now owned or hereafter acquired, which have an aggregate value in excess of $6,000,000, subject only to the lien of a closed $1,000,000 collateral trust bond issue maturing Jan. 1, 1932. Junior to the notes there are outstanding in the hands of the public $783,700 of 6 per cent preferred stock and $2,914,100 of common stock. Dividends on the common stock have been paid since 1910, and since Dec. 15, 1915, at the rate of 10 per cent per annum.

Notice of Failure to Pay Interest.—Homer Loring, chairman of the public trustees of the Eastern Massachusetts Street Railway, Boston, Mass., announced on June 30 to the holders of series A and series B refunding mortgage bonds of the company issued under indenture of mortgage dated Jan. 1, 1919, that the coupons due July 1, 1920, appertaining to the Eastern Massachusetts Street Railway refunding mortgage bonds of series A and of series B would not be paid at maturity. He promised that further announcement would be made as to the payment of the coupons or as to the issue of negotiable receipts in exchange therefor if the interest represented thereby is extended in accordance with the provisions of the indenture of mortgage. Lee, Higginson & Company, reorganization managers, explain that the above notice does not refer to the refunding mortgages one-ten year serial 6 per cent bonds, series SA, which are, in effect, guaranteed by the Commonwealth of Massachusetts, under the provisions of Chapter 188, special acts of 1918.

Preferred Stock Issue Contemplated.—A special meeting of the shareholders of the Winnipeg (Man.) Electric Railway has been called for July 27 for the purpose of ratifying and approving a by-law, amending the by-law authorizing the issue of $3,000,000 of 7 per cent cumulative preferred stock of the company, by providing for the payment of the dividend of 7 per cent per annum quarterly, instead of half-yearly, and for the purpose of sanctioning and confirming a by-law repealing the by-law authorizing the issue of paid-up common stock as a bonus in connection with the purpose of passing a resolution, authorizing the directors to sell and dispose of the preferred issue for such price and on such terms and conditions as they may think advisable. The president, Sir Augustus Nanton, in a letter to shareholders, regarding the new issue, states that the company's position has improved materially during the past eighteen months as a result of increased fares, other increased revenue and improved business conditions. The removal of the floating debt, he anticipates, will make surpluses available for extensions or dividends.

Traffic and Transportation

Commission Upheld

Pennsylvania Supreme Court Rules Commission's Rate-Making Power Is Absolute in Scranton Case

The Supreme Court of Pennsylvania on June 26, in deciding the case of Scranton vs. the Public Service Commission went on record as upholding the absolute authority of the commission to fix street railway fares regardless of contracts, franchises or ordinances.

The commission allowed the Scranton Railway a 7-cent fare or four tickets for 25 cents. The city of Scranton brought action against both the commission and the railway, claiming that the franchise of the company provided for a 5-cent fare and this provision could not be changed during the life of the franchise. The cases were appealed to the State Supreme Court. Chief Justice Brown rendered a decision in favor of the commission in the one case and dismissed the action against the railway.

Decision Far-Reaching in Effect

The court decided that the rate-making power of the Public Service Commission was absolute; that it was part of the police power of the State and that no contract made between a municipality and a public utility fixing a rate was valid as the municipality has no jurisdiction and no legal right to assume a power delegated by the State to the Public Service Commission.

The effect of the decision will be far reaching. The ruling is said to have immediate bearing on the case of the city of Philadelphia and the Philadelphia Rapid Transit. Apparently the decision renders inoperative the clause in the 1907 contract between the city and the Rapid Transit Company fixing a 5-cent fare.

In rendering his decision Justice C. J. Brown states:

> The ninth section of the ordinance of the city of Scranton, giving its consent to the construction within its limits of the street passenger railway now owned and operated by the Scranton Railway, provides that a passenger "may ride from one part of the city to any other part of the city for a fare, which shall not exceed five cents." In pursuance of an order of the Public Service Commission, made April 22, 1919, the Scranton Railway filed a new schedule of rates, increasing its unit fare to 5 cents. An appeal from this order to the Superior Court was dismissed: City of Scranton vs. Public Service Commission 73 Sup. Ct. 192. On petition of the city of Scranton this appeal was allowed, limited however, to a consideration of the constitutional question of the power of the legislature to authorize the Scranton Railway to charge a fare in excess of that fixed in the consulting ordinance.
>
> The Legislature could not have authorized the construction of a street railway within the limits of the city of Scranton without its consent—for the consitution says—no street passenger railway shall be constructed within the limits of any city, borough or township without the consent of its local authorities.

Justice Brown then interprets this provision in terms of the decision in the case Allegheny City vs. Etna & Sharpsburg Street Railway, 159 Pa. 411, and states that this provision of the constitution must be read in connection with the third secion which says "the exercise of the police power of the State shall never be abridged or so construed as to permit corporations to conduct their business in such manner as to infringe the equal rights of individuals or the general well being of the state."

Justice Brown then continues:

> Street railways have become necessities. They exist everywhere and contribute in a very large measure to "the general well being of the State," as means of transportation and communication—though this is so, they cannot be operated in any municipality without its consent. With such consent they may be, and, as between the local authorities and the railway companies, there may be attached to it terms and conditions which must be performed by the companies, but a municipality may not annex such terms to its consent as will deprive the commonwealth of its inherent police power to see that a street passenger railway company is not prevented from serving the public by the municipality's enforcement of conditions in a consenting ordinance that have become impossible of performance. What may have been a reasonable rate of fare at the time of the passage of a consenting ordinance may, under changed economic conditions, become confiscatory, and a street passenger railway may not be able to serve the public on account of insufficient revenues, based upon the fare fixed in the ordinance. When such a situation arises, as it has arisen and will arise again, there must be relief somewhere to the public, and it lies in the police power of the state, which is never to be abridged or bartered away.

Tri-City Company Will Ask Increase

The Tri-City Railway, Davenport, Ia., already losing money on a 7-cent fare and a 60-cent scale, is arranging to take steps to increase its revenue to offset an increased labor charge of from $120,000 to $150,000 annually imposed under the arbitration award noted elsewhere in this issue.

A petition for an increased fare will be presented to the Public Utility Commission of Illinois at once. The petition will ask for either 8 or 9 cents, probably the latter.

In Iowa, where the cost of operation is higher than in Illinois, 9 or 10 cents will probably be necessary.

The situation in Iowa is complicated by an injunction secured by the retail merchants some time ago restraining the city from enforcing a 5-cent fare and providing for the collection of a 7-cent fare, the fare that has been in force for a year.

The situation there is also complicated by valuation and appraisal of the traction lines, a move instituted by the city at a probable cost of $25,000. This appraisal work is being done by Burns & McDonnell, engineers, of Kansas City. It will not be finished for 120 working days from June 28.

New York Cases Decided

Court of Appeals Has Defined Car Fare Increase Limitations—Rochester Case Cited

The Court of Appeals of New York in a decision handed down on July 7 declares that under certain franchise agreements the Public Service Commission for the First District may hear applications for increased fares separated as to lines of the Brooklyn Rapid Transit System, but has no jurisdiction to hear petitions for increased fares relating to the system as a whole.

The court also handed down a decision in the application of the city of Niagara Falls for a writ of prohibition against the up-State Public Service Commission and the International Railway, in which it held that where a street railway was operating under franchise granted prior to 1907, when the Public Service Commission was created, it could not charge a higher rate of fare than that specified in the franchise granted by the municipality.

The court holds, in the Brooklyn cases, that the following classes of franchises fall outside of the scope of the decision in the Niagara Falls case and the famed Quimby, or Rochester Railway case:

1. All franchises granted by the Legislature.
2. All franchises granted by municipal authorities prior to Jan. 1, 1875.
3. All franchises granted by municipal authorities subsequent to the passage of Public Service Commission law, July 1, 1907.
4. The following franchises were granted between Jan. 1, 1875, and July 1, 1907, the time when the Public Service Commission was created: (a) The franchise granted by the Brooklyn Common Council to Atlantic Avenue Railroad, March 13, 1882; (b) franchise granted by Common Council at Brooklyn to Prospect Park & Coney Island Railroad, Sept. 21, 1885; (c) franchise granted by Common Council, Brooklyn, to Nassau Electric Railroad, June 19, 1893, covering a number of lines.

The court says the affirmance is without prejudice to the right of the Brooklyn receiver to make separate application as to the franchises which thus come within the jurisdiction of the Public Service Commission.

In the three cases involving branches of the Brooklyn Rapid Transit System the Court of Appeals has affirmed the order of the Appellate Division which dismissed the writ obtained by Receiver Lindley M. Garrison to review the action of the Public Service Commission in refusing to permit an increase in fares to 8 cents on three subsidiaries, but without prejudice to the right of the receiver to make separate application as to franchises that come within the jurisdiction of the commission as indicated in the opinion of the court.

Corporation Counsel O'Brien of New York City has expressed the opinion that the franchises which fall outside the scope of the Rochester ruling are so few and so interwoven with franchises which are plainly controlled by the Rochester decision as to make it practically impossible to work out any increase in fares upon any of the systems of street railways within the city.

Five-Cent Fare Fast Disappearing

Association Figures Show That Only Sixty-six Out of 273 Cities Having 25,000 Population or More Retain Five-Cent Fare

Since the compilation made public by the information bureau of the American Electric Railway Association last February and up to June 1, 1920, fares in thirty-two additional cities of more than 25,000 population have been increased. Of these twelve were original increases, while the remainder were second and in a few instances third increases. Of the thirty-two new base cash rates thus established, two were 10 cents, four were 8 cents, seventeen were 7 cents, eight were 6 cents, and one was a 5-cent rate with an additional charge of 1 cent for a transfer.

THESE additional increases leave but sixty-six out of the 273 cities in the United States which according to the 1917 estimate of population had 25,000 or more inhabitants with a 5-cent car fare, and in forty-five of these an increase in fare is under consideration.

Only Sixty-six Five-Cent Cities

At this date car riders in 207 out of the 273 cities are paying more than a 5-cent base rate.

Car riders in 139 out of the 273 are paying more than a 6-cent base rate.

Car riders in 69 out of the 273 are paying more than a 7-cent base rate.

Car riders in thirty-six out of the 273 are paying more than an 8-cent base rate.

The following table summarizes the situation:

Cities having a 10-cent base rate......	25
Cities having a 9-cent base rate.......	1
Cities having an 8-cent base rate......	14
Cities having an 8-cent rate on elevated lines and 6-cent rate on surface lines.	1
Cities having two 7-cent zones.......	3
Cities having 7-cent central and three-cent outer zones..................	1
Cities having a 7-cent base rate with 2-cent transfer charge	1
Cities having a 7-cent base rate with 1-cent transfer charge	15
Cities having a 7-cent base rate......	55
Cities having a minimum base rate of 6-cents for 2 mile zones and 3-cents per mile zone thereafter...........	8
Cities having two or more 6-cent zones	6
Cities having a 6-cent base rate with 2-cent transfer charge	2
Cities having a 6-cent base rate......	65
Cities having two 5-cent zones.......	1
Cities having 5-cent base rate with 3-cent transfer charge on certain lines.	1
Cities having 5-cent base rate with 2-cent transfer charge	2
Cities having 5-cent base rate with 1-cent transfer charge	1
Cities having a 5-cent base rate with additional charge outside city limits.	4
Cities having 5-cent base rate on most important lines with varying fares on others	1
Cities having a 5-cent base rate......	66
Total	273

In St. Louis the fare has, by order of the Missouri Public Service Comission, been decreased from 8 cents, two tickets for 15 cents, seven tickets for 50 cents, fifty tickets for $3.50, to a straight fare of 7 cents, with no tickets. In Fall River, Mass., although the base rate of 10 cents cash has been retained tickets are being sold, go to the traffic center, at sixteen for $1. There have been no other decreases.

Only Two Five-Cent Cities in New York

Of the principal cities of New York State only New York and Rochester are left with their original car fares. A 7-cent fare to take effect July 1 was agreed upon and a service-at-cost agreement is looked for in the latter city in the immediate future.

In forty-seven of the seventy cities control of the rate of fare is in the hands of city authorities and in the remaining twenty-three cases it is under the control of state commissions. In fifteen of the instances where the commissions are in control there is no application for increase pending, and in five more cases application has only

(Continued on page 100)

Base Fare Rate in Cities of More Than 25,000 Population, Census Estimate of 1917.

Ten Cents—25 Cities

Boston, Mass.
Pittsburgh, Pa.
Fall River, Mass.
Lowell, Mass.
Cambridge, Mass.
Lynn, Mass.
Lawrence, Mass.
Somerville, Mas.
Brockton, Mass.
Malden, Mass.
Salem, Mass.
Haverhill, Mass.
Chelsea, Mass.
Newton, Mass.
Wheeling, W. Va.
Fitchburg, Mass.
Everett, Mass.
Quincy, Mass.
Joliet, Ill.
Taunton, Mass.
Brookline, Mass.
Waltham, Mass.
Nashua, N. H.
Medford, Mass.
Walla Walla, Wash.

Nine Cents—One City

Portland, Me.

Eight Cents—15 Cities

Chicago, Ill.,
(elevated lines).
Cincinnati, Ohio
Washington, D. C.
Kansas City, Mo.
Youngstown, Ohio
Kansas City, Kan.
Manchester
Wilkes-Barre, Pa.
Johnstown, Pa.
Dubuque, Ia.
Aurora, Ill.
Norristown, Pa.
Easton, Pa.
Shenandoah, Pa.
Elgin, Ill.

Seven-Cent Zones, Two—Three Cities

Worcester, Mass.
Chicopee, Mass.
Springfield, Mass.

Seven Cents Central Zone, Outer Zones · Three Cents—One City

Milwaukee, Wis.

Seven Cents, Two Cents Transfer—One City

Toledo, Ohio

Seven Cents, One Cent Transfer—15 Cities

Newark, N. J.
Jersey City, N. J.
Paterson, N. J.
Trenton, N. J.
Camden, N. J.
Elizabeth, N. J.
Hoboken, N. J.
Passaic, N. J.
Bayonne, N. J.
West Hoboken, N. J.
East Orange, N. J.
Perth Amboy, N. J.
Orange, N. J.
Montclair, N. J.
New Brunswick, N. J.

Seven Cents—55 Cities

St. Louis, Mo.
Baltimore, Md.
Buffalo, N. Y.
Omaha, Neb.
Scranton, Pa.
San Antonio, Tex.
Nashville, Tenn.
Tacoma, Wash.
Houston, Tex.
Reading, Pa.
Albany, N. Y.
Wilmington, Del.
Davenport, Ia.
Racine, Wis.
Lincoln, Neb.
Macon, Ga.
Butte, Mont.
Montgomery, Ala.
New Castle, Pa.
St. Joseph, Mo.
Troy, N. Y.
Erie, Pa.
Allentown, Pa.
Chattanooga, Tenn.
Charleston, S. C.
Atlantic City, N. J.
Mobile, Ala.
Rockford, Ill.
Gary, Ind.
York, Pa.
Augusta, Ga.
Wilmington, N. C.
East Chicago, Ill.
Newburgh, N. Y.
Rock Island, Ill.
Butler, Pa.
Lewiston, Me.
Moline, Ill.
Chester, Pa.
Charlotte, N. C.
Auburn, N. Y.
Jamestown, N. Y.
Quincy, Ill.
Oshkosh, Wis.
Columbia, S. C.
Winston-Salem, N. C.
Jackson, Miss.
Oak Park, Ill.
Bloomington, Ill.
Muskegon, Mich.
Hammond, Ind.
Durham, N. C.
Hagerstown, Md.
Cohoes, N. Y.
Burlington, Ia.

Six Cents, Two Zones (Three Miles), Three Cents a Mile Thereafter—Eight Cities

New Haven, Conn.
Bridgeport, Conn.
Hartford, Conn.
Waterbury, Conn.
New Britain, Conn.
Stamford, Conn.
Meriden, Conn.
Norwalk, Conn.

Six-Cent Zones—Six Cities

Providence, R. I.
Holyoke, Mass.
Pawtucket, R. I.
Woonsocket, R. I.
Cranston, R. I.
Central Falls, R. I.

Six Cents, Two Cents Transfer—Two Cities

Norfolk, Va.
Portsmouth, Va.

Six Cents—66 Cities

Chicago, Ill.
(surface lines).
Detroit, Mich.
New Orleans, La.
Portland, Ore.
Denver, Col.
Oakland, Cal.
Columbus, Ohio
Atlanta, Ga.
Birmingham, Ala.
Syracuse, N. Y.
Spokane, Wash.
Memphis, Tenn.
Grand Rapids, Mich.
Salt Lake City, Utah
Ft. Worth, Tex.
Schenectady, N. Y.
Utica, N. Y.
East St. Louis, Ill.
Harrisburg, Pa.
Peoria, Ill.
Springfield, Ill.
Berkeley, Cal.
Altoona, Pa.
Little Rock, Ark.
Saginaw, Mich.
Pueblo, Colo.
Binghamton, N. Y.
Springfield, Ohio
Lancaster, Pa.
Topeka, Kan.
Bay City, Mich.
Lansing, Mich.
Lexington, Ky.
Springfield, Mo.
San Jose, Cal.
Colorado Springs, Col.
Amsterdam, N. Y.
Cedar Rapids, Ia.
Shreveport, La.
Fresno, Cal.
Stockton, Cal.
Jackson, Mich.
Bellingham, Wash.
Joplin, Mo.
Kenosha, Wis.
La Crosse, Wis.
Zanesville, Ohio
Madison, Wis.
Charleston, W. Va.
Poughkeepsie, N. Y.
Newport, R. I.
Battle Creek, Mich.
Green Bay, Wis.
Fort Smith, Ark.
Evanston, Ill.
Hazelton, Pa.
Beaumont, Tex.
Cheboygan, Wis.
Alameda, Cal.
Steubenville, Ohio
Bangor, Me.
Kingston, N. Y.
Cumberland, Md.
Asheville, N. C.
Union, N. J.
Paducah, Ky.

Two Five-Cent Zones—One City

San Diego, Cal.

Five Cents, Three Cents Transfer Certain Lines—One City

Philadelphia, Pa.

Five Cents, Two Cents Transfer—Two Cities

New Bedford, Mass.
Pittsfield, Mass.

Five Cents, One-Cent Transfer—One City

Cleveland, Ohio

Five Cents, Additional Charge in Suburbs—Four Cities

Yonkers, N. Y.
New Rochelle, N. Y.
Elmira, N. Y.
Mt. Vernon, N. Y.

Five Cents on Most Important Lines, Varying Fares on Others—One City

New York, N. Y.

Five Cents—66 Cities

Los Angeles, Cal.
San Francisco, Cal.
Minneapolis, Minn.
Seattle, Wash.
Indianapolis, Ind.
Rochester, N. Y.
Oklahoma City, Okla.
Duluth, Minn.
Akron, Ohio
Jacksonville, Fla.
Ft. Wayne, Ind.
Evansville, Ind.
Wichita, Kan.
South Bend, Ind.
Savannah, Ga.
El Paso, Tex.
Sacramento, Cal.
Terre Haute, Ind.
Canton, Ohio
Covington, Ky.
Knoxville, Tenn.
Sioux City, Ia.
Flint, Mich.
Tampa, Fla.
Kalamazoo, Mich.
Pasadena, Cal.
McKeesport, Pa.
Huntington, W. Va.
Muskogee, Okla.
Superior, Wis.
Roanoke, Va.
Galveston, Tex.
Decatur, Ill.
Hamilton, Ohio
Niagara Falls, N. Y.
Lorain, Ohio
Everett, Wash.
Lima, Ohio
Waterloo, Ia.
Boise, Idaho
Austin, Tex.
Williamsport, Pa.
Waco, Tex.
Highland Park, Mich.
Lynchburg, Va.
Danville, Ill.
Tulsa, Okla.
Ogden, Utah
Newport, Ky.
Council Bluffs, Ia.
Watertown, N. Y.
Newark, Ohio
Portsmouth, Ohio
Long Beach, Cal.
Clinton, Ia.
Pensacola, Fla.
Columbus, Ga.
Petersburg, Va.
Muncie, Ind.
Richmond, Ind.

recently been made, so that it may be said that no tendency on the part of the commissions to refuse relief is revealed. This is plainly evidenced by the geographical location of the cities in which the base rate is still 5 cents. Forty-nine of such cities are located in states where the commissions are without jurisdiction over fares stipulated in franchises.

UPWARD TENDENCY PLAINLY INDICATED

The trend toward fares higher than 6 cents is indicated by an examination of the fifty-nine applications for increases now pending. Of these, seventeen are second applications. Of the entire number, one is for a 10-cent fare with a 2-cent charge for a transfer; nine are for 10-cent fares; six for 8-cent fares; one for a 7-cent fare with a 3-cent transfer charge; sixteen for a 7-cent fare; one for a 6-cent fare with a 1-cent transfer charge; thirteen for a 6-cent fare and in eleven cases the relief asked is not specified.

The table on page 99 shows the various base rates of fare and the cities in which they are being charged, as compiled by the American Electric Railway Association. The ticket fare is not given and in consequence the actual revenue received per passenger cannot be definitely stated.

Rainier Line Asks Another Increase

The Seattle & Rainier Valley Railway, Seattle, Wash., has applied to the State Public Service Corporation for permission to increase its fares. The new schedule is intended to supersede the 7-cent fare put into effect on the company's lines on June 6, the company declaring that the further increase is necessary in order to operate the privately-owned system without loss. If approved, the new tariff will be put into effect on July 19, the day set for increasing fares on the municipal lines. The proposed schedule follows:

> Ten-cent cash fare for adults and for children more than six years of age, and for children less than six years of age, when occupying seats required by other passengers, or when traveling alone.
>
> Fare at the rate of 6⅔ cents each for metal tokens, purchased in lots of fifteen for $1.
>
> School fare metal tokens good only for children going to and from school, 3⅓ cents each if purchased in lots of ten.
>
> Lap dogs carried free of charge; other dogs, except between the hours of 7 and 8:30 a.m. and 4:30 and 6:30 p.m. 10 cents. During the hours designated, they may not be taken on the cars at all.
>
> Fares for Zone 2 (between the city limits and the town of Bryn Mawr) 15 cents, and 5 cents between two points in that zone. For Zone 3 (from Bryn Mawr to Renton) 20 cents. Fares between points in Zones 2 and 3, 10 cents.

The schedule provides for interchange of transfers between the Rainier Valley cars and municipal lines at a cost to the passenger of 2 cents if his original fare was paid with a token. Transfers will be issued without charge, however, on the 10-cent cash fare.

The company put the present 7-cent fare in effect on June 6, with the approval of the commission. This tariff was passed without protest.

Service at Cost Suggested

Louisville Railway Committee Sees Ohio as Most Promising Avenue of Relief

The executive committee of the Louisville (Ky.) Railway, composed of W. S. Speed, John W. Barr, Jr., and William H. Kaye, has submitted to Mayor Smith an exhaustive report in which it asks for an increase in fares from 5 cents to 7 cents and announces that it will offer an ordinance to the City Council which, if passed, will enable the company to operate on what is termed a "service-at-cost" plan. The report says a 7-cent fare is required if the company is to get sufficient revenue to render adequate service, make necessary charges for maintenance, remain a going concern and provide a reasonable return on the investment. The request has as its basis operation under a 5-cent fare for a considerable trial period. The report declares that a continuation of the 5-cent fare would mean a deficit this year of $571,896 if dividends were paid. An initial 7-cent fare is suggested.

THE report to the Mayor was signed by W. S. Speed, chairman; John W. Barr, Jr., and W. H. Kaye, the executive committee, and is supplemental to the report made in March, 1919, by the Arnold Company, Chicago, engineers, which reached much the same conclusions as to the need for an increase in fares in Louisville. Its technical portion was prepared by the Arnold Company from facts gathered from the company's books.

$500,000 LOSS LIKELY

Unless there is a raise in fare, the report shows, the company will fall short by more than $500,000 both this year and in 1921 of the amount needed to pay interest on the investment. Even with the use of one-man cars in 1921 the deficit would still be about $469,000, and these cars would cost the company about $400,000, a sum which it would find difficult to borrow on the financial showing it can make with the present rate of fare. The report says changes suggested in the March, 1919, report have been carried out and have effected some savings, suggests others in addition to the introduction of one-man cars which might be resorted to, but says that none will meet the situation nor bring the Louisville company the revenue it needs so that it can give the city adequate service and provide a reasonable return on the investment.

The report discusses some of the solutions other than a fare raise to meet the problem of the company's increasing expense list and its fixed revenue. The zone system which has been tried but not found successful in other cities and the payment of a charge for transfers, now issued free, are each discussed in detail and dismissed as impractical or clearly insufficient to raise the revenue needed, put the company firmly on its feet and keep it a going concern which can renew worn-out parts of its plant from year to year, keep its employees satisfied, give good, safe, comfortable service and provide some return for security holders.

$1,800,000 NEEDED FOR NEW WORK

The report points out also that in addition to taking care of maintenance charges, ordinary expense and providing revenue for interest and dividends, the company will absolutely need about $1,891,000 in the five years from 1920 to 1924 for the purchase of double truck cars, one-man cars, air brakes and motor equipment, for track extensions, carhouse construction, etc., to keep the system going. Renewal charges in connection with these items for the same period would amount to $1,025,000 additional.

Money for the purchase of these cars and the equipment must be raised on security issues and unless the credit of the company is improved through a higher rate of fare it will have great difficulty in getting the necessary financial assistance, the report asserts.

In discussing a zone fare system for the city, the report says:

> Probably the only line on which a second fare could be collected is the Fourth Street line. Traffic counts at the city limits are not available, but it seems probable that, at a maximum, not over 4,000 to 5,000 additional fares per day would be collected. If an additional fare of 5 cents were charged for a ride beyond the city limits, the revenue obtained would probably not exceed $90,000 a year, which is obviously inadequate to meet the probable deficit.

After declaring it is difficult to estimate with any degree of accuracy the amount of revenue that might be obtained by a charge for transfers, the report says during 1920 probably 40 per cent of the passengers carried will transfer. The report continues in part:

> It is probable that a 1-cent charge for transfers would result in the immediate reduction in the number of transfer passengers by possibly 50 per cent and in some reduction in cash fares. In our opinion, the additional revenue from a 1-cent transfer would not exceed $120,000 a year. A higher charge for transfers will result in a further reduction in the number of transfer passengers so that the increase in revenue will not be proportional to the increased charge. And it is believed that the required increase in revenue would not be obtained by any transfer charge.
>
> Even assuming that the revenue required could be raised by a charge for transfers, the justice of such a charge on a system such as operated in Louisville is open to serious question. The operation of through routes makes it possible for passengers to take a very long ride for a single fare if they so desire and this character of long haul cannot be reduced except by the installation of a zone system of fares, which is deemed impractical under Louisville conditions.
>
> Transfer passengers on the average probably do not ride much, if any further, than cash passengers, although their points of origin and destination require them to use two car lines. The effect of a transfer charge would be to penalize a passenger whose home and place of business do not happen to be on the same car line. The long ride now possible for a single fare would not be reduced materially, but many passengers taking a relatively short ride would have their fare unduly increased.
>
> As a matter of fact, the number of passengers taking an excessively long ride, either for a single fare or with a transfer, is probably not a serious matter. Several very long hauls are possible, but the vast bulk of the riding is between the business and residence districts.

In view of all the conditions, it appears that the most practical and equitable means of raising the required revenue is by an increase in the rate of fare. The alternative, a zone fare system, has not been very successful on street railways in the United States, and further, it is not believed that Louisville conditions warrant such fare system.

ECONOMY IN RESCHEDULING

A study of traffic and service indicates that by rerouting and rescheduling there can be effected a saving in expense of $40,000 a year, of which only $20,000 could be saved in 1920.

By the use of a number of one-man safety cars for appropriate routes it is estimated that a further saving of $84,700 a year can be effected. This saving cannot be effected in 1920, and can only be made after the cars are purchased at a cost of about $400,000.

Including these savings the amount available for dividends is estimated to be: 1920, $102,520; 1921, $151,000 (without one-man cars); 1921, $204,700 (with one-man cars).

On the basis of dividends of 5 per cent on the preferred stock and 6 per cent on the common stock, $674,416 per year, the company would face a deficit as follows: 1920, $571,896: 1921, $522,916 (without one-man cars); 1921, $469,718 (with one-man cars).

Under Louisville conditions it is believed that a transfer charge would be inequitable and an undue burden on passengers whose points of origin and destination require the use of two car lines.

It is recommended that by an increase in fare, sufficient revenue be provided to furnish adequate service to the community and to provide a reasonable return to the company on its invested capital.

With the view of affording the greatest convenience to the greatest number of people the movement of street cars should be favored over that of automobiles since a delay to a car carrying sixty-five passengers is as serious as a similar delay to sixteen automobiles carrying four passengers each. Further, it should be recognized that the primary function of the public street is the movement of traffic and not the storage of vehicles.

PARKING PROHIBITION ASKED

The report says where there is available street space every effort should be made, with police department co-operation, to keep vehicles off the car tracks but says that on some streets, notably Fourth, conditions are particularly bad and result in many delays. In this connection the report says in part:

The most obvious remedy for this situation is the prohibition of automobiles parking on Fourth Street during rush hours. By this means the space now used by standing vehicles would be available for moving vehicles and the car tracks usually kept clear for street cars. Some measure of relief could be obtained by prohibiting parking, for perhaps 150 ft. adjacent to a car-loading berth, thus enabling automobiles to get off the car track for that distance and permitting a less obstructed approach to the corner for cars.

In making its conclusions and recommendations the committee shows the company's estimated revenue for 1920 to be $4,102,000 and for 1921 to be $4,220,000. Operating expenses, taxes, maintenance and other charges with interest on bonds would leave for dividends on the present fare basis in 1920, $82,500, and 1921, $80,000. This is about one-seventh of the amount required to take care of dividend requirements.

Ask Higher Freight Rates

A general increase in freight rates is asked by twenty-one electric railways operating interurban lines in Indiana in petitions recently filed with the State Public Service Commission. Among the petitioners are the Chicago, South Bend & Northern Indiana Railway, South Bend; the Union Traction Company of Indiana, Anderson, and the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis. The companies seek an advance in rates sufficient to place them on an equality with steam roads operating within the State.

Recent activities on the part of freight departments of the various interurban lines leads to the general belief that these lines are taking steps to build up their long-neglected freight business. In spite of the fact that Indiana is crisscrossed in every section by traction lines, they never have made an active bid for extensive freight business. During the recent car shortage on the part of the steam roads more and more demands have been made upon traction lines for short-haul freight, with the result that officials are being favorably impressed with the possibilities of the freight end of the business.

Shippers in the smaller industrial cities surrounding Indianapolis, such as Terre Haute, Richmond, Kokomo, Anderson, Muncie and Frankfort, found it impossible to ship goods during the car shortage. Indianapolis was very fortunate in being able to ship, even though the car movement was curtailed, the most of the time when the shortage was at its worst. The result was that shippers in these smaller industrial centers shipped their goods by trolley freight to Indianapolis and from there to the destination over steam roads.

Hearing July 15 on Application of Pacific Electric for Rate Increase

The California State Railroad Commission has set July 15, 1920, as the date for a public hearing in the matter of the Pacific Electric Railway's application for an increase in both interurban and local fares. The interurban company's petition applies for an increase in freight rates at the same time. Hearing will be held in Los Angeles before three commissioners of the State.

An increase in freight rates equivalent to that which may be granted by the Interstate Commerce Commission to steam roads in their application for a 24 per cent increase in the California territory has been petitioned for by the Pacific Electric. It has been brought out that the same increases in operation costs of steam roads are obtaining in the cost of handling freight over electric lines, necessitating that an increase in conformity to that applied for by the steam roads be granted.

Of the Pacific Electric Railway's gross traffic, only 22 per cent is taken up in the handling of freight. Forty-five per cent of the freight handled by Pacific Electric Railway is interstate in character and the rates for this, it is cited, should be maintained at a parity with steam lines competing for this business. Without an increase in the rates for handling freight, additional increases over those already submitted in passenger rates would have to be petitioned for, it is asserted.

Jitneys or Trolleys?

Auto-Ridden Bridgeport Must Decide by July 15 Which It Will Retain

Trolleys may cease to run in Bridgeport, Conn., on July 15. The Connecticut Company has been forced to indicate that it may be necessary to suspend service owing to the inroads made by jitneys operated under conditions of competition distinctly unfair to the railway. The company had indicated previously that this was its decision. In a formal statement made on July 3 the company said:

As is well known, jitneys have been operated in the city of Bridgeport for the several years last past in direct competition with the cars of the Connecticut company and to a greater extent than in any other city of the State. This competition has materially affected the revenues of the company, the amount received having been for a long time insufficient to meet ordinary operating costs and recently having so fallen off as to but barely meet the payrolls, leaving not enough to pay for materials and supplies. In other words, at the present time the company is actually losing money by the operation of its cars in Bridgeport.

The company has sought to meet this competition and to improve the character of its service, having purchased a large number of safety cars, but unfortunately the financial results have not only failed to improve but have grown steadily worse. Manifestly, this cannot continue. The company has no profits at other places which it can draw upon to make up its losses in Bridgeport. The continuance of its operations must depend upon the revenues received.

DIRECT COMPETITION UNFAIR

The great cause of the competition which has proven so ruinous to the company is that the routes assigned to the jitneys by the public authorities are all on streets upon which the railway tracks are located, so that all the revenues which they receive comes from those who would otherwise pay car fares and thus directly takes away the the revenues of this company. The extent of this competition is shown by the fact that the jitneys are carrying over one-half the total number of passengers.

Under such severe and unregulated competition it is impossible for this company to operate. It is obliged to pay a percentage of its gross receipts in the form of a tax and in addition must maintain the greater portion of the pavements on the streets in which its tracks are located and contribute towards the cost of all bridge renewals. It performs a full measure of service for more than eighteen hours of each day and during snow storms keeps the streets open for the passage, not only of its own cars, but for jitneys, delivery wagons and other vehicles. Its service must be continuous and dependable. No means of conveyance not confined to definite track areas can supply the amount of service required, especially in a city with narrow central streets.

The jitney operates wherever and whenever the individual owner pleases without regard to the necessity or convenience of the community, and the jitneys alone cannot give an entire city such service as is necessary for its continued growth and prosperity.

There are areas in the city of Bridgeport without means of public transportation through which motor bus routes would be of great service and would meet a real necessity, and we are advised that it is within the power of the city to establish such routes and to confine jitney operation thereto. By so doing a material improvement in public transportation would be afforded and by eliminating ruinous competition the continued operation of street cars would be made possible. Without some action of this kind continued operation is not possible.

In making this statement the trustees desire only to point out the real situation. They have no wish to take an unreasonable attitude. The point is simply that the railway service cannot be carried on in the face of existing jitney competition. And if such service be discontinued it will be because under existing conditions this company cannot make enough money to pay its expenses.

The trustees desire to call attention in this connection to the fact that the Connecticut Company has no legal process available to it for restriction or control of jitney competition or service either by appeal to the courts or to the Public Utilities Commission while the city government, as they are advised, has adequate power in the premises.

As the jitney competition is more intensive in Bridgeport than in any other portion of the State, the exact plan has been determined for that locality only, no details having as yet been worked out relative to action in any other city. It will, however, be essential to give careful attention to this matter in all parts of the State, and as the solution lies within the power of the local authorities in each instance, it is probable that proper steps will be taken in each locality.

Six Cents in Canton

The City Council of Canton, Ohio, on July 2, by a unanimous vote, passed an ordinance giving the Northern Ohio Traction & Light Company a 6-cent cash fare with seventeen tickets for $1, but the Mayor vetoed the measure. The newspapers declared that the settlement was satisfactory to all concerned and the Council will undoubtedly proceed to pass the bill over the Mayor's veto.

On July 3, the City Council of Massillon informed the company that it will not grant a 10-cent fare and that the offer of 8 cents, with four tickets for a quarter, is the best that can be made. The local men have since gone on strike.

Pittsburgh Petition Presented

Holding the objections of the Pennsylvania State Public Service Commission to an increase in fare in Pittsburgh from 7½ to 8½ cents, or three tickets for a quarter, "merely a question of procedure," the receivers of the Pittsburgh Railways formally announced last week that they had filed a petition with the commission, asking approval of the contemplated increased fares.

Filing of the new petition, however, after the previous petition met with a setback at the hands of the commission, means a delay of at least a month in putting the 8½-cent fare into effect. The receivers fixed the date at July 14.

The commission has fixed Aug. 10 as the time for a hearing on the petition. As the increased fare cannot now go into effect, under the commission's ruling, until the commission approves it, this approval, if given, must not come later than Aug 10, the day of the hearing.

The Mayor and the Council urged that the trainmen be given a substantial increase in wages. Whether they will oppose the fare increase when the commission takes up the matter will not be determined until next week when the city officials will advise on what attitude should be taken by them.

On two different occasions the Mayor and the merchants have promised that, if the company granted an increase to the men, they would join the company in an appeal to the State authorities for permission to increase the fare in order to meet the added expenses due to a bigger payroll. When the time came, however, both the merchants and the Mayor opposed an increased fare.

Transportation News Notes

Interstate Line Wants More.—The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill, has applied to the Interstate Commerce Commission for an increase in fare from 2.5 cents to 2.7 cents a mile.

Higher Rate Denied.—The Illinois Public Utilities Commission has issued an order pending until Dec. 29, 1920, the proposed increase in fare from 6 cents to 7 cents on the lines of the Jacksonville Railway & Light Company, Jacksonville.

Increase Asked in Gary.—The Gary (Ind.) Street Railway has petitioned the Public Service Commission for a 10-cent fare in Gary, Hammond and East Chicago. The petition asks authority to sell ten tickets for 70 cents, with a 5-cent fare in interurban zones.

L. A. Carmen Read "Two Bells."—Carmen and other employees in the service of the Los Angeles (Cal.) Railway are now looking forward each week to the appearance of *Two Bells*, the company's new magazine. The paper is edited by J. G. Jeffery, director of public relations of the railway.

Ten Cents Asked in Greenfield.—The Connecticut Valley Street Railway, Greenfield, Mass., has petitioned the State Department of Public Utilities for an increase in fare from 6 cents to 10 cents. The company proposes to sell labor tickets at 7½ cents each. The road has paid no dividends on its common stock since 1916, and no dividends on preferred stock since 1918.

Ten-Cent Fare Stands.—The Chicago & Joliet Electric Railway, Joliet, Ill., has been authorized by the State Public Utilities Commission to continue until further notice the 10-cent fare now being charged on its Joliet lines. The commission has authorized the Central Illinois Public Service Company, Mattoon, to continue charging a 6-cent fare on its lines in Mattoon.

Seven Cents in Lexington.—Car riders in Lexington, Ky., are now paying a local fare of 7 cents, and a minimum fare of 7 cents on the interurban lines of the Kentucky Traction & Terminal Company. The new rates became effective on June 14. The fare was formerly 6 cents. There was little opposition to the increase on the part of the public.

Zone Fares Six Cents.—The Public Service Commission for the Second District of New York has authorized Leverett S. Miller, receiver of the Westchester Street Railroad, to increase the rate of fare from 5 cents to 6 cents in zones where franchise restrictions have been waived by local authorities. These waivers terminate on Aug. 1, 1920. The commission's permission to charge the 6-cent fare is effective only to and including July 31.

Seven Cents in Springfield.—An increase in cash fare from 6 cents to 7 cents on the lines of the Springfield (Ill.) Consolidated Railway was authorized by the State Public Utilities Commission on June 16. The commission announced that the new rate would be effective ten days after the company's acceptance of the order. The company was directed to sell four tickets for 25 cents and thirty-five school tickets for $1.

Safety-First Placards. — A safety-first campaign has been started by the Monongahela Valley Traction Company, Fairmont, W. Va., on its Fairmont division for the purpose of instructing passengers in the proper methods of getting on and off and riding on its cars. A series of placards is being displayed in the cars, illustrating the mistakes most frequently made and their evil results. These placards will be changed from time to time

Fares Decreased, But Zones Increased.—The Interstate Consolidated Street Railway and Attleboro Branch Railroad, have been granted a fare increase through re-arrangement of fare zones. The actual cash fare has been reduced from 7 cents to 5 cents, but the zones have been shortened and the number increased. On April 18, the companies were permitted to increase their fares from 6 cents to 7 cents pending an investigation by the Public Utilities Commission.

Jersey City Interested in Newark Case.—Counsel for Jersey City has requested recognition by the court as co-defendant in the case of the Public Service Railway of New Jersey to enjoin the jitneys from operating in Newark, N. J. This is asked upon the ground that the jitneys pay 5 per cent of their gross revenue to the city. This fact seems to offer little support, however, to the defendant jitneys, as the railway also pays a similar percentage. The city of Newark takes a less prominent position, being interested only in the question of authority of the municipality to regulate both utilities. This right the Public Service Railway does not dispute, the question of regulation not being raised. It is expected that the case will come up for trial July 10.

New Publication

Essentials of Alternating Currents

By W. H. Timbie and H. H. Higbie. John Wiley & Sons, Inc., New York, N. Y.

The authors of this book are well known for their ability to explain in clear, simple language the essentials of electrical circuits and machinery. The book should be useful to practical men who wish to study for the first time or to review the principles underlying their everyday duties. It is nonmathematical in character and is replete with problems and diagrams.

Personal Mention

New Board Member

Colonel Stayton Will Assume New Post at Kansas City on Aug. 15—Succeeds R. P. Woods

Col. Edward M. Stayton has recently been made the city representative on the Board of Control of the Kansas City (Mo.) Railways of which Philip J. Kealy is the other member. Colonel Stayton takes the place of R. P. Woods, who recently resigned to devote his time to the Kansas City, Clay County & St. Joseph Railway, of which he is vice-president and general manager.

Kansas City is indeed fortunate in securing the services of a man of Colonel Stayton's caliber and engineering experience. Born on Sept. 4, 1874, near Independence, Mo., he attended the Independence schools and later Missouri University. From 1894 up to the present time he has been actively engaged in engineering work, a large part of his time being spent in and about Kansas City. Mr. Stayton probably knows Jackson and Clay Counties from the highway and railway standpoint better than any other man. In 1903-04 he was chief engineer for the proposed Kansas City, Parkville & St. Joseph Railway, making surveys, estimates, etc., also superintendent of construction for the State of Kansas in the building of a brick street costing $20,000. In Spanish Honduras during the following two years he located and built 8 miles of narrow-gage road for the Las Palmas Plantation Company.

From April, 1905, to September, 1906, Mr. Stayton was chief engineer for Kansas City, Parkville & St. Joseph Railway and the Kansas City, St. Joseph & Excelsior Springs Railway. From September, 1906, to July, 1907, he was locating engineer for Div. No. 1 of the Missouri River & Gulf Railway (proposed) between Kansas City and the Gulf of Mexico. From January, 1905, to June, 1905, he was employed as chief engineer of surveys of the Kansas City & St. Louis Electric Railway. During the five years from 1911 to 1916 he was connected with the Kansas City, Clay County & St. Joseph Railway and engaged in general consultation practice on highways and railways.

Before leaving for the Mexican border in June, 1916, Colonel Stayton, then Major of Artillery, U. S. was Highway Engineer of Jackson County, Missouri. Only a few months after returning from the border he again entered the service and as Major 110th Engineers, U. S. A., later Lieutenant-Colonel, and left with his regiment for France. Since his return Colonel Stayton has been consulting engineer for the location and construction of highways for Clay and other counties in Missouri.

On May 28, Mr. Stayton was elected Colonel of the Seventh Regiment of the Missouri National Guards. Colonel Stayton is a member of the American Society of Civil Engineers. He will not assume his duties on the Board of Control until Aug. 15.

Mr. Kidder Advanced

Electrical Superintendent of Interborough Will Succeed Mr. Finlay as Superintendent of Power

Announcement has been made of the appointment of H. A. Kidder, electrical superintendent in the motive power department of the Interborough Rapid Transit Company and the New York Railways, New York, N. Y., to be assistant superintendent of motive power of these companies. The appointment is made pending final severance of the relations of W. S. Finlay, Jr., with these organizations in the near future, at which time Mr. Kidder will become superintendent of motive power.

H. A KIDDER

Mr. Kidder's appointment follows the election of Mr. Finlay to be vice-president of the American Water Works & Electric Company, New York, which operates a number of water works and other public utilities. A biography and a portrait of Mr. Finlay were published in the ELECTRIC RAILWAY JOURNAL for May 29, page 1122. Mr. Finlay was recently tendered a dinner by his associates in the Interborough. On this occasion President Frank Hedley referred to Mr. Kidder as Mr. Finlay's successor.

In his new position Mr. Kidder will have direct supervision of the manifold activities connected with the furnishing of power for the Manhattan rapid transit and surface lines. His headquarters will be at the Fifty-ninth Street power station of the Interborough, the chief generating plant of the system. This great installation, one of the largest of its class in the country, was constructed under the direction of the late Henry G. Stott, who, until his death in 1917, occupied the position of superintendent of motive power.

Like Mr. Finlay, Mr. Kidder has been connected with the Interborough since the early days of the system. Joining the company in 1906 as assistant electrical superintendent, he had a part in the development of the Fifty-ninth Street station and in the other power installations of the company. He therefore has a thorough working knowledge of the system's motive power problem and is well equipped to perform his new duties, which, in addition to those that directly involve power generation, include the direction of the engineering and construction work coming within the scope of the motive power department.

Mr. Jones, General Manager

On July 1 T. Norman Jones became general manager of the Norfolk and Portsmouth division of the Virginia Railway & Power Company. He has been assistant general manager of the division for three years. Mr. Jones in his fourteen years' service with the Virginia Railway & Power Company has been in practically every division. Born in Richmond in 1882 he was educated in the schools of Wilson, N. C., and the University of Virginia. As a young man he became associated with the engineering corps in charge of the construction of the Potomac yards, and with the McKay Engineering Company, and the United Electric Light & Power Company. In 1906 at the age of twenty-four he took the position of mechanical and electrical engineer with the Virginia Railway & Power Company. The next year he devoted his time to the operation of the Richmond & Chesapeake Bay Railway. In 1911 he returned to the Virginia Railway & Power Company as chief engineer and he continued in that position until 1916, when he was appointed assistant general manager. Up to the present time C. B. Buchanan, vice-president of the company, held the title of general manager.

Edwin D. Smith, who has given fifteen years' service to the United Railways of St. Louis, will resign as chief engineer on Sept. 1. Born in Galion, Ohio, in 1877, he was educated in the grade schools of Missouri and was graduated from the Missouri University. In 1901 he entered the employ of the St. Louis Transit Company, the predecessor of the United Railways. He held various positions in the power stations of the company until in 1904 he was appointed superintendent of power stations. Mr. Smith is a member of the City Plan Commission, the St. Louis Electrical Board of Trade and the State Public Utilities Association. He resigns to become superintendent of power and maintenance National Cash Register Company, Dayton, Ohio.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Market for Fare Boxes and Registers Expanding

Growing Favor of Metal Ticket and Increasing Tendency to Count Fares Aiding Sales of Equipments

Growing use of the metal ticket, which is rapidly coming into favor with electric railways, is largely responsible for the greatly increased sales of registering fare boxes, according to one of the large manufacturers. A good demand is also felt for fare registers. but the increase of business there has not kept pace with the growth of the fare box industry apparently. Orders for fare registers are being received in normal volume or about the same as last year, the first six months of which represented an increase of approximately 30 per cent over the same period in 1918. On the other hand, sales of registering fare boxes have presented a steady increase thus far over the corresponding period a year ago, amounting to about 50 per cent. The turning of the half-year mark in 1919 was again 75 per cent ahead of the figures for 1918.

Manufacturers of registers are in a better position to make shipments, orders for standard material being usually filled promptly from stocks kept at a level of three months' surplus.

The fare boxes cannot be supplied from stock, however, as back orders have piled up for ninety days. Deliveries were made in from forty to seventy days last fall. In neither case are labor troubles affecting the situation.

The raw material supply is another matter, as in that respect makers of both products are meeting considerable difficulty in obtaining such material as steel and malleable iron castings from the mills, which are tied up with transportation and labor troubles. This condition has its reflection in the production of fare boxes and registers, which in the case of some manufacturers is sub-normal. Other producers, however, report operation at full capacity.

A slight increase in the price of fare boxes was reported on June 1 by one representative company, amounting to from 4 to 5 per cent. Rising costs of labor and material are given as the cause.

In this instance the prices of 1919 presented no increase over those of 1918. Another large manufacturer representing the fare register industry has made no recent price changes, but quotations were increased materially during 1919. Opinions agree that present prices have about reached their top figure. A favorable factor is the entire absence of order cancellations in this line.

The policy of electric railways is tending more and more toward counting the fare rather than the passenger. Recent large orders placed by important traction companies are evidence of this. One large manufacturer has recently filled orders to the extent of 1,650 registering fare boxes and about 2,200,000 metal tickets, distributed among five companies in amounts of approximately 700, 600, 200, 100 and 50 equipments, and providing a complete installation on three of the five lines. Another producer who specializes in fare registers has recently filled orders for approximately 600 equipments divided among three traction companies.

Coal a Little Freer

Acute Situation Eased Somewhat, but Still Causing a Great Deal of Uneasiness

Although the edge has been taken off the very acute coal situation facing the traction companies, they are not out of the woods, by any means. Even at this early date, with the thirty-day priority on open-top cars for delivery of coal only half up, certain leeway is being afforded metal interests for the use of such cars for shipments of metals. On the face of it, this is not assisting much in the laying in of coal reserve stocks.

In discussing the fuel situation, F. H. Miller, vice-president of the Louisville (Ky.) Railway, said: "At this time last year we had about 17,000 tons of coal on hand, but right now we have only about 2,500 tons. While we have a contract with a reliable coal concern, contracts don't mean much where the operator is unable to secure cars for shipment. The coal situation has been giving us a little uneasiness, and it may increase operating expenses materially."

It is a well established fact that eastern Kentucky and West Virginia gas coal has advanced to a point where it is selling at $9 to $9.50 and even $10 a ton for mine run at mine, while non-gas coal of the better grades is quoted at $8.00 to $8.50 at the East Kentucky and West Virginia mines. Western Kentucky mine run is quoted at $5 to $5.50 at mine. These prices were secured from operators recently. It is reported that public utility companies, steel companies, by-product concerns, etc., are entering the fields with cash and certified checks and bidding up prices, offering higher than the last offer in order to secure shipments.

Good Demand for Motor-Driven Chain Blocks

Stocks Are in Good Shape in Distributers' Hands, with Factory Shipments in About Five Months

Generally speaking, shipments of electrically driven chain blocks can be made from stocks which are in dealers' and distributers' hands throughout the country. Manufacturers are ordered up above their present production capacity, but are able to make factory shipments in about five weeks. Stocks of raw materials are in fair shape, but stocks of motors are not so good. Considerable difficulty is still being experienced in getting enough motors, and this is the main feature lengthening shipments. At the same time, the motors are so standardized that few different styles have to be kept, and therefore greater ease of stocking is experienced.

Demand for chain blocks is good among electric railways and is tending constantly to the use of motor-driven blocks. Prices have been holding rather steady during the last six weeks, but it would not be surprising to see an advance, because that is the direction any change would take, it is understood from the manufacturers.

Switzerland Floats $25,000,000 Loan to Electrify Federal Railroads

Development of hydro-electric power, estimated to total 2,700,000 horsepower, is aimed at in the recent loan of $25,000,000 negotiated in this country by the government of Switzerland for the purpose of electrifying the Swiss Federal Railways. The utilization of her vast amount of unused water power will greatly simplify Switzerland's fuel question and relieve her from the present necessity of importing coal from outside sources at extremely high prices. It is estimated that if the old hydro-electric plants were replaced by new ones, the total water-power resources of the country could even be raised to 8,000,000 hp. It is expected that the development of this power will effect large economies in the operation of all Swiss railways and industries.

In 1913 the government of Switzerland owned 1,800 miles of the 3,671 total mileage of the country. Of the remaining sum owned by private companies, 622 miles are already electrified, but only a small portion of the government-owned railroads have made the change from steam to electric power. Of the government's total debt, amounting to about seven and a half millions, slightly more than half is attributable to the federal railways, although in normal years these have shown a substantial profit.

The loan has been negotiated in the form of twenty-year bonds yielding 8 per cent, callable after ten years and with a sinking fund of $1,000,000 per annum for the purchase of the bonds. One of the provisions of the transaction is that the equipment involved in the electrification of the railways be purchased in the United States.

Stranded-Steel-Wire Market Steady Under Short Supply

Railways Buying Less, but Labor, Transportation and Shortage of Raw Materials Are Cutting Production

Although demand for stranded steel wire is not extra heavy, manufacturers are having considerable difficulty in meeting orders. The volume of buying has increased slightly over a year ago, but is still subnormal if anything. Little new construction work is being undertaken, repairs and replacements accounting for most of the orders. Where formerly the electric railways would stock ahead on suspension and guy wires, money tightness is now causing them to cut expenditures to the bone; consequently stranded wire is ordered only as absolutely needed.

In spite of this circumstance production is generally inadequate to meet demands, one of the largest wire producers reporting operation at only about 65 per cent of capacity owing to raw material and transportation difficulties. Another manufacturer has been hindered by labor troubles, the mills of this company operating only seven months last year because of strikes. Zinc is reported hard to obtain; hence the process of galvanizing stranded wire is one more factor delaying some producers, although other mills which own their own zinc and coal mines are free from this trouble.

As a result of these conditions orders are running further and further behind, with deliveries ranging from ten weeks to five months. Stocks in this field seem to have gone out of existence. Transportation difficulties continue to tie up shipments at the mills; in fact, with the recent coal priorities order in force, manufacturers report no relief in that quarter.

The encouraging features of the situation seem to be the entire absence of order cancellations and the continued steadiness of the market, prices having remained firm during the past year, although the tendency would seem to be up at the present time.

Agreement Reached in Sheet Wage Controversy

Independent manufacturers in the sheet and tinplate industry and the Amalgamated Association of workers in the steel, iron and tin mills came to an agreement on the scale controversy last Friday. The suspension and curtailment of numerous mills throughout the producing centers of the middle west has been averted and the workers will go on under virtually the same agreement as existed up to June 30.

The 20 per cent wage increase and the six-hour shift for an eight-hour shift have been abandoned, but some minor concessions were made by the producers. A spell hand is introduced here and there and a few adjustments of little importance are made in both sheet and tin mill scales.

Rolling Stock

Cape Girardeau-Jackson Interurban Railway, Cape Girardeau, Mo., announces the expectation to purchase four or five used single-truck cars.

Sacramento Northern Railroad, Sacramento, Cal., has purchased two sixty-ton electric locomotives at a cost of approximately $72,000. The locomotives, which are of the same size and type of two others bought last year, will be used in handling crops along the Sacramento Valley this summer and fall. Delivery is expected this month.

Shamokin Mt. Carmel Transit Company, Mt. Carmel, Pa., recently had its machine shop and carhouses destroyed in a fire originating from lightning. Two cars were also lost, raising the damage estimate to $30,000.

Concord Electric Railway, Concord, N. H., expects to place contracts during the next two weeks for brakes, fenders, registers and other rolling stock equipment to be used for safety cars the company is rebuilding.

Recent Incorporations

Blue Ridge Development Company, Hickory, N. C.—The Blue Ridge Development has recently been incorporated with a capital stock of $500,000. A survey of the road is being made which will connect Charlotte, Hickory and Blowing Rock. The company expects to lay 100 miles of single track. The incorporators include N. T. Shipp, Newton; G. N. Hutton, J. D. Elliott, J. L. Cilley and others of Hickory.

Franchises

Houston, Bay Shore & Texas City Traction Company, Houston, Tex.—The Houston, Bay Shore & Texas City Traction Company has received a franchise to run its new interurban line from Houston to Texas City through Harrisburg. The City Council of Harrisburg passed the franchise.

Babylon Railroad, Babylon, N. Y.—Joseph G. Robin has made application to the Babylon Village Board for a franchise to construct and operate a street railway between Babylon and Amityville. The aim is to rehabilitate the Babylon Railroad, the franchise for which has been suspended. A report on the new franchise will be made on July 12.

Track and Roadway

Connecticut Company, New Haven, Conn. — The Connecticut Company, operating the Putnam trolley line, will begin improving its right of way on Grove Street at once.

Chicago & Joliet Electric Railway, Joliet, Ill.—The Chicago & Joliet Electric Railway expects to build 3 miles of double track some time this season, being a detour around the city of Lockport on its interurban line.

Municipal Street Railway, Alexandria, La.—The Municipal Street Railway of Alexandria is rebuilding four blocks with girder rail on Second Street and has purchased material to rebuild six blocks on Monroe Street with the same kind of rail.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway will replace worn rails and ties in Main Street.

Springfield (Mass.) Street Railway.—Extension of the tracks of the Springfield Street Railway in the eastern section of Springfield is now assured by the successful efforts of the citizens and the Chamber of Commerce to raise $300,000.

Winston-Salem, N. C.—While conditions which exist at present with respect to the borrowing of money for construction purposes would seem to preclude the possibility of carrying out a program for building an electric line, yet the construction of an interurban railway connecting High Point with Greensboro and Winston-Salem is being discussed with a view to the realization of this project when conditions return more nearly to normal. Among those interested in the undertaking is F. Hahn, a contractor of Winston-Salem.

Evansville & Ohio Valley Railway, Evansville, Ind. — The Evansville & Ohio Valley Railway is completing the construction of a high tension line 10 miles from Newburgh, Ind., to Evansville in order to connect the present high tension line with the power station of the Public Utility Company, Evansville.

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Traction & Light Company will make improvements on its Canton system. In the list is included a new terminal for Canton, double tracks on certain lines, building one new line and relaying tracks in different parts of the city. The expense will be approximately $500,000 and the work will cover a period of three years.

Scranton (Pa.) & Binghamton Railroad, Scranton, Pa.—This company is constructing a 66,000-volt transmission line from Tiffany (Pa.) to Binghamton (N. Y.), a distance of 22 miles. This will complete the line from the Brookside (Pa.) power plant, 11 miles out of Scranton to Binghamton, the line from Brookside to Tiffany, a distance of 25 miles, having been in operation since 1916. The construction will consist of 35-ft. wooden poles, spaced 150 ft. maximum and 125 ft. minimum, with Keystone triangle and No. 360 70,000-volt lock insulators and will be three-wire, three-phase. Eventually the Binghamton plant, which now supplies the energy for the local street railway, will be shut down and held as an auxiliary, current being received over the transmission line from Brookside. There is now sufficient generating equipment at Brookside to carry the additional load, and two additional 500-hp. Heine water tube, 200-lb. pressure boilers are being installed. The extension of the transmission line does not indicate that there will be anything done in the immediate future on extending the Scranton & Binghamton interurban line to Binghamton, although it is still intended that eventually this will be accomplished. The local street railway at Binghamton, N. Y., is owned by the interurban line.

The Beaver Valley Traction Co., New Brighton, Pa.—The Beaver Valley Traction Company has placed a contract with Littefield, Fry & McGough to weld approximately 2,500 rail joints. It has also placed a contract with the Republic Engineers, Inc., to weld approximately 130 joints. It is expected that the work will start within the next few weeks.

Montreal (Que.) Tramways.—The extension of the line on Kelly Street from Millen to Lamothe Street will soon be commenced. This extension is in accordance with the contract signed between the city and the company in January, 1918, construction being dependent upon the city's securing the necessary right of way.

Montreal (Que.) Tramways Company.—The Montreal Tramways Company will start work right away on the construction of a tram line from Mount Royal Avenue to within 60 ft. of the summit of the mountain. The work will cost about $250,000. The line will be part of the service of the city and passengers on other cars wishing to go to the top of the mountain will only have to obtain transfers.

Power Houses, Shops and Buildings

Butte Electric Railway, Butte, Mont.—The Butte Electric Railway within the next few months expects to fit out its carhouse with new general offices.

Cairo & St. Louis Railway, Cairo, Ill.—The Cairo & St. Louis Railway expects to equip all its boilers with super heaters, "Sealflex" arches and chain grates.

Worcester (Mass.) Consolidated Street Railway.—The Fremont Street power house of the Worcester Consolidated Street Railway has been leased for three years to the Curtis & Marble Machine Company. It will be remodeled for occupancy as a foundry.

Professional Notes

Frederic W. Erickson and Henry M. Taylor, consulting engineers, announce the opening of offices at 383 Madison Avenue, New York City, for the practice of electrical, civil and mechanical engineering.

E. S. Lincoln, Inc., 534, Congress Street, Portland, Me., consulting electrical engineer, is successor to Lincoln, Hanson & Abbott, Inc. Mr. Hanson and Mr. Abbott are no longer connected with the firm.

Trade Notes

The Under-Feed Stoker Company of America, Chicago, has filed notice of an increase in capital stock from $1,000,000 to $1,250,000.

The Kuhlman Electric Company, Bay City, Mich., has filed notice of an increase in capital stock from $75,000 to $150,000 to provide for extensions and its increasing business.

The Morganite Brush Company, Inc., 519-523 West Thirty-eighth Street, New York City, has been organized to take over the business and property of the Morgan Crucible Company.

The Allentown Cable & Machine Company, Allentown, Pa., is asking for bids for the construction of a one-story building, 50 ft. x 100 ft., at Hamilton, to cost about $35,000.

The Fafnir Bearing Company, New Britain, Conn., has recently appointed Rufus N. Hemenway manager of the industrial bearings division, which includes the sale of double bearing transmission boxes.

The Roller-Smith Company, 233 Broadway, New York City, held a sales conference at its works at Bethlehem, Pa., on June 14, 15 and 16. In addition to regular business conferences and inspection trips through the works, there were several social functions.

The Consolidated Car-Heating Company, Albany, N. Y., at its recent annual meeting elected Cornell S. Hawley president and treasurer. William S. Hammond was re-elected vice-president. Lee P. Hynes was made chief engineer and John H. McElroy secretary.

A. Dwight Smith, district sales manager of the Northern Electric Company, Montreal, Que., Can., has been transferred to the general sales department at the head office. In his new position he will have charge of sales to railways in the Dominion of Canada. N. S. Richards, who has been sales manager at Calgary for the last three years, succeeds Mr. Smith as Montreal district sales manager.

Samuel H. Taylor, general manager of the Electrical Railway & Manufacturers' Supply Company, San Francisco, Cal., was chairman of the business program committee at the convention of the Electric Supply Jobbers' Association held recently at Del Monte. Mr. Taylor has the distinction of being the oldest jobber, in years of service, on the Pacific Coast, as he has directed the destinies of the Electric Railway & Manufacturers' Supply Company since its organization in 1898.

The Edison Storage Battery Company, West Orange, N. J., announces the appointment of Don C. Wilson as assistant sales manager in charge of its railroad department. Mr. Wilson has been active in railroad operating and mechanical departments for many years, serving in various capacities with the Stone & Webster Construction Company, Seattle; the Pacific Gas & Electric Company, Los Angeles, and also as electrical engineer for the Union Pacific Railroad at Omaha, Neb., and in a similar capacity for the Central of Georgia Railway at Savannah.

J. G. Brill Company, Philadelphia, has rebegun the publication of Brill's Magazine, discontinued in May, 1918. The present number is dated June, 1920, but no definite date is set for the next issue. It will be the policy of the company to issue these magazines from time to time as suitable material is available. The company declares that the standardization of the Birney safety car, by introducing uniformity in cars, created a scarcity of suitable material for the magazine, as hitherto different types of cars were manufactured.

The Watson-Stillman Company, New York City, announces several changes in the board of directors of the company due to the retirement of A. F. Stiilman from active interest in the management. Mr. Stillman remains as president of the company and also has full supervision of the sales. Carl Wigtel, chief engineer, was elected vice-president; A. Parker Nevin, secretary; W. H. Martin, purchasing agent. Mr. Wigtel has started on a ten weeks' trip to the Scandinavian countries, England, France, Belgium and Holland. While he is going mainly for a vacation, he will also investigate new developments in the line of hydraulic machinery in all of the above countries. Mr. Wigtel has been connected with the company for thirty-three years.

Lester C. Hart, previously sales manager of the Railway & Industrial Engineering Company, has become president and general manager of the Hi-Voltage Equipment Company, Cleveland, Ohio, manufacturers of air break switching and protective equipment.

New Advertising Literature

Transmission Lines. — The British Aluminum Company, Ltd., 109 Queen Victoria Street, London, England, is circulating a booklet entitled "From the Falls to the Factory," in which it gives special attention to American practice in transmission-line engineering.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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The Torque-Producing Ability of the Electric Motor

THE principal difficulty which has been experienced in the design of electric locomotives has been in the mechanical parts. The electric motor is so inherently different from the steam engine in the character of its output that it is natural that time should be required by designers in learning to adapt this motive power to heavy traction conditions. The electric motor, with almost unlimited power behind it, can produce torque many times in excess of its rating if it is overloaded. This is hard on the motor, to be sure, but it is worse on the mechanism driven by the motor unless provision is made for the resulting excessive stresses. When the steam engine is overloaded it simply "lies down" and refuses to injure itself. It can produce no more torque than is accounted for by the area of the piston and the "mean effective" steam pressure. The electric motor, if permitted to do so, will take on more load until either it is overheated and injured or until some mechanical part gives way. Failure fully and practically to realize this fact accounts for the high maintenance costs which have been incurred in some cases. As the mechanical difficulties are overcome, and they are rapidly being overcome, it will be possible still more fully to utilize the torque-producing possibilities of the electric motor.

This situation regarding the application of electric motive power to heavy traction reminds one of the early development of the electric motor itself. It will be remembered that inventors first made motors in imitation of the steam engine, with an iron plunger or core drawn into a coil of wire and then released, a device analogous to James Watt's in practically every particular except as to the service of the pull and push on the piston. This plan was soon abandoned for the more effective one of direct rather than indirect torque production. Just so in the case of the electric locomotive. In some cases the motor has been applied as a direct substitute for the steam engine, whereas it needed to be applied in such a way as most effectively to utilize its natural characteristics.

Sporting Events Assume a New Significance

TIPPITY WITCHET is the five-year-old son of Broomstick. One day recently he beat Salvestra under the wire at Belmont Park, with Gloomy Gus a bad third. That is history. It is not an omen of what Tippity Witchet may do the next time out. He may then be an also ran. There is no desire to tip you to a good thing. On the same day that Tippity Witchet won Babe Ruth again helped the Yankees to victory by crashing another home run into the grand stand at the Polo Grounds. If you are a railway manager operating under service at cost or if you ever hope to operate under that plan, then Tippity Witchet, Babe Ruth, Georges Carpentier and other celebrities of the sporting world hold more than ordinary interest for you.

Take Cincinnati! Under service at cost, patrons of the Cincinnati Traction Company, with the champion Reds drawing record crowds, have recently been paying a 7½-cent fare. If it were not for Pat Moran's ball team the fare might even be higher. In fact, we shudder to think what the fare might be if the World Champion Reds had finished last instead of first in the pennant race last season. In Cleveland the case is very much the same. No doubt Mr. Stanley knows just what effect the present spurt of the Indians is having on the fares under service at cost in his city.

Take Louisville! Louisville isn't operating under service at cost. It isn't even certain that the company will operate under such an agreement, but indications point that it may possibly do so. In consequence, the railway management there is said to have begun to figure on the results which the return of boxing under the new law in that State would have on fares under service at cost. Fight fans in Louisville are said to be hungry to attend the coming bouts.

Of course, sporting events have always had their deep significance for the railway manager as traffic problems and as sources of revenue, but under no other system than service at cost has the general public enjoyed the exhilaration of knowing that the more it spent for fare in the aggregate the less it would really have to spend individually. A *reductio ad absurdum*, you say. No such thing. Violent fluctuations in traffic are not in themselves desirable, but you can't blame a railway manager operating under service at cost if his risibilities rise at the thought of the effect of the Kentucky Derby upon the rate of fare he is charging.

Fares and Franchises

THE precarious condition of railway properties is not improved and investments in railway securities are not encouraged by the chaotic conditions existing in commission rulings on franchise clauses fixing fares.

When the Pennsylvania courts uphold the power of the state commission to fix fares irrespective of franchise clauses and at the same time the New York courts hold that the commission in that state has no jurisdiction over franchises granted during the thirty-three years which elapsed before the formation of the commission the interested observer wonders what it all means. There is such a mixed combination of laws, legal rights, precedents and interpretations in the various state court and commission rulings that the fundamental elements in the franchise clause versus fare increases controversy are sometimes obscured.

What remedy for its financial ills can a company obtain when bound by a franchise fare clause and how can the public get adequate service?

Legal battles on a confiscatory basis, receiverships, etc., simply augment the bill the consumer must pay and prolong the agony. When an economic ill exists an economic remedy must be applied and the quicker the better. Until our regulatory commissions are empowered to exercise complete jurisdiction over all elements incidental to the successful operation of a public utility, are released from legal restrictions of procedure and evidence, are made up of a personnel experienced, judicial and far-seeing and have the respect of the public as a court, but without the court's formality, the utilities can hope for little aid from commission regulation and the public can ask in vain for more adequate service.

The rainbow in the cloudy sky of regulation lies in the public's realization of the fact that the most practical method for maintaining private ownership and operation of public utilities with public supervision is by commission regulation. Government ownership and operation or uncontrolled private operation and ownership are both unsound from the public's standpoint, so that the good old weapon "public sentiment" is ready to be wielded in defence of commission regulation and has already accomplished results in many states.

Rome was not built in a day, but we hope that commissions can obtain their proper jurisdiction and status in the near future in order to afford the railway industry and the public an agency, and apparently the only one, whereby they can obtain quick and common-sense decisions on vital but disputed points.

C. E. R. A. Takes Action to Rejuvenate Member Interest

IN LAST week's issue we devoted a great deal of space to material which had as its plain purpose the arousing of greater activity and the overcoming of backsliding on the part of all of us who have contributed much to and owe much to the electric railway industry. To read in this week's issue the report of the C. E. R. A. convention at Ottawa Beach, one sees a concrete example of the condition, not uncommonly prevalent in the industry, which inspired the subject matter of our July 10 issue. At this meeting one of the most important matters proposed by this central association in a number of years—the formation of an electric railway express company similar to the American Railway Express Company—had to be abandoned because of the lack of co-operation on the part of the committee members and later the company members generally. The chairman of the important committee on standards had to report no action because of his inability to get the members of the committee to take any interest or do any work. The subsidiary association of the accountants, in its meeting following that of the parent body, passed resolutions looking toward the ultimate disbanding of the association if greater interest was not manifested at the next meeting.

But this is not a condition inherent with the men of our industry, though it shows a most lamentable situation and one which this paper is determined shall not be permitted to go on unchallenged. That the condition is not inherent is perhaps demonstrated by the incident at the Ottawa Beach meeting in which Mr. Scullin of Cleveland was game enough to give voice to his thoughts that the efforts of the standards committee, of which he is a member, were a waste of time and worry because the developments are so rapid that standards established today are obsolete in a few months. The promptness and vigor with which this frank expression was treated by the remainder of the delegates present gave ample proof of the fact that the men of the industry for the most part have not lost their interest in advancement, but need only to be aroused. And it was for this purpose that we sought for publication last week the very frank articles which appeared.

We believe that the action taken by the main body and accountants of the C. E. R. A. dealing with lack of active participation in the association work is indeed a healthy sign. There are only a very few circumstances which should be permitted to stand in the way of attention to association work. Repeated absences are inexcusable, for not only does this hamper the work of the association, and therefore do harm to all member companies by holding back progress, but it robs the individual of a splendidly broadening influence.

Every man owes it to his company to do his full part in association work and no one is too well informed himself but that he can derive new ideas from his fellows.

Can the "Piece Work" System Be Applied to Railway Management?

A VITAL element in the railway industry is efficiency in management, yet it has been found difficult to incorporate in any service-at-cost franchise a method by which this quality will be properly rewarded. As efficiency in operation is best obtained in any industry by the award of inducements rather than penalties, this problem naturally becomes one of offering rewards that will appeal to capital, labor and the public.

What rewards should be given and how can efficiency in management be measured or obtained?

Various methods have been suggested to solve this problem, *i.e.*, the allowance to capital of a return varying inversely according to an agreed ratio with the fare charged, a bonus system for capital based on an artificial standardized bogey consisting of a balancing fund between fixed limits, and a return based on the number of passengers carried. All these plans have faults, yet at least they make an attempt to solve the problem. In the interests of the future of the service-at-cost franchise a solution is desirable. The railway industry is facing a fact and not a theory; the companies need capital to supply the additional service required by an increasing population, yet when the general sentiment of investors is that any one is foolish who invests in railway securities, the need for some means to secure this investment is obvious.

If economic and regulatory conditions should remain constant the problem would be an easy one. It would be necessary only to set a reasonable bogey for the operating ratio and allow a higher return as the performance proved better than the standard set. But no matter how fair such a plan might be when established, changing conditions would make it in time inequitable for one side or the other.

One remedy would be to permit either side to ask for an alteration of the bogey at stated periods, just as standards for piece work in manufacturing may be altered periodically if found to be grossly unjust. Any change of this kind would have to be made with the greatest fairness, yet this does not seem impossible of fulfillment if certain recognized standards, such as current rates of interest for different classes of securities, are taken into consideration, and perhaps agreed upon in advance. A provision of this kind would at least have obviated such injustice as has been caused to certain companies which accepted so-called service-at-cost franchises only a few years ago when a nickel was a reasonable fare for the average ride and 5 per cent mortgage bonds could be sold at par.

Here is a problem for the expert in railway economics. It may be that we need a Fred W. Taylor to supply the answer. The problem is difficult and differs from that in the manufacturing business, but the fundamental principles are the same, and the methods used in manufacturing which have proved to be practical and workable at least offer prospects of success.

Don't Forget "Safety First"

THE electric railway industry made the slogan "safety first" its own property in the minds of the public until the war arrived to work havoc with normal conditions. The war made "get there first" and not "safety first" the slogan of the nation.

Economic conditions in the railway industry have occupied the attention of the managements since the war—self-preservation is the selfish law of nature—and safety methods were allowed to lapse and grow into a rut. Then, again, a changed operating personnel, different operating conditions, changes in operating equipment and increased use of motor vehicles all put new factors in the safety problem.

The electric railway industry has made a splendid record in safety work. It decreased its death rate per 100.000 inhabitants from 4.37 in 1907 to 2.66 in 1916. as compared to a decrease in rate for the railroads of from 17.84 to 11.50 and an increase in deaths by automobiles from 0.68 to 4.92 for the same period. Such a record, considering the number of passengers carried and the operating conditions for each agency, shows how brilliantly the electric railways were enforcing their safety slogan just before the war.

There is a selfish interest in maintaining safety campaigns and devices. Accidents mean legal battles, insurance claims, damaged public relations and other disagreeable financial and operating conditions that may burden the railway system more than the efforts and money needed to maintain safety standards.

There are burdens, financial and otherwise, associated with high standards of safety. The public and the employees must be educated continuously, for safety campaigns never get results unless maintained with undiminished vigor; new devices must be tried out and purchased to suit changes in conditions and equipment; old safety methods and slogans must be continuously revamped to maintain efficiency and interest; the attitude and intelligence of the employee has changed considerably, as he must be induced, not ordered, to carry out, to him, non-essential policies such as courtesy campaigns and safety-first precautions, but the railway industry cannot afford to backslide on its "safety first" slogan.

In maintaining the lead in national safety movements it is rendering a national aid, gaining a national prestige, gaining public good-will and keeping its earnings intact. It can, with profit, co-operate in any safety drive such as the Lehigh Valley drive, described in the last issue of this magazine, and can render material aid to the American Engineering Standards Committee in its attempt to codify safety methods.

Give the Master Mechanic a Little More "Head"

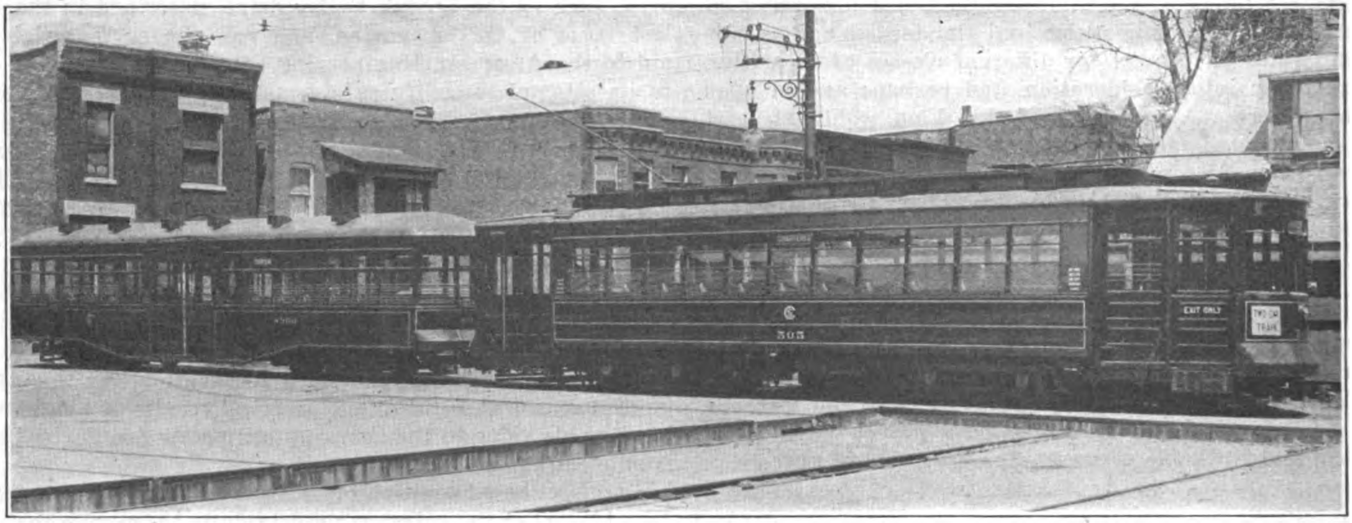
THE meeting of the equipment men, or Association of Electric Railway Men, at Youngstown, a report of which is given in this issue, is a move in the right direction. We wish there were more of such meetings fostered by parent associations like the C. E. R. A., the Illinois Association and Iowa Association, for there is good reason to believe that practical results of almost inestimable value to the company ultimately are derived from meetings of this sort.

To quote the admonition of "Engineer" in the issue of July 10, "what the railways need to do is to provide the public the sort of rides that the public wants." The master mechanic is in a strategic position to make or unmake strong public sentiment for the company through one of those elements of good service, namely, reliability of its equipment.

Now, there are all sorts of labor-saving devices, there are many methods of handling particular pieces of work and there are numerous shop kinks and other kinds of information which master mechanics can exchange when they get together around a table for informal discussion. An incident was recently related in which one master mechanic found himself entirely without repair parts of a certain kind, while on a connecting road the master mechanic had a surplus of this very thing. But master mechanic No. 1 was not even acquainted with master mechanic No. 2, and as a consequence service on his road was much crippled until sufficient time had passed to obtain parts from a factory. It seems almost inconceivable that such conditions do exist, and the way to eradicate them is to encourage the fullest sort of discussion, accompanied by visits to shops of the various companies with a view of benefiting by the other fellow's experience. It is probable that the smaller roads suffer from this situation more than the larger ones, but all can benefit from the other fellow's experience.

This is not so much a message to the master mechanic as it is to the manager, who ought to study this question carefully. He should do everything within his power to enable his master mechanic to attend meetings, not of managers but of master mechanics. These men are practical men and not only do they talk but they visit each other's plants and exchange first hand information.

We have mentioned this one line of work, but like results can be obtained by meetings of power plant superintendents, maintenance of way engineers and transportation men. Much of the real work of providing transportation is done by these various groups, and while the management which is ultimately responsible on each property tries to give encouragement to every element of its operating personnel, too often, we are afraid, this need of the men of the operating organization getting together with men in similar work on other roads is overlooked. We believe it to be one of the greatest fields of usefulness of local associations to foster such meetings, though not necessarily to make them a part of the program of the parent association meetings.



CHICAGO'S TWO-CAR TRAIN WITH NEW TRAILER AND REMODELED MOTOR CAR

Chicago's Trial Trailer Completed

Forerunner of Two Hundred Weighs 26,000 Lb. and Seats Sixty-two—Design Has Many Interesting Features and General Appearance Is Unusually Attractive

CHICAGO'S trial trailer, a magnificent piece of car design work, for which credit is due H. H. Adams, superintendent of equipment Chicago Surface Lines, and his staff of engineers, is now in daily operation. With its rearranged motor car it is making a morning and afternoon rush-hour round trip on various lines to demonstrate the practicability of trailer operation in general and the features of this particular train under all operating conditions and to acquaint the trainmen and the public of the several sections of the city with the aspects of this character of service.

An earlier story about this trailer, which appeared on page 820 of the April 17 issue of ELECTRIC RAILWAY JOURNAL, noted that a drive to build the car and rearrange the motor car within sixty days was being made. This bogey was made but for a few days, and on June 18 the train made its initial trip, carrying a party of company officials and engineers, city representatives and newspaper men. Since then it has been run about eighty miles a day on the same schedule that is maintained by the single-car units and further complete tests and trials will be made.

On these trial runs a careful watch has been kept of the motor temperatures to determine whether the Pullman cars, equipped with four GE-216, 55-hp. motors, 33-in. wheels and 15/71 gear ratio, could be safely used in the trailer service. The conclusion reached after more than two weeks' operation is that these cars can be used for rush-hour service without dangerous rise in temperature if a layover of three or three and one-half hours can be had between the two trips. The motor car used for the first trailer was equipped with a National A-4, 15-cu.ft. air compressor. This was not changed, and so far it seems to be standing satisfactorily the extra heavy duty imposed by the trailer. Actual temperature readings of the car motors and compressor motor taken in the morning after one round trip on route No. 22, having a mileage of 38.44, and again after the afternoon similar run, with a layover of three and one-half hours between the morning and afternoon runs, showed the following temperature rises:

MAXIMUM RISE ABOVE ATMOSPHERE DEG. C.
(Outside temperature 24 deg. C. in both cases)

		Commutator	Field	Armature
Readings taken when car stopped at 10:38 a.m.	Motor No. 1......	51	52	53
	Motor No. 3......	53.5	50	51.5
	Compressor	48		
Readings taken when car stopped at 6:18 p.m.	Motor No. 1......	55.5	58	60
	Motor No. 3......	57	55	64.5
	Compressor	37		

The operating practicability of trailers in Chicago from traffic and equipment standpoints has now been pretty well established and the new management of the Chicago Surface Lines is about to take the progressive step of inaugurating trailer operation on a large scale by converting 200 of the Pullman type cars in the manner described below and securing 200 new trailer cars of the design here described, except for changes noted, as soon as the financing can be arranged. The company will probably build about fifty of the trailers, in addition to reconstructing the motor cars in its own shops, and buy the remaining 150 trailers.

PRINCIPAL FEATURES OF TRAILER DESIGN

In general, the trailer is a two-way, center-entrance car measuring 47 ft. 6 in. long, balancing the scale, completely equipped, at exactly 26,000 lb., and seating sixty-two passengers. The body is of arch roof design with a steel underframe and side girder up to the window rail and a wooden superstructure, this combination of steel and wood providing a lighter car than could be built of all steel. The steel portion is made up entirely of standard structural steel sections and plates and weighed when completed 6,260 lb. The body is mounted on Brill 67-F trucks with 22-in. rolled steel wheels and a 4-ft. 4-in. wheelbase. All of the main and many of the detail dimensions of the car body and other information are shown in the accompanying drawings. And the accompanying photographs of the completed car gives a very good idea of the general design and of the pleasing lines and finish of the car, both inside and out.

In making up the superstructure, the design was so worked out as to eliminate the wooden side sill along the bottom of the side plate, thus saving that weight and avoiding deterioration of the sill. The side posts, which it will be noted are only 2 in. thick at their maximum section and taper off to 1¾ in., are fastened to the steel underframing by means of straps and bolts which clamp them to the side girder plates. Every other post is a pier post and is babbetted to permit the insertion of a ⅜-in. tie rod. A filler strip is glued in place to cover up the rod and fill in the remainder of the groove. These tie rods are bolted to the angle at the bottom of the girder and at the top, through the top side plate. The pier posts are fastened to the side plates by three straps at the top, center and bottom of the girder plates, and the straps are made short so that they can be drawn up tight. The intervening posts are through-bolted to the side plates at the top and middle and fastened with a strap at the bottom of the plate. The carlines are made of wood and those resting on the pier posts are reinforced by 1¾-in x 5/16-in. straps bolted to them and carried over the top of the side posts.

The flooring underneath the seats is built with a single layer of 13/16-in. maple. That in the center well and in the aisles is laid double, the first layer being of ⅝-in. yellow pine with a top layer of ⅝-in. maple boards, grooved in sections 4 in. wide. The floor of the well is level, but there is a ramp of 5¼ in. in 9 ft. each way from the well.

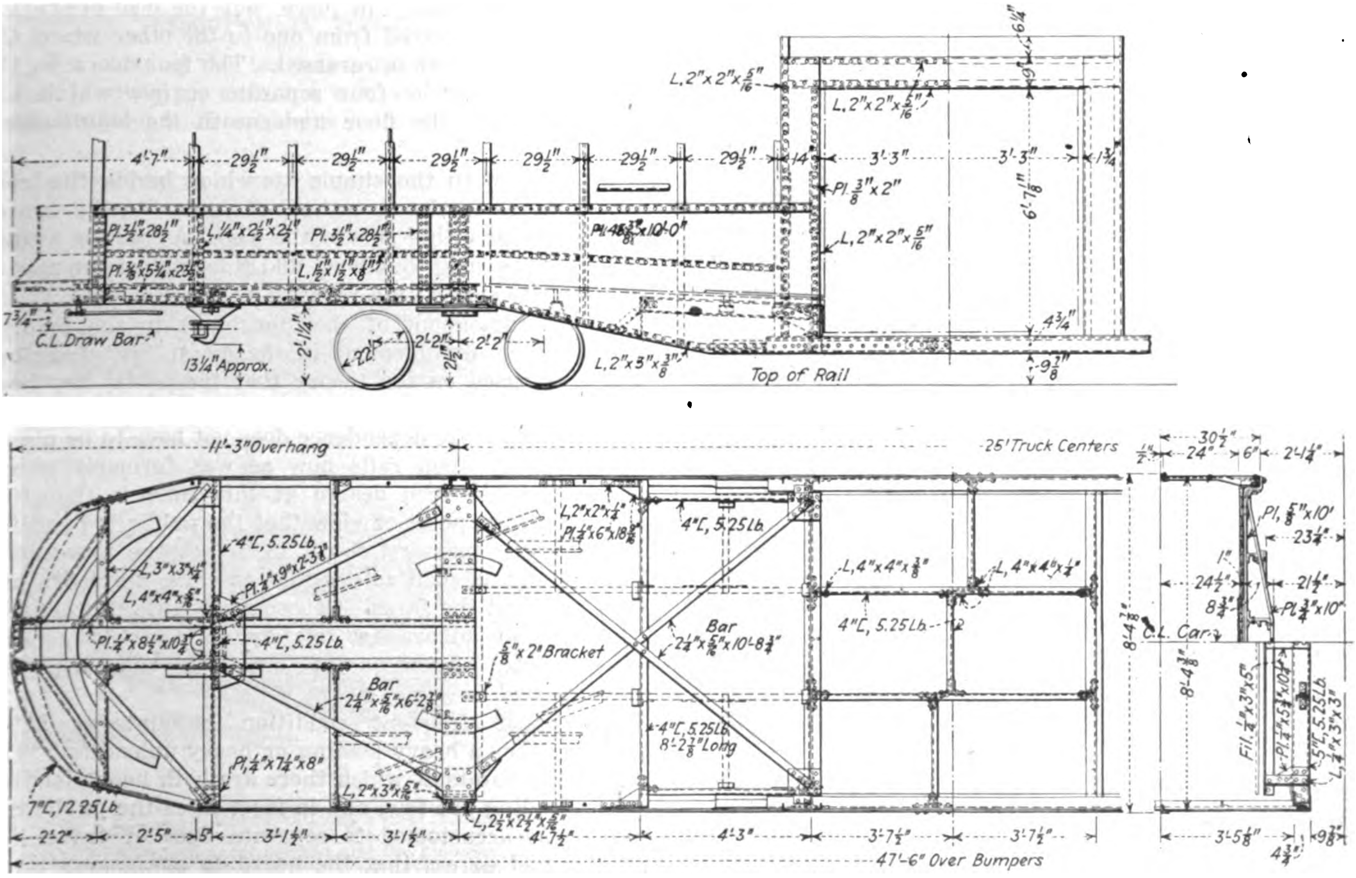
One of the features of the car body construction is the use of hollow brass tubing for the window guards, instead of the heavy wire screen formerly used in Chicago and shown on the motor car in an accompanying picture. This new type of window guard is made up of seven lengths of tubing, supported at the center and ends by brass castings and fastened between the side posts by means of four No. 12 flat-head wooden screws at either end. The brass tubing used is of No. 18 gage brass and has an outside diameter of 7/16 in. The guards are made up in short sections and fastened between the side posts, leaving sufficient clearance inside the outside post line for putting on storm sash without removing the guards. This manner of fastening the window guard in sections between the posts adds materially to the strength of the side construction of the car. Besides adding stiffness to the structure, this type of window guard saves about 100-lb. weight per car; it reduces maintenance, since it does not have to be painted or taken care of in any way, and it can be left on the car permanently winter and summer, since the windows can be readily washed through the guard. The weight of each section of the guard is 4¼ lb.

INTERIOR FINISH ATTRACTIVE

Agasote head lining, painted a very light buff, and a cherry finish of the interior woodwork, together with the installation of all molding in unbroken straight lines from one end of the car to the other, give the car interior an unusually clean, plain, attractive appearance.

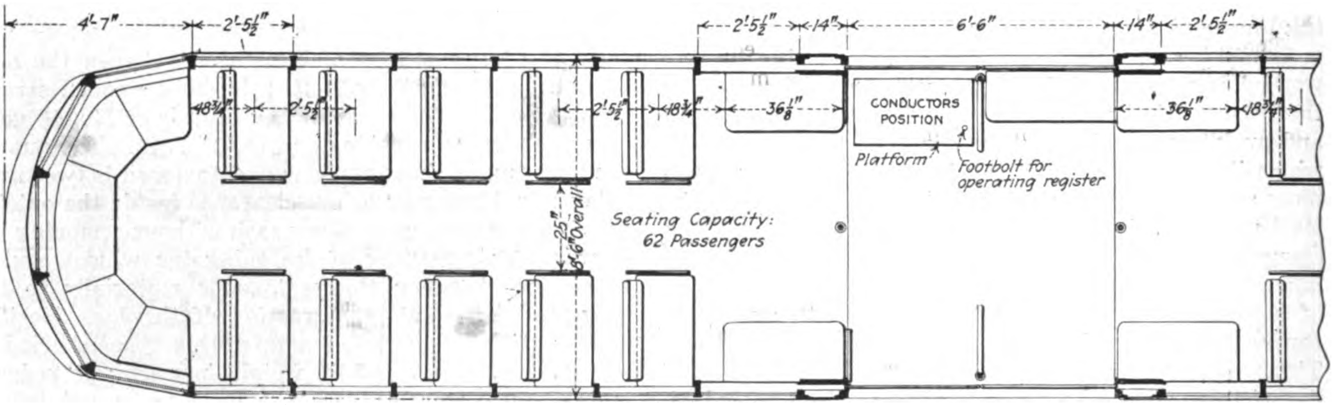
The windows are made with wood sash with a brass channel at the sides and are so designed that it is not necessary to remove the sash from the cars in summer, since these are very light. Only one O. M. Edwards lock and rack is used per sash, the opposite side of the sash being equipped with an Edwards sash brake, which prevents the sash from falling all the way down.

The curtains are also installed in a manner which bears comment. These are made of a double-faced



L, 2"x2"x5/16"
L, 2"x2"x5/16"
6¼"
9"
4'-7"
29½"
29½"
29½"
29½"
29½"
29½"
14"
3'-3"
3'-3"
1¾"
Pl. 3/8"x2"
6'-7⅞"
Pl. 3½"x28½"
L, ¼"x2½"x2½"
Pl. 3½"x28½"
Pl. 48⅞"x10'-0"
L, 2"x2"x5/16"
Pl. 3/8"x5¾"x23⅝"
L, ½"x1½"x8"
7¾"
C.L. Draw Bar
13¼" Approx.
2'-1¼"
22"
2'-2"
2½"
2'-2"
L, 2"x3"x3/8"
Top of Rail
4¾"
9⅞"
11'-3" Overhang
25' Truck Centers
30½"
½"
24"
6"
2'-1¼"
L, 2"x2"x¼"
Pl. ¼"x6"x18"
4"[, 5.25 Lb.
4"[, 5.25 Lb.
L, 3"x3"x¼"
Pl. ¼"x9"x2'-3⅞"
L, 4"x4"x5/16"
Pl. ¼"x8½"x10¾"
4"[, 5.25 Lb.
5/8"x2" Bracket
Bar 2¼"x5/16"x10'-8¾"
L, 4"x4"x3/8"
L, 4"x4"x¼"
4"[, 5.25 Lb.
Bar 2¼"x5/16"x6'-2⅞"
4"[, 5.25 Lb. 8'-2⅞" Long
Pl, ¼"x7¼"x8"
L, 2"x3"x5/16"
7"[, 12.25 Lb.
L, 2½"x2½"x5/16"
Pl, 5/8"x10'
23¼"
1"
24½"
21½"
8¾"
Pl. ¾"x10"
C.L. Car
8'-4⅞"
8'-4⅞"
Fil. ¼"x3"x5"
Pl. ¼"x5½"x10½"
5"[, 5.25 Lb.
L, ¼"x3"x3"
2'-2"
2'-5"
5"
3'-1½"
3'-1½"
4'-7½"
4'-3"
3'-7½"
3'-7½"
3'-5⅛"
9⅞"
4¾"
47'-6" Over Bumpers

PLAN AND ELEVATION OF CHICAGO TRAILER STEEL FRAME



FLOOR PLAN SHOWING SEATING AND LOADING WELL ARRANGEMENT

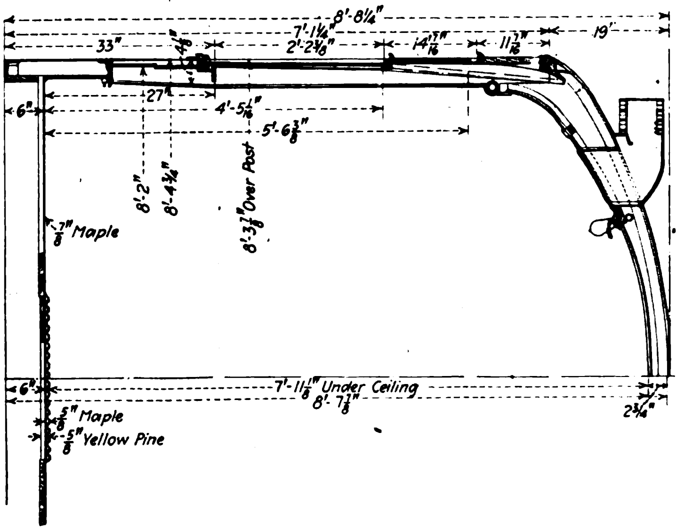
material supplied by the O. Bannon Company, and the rollers are mounted so that they are entirely exposed, the ends of the rollers and fixtures being covered up with a small curved brass plate. With the full curtain exposed in this manner, it is possible to clean both sides at the same time by wiping the roll and the inner side of the curtain as it is pulled down.

The cross seats are of the form fit springless type, rattan covered. The weight of the seat is 57 lb. complete, which, incidentally, is 18 lb. per seat lighter than the spring cross seat in the motor car. The rattan on the backs of the seats at the end of the car and those longitudinal seats adjacent to the loading well are carried only part way down to the cushions, thus saving rattan and at the same time making the seats more comfortable.

Ventilation is provided by means of twelve Railway Utility ventilators, there being four exhaust ventilators and two intake ventilators on each side of the car. This provides the same system of ventilation, making use of a compensated intake, that is employed on all of the motor cars of the Chicago Surface Lines.

ARRANGEMENT OF LOADING WELL

The loading well has been arranged with the idea of obtaining the maximum reservoir capacity for boarding passengers. Entrance or exit is made through either of two wide sliding air-operated doors, except only as entrance is blocked by the egress of passengers. The conductor's position is placed at the opposite side of the well from the entrance doors and a platform 6 in. high is provided for him to stand upon, thus giving him a position elevated above the passengers and affording him full control. A seat or stool is made an integral part of this platform and as the direction of the car is reversed this platform is moved to the diagonally opposite position in the well. The register is mounted over the door and is operated by a foot pedal extending down through the conductor's platform and through the floor. When the platform is moved to the opposite position the register is operated in the same manner without moving it. Both positions of the conductor's register pedal engage with the same operating mechanism. The control levers for the doors are installed just above the stanchion beside the conductor and the push button for the single stroke bell signal system is mounted on the under side of this stanchion just below the door-operating levers. A duplicate push button for the bell signal system is installed in either stanchion, the stanchion being fastened permanently in place, but the door-operating levers are transferred from one to the other when the direction of the car is reversed. The four doors in the car are operated by four separate engines which are installed above the floor underneath the longitudinal seats.



CROSS SECTION OF TRAILER, SHOWING CONSTRUCTION OF SUPERSTRUCTURE

In addition to the simple stanchion beside the conductor, there is also a vertical stanchion in the center of the aisle on either side of the well. A chain is swung across to the small bulkhead and this chain is swung to the opposite side with a reversal of direction.

This arrangement of the stanchions in the loading well and the arrangement in the motor car, described below, is based on the theory that the public has been educated to the prepayment system of fare collection and that therefore dependence does not have to be placed so completely upon rails now as was formerly necessary. The platform design at this time is therefore made from the point of view that the public is educated and that the primary object is to get the passengers into the car as soon as possible, to close the doors and then to collect the fares. Consequently it is not thought advisable to adhere too rigidly to the old scheme of complete separation of boarding and alighting passengers.

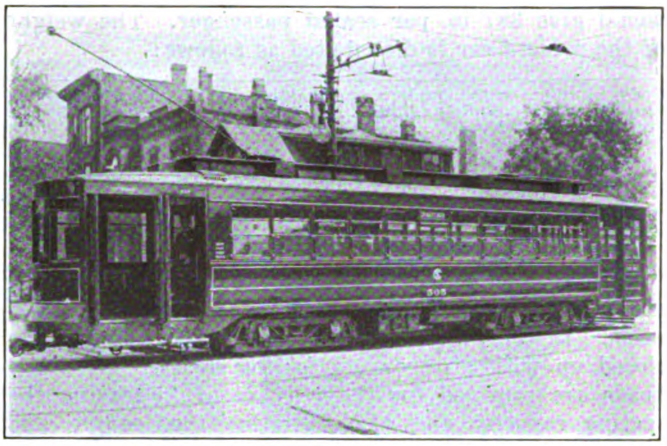
The most frequent condition encountered at a stop is either a heavy loading or heavy unloading. The number of points at which there are both heavy loading and unloading are few, and in most cases the public has become so accustomed to separate lines of travel for ingress and egress that the boarding passengers automatically give way to the alighting passengers, but when the latter are all off the former pour in at all points and make the loading extremely rapid.

The doors of the Chicago trailer have been equipped with electric door interlock control, and the motor car is likewise equipped, so that the motorman receives the go-ahead signal at the instant the doors are closed. The conductor is given control of the train in case of emergency by an emergency valve which is installed convenient to his position. A hand brake is provided for holding the car when detached from a motor car and this is installed adjacent to the vertical stanchion at one side of the well and so designed that it requires no support above the car floor. It is equipped with a drop handle and a heavy staff which is supported at two points below the floor. The ordinary service braking of the trailer is done by two 7-in. brake cylinders, located one on either side of the well. It is found that less weight is involved by installing two brake cylinders than to install one cylinder with the necessary connecting rods. The double-cylinder arrangement also avoids the necessity of having a rod extend underneath the well where the clearance is small.

Both motor car and trailer are equipped with two Tomlinson automatic couplers, with which the electric jumper for the light, signal and heater circuits is ingeniously combined. The electric coupler consists of a four-point socket fastened on one side of each car coupler by means of a special iron bracket bolted to the coupler. The jumper, with plugs attached to either end, is connected across underneath the coupler to the two sockets. The complete jumper with plugs is only 28 in. long. It carries five wires, two of which are connected together to carry the heater current. The neat appearance of this jumper arrangement may be seen at the extreme right of the accompanying straight side view of the trailer.

REDUCTION IN WEIGHT POSSIBLE

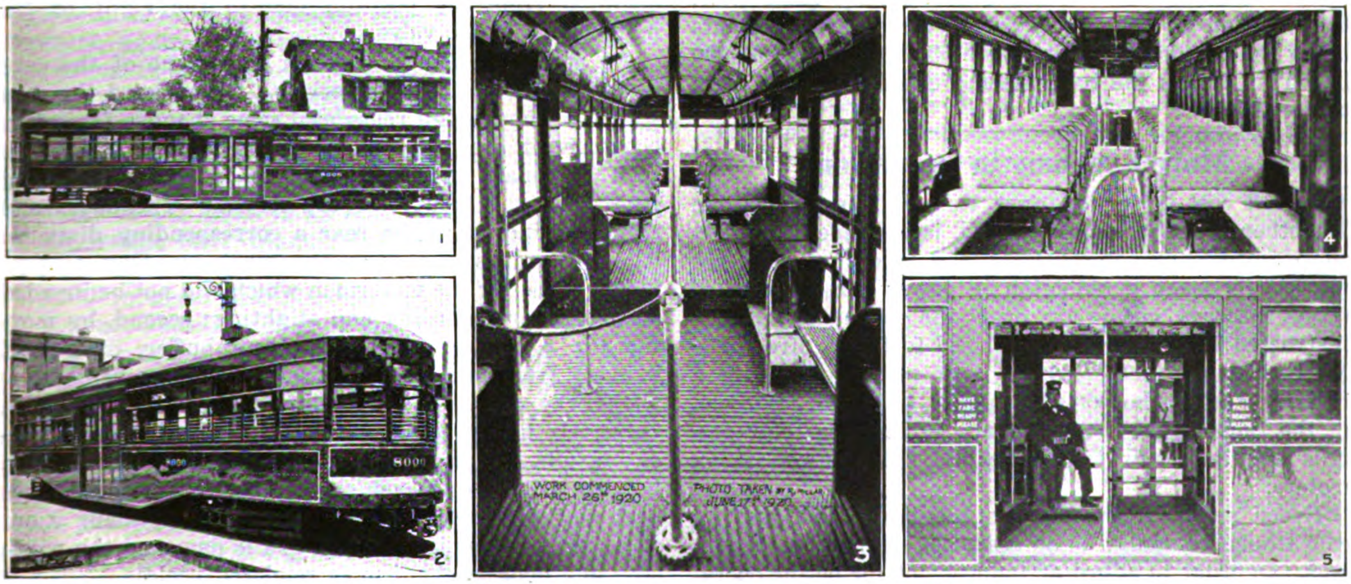
In planning the trailer, a weight of 24,000 lb. was set as the goal, and this will undoubtedly be attained in building additional cars. In building this first car time was an important factor, and when delivery of materials of just the desired kind could not be obtained soon enough it was necessary to resort to materials on hand as a substitute. For example, the side girders were made of No. 12 gage steel instead of No. 13, some angles and channels used in the underframe were heavier than was wanted, built-up type bolsters instead of cast-steel bolsters were used and the trucks are somewhat heavier, it is believed, than they will be when there is time for them to be built after the company's specifications. These factors should decrease materially the final weight.



EXTERIOR OF REMODELED MOTOR CAR

There will also presumably be an opportunity to reduce the weight at least 1,500 lb. on future cars by making them one-way instead of two-way cars. On this trial car, in view of various considerations, it was thought advisable to make it a two-way type, but it is now practically decided that the one-way type will meet traffic requirements equally as well and will make possible several advantages from the standpoint of equipment design.

The present weight of 26,000 lb. is 419.35 lb. per seated passenger and the 24,000 lb. weight if attained



VIEWS OF THE FINISHED TRAILER FOR CHICAGO

Nos. 1 and 2—Views of Chicago's trial trailer. Note neat jumper connection at extreme right of the picture at the bottom.

No. 3—The well arrangement and the pleasing interior finish are well protected in this picture. New devices are mounted in sight inside the car.

No. 4—Interior of the remodeled motor car, showing the addition of folding doors and steps, the new position for the conductor and the prepayment rail arrangement and two folding seats on the platform.

No. 5—View of the center well as seen from outside the car.

would give 387 lb. per seated passenger. The weight of the present car is distributed as follows:

Body complete with couplers and fenders	17,950 lb.
Steel framing complete	6,260 lb.
Superstructure	9,580 lb.
Trucks with wheels and axles	8,050 lb.
Couplers and electric jumpers and fenders	2,110 lb.

RECONSTRUCTION OF THE MOTOR CAR FOR TRAILER OPERATION

Several changes in the interior arrangement of the motor car were made in preparation for trailer car operation. In the first place, the open rear platforms are closed up with air-operated folding doors. The bulkheads are removed for the purpose of increasing the seating capacity and of facilitating the loading and unloading of passengers through the provision of a larger reservoir capacity. With the bulkheads removed, the conductor's position is changed from the platform up onto the car floor, which is made to project out on to the platform beyond the end sill a distance of 10 in. This brings the conductor forward and in an elevated position, so that he can see the steps over the heads of the passengers and collect fares from the platform as the passengers pass on either side of him. This arrangement not only gives the conductor good supervision of passengers but provides an ample passageway on either side of his position for passengers to enter or leave the car body. Only the simplest kind of stanchion is provided, as seen in an accompanying photograph, dependence being placed on the theory that passengers are already educated to the prepayment plan, as noted in connection with the trailers.

With the bulkhead removed, it is possible to remove the sand boxes and combine them with the end longitudinal seats and move the longitudinal seats at the end of the car body toward the ends of the car a sufficient amount to permit of the installation of an additional cross seat on either side of the car at both ends. Furthermore, two folding platform seats are installed, providing a seat for six additional passengers. By these additions, the seating capacity of the motor car is increased from forty to fifty-four. At the same time, the addition of couplers and the other rearrangements bring the weight of the car from 53,440 lb. up to 55,400 lb. This brings the total seating capacity of the train up to 116.

More Economy in Operation

LOWER cost is an important item and any reduction, other things remaining equal, is welcome. The purchase of power-saving devices and recorders does not necessarily mean a reduction in power consumption of street railways, and in any event the employees must be instructed in their use and induced to follow directions. M. F. Skouden, superintendent of motor power, in a recent issue of the company paper, asks the trainmen of the Indiana Traction Company to improve their records and tells how to get results from power-saving meters.

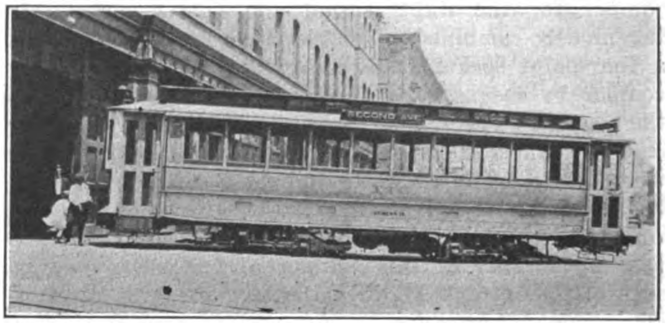
Every such device requires intelligent use and an educational campaign is an essential element in its success. In order to afford an inducement for better operation some companies offer cash prizes for the men making the best monthly records. Such prizes, however, must be used with care to avoid slowing down schedules, or causing jealousies and labor trouble, as routes, hours or traffic conditions differ.

One-Man Cars Used in New York

Second Avenue Railroad Making a Trial of Some Remodeled One-Man, Two-Man Cars for Its Service, with Marked Success

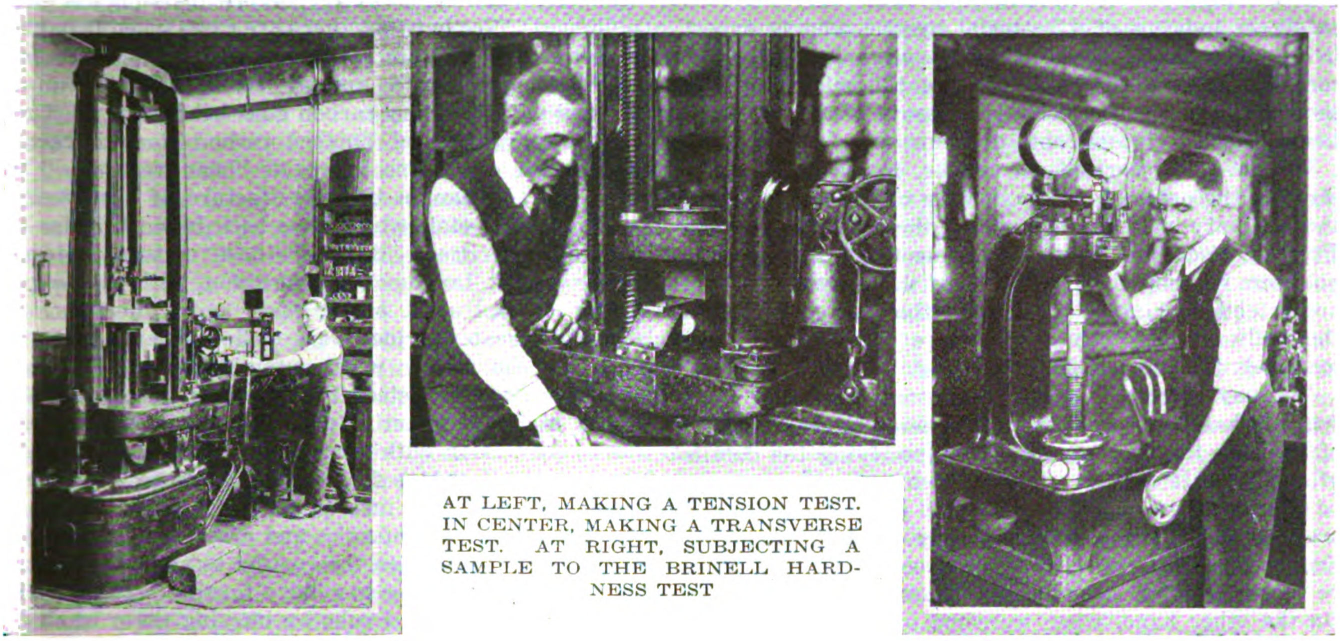
THE Second Avenue Railroad has remodeled five of its closed passenger cars for one-man operation. This work was done in its shops and additional cars are being remodeled for this service as rapidly as possible. These cars are equipped with maximum-traction trucks, hence have two motors each. The cars weigh 12½ tons and seat thirty-six passengers.

The changes made for this service consist in the addition of folding doors and steps to both sides at each end, together with the necessary operating apparatus and air brake equipment. The folding doors and steps are hand-operated, arrangements being made for the use of operating levers at two locations on each platform. One of these is just to the right of the motorman's brake valve and is used by the operator in one-man operation. The other location is on the right side of the front platform and left-hand side of the rear platform next to the bulkhead. This latter operating lever connects with the rear right-hand door and is used by the conductor when two men per car are necessary. The right-hand front doors, which would be used for one-man operation, are operated from the position just to the right of the motorman's brake valve.


CAR REMODELED FOR ONE-MAN, TWO-MAN OPERATION IN NEW YORK CITY

An accompanying illustration shows one of the cars as remodeled and now in service. On some of the cars which are now being remodeled some changes from this construction are being made. Among these is the use of a stationary panel about 15 in. in width extending back from the front of the platform. The doors and steps are moved to the rear a corresponding distance. The advantages of this arrangement are, first, to provide a space for the motorman which will not be invaded by passengers boarding and alighting; second, by moving the steps back from the front buffer, danger of damage from bumping of trucks or heavy vehicles is done away with. These cars are required to operate in extremely heavy traffic sections and considerable damage results from having the steps too close to the buffer, because whenever a vehicle is struck it either slides back and strikes the step mechanism, thus putting it out of commission, or if the front end is damaged the whole step and door mechanism is rendered useless.

These changes have been carried out at the direction of C. E. Chalmers, receiver for the railroad, and he states that the operation is proving popular both with the traveling public and the men who operate the cars as well.



AT LEFT, MAKING A TENSION TEST. IN CENTER, MAKING A TRANSVERSE TEST. AT RIGHT, SUBJECTING A SAMPLE TO THE BRINELL HARDNESS TEST

Railway Car Materials – Steel III

A Description of Special Tests that Are Used in Determining Car Material Qualities, Together with Heat Treatment and Alloys Used

BY NORMAN LITCHFIELD

Physical and Chemical Properties Closely Connected

IN ADDITION to the usual tests for steel which were outlined in a preceding article certain special tests have been developed in the past few years which will be described briefly, as they enter but slightly into the realm of car materials.

The first of these is the Brinell test for measuring hardness, in which a hardened steel ball is forced under pressure against the piece to be tested, forming a depression in the latter. This depression is measured and the corresponding "hardness numeral" found from a table. A more or less definite relation exists between the numeral and the tensile strength and hence the test is useful in determining the strength as well as the hardness of the metal in an object which cannot be cut up for tensile test. Manufacturers of gears have used this method for checking up the character of the material in gears and pinions. It is a test, however, quite apart and distinct from the ordinary tensile tests and its use is hardly justified except in special cases.

Another instrument used to measure hardness is the scleroscope, in which a small steel hammer, diamond pointed, drops in a glass tube against the surface of the material to be measured. The hammer rebounds up the tube, the height of the rebound depending upon how much the diamond point penetrates the material—the softer the material the greater the penetration and the less the rebound. The tube bears a graduated scale, 100 being the point to which the hammer rebounds on hardened carbon steel. This highly rigorous test is somewhat special in nature and is not in general use in the realm of electric railway materials. Among the places where it is used is in the measurement of the relative hardness of carbon motor brushes. All of the foregoing tests relate to the strength of the material under steady loads. Experience has demonstrated the fact that metal which shows up all right under the usual tension and bending tests will fail in service where it is subjected to shock, vibration or reversal of stress, and much study has been given to developing a laboratory test which will show the ability of the metal to resist these dynamic stresses.

Impact tests have been devised in which the test specimen is bent back and forward until rupture occurs. Others which are obtaining considerable favor are based on the principle of a swinging hammer falling in the arc of a circle from a given height against the specimen at the bottom of its swing, rupturing the specimen, and continuing upward in its circular path. The distance the hammer continues after breaking the specimen is measured, this being in some measure proportional to the resistance of the material to shock.

For the "reversal of stress" test or "fatigue" test the specimen is loaded with a weight sufficient to produce the desired stress and rotated, the number of revolutions to rupture being recorded.

Lastly, as a means of determining the nature of the metal, we have the micro-photograph. In this a small piece of the material is highly polished, etched and photographed through a microscope, at any desired degree of magnification, that recommended by the American Society of Testing Materials being one hundred diameters. The study of the character of materials by use of the microscope and the micro-photograph has developed into a science in itself, and the microphotograph, or "micrograph," can only be used safely in judging of a material by one who is expert in that science. The railway engineer however, can, and to some extent does, use the micrograph to show the fineness or closeness of grain of the metal in cases where it is desirable to know this feature.

We have now carried the reader, in outline fashion, through the processes of production of the material and the ordinary methods of testing the finished product. Further discussion of the refinements of testing does not seem warranted in the limits of these articles, which are intended principally to point the path to those in the railway field who desire more knowledge of the materials they are constantly using.

We may therefore pass to the consideration of some special phases. One matter of general interest is that of how far the user should go in specifying the details of the manufacturing process which are or are not to be used. Some of them are quite generally used and are accepted by the manufacturers without comment. Such is the specifying by what process the steel must be made, whether open hearth, bessemer, crucible, etc. On the other hand, when we come to such a matter as discard, *i.e.*, the amount of the ingot which is to be cut off and not used, we enter a realm which is more or less in dispute. The purpose of the discard is to eliminate piping and segregation as far as possible and some ingots will require more discard than others. It therefore seems fairer, in specifications where it is desirable to guard against piping, to provide simply that sufficient discard must be made to prevent undue piping and leave the actual amount a matter for arbitration between the inspector and the mill.

AVOID NON-ESSENTIAL REQUIREMENTS

Somewhat analogous is the listing of definite limits for tensile properties in a specification, and the inclusion therewith of equally definite limits for the chemical composition. As we have previously pointed out, the physical properties and chemical composition travel, as it were, hand in hand, and to specify both is about like applying an overhead check rein to a horse pulling a heavy load up hill. The steel producer in such cases inevitably will kick much like the horse. It is perfectly fair of course to ask for limits to the impurities, such as phosphorus and sulphur, besides the required physical properties, but when it is attempted to require exact carbon and manganese contents besides the tensile requirements it becomes unreasonable. It seems only fair that the user should determine in his own mind what is the important feature for his purposes, the chemical composition or the tensile strength. Thus if he proposes to use the steel for some welding purpose he would naturally desire to limit the carbon content and he would be satisfied with a general knowledge of the tensile strength. On the other hand, if he purposes using the steel in a part where the working stress must of necessity run high he would require an exact knowledge of the tensile strength and be but little interested in the chemical composition. It should be remembered that too great particularity in such matters is reflected in the price of the material, for the minute any specification requires a class of material which cannot be produced regularly and commercially, but which necessitates the selection of heats, etc., the steel maker naturally has to be reimbursed for the extra labor and the upsetting of his production schedule. So the wise man will reflect whether all the provisions of his specification are entirely necessary before insisting on their fulfillment. Not but that there are cases when it pays to be particular; in such cases one must prepare to pay.

The demand for a greater strength than can be obtained with ordinary carbon steel led to two practices, one the subjecting of finished carbon steel to certain temperature conditions known as "heat treatment," the other the addition in the manufacture of the steel of certain other metals which have been found to raise the physical properties. Both of these matters obtained their original impetus in connection with the manufacture of tool steel, armor plate and projectiles, and later still greater strides were made and are still being made in connection with automobiles and aircraft. Other than for tool steel, the first introduction of heat treatment in its scientific phase into railway materials was in connection with gears and pinions, of which the life and the freedom from breakage were enormously increased with the introduction of these materials. Another field is that of axles and armature shafts. For many years it has been the custom to anneal passenger car axles after forging to relieve forging strains. This was done, as a general rule, by burying them when hot in dry ashes. While this relieved the strains and to some extent refined the grain of the metal it could hardly be called heat treatment in the present acceptance of the term.

The phrase "heat treatment" is one which has been very loosely used and may be said to have often covered a multitude of sins. Strictly speaking, it is any process of reheating to which a piece of steel may be put in order to alter its physical properties in some way.

A rough approximation of the various conditions of steel at different temperatures may be given somewhat as follows: As every one is familiar, steel, when subjected to a sufficiently intense heat, finally passes into a molten or liquid condition. Somewhat below this temperature there comes an actual separation of the grains of the steel. It is at that point that, if allowed to cool normally, the steel is in the condition, familiar to forge men, known as "burned" or overheated, and in this condition it cannot be restored to its normal state except by remelting. By cooling the steel again below this point there comes a state where there is a "remarkable development of sensible heat, causing the color to brighten up again, this phenomenon being known as recalescence" (the language being that of Prof. Johnson). The temperature at which this occurs is known as the critical temperature, this varying somewhat with the composition of the steel. Or, as is expressed by another authority, "critical temperatures are temperatures at which retardation occurs in the heating and cooling curves of iron and steel."

Between the critical temperature and that which approaches the "burned" conditions, before mentioned, there comes a change in the grain structure of the steel, the grains becoming larger and larger and the steel harder. It is these changes, their control and interpretation that form the field of that interesting but complex science known as metallography which has received so much attention the past few years.

In the fabrication of the article, whether it be axle, gear or other forging, it often happens that the forging process or the cooling, or some other factor, disarranges the normal condition of the steel so that it is not in its best condition for use to resist strain or shock. Recourse is had therefore to some form of heat treatment to put the steel in a proper condition. This may be a simple "normalizing," which consists simply in heating the steel to the critical temperature and cooling slowly in the air. This is a more or less approximate process and may or may not give definite results.

For definite results we must go to a more carefully controlled process, that now known technically as "annealing." The American Society for Testing Materials has formulated a recommended practice for annealing, under the serial designation A-35-11. In this it is stated: "The usual purpose in annealing is to remove existing coarseness of grain. This removal is brought about by heating the object to an annealing temperature, which varies with the carbon content of the metal. But the rate at which the object cools from this annealing temperature influences its properties very profoundly. Hence this rate of cooling should be suited to the duties which the object has to perform in service, and hence to the properties which we seek to give it. Under certain special conditions an annealing is required in order to remove, not coarseness of grain, but the effects of rolling or otherwise working the metal at a temperature so low as to set up serious internal stress." The specifications then proceed to outline the method of heating and the control of the temperature.

The following ranges of temperature should be used for the several ranges of carbon content indicated:

Range of Carbon Content	Range of Annealing Temperature
Less than 0.12 per cent.....	875 to 925 deg. C. (1,607-1,697 deg. F.)
0.12 to 0.29 per cent.....	840 to 870 deg. C. (1,544-1,598 deg. F.)
0.30 to 0.49 per cent.....	815 to 840 deg. C. (1,499-1,544 deg. F.)
0.50 to 1.00 per cent.....	790 to 815 deg. C. (1,454-1,499 deg. F.)

Attention is then called to the effect of different rates of cooling: "After the object has been held at the annealing temperature long enough to make its temperature nearly uniform throughout and to complete the refining of the grain it should be cooled in a way suited to its carbon content and to give it the specific properties needed. The general principles are, first, the higher the carbon the slower should be the cooling, and, second, the slower the cooling the softer and more ductile the metal will be and the lower will be its tensile strength, elastic limit and yield point. The greatest softness and ductility are obtained at a certain sacrifice of strength and elasticity and the greatest strength and elasticity at a certain sacrifice of softness."

It should be remembered throughout that all of these changes take place without any change in the total carbon and iron content of the steel, but are brought about solely through the alteration of the conditions in which the carbon exists in the steel, it being further remembered that the heating above the critical temperature coarsened the grain and hardened the steel. Hence it is natural to find that by cooling the steel slowly sufficient time is given the elements to rearrange themselves so as to put the steel in its most normal soft condition.

The specifications then point out that to give great tensile strength and high elastic limit, even at a certain sacrifice of ductility, the cooling should be more rapid, and "to give an unusually high combination of ductility with tensile strength and elastic limit, recourse should be had to water or oil quenching and annealing."

This process is often known as "quenching and tempering," this term in fact being used in the A. E. R. E. A. standard specification Et 9b, for "Quenched and Tempered Carbon Steel Axles, Shafts and Similar Forgings," which in a modified form has become an A. S. T. M. standard, serial A 19-18.

It was this particular form of heat treatment which became first known generally to the electric railway industry, and hence, to some minds, the phrase "heat treatment" always means "quenching and tempering," although, as already pointed out, the latter is but one form of heat treatment. Not only is it but one form, it also is perhaps the most difficult, the specifications going on to say: "This process needs great care and intelligence and should in general be used only by those familiar with high grade steels."

The first step of the process is similar to the annealing already described, *i.e.*, the object is thoroughly heated to the annealing temperature correct for the given carbon content. It is then removed from the furnace and quickly, without delay, plunged into a bath of either oil or water. There is much discussion in regard to the relative merits of oil and water quenching, but it is generally argued that good results can be obtained either way with some characters of steel and shapes. The A. S. T. M. specification states: "It may be quenched in water if its carbon content is so low and its shape so simple that it is not in danger of cracking or receiving permanently harmful stress.

ANNEALING MUST BE DONE SLOWLY

In this condition (after being quenched) the steel is very hard and practically unfit for use without further treatment. As has already been explained, the heating of the steel above the "critical" temperature changes the grain structure, making it very coarse and the steel very hard. Now if allowed to cool very slowly, as in the regular annealing process, the crystalline structure gradually rearranges itself, the grains becoming finer and finer and the steel softer. This all takes time and annealing must therefore be done slowly. But if instead of allowing plenty of time the object, after attaining the annealing temperature, is suddenly plunged in a relatively cold bath, the effect is to hold the coarse crystallized structure peculiar to the region of the annealing temperature. It is as if it were frozen that way.

To put the steel now in a condition that it can be used with desirable values of tensile strength, elastic limit and elongation it must be annealed or "tempered." This tempering is done by reheating, the final temperature being considerably less than the so-called "annealing" temperature to which the object was heated before quenching. Thus, for instance, the "Range of Annealing Temperature" given in the table is from 1,454 deg. F. to 1,697 deg. F., while the tempering range is from 932 deg. F. to 1,382 deg. F. In general, the higher the temperature the more ductile will the steel become and the lower will be its strength and elastic limit. The object should be held at this second annealing or tempering temperature long enough not only to allow its interior to reach it but also to relieve the stress given in the water or oil quenching.

By this process the ultimate strength of carbon steel may be raised from a value untreated of say 60,000 lb. per square inch to as high as 85,000 lb. or 90,000 lb. per square inch and still maintain good ductility, say 20 per cent in 2 in. The ultimate strength obtained depends on the size of the section.

Another phase, or rather application, of heat treatment is that given to case-hardened steel objects, such as railway motor gears, which have the teeth case hardened to resist wear. The A. S. T. M. has developed a "Recommended Practice" for such treatment, Serial No. A 37-14, which is given after the regular case-hardening process has been completed. This is a quench and temper treatment and is one which requires very expert handling.

Alloy Steels Coming Into Favor

All of the foregoing has dealt primarily with ordinary carbon steel, *i.e.*, steel whose characteristics are dominated by the percentage of carbon present, whatever other elements there are represented being in such small quantities that they are not controlling, these elements being chiefly manganese and silicon, in addition to the ever-present phosphorus and sulphur, the two latter generally being considered as impurities.

There are certain other metals which when added to the steel materially increase the physical properties and refine the grain. From a structural standpoint the most useful of these is nickel, which is used generally in quantities of about 3 per cent. One advantageous property of nickel is that it does not tend to collect in separate crystals in the steel, as is the tendency of carbon, but forms a true chemical solution with the iron. Quenched and tempered nickel steel forgings will have an ultimate tensile strength as high as 100,000 lb. per square inch in the elastic limit of 65,000-70,000.

Just how much the use of nickel steel has come into favor in electric railway materials is somewhat of a question. To some extent it has been used for axles and possibly for armature shafts. On foreign railways it is extensively used for the screw couplings between cars which are common in European practice in the place of our automatic couplers.

A second element used as an alloy is chromium, which is somewhat similar to nickel and is often used with it, the steel then being known as chrome-nickel steel. Such a steel in objects of proper section can be made by heat treatment to produce extraordinarily high physical properties, some motor gears of the material having shown an elastic limit of more than 100,000 lb. per square inch, with an equally high elastic ductility.

It is, however, felt to be a very difficult material to handle properly and as yet has had but little use in the railway field, other than in some tool steels.

Vanadium is also being largely used as an alloy, sometimes by itself and sometimes with chromium, either in carbon steel or nickel steel. Both chromium and vanadium raise the elastic ratio, *i.e.*, the elastic limit is raised proportionately more than the tensile strength. Inasmuch as laboratory tests of resistance to shock and endurance under repeated or alternating stresses indicate that, for a given working stress, the higher the elastic limit the greater the endurance obtained, chrome and vanadium steels are in large use in places where the dimensions of a part exposed to shock must necessarily be small, as in the automotive industry.

Much interest has been aroused by the development of an ultra-lightweight gasoline-propelled car which is now in course of construction and which it is understood embodies in its construction a considerable amount of alloy steel. Such an experiment is of undoubted value and may point the right way to a more extended use of alloy steels in the electric railway fields.

Another metallic element used as an alloy is manganese, which is added in amounts of about 10 or 12 per cent. It is used in places where great resistance to wear is required, notably in track special work and on curve rails in places of highly congested traffic. For some time a certain make of cast gear made from manganese steel was popular, but while showing great resistance to wear it proved exceedingly brittle and its use was, we believe, altogether abandoned in railway service.

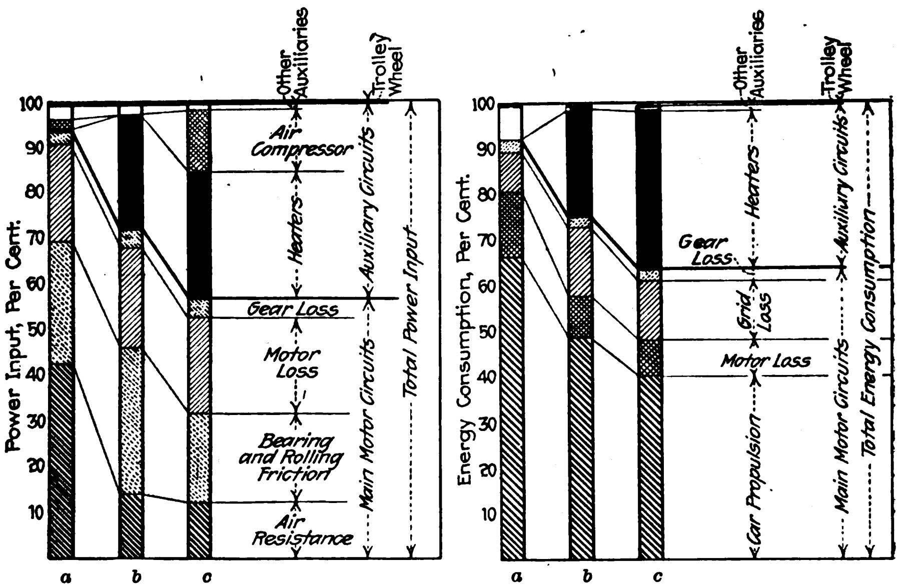
The foregoing are the more ordinary alloys that are met with; other and more unusual elements as alloys being tungsten, tantalum and molybdenum, entering into the composition of some tool steels and to a certain extent in rails.

No more interesting subject exists than that of the manufacture and use of steel in its widely varying modifications, and it is hoped that the foregoing series of articles may be of interest to electric railway men and stimulate further interest in the study of the subject which is of so great importance.

Car Losses Graphically Presented

At the annual meeting of the Central Electric Railway Association, held at Louisville, Ky., March 11, a paper on "Economical Use of Energy for Car Purposes" was read by D. D. Ewing, professor of electric railway engineering Purdue University. It was abstracted in the issue of this paper for March 27, page 641.

In connection with this paper Professor Ewing prepared charts which show graphically the relations of the data presented previously in tabular form. These charts are reproduced herewith. They show respectively the sub-division of the power input to a car and the subdivision of the energy consumption among the several elements of loss and useful work. These distributions differ because the several parts of the equipment which consume power operate for different lengths of time.



Power Distribution Chart Energy Distribution Chart

WHAT THE CAR DOES WITH ITS SHARE OF THE POWER PLANT OUTPUT

a—Suburban car. *b*—14-ton city car. *c*—Birney car.

Ohio-Pennsylvania-West Virginia Equipment Men Exchange Experience

An Informal Round-Table Discussion Brings Out the Best Methods to Be Followed in Many Detail Maintenance Practices—Many Points of Value to Electric Railway Equipment Men Are Emphasized

ON JUNE 9, at the Ohio Hotel, Youngstown, Ohio, a group of thirty railway equipment men and manufacturers' representatives from Ohio and Pennsylvania met for the fifth time for a round-table discussion and interchange of experience on the problems and practices of maintaining rolling stock. The group is loosely organized as the Association of Electric Railway Men and it had its inception three years ago, when the Westinghouse Electric & Manufacturing Company called the equipment men of these two States to Pittsburgh for a conference on ways and means to cope with the serious troubles all were experiencing as a result of the very severe winter. The benefits of such a conference were at once apparent and some one moved that the group be made into a permanent organization and that it meet regularly. The association resulted and officers were elected.

At this fifth meeting the president, Daniel Durie, superintendent of equipment West Penn Railways, could not be present, and the secretary, F. G. Hickling, Westinghouse company, Pittsburgh, asked Rufus Moses, assistant general superintendent Youngstown Municipal Railway, to preside. A set of twenty-five questions had been prepared in advance to organize the discussion and the men exchanged experiences and opinions back and forth across the table without restraint. A luncheon at the hotel and a chicken and waffle dinner at New Springfield in the evening helped to make the meeting enjoyable. Those present were H. P. Meyer, New Brighton, Pa.; M. M. Chalfant, Butler, Pa.; P. J. Wood, Erie, Pa.; W. R. Goodnight, Elyria, Ohio; C. D. Smith, O. R. Hill, Carl Knittle, J. B. Stewart, Rufus Moses, A. B. Creelman, A. D. Brackett and F. C. Gething from Youngstown, Ohio; C. W. Folwell, Parkersburg, W. Va.; P. J. Barron, Meadville, Pa.; J. A. Rogan and R. S. Bull, Pittsburgh; Walter Goodenough, Mansfield, Ohio; F. C. Martin, Wheeling, W. Va.; S. F. Witt, Connellsville, Pa.; A. A. Crawford and H. A. Rhoades, Leetonia, Ohio; J. M. Pneuman, F. W. McClosky, W. M. Hutchinson, C. S. Doddleson, W. D. Parker and F. G. Hickling, Westinghouse Electric & Manufacturing Company; W. M. C. Horner, Westinghouse Air Brake Company, and Mr. Dagan, Universal Lubricating Company.

THE BEST WAY TO REMOVE OLD PAINT

The first matter brought up for discussion had to do with the cheapest and most satisfactory method of removing paint from car bodies. Some of the men seemed to be having good success with the old method of using a blow torch and burning the paint off, while others had had better success with some kind of varnish remover. Those using the remover had varying success. Some were able to remove the paint down to the wood by this method, while others had success only in removing the outer coating. Several kinds of varnish remover were in use and the Pittsburgh Railways was having good success with a solution of wood alcohol, benzol, camphor and nitric acid. The discussion developed no method that stood out as best or cheapest. All were agreed that the sand blast was the best method of removing paint from steel cars, for it not only removed the paint but took off the rusty spots and did the job quickly and cheaply.

In discussing methods for reducing the expenditures for incandescent lamps there seemed to prevail a general opinion that cars are overlighted. On different properties it was brought out that the number of lamps used in a car varied from one circuit of 94-watt lamps to six circuits of 23-watt lamps. One master mechanic testified that his company had to replace 100 lamps for every 10,000 car-miles operated. These were of the 23-watt size. It was pointed out that bad track has a strong influence on the life of lamps and that the life is better when the lamps are not suspended at an angle to the vertical. The consensus of opinion seemed to be that the cost of lamp replacements could be cut down by using larger wattage lamps and fewer circuits. The advantage of standardizing on one size of lamp on a property was spoken of as helpful. One master mechanic pointed out that it was cheaper to use carbon lamps in carhouse and shop pits because of their greater ruggedness.

SAFETY CARS DISCUSSED FROM ALL ANGLES

While a number of the equipment men present showed a strong tendency to "knock" the safety car because of its "extreme light weight and consequent costly maintenance," there were a few who were ready to acknowledge that the criticism was attributable mainly to the earlier safety cars built and that the weaknesses which had developed in these first cars had been largely overcome and that the maintenance characteristics were very satisfactory. Many of the men argued for the strengthening of the vestibule and platform framing to better withstand collisions with automobiles and motor trucks. Ball bearing armature and axle bearings were given an indorsement by Mr. Goodnight, Cleveland, Southwestern & Columbus Railway, when he stated that his company had been operating two cars weighing only 11,500 lb. and fully equipped with ball bearings for thirty months without any trouble. In fact the bearings had never been opened up for the second greasing until just recently. The safety cars were also discussed from the transportation, financial and nearly every other angle in addition to the maintenance of them.

Mr. Hill, Youngstown, Ohio, told of several alterations in the safety cars in use by his company which have tended to reduce maintenance costs. Ordinarily the hand-brake staff is braced from the bumper channel, and every bump which affects the bumper channel bends the brake staff and makes it inoperative. The likelihood of damage to the brake staff in small collisions has been largely overcome by bracing the staff from the rear and disconnecting it from the bumper channel. A saving has likewise been realized from replacing the single steel sheet forming the dash by three separate sheets. Also, the buffer sheet has been made a separate piece and put on over the dash. The bumper channel was extended out slightly to the side to protect the doors in a collision. A 30-in. section of the same channel as used in the bumper was placed on the bottom of the bumper as a kind of anti-climber.

Mr. Wood, Buffalo & Lake Erie Railway, told how a very satisfactory economy has been realized in connection with the reclaiming of steel wheels with flanges worn thin. In order to restore the proper flange contour after a steel wheel has been in service long enough so that the flange has worn to the limit, it is often necessary to turn the tread of the wheel down an amount which is equivalent to perhaps 50,000 miles of travel. This mileage is almost completely saved by building up the flange by means of an electric welder to approximately the proper contour. Only a slight amount of the tread is turned off, or none at all, and the throat and gage side of the flange are not even turned smooth after the welding, for it has been found that after the wheel has been in use for a while it is difficult to tell whether it has the original flange or a built-up flange. Mr. Wood stated that the cost per 26-in. wheel was approximately $4 for building up the flange in this manner.

The question was raised as to the desirability of reclaiming wool waste and lubricating oils, and while few of those present had had experience along this line, it was agreed that some method of reclaiming was an economy which should be put in. Mr. Wood said that he was installing a filtering system at a cost of $200 which would have a capacity for filtering old oil of 30 gal. a day. This separates the oil from the water as well as dirt and waste and he expected it would result in a very worth-while saving.

The next question taken up was whether it would be economy to bring a steel wheel back to its original diameter, after it had reached its last turning, by making use of a steel tire. Mr. Creelman, Pennsylvania-Ohio Electric Company, had had a great deal of experience with handling steel tires and wheels when he was with the Boston elevated system. He told of some of the difficulties in keeping the tires from coming loose. In this endeavor, the allowable shrinkage had been gradually increased from 0.0030 in. to 0.0075 in. He pointed out that it was necessary to bore each tire specially for the particular center on which it was to be shrunk, since the diameter of the center had been found to compress from 0.005 to 0.010 in. after each new tire had been put on; in other words, a new diameter of the center had to be figured on upon each re-tiring. It was his opinion that the steel tire costs almost as much or more than steel wheels by the time it is turned and installed; that there is little if any saving in labor; that the steel-tired wheel is unsafe and unsatisfactory and introduces a good chance for an accident, and that taking into account the full consideration of labor and material cost the solid steel wheel is much more economical. Others corroborated this opinion, though two or three were having reasonable success with the use of steel tires. In this connection, Mr. Witt, West Penn Railways, brought out that his company is getting an average life for rolled steel wheels of more than 400,000 miles, many running more than 450,000 miles. These are wheels used in interurban service, where all magnetic brakes are employed and the 34-in. wheels are permitted to wear down to as low as 29¼ in. before being removed. The wheels are turned only when it is necessary to correct the flanges, which is usually necessary on account of the many curves over which the cars run. This long life is attributed to the absence of brake shoes and to the fact that the wheels are allowed to wear down to so small a diameter. Most companies cannot use wheels beyond a diameter of 31½ in. on account of motor clearance, but sufficient clearance is obtained on Mr. Witt's cars by tilting the motors up 1 in. when they are installed on the trucks.

The next topic brought up for discussion was as to the best method of installing tape bands on mica V-rings on old type armatures and as to what insulation is used. Inquiry developed that most of the men were making use of Hope tape and string bands and shellac. Mr. Bull, Pittsburgh Railways, supplied the interesting information that his company is not using any bands, but instead is simply applying a cement composition made up of dextrine, plaster of paris and shellac, with very good success. He said that he had had much less trouble in using this cement than he had with tape and string. He could not supply the proportions of the composition at the meeting, but stated that he would be glad to give this information to any one interested.

From the discussion as to what kind of circuit breaker had given the best result for double-truck cars, it developed that there are a great many types of circuit breakers in use, but that they have been the source of but little trouble. It was also brought out that the breakers are but rarely calibrated. Those companies which have attempted to check them up have taken them off the cars and calibrated by means of a water rheostat, but have found that only a few were out of calibration, and these not greatly. Some trouble was noted with trainmen setting the circuit breakers up to the top notch on the type which has a screw for adjusting the amperage at which the breaker operates. One company had had considerable trouble on account of the circuit breakers being mounted underneath the cars, where they collected a good deal of dust and hence frequently short-circuited.

The Miller trolley shoe came up for discussion and was generally thought to be very satisfactory except for one limitation, that it will not back up. Because of this limitation, one master mechanic had found it desirable to mount the type E Miller shoe in a bayonet harp so that on a big traffic day trolley wheels could be conveniently substituted for the shoes in order to aid in the switching of cars required on such occasions. Mr. Witt said that it had been the experience on his property that the Miller shoe would back up where the wire was low, but that it was impossible where the trolley was high. The average life of a Miller shoe was reported to be from 7,000 to 8,000 miles by several of those present. One company not represented at the meeting was reported to be securing a much better life by removing the shoes when they became grooved and grinding them to the original contour by means of a special emery wheel and jig, which brought the shoe to the proper shape without adjustment. There was a general agreement that the shoe provides a good current collector; that it eliminates noise and arcing, and that best results are obtained when all shoes are used rather than a mixture of shoes and wheels, since by this practice the wire becomes slick and the wear therefore less.

Open circuits resulting from broken leads to the armature coils, in the neck of the commutator, have formed a prolific source of trouble for the maintenance men. Many schemes have been thought out to eliminate this trouble, but it appears to be an erratic one and difficult of solution. While it was difficult to pin the cause of the trouble down to any definite thing, in general it was thought to be caused by the magnetic and gear vibration. One company tried to overcome this difficulty by putting on a steel band over the ends of the coils just under the top leads, but it was found that the coils would shrink after they had been in use for a while and would become loose and vibrate and break.

Mr. Meyer, Beaver Valley Traction Company, said that he had adopted the practice of weaving heavy gray webbing in among the leads in order to make a solid mass, and as a result had had only one broken lead in a little over a year. Mr. McClosky told of the practice of the Westinghouse company in connection with the type 506 motors. After the leads have been soldered to the commutator they are first given a coat of very light shellac, followed by a coat of very heavy shellac and then bound with a band of heavy machine twine and again shellacked and baked. He said that while this process had given very satisfactory results for this type of motor the manufacturer was not yet ready to recommend it for all armatures. He pointed out that some companies have reported that this trouble has been practically eliminated by not soldering the leads to the commutator, on the theory that the vibration is then not concentrated at the neck of the lead, at the point where it is attached to the commutator. Mr. McClosky also spoke of the method which was used by the manufacturer in connection with the type 333 motors, a large number of which have been in service for three years without any broken leads. In this motor phosphor bronze clips were riveted to the leads to reinforce them. A high-necked commutator was also used, but the absence of breakage of leads is believed to be due to the better application of remedial devices than to the high-necked construction of the commutator, and in fact he said that not much advantage is apparent for the high neck.

Some one brought up the thought that the sharpness of bends in the leads had a bearing on the amount of breakage, but Mr. McClosky pointed out that he had had an excellent opportunity to experiment with more than 100 motors of a great variety of types, some with sharp bends and others with long leads and gradual bends, and he had found that more breakages had occurred where the leads were long and the bends gradual, probably due to the greater opportunity for vibration. Yet he said that he knew of an epidemic of breakages in some of the motors used in the subway in New York which was cured by putting on long leads. Mr. Bull, Pittsburgh Railways, said that his company had had good success with some of the large interurban motors in eliminating this trouble by plastering the neck full of a composition made up of about one-half dextrine and one-half plaster of paris, but said that this remedy could not be used on small motors. Another delegate pointed out that he had tried this remedy, but found that this made repair work on the armature exceedingly difficult if the composition had to be taken out.

The next question discussed was as to what results had been obtained from leaving front and rear hoods open to ventilate the windings of railway motor armatures. The tendency among the manufacturers, it was stated, is to do away with the hoods, especially for interpole motors. Summing up the thoughts expressed by the railway men, it would seem that while they feel that the hood helps to prevent flashovers, yet the advantage of overcoming the accumulation of dirt behind the hood is of considerable value. The tendency seems to be toward leaving the hoods off. For example, the Cleveland, Southwestern & Columbus Railway is leaving the hoods off altogether on all of its old Westinghouse 56 motors and finds their operation more satisfactory.

The next question raised was whether it was advisable to prevent excess oil in the armature bearings from saturating the field windings by providing an overflow outlet in the housing. In the discussion it was pointed out that the later type motors and all modern compressor motors are provided with such an overflow. Some thought it as undesirable to have the excess oil dripping into the pits as to have it in the motor housing, but others thought that the dripping of oil into the pits would be a good telltale on poor workmanship on the part of the oiler. Mr. Rogan, Pittsburgh Railways, said that they had had so much trouble from excess oil that they had bored two 1½-in. holes in the bottom of the motor housings so that the excess oil could run off. This practice had to be changed later to prevent snow and ice from getting into the housing as the motor sheared along the snow and ice between the rails. Mr. Creelman has provided an outlet down through the housing of such construction so that the oil is drained out but water cannot get in, unless the motor actually stands in water.

Mr. McClosky spoke of the fact that some trouble along this line resulted with ventilated motors when operating at high speed. The cooling air is pulled in under such high velocity and pressure that it pulls oil from the bearings into the motors. He said it was planned on future motor designs to limit the amount of air that can get into the housing. He recommends that the air passages be kept perfectly clean so that there would be ample intake area and thus decrease the draught on leakage ports such as through the bearings.

The question was raised as to whether companies check the spring tension on brushholders frequently and as to what tension is used on different sizes of motors. The discussion developed the fact that few companies give any particular attention to the compression of brushholder springs. Most of the companies inspect the springs only incidentally and on rare occasions test the spring pressure with a pair of scales. A spring pressure of 4½ lb. per square inch is maintained in Pittsburgh, while 6 lb. is the amount carried on the West Penn Railways.

The discussion following the query as to what general types of pinion pullers are in use brought out the fact that the majority of the shops are making use of the old-fashioned sledgehammer and wedge method of removing pinions. The reason for this, it seems, was that many of the pinion pullers on the market are of such design that they cannot be used where the clearance between the pinion and motor housing is small. It was found that two of the companies follow the practice of heating the pinion when it is put on, having had fewer loose pinions as a result.

The discussion then turned to helical gears. It was soon apparent that the great reduction of noise and vibration and the apparent long life of the helical gears are giving them a real hold on the master mechanic's attention. Mr. Witt reported that the gear and pinion manufactured by the R. D. Nuttall Company, which has been in use on this property for the last two and one-half years and was exhibited at the Atlantic City convention last year, has now run 386,000 miles to date with scarcely any noticeable wear. This property now has about eighty gears and pinions of the helical type in service and Mr. Witt stated that he is having considerably less armature trouble, presumably due to the lessened vibration. Other delegates testified that the use of helical gears and pinions with safety cars and large double-truck cars, with 24, 26 and 34-in. wheels, have uniformly given very excellent results and to date, after two years or more of service in some cases, have shown no appreciable wear.

Incidentally the session turned to bearings, and Mr. Witt offered the interesting information that he had done away with the castiron shell altogether and was using bearings made entirely of babbitt metal, having a composition of 80 per cent lead and 20 per cent No. 1 More-Jones babbitt metal. He said this had overcome the end play trouble and all undue wear on armature and axle bearings. When those bearings are worn out it is possible to scrap the whole thing rather than to melt out the babbitt and reclaim the castiron shell. He said that when this practice was first begun a fifty-fifty composition was used and some breakages followed, but no broken bearings have occurred since beginning the use of the eighty-twenty composition. In installing a pair of these babbitt bearings leather liners are placed between the two halves and the inspectors are instructed to watch carefully to see that the bearings are always tight. He said that this was essential to their successful use.

Mr. Bull remarked, in answer to questions, that motor failures on the road have been very materially reduced by the practice adopted in the shop of subjecting all motors to a test of 125 per cent of full load for a period of fifteen minutes in each direction before the motor is placed in service. This has been found to show up any broken down fields, armature shorts, etc., before the motor gets into service.

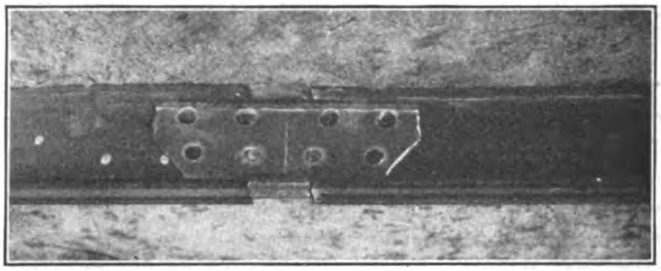
Rail Joint Reclamation

In New Orleans Old Angle Bars Are Built Up and Ground and a Novel Insert Is Used to Replace Broken Rail Ends

At a cost of 80 cents for material and labor, as compared with $2.50 to $3.50 for a new angle bar, M. V. Houlard, superintendent of track New Orleans (La.) Railway & Light Company, is reclaiming about 6,000 joint plates a year. These are taken out of track that is to be rehabilitated or laid new and after reclaiming them they are used for rehabilitating the joints on other track.

As the old angle bars are taken out of the track they are accumulated at the track storage yard. There they are sorted and stored in neat piles and as rapidly as a small crew of men can handle them they are reclaimed and restored ready for future use. If they are bent they are heated and straightened in a press. They are often worn as much as ¼ in. at the top, and sometimes the bottom is somewhat worn. Slightly more than enough new metal is then deposited along the edges to make up for any amount that has been worn away.

The final step is to grind off the top and bottom edges so that the plate will fit the rail properly. This is done by bolting the plate temporarily in a jig on a piece of track so that a Goldschmidt grinder may be used for the work. It is claimed that a better fit can be secured on old rails with these reclaimed plates than with new plates, since they can be made to take into account the fact that the railhead as well as the old plate has probably worn to a certain extent, whereas a new angle bar would be made correct for a new rail.

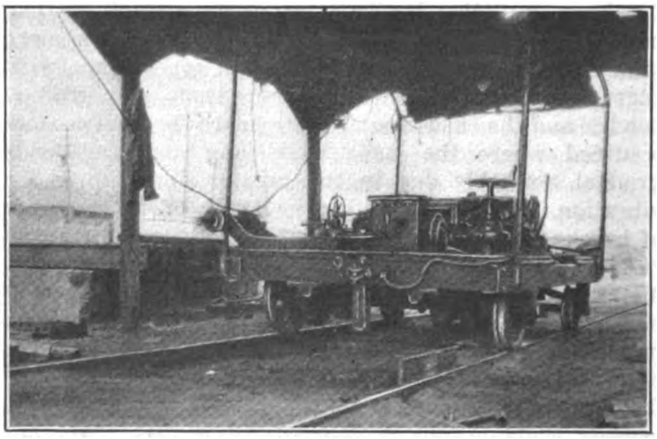


"DUTCHMAN" SPLICE BAR USED FOR REPAIRING BROKEN RAIL IN NEW ORLEANS

A NOVEL SCHEME FOR REPAIRING BROKEN RAIL

A rather unique method of repairing a break in girder groove rail has been used in New Orleans. Either an oxyacetylene flame or a saw is used to cut off a short section of the head of the rail at each side of the break. A piece of old center-bearing rail of 9-in. section is then prepared as a "dutchman" splice bar by burning off the base and all of the head except a short piece of about the right length to fill in the gap which has been made between the two broken railheads. Bolt holes are also burned in the web of this piece and it is bolted in place through the web of the running rail and welded at the edges and at the joints in the railhead. Enough metal is deposited along the flangeway, if needed, to make this continuous, and a grinder completes the job by smoothing up both the tread and the flange surfaces of the rail.

If the rail becomes badly cupped at any point or broken down at a joint, thus necessitating the cutting out of a short piece of the rail, such an opening can also be filled in and repaired in the above manner. Very good success has been had with rails repaired in this way. The accompanying illustration of this method shows only the manner of preparing the dutchman and does not show the manner of preparing the rails to be spliced by cutting back the heads.



GRINDING OFF THE EDGES OF RECLAIMED ANGLE BARS

C. E. R. A. Midsummer Meeting Ashore

Ottawa Beach Resort Scene of Interesting Meeting, at Which Several Practical Papers Occupy Attention—Members Miss Usual Boat Trip, but Enjoy Shore Sports

WITH Robert I. Todd, president, presiding, the summer outing convention of the Central Electric Railway Association began its two-day meeting on July 8 at Ottawa Beach, with about 150 in atetndance. Despite the attractions of golf, bathing, tennis and fishing, the sessions were well attended, while the evenings were made enjoyable with dancing and that other favorite indoor sport—favorite since the drought settled upon us. While the attendance was far below normal, those present seemed to enjoy themselves and the general feeling was that it was a good convention, though there were many references to the boat trip of former conventions, and if the meetings were short and the papers not as outstanding as they are at times, the interchange of ideas between operators was well worth the time spent off the job.

At the morning session on July 8 the first order of business, after the reading of the minutes of the Louisville meeting in March by Secretary A. L. Neereamer, was the report of the committee on the formation of an American electric express company by the chairman, H. A. Nicholl, Anderson, Ind. In presenting his report he expressed great regret at the lack of interest on the part of the committee members and member companies in connection with the compilation of data for the report. In view of this attitude on the part of the companies, the substance of the committee report was contained in a resolution stating that the committee did not recommend the establishment of such an express company at this time, but urged the installation of through express rates between companies and an endeavor to secure through business. This resolution was adopted, after amendment proposed by C. L. Henry, Indianapolis, Ind., that some provision be made for prompt settlement of disputes arising over the division of through rates. The finding which the committee found necessary to report was a distinct disappointment to some of the railway men.

The ladies return from a launch ride to some of the 1,000 ports of Black Lake. John Benham was the host, you might know. Without him on the entertainment committee, there is a noticeable void.

Mr. Nicholl then was called upon to report for the committee on the president's address at the Louisville annual meeting. This was the address of former president John F. Collins, Jackson, Mich. The committee's report advised that certain of the president's recommendations be referred to proper committees for further study and disposition and that other recommendations be indorsed, while issue was taken with one or two other recommendations. The committee report was accepted. (Mr. Collins' address appears in substance in the ELECTRIC RAILWAY JOURNAL for March 13, 1920, page 527).

Reporting as chairman of the standards committee, H. H. Buckman, New Albany, Ind., also lamented his inability to get co-operation from members of the committee and repeated some of the excuses given, saying that for this reason he had no definite report to make. This aroused a lively discussion, in which the issue was whether or not the standards committee, which has always been a most important one and has done some very constructive work in the C. E. R. A. territory in times past, had ceased to be of importance. The discussion resulted in the loud approval of a motion proposed by C. L. Henry that President Todd be instructed to address a personal letter to all the members of the standards committee and to the managers of the roads represented by these men urging the great importance of that committee work and that it be given full attention. In this connection W. H. Bloss referred to the very complete compilation made during the war of data covering rolling stock in use in the territory as being of great value in the study of further standardization.

The start of a 100-yd. (lame muscles) race. We don't know who won. There wasn't any finish to the race. But notice the variety of "form." Electric railway men aren't in the habit of running.

Mention was also made, in answer to a query of "why standardization?" that of the steel wheels made, 90 per cent are used by steam roads and they are all to one specification and 10 per cent are used by electric roads and there are 360 kinds and sizes. Mr. Richardson of the Midvale Steel & Ordnance Company, whose paper came later in the session, said that the standardization of wheels would help roads as well as manufacturers because deliveries would be better and prices lower.

James Harmon, New Albany, Ind., chairman of the C. E. R. A. committee on safety work, recommended that the subject of safety be put on the convention program from time to time, saying that he believed it had not been so considered since 1907. His report was adopted.

A telegram from A. Gaboury, president Canadian

Electric Railway Association, was read. This called attention to Montreal as an ideal location for the next convention of the C. E. R. A.

The remainder of this first session of the convention was occupied by a very instructive and interesting motion picture and talk by G. A. Richardson on the mining of ore, production of iron and steel and manufacture of rolled steel wheels as carried on by the Midvale Steel & Ordnance Company. A motion picture of the members on the boat trip last year was also shown, much to the delight of those who had posed.

The second session was held Thursday afternoon and was devoted to an "experience meeting." C. L. Henry, chairman of the program committee, said that this sort of meeting was somewhat of an innovation and was an attempt to get some of the men who were really doing certain concrete pieces of work to come in and tell about them. He said a general request had been mailed to member companies to have some one in the organization relate some accomplishment of the past year. As a result, five prepared "experiences" were reported, one of these being given at the Friday morning session.

One of these reports was by Frank R. Coates, president Toledo Railways & Light Company, who detailed the "Moving the Cars to Michigan," which was done so dramatically and which has already been chronicled in these pages. Abstracts of the other experience discussions are grouped elsewhere in this issue.

G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, told of some work his company had done in order to make it possible to use Master Car Builder equipment satisfactorily on short curves in special work in city service. Considerable trouble had been experienced through derailment caused by the shorter gage distance between inside of flanges on equipment of this sort. It was decided to try to turn off ⅛ in. of the wheel flange on the inside and this was accomplished, even though the wheels were made of chilled steel. In answer to questions, Mr. Jeffries said that this work was done on a regular lathe, that there was no apparent damage to the lathe or trouble experienced and that there was no apparent damage to the wheel, which seemed to wear as well as ever, although he did state that the finishing touches were done by an emery wheel.

Another member stated that his company had met the same difficulty and had merely set the wheels ¼ in. farther apart on the axle and had experienced no difficulty on account of this difference in spacing, but on the other hand had been able to negotiate the special work short curves satisfactorily.

In the discussion on the "experience" papers, Mr. Brown, in answering a question, stated that sidings which were put in by his company in order better to distribute freight and express, where these sidings were installed for a particular company, they were paid for originally by the companies benefited, but were finally paid for by the railway company by deducting from bills of the company in question at the rate of 5 per cent per month.

Mr. Gunn's paper on "Welding Flanges" attracted a good deal of discussion. He stated that the flanges were, of course, turned after being formed by welding, but that he had not included the cost of this turning as an additional cost of treating the wheel, because he assumed that any wheel brought in for working over on account of sharp flange would have to be turned, and it would be no more expensive to turn one on which the flange had been built up than one on which the flange had not been built up. No difficulty was experienced in cutting the built-up flange. He stated that after much trial of almost every sort of steel he had determined that grade D steel rod gives the best service as material to build up the new flanges.

One interesting point was that the welder, that is, the operator, never had any previous experience on railways and had never had any experience with a welding outfit of this sort, although he had done a small amount of oxyacetylene welding. For this reason Mr. Gunn said he thought it was not necessary to obtain a high-priced man to start with. The welding outfit used was one bought originally for trackwork and adapted to this work, and while a larger machine would really prove advantageous, excellent work was being done with the one in use. From a sample Mr. Gunn brought with him it was impossible to tell where the weld began and where the original metal ended. Mr. Gunn said that he had used this same welder successfully for repairing drawbar heads, building axles up to standard and all general shop-welding work which he had found necessary on his road.

In a subsequent informal discussion Mr. Brown explained the lower cost per car-mile after abandonment of the power plant mentioned in his discussion by saying that the measurements of kilowatt-hours per car-mile were made at the substation and not on the car. Total car-miles were divided into total kilowatt-hours over a certain period of time. With the new arrangement, with a higher and more uniform voltage for distribution, with power measured only when actually being used by the cars, and, consequently, there being no operation of plant while no cars were running, the final result indicated a lower cost, or a lower kilowatt-hour per car-mile.

At the Friday morning session C. L. Henry of Indianapolis presided in the absence of President Todd, who had found it necessary to return home. Mr. Henry read a telegram from Robert M. Feustel, who was scheduled to present a paper on the "Interurban Electric Railways, Their Problems and the Solution Thereof." Mr. Feustel regretted his inability to be present and present the paper on this subject and stated that it had been impossible for him to obtain and digest sufficient data to make a presentation of the subject advisable, because if he presented it at the present time it would represent merely his personal opinion and he could present no conclusions drawn from data which he anticipated having and upon which he hoped to base a paper in the near future.

The other paper of the morning, on the subject of "City Electric Railways, Their Problems and the Solution Thereof," by A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company, Akron, Ohio, was read by Mr. Henry in the absence of Mr. Blinn, H. A. Nicholl being in the chair.

Mr. Blinn in his paper passed over all other problems of the railways except the financial one, which he says stands out with such prominence that all other problems are of a secondary nature, for the business has been literally starved to death and can only be made well and strong again by increasing its nourishment in the form of more revenue. He also made the assertion that the conclusion must unquestionably be reached that, generally speaking, the fares are not only now wholly inadequate for the needs of the business but the income has never been wholly sufficient to pay expenses and a fair return on the fair value of the property. He argued that this was the result of the public's exercising its right to control without acting on its obligation to protect. He also blames the starvation policy of the municipalities for the fact that the physical properties are not now in the 85 per cent physical condition in which every street railway should find itself, but he does not lay all the blame on the municipalities, but partly on the managers of the properties, who have been at fault in not seeing to it that the conditions under which the railways have been operating for years be made public.

Mr. Blinn stated that the stockholders have been the worst losers, in that they have not only not received a return from their stock but their property has been worn out and the investment thus impaired.

He repeated the oft-heard statement that the present problem is to bring fares up to a point which will put the railways in a sound condition and emphasized the argument back of this, the troubles in the way of getting it, particularly political ones, and urged the taking of every opportunity of making public the story of the railways. He argued that until communities take more than a passing interest in the affairs of their public utilities full justice will never be done.

Referring to the pre-war condition, under which he said that the old rates were not sufficient to pay all of the cost of keeping properties in efficient operating condition, he urged that the railway industry should exert itself to maintain present increased rates of fare even though the country may some time enjoy pre-war price levels. This, he said, must be done for the benefit of both the public and the properties, to the end that the public may be served as it wants and the lines be maintained in satisfactory physical condition and at the same time capital be paid a justly deserved fair return.

There was no discussion of the paper.

Mr. Henry reported for the executive committee that an amendment to the constitution would be presented at the next regular meeting of the association, which amendment would provide for two regular meetings in place of three meetings per year.

With reference to the time and place of the next meeting, the executive committee announced that it would be held either at Purdue University, Lafayette, Ind., or at Indianapolis, and that the date probably would be Dec. 3.

The convention adjourned Friday noon.

Freight and Motor Truck Competition Report

A report from the committee on interurban freight and motor truck competition was presented to the executive committee and becomes a part of the record of the meeting. This report had no place on the program and so occasioned no discussion.

To the Officers and Members of the Central Electric Railway Association:

The following report of the committee on interurban freight and motor truck competition is respectfully submitted for your consideration.

Your committee sent a questionnaire to a great many interurban companies and for the sake of brevity your committee has combined in a general way the answers to the questionnaire with its own general views on the situation.

1. Have you any motor truck competition?

There is considerable motor truck competition and without having answers from all roads the committee assumes that at least 60 per cent of the interurban railways have such competition in the way of more or less permanent all year around service.

2. Approximate number and capacity and do they have trailers?

From answers received it would seem that within the three states covered there would be at least 700 motor trucks having a capacity of from 1 to 10 tons, with probably 250 trailers which average from 1 to 5 tons capacity.

3. What service do they perform?

As a whole the service is practically similar to that performed by the interurban railways.

4. Between what points is this competition strongest?

Truck competition is most dense, radiating from commercial centers having large manufacturing interests and wholesale houses. This is especially true at cities like Indianapolis, Toledo, Cleveland, Akron, Detroit, Columbus, Grand Rapids, Kalamazoo, etc. A great deal of course is dependent upon the condition of the roads, but just as soon as good roads are completed leading from business centers it is there that competition quickly springs up.

4a. Give comparison of truck service with service furnished by your company.

Harry Reid, executive committeeman and Robert I. Todd, president of the C. E. R. A. are here seen loafing on the board walk at Ottawa Beach, Mich., between sessions of the convention. Ralph Brown, at the left, of Curtain Supply fame, got a "stand in" with Reid by leading the bunch in a song about "Old Kentucky."

No satisfactory replies were received to this answer, although service is given at all times during the day, usually, however, mostly in the morning and in the evening.

4b. Give comparison of rates.

Generally speaking, the rates are higher than those charged by the interurban railways, although in some few cases the rates are a trifle lower, this, however, being due to the lack of proper knowledge on the part of the truck owners of their costs. Higher rates are natural, as the truck service carries with it the pickup and delivery of all freight handled.

4c. Do the truck operators give receipts, take receipts, collect tax?

Generally speaking, the operators do give receipts and take receipts; however, to the best of our knowledge war tax is not generally collected.

5. Are the truck operators in your territory responsible?

Generally speaking, the trucking concerns are responsible and honor claims when presented.

6. What commodities are being handled by trucks in your territory?

The answer to this question has already been made in answer to question 3.

7. Have you any suggestions to offer as to manner of meeting this competition?

The consensus of opinion in the answers all tend toward the one general broad answer, which is that good service on the part of interurban railways is the best method of competing with truck competition.

8. Are any truck lines operating as "feeders" to your lines?

There are but very few instances where truck lines operate as feeders to interurban railways, as it is quite a pioneer movement.

9. State general conditions of roads on which truck competition exists.

It is obvious that the condition of the roads over which truck competition is handled must necessarily be very good, as very little competition is found where the roads are poor. The owners of trucks competing are wise enough not to pick up any business except the cream of it and naturally stick to the best roads.

10. What is cost of operation of trucks in your territory? The cost of operating trucks naturally varies as to size of the trucks, but when the information was gathered it seems that the cost of trucking varied from 35 cents to 60 cents per mile. It is natural to assume that under the present existing conditions of high wages and of great cost of trucks this figure might easily reach 75 cents per mile. As a whole, however, the owners of trucks or associations performing such service do not themselves know, or if they do they will not divulge, the real fact as to the real cost of performing such service. They are going through the formative period at the present time and must naturally learn by experience that they are not properly charging all the cost of such service and that they are not making proper allowance for depreciation, wear and tear, interest, etc. As far as the length of time which one concern may continue in business is concerned, that is hard to learn. However, at large centers of population already established, concerns which started truck competition are still in business and it has been going on for two or three years, with the likelihood that they will keep on, as they are more able, in a business way, to "carry on" than the individual truck operator, who as a rule does not last much longer than nine to twelve months.

11. Average number of months operated each year. About nine months in the year, although there are sections where they operate only about six months and others where they operate all the year around.

In considering this report the committee wishes to extend its views to the association at this time.

It is quite evident from replies received that little enough attention has been given by various managers to the seriousness of truck competition, as there seems to be quite a lack of interest in the attempt to preserve their own business. The committee wishes to emphasize the necessity of the individual roads quickly waking up to a situation now confronting them which it believes is becoming more serious every day.

With all the money which is to be spent in the states canvassed it would seem quite advisable for the individual roads or this association, if deemed wise, to bring to the attention of the authorities in charge of building highways the fact that it would be well to build a road which could be utilized to act as feeders for electric railways rather than to build long stretches of road between important centers which will act as competitors for the electric railways. There is no question in the mind of the committee but that such competition is here to stay and that we may as well face the music; there is, however, no reason why this association or its individual members cannot do some missionary work with the before-mentioned authorities, for they have a perfect right to do so, as their investment is very much in jeopardy.

Your committee respectfully suggests to the association members the advisability of becoming more closely associated with the local Chamber of Commerce, or of any association which today is lending its aid to transportation by means of trucks. With the proper diplomacy we believe a great deal of good can be accomplished.

It is likely that opposition will be met on the part of such associations in the way of stating that the transportation system of this country as a whole has been near the breaking point several times in the past few years and that it is only natural as a matter of self-protection for individual shippers or associations of shippers to fall back on any means of transportation.

Such statements can only be met by a clean-cut counter-statement as to the financial condition of the interurban railways.

The committee of course realizes the financial stringency at present, but believes that better use can be made, with slight expenditure, of the terminals now used by interurban railways and that better results can be obtained if a closer co-operation is had with the shipper.

Since automobile industries have seen fit to spend thousands of dollars in advertising, it would seem advisable to this committee that the association carefully consider the necessity for spending some of its energies and real money in promoting an advertising campaign setting forth the service performed by electric railways.

The committee further brings out the point that it would seem advisable for the individual members or the association as a whole to bring to the notice of the public service commissions the seriousness of truck competition, suggesting the advisability on the part of the commissions of investigating the matter with the idea in view that owners of trucks should be classed as common carriers. The committee further believes that more attention should be given on the part of interurban railways to the matter of soliciting long-haul traffic rather than to worry themselves about the short-haul traffic, as the committee believes it will be impossible, for some years to come at least, to bring about the abandonment of truck competition in short-haul service. This of course means providing through rates as between various connecting interurban' railways.

Your committee submits the foregoing report, with the hope that certain recommendations may come from it, with this statement, that the committee has not seen fit to offer any conclusive or definite recommendations as to the method of procedure in the future. It would seem that this committee should be discharged and that perhaps another committee should be formed to take its place, the duties of which might be for the promoting of the interests of the interurban railways, inasmuch as the duties expected of this committee seem to the general chairman to have been performed.

Knoxville Passes New Traffic Ordinance

THE passage of a new traffic ordinance by Knoxville, Tenn., furnishes one more example of stringent ordinances to increase safety and expedite traffic. In the near future it is hoped that more uniformity in urban traffic regulations will prevail, as it is very difficult for the touring motorist or interurban street car to conform to non-standardized traffic regulations.

The new Knoxville ordinance provides for the registration of all automobiles with the city police department and the licensing of all motor vehicle operators. It provides that no vehicle shall pass a stationary street car while it is receiving or discharging passengers. No street car is allowed to stand in excess of three minutes in the business district with certain exceptions. The ordinance provides for the "near" side stop of street cars and prohibits "jay" walking by pedestrians. One notable feature is that forty minutes is set as the standardized parking time for all restricted locations.

The motor speed limit is fixed at 15 miles in the business district, while the street cars cannot operate at a speed in excess of 8 miles. The penalties vary from $3 to $50 and revocation of license.

The Boy Scouts are aiding in the enforcement of the "jay" walking law, as it is the intention stringently to enforce this feature of the ordinance.

Symposium of "Experience" Papers

Power Plant Economies, Maintenance of Equipment and Interurban Freight Service Subjects of Special Attention in the "Experience Meeting" Session of the C. E. R. A.

AS INDICATED in the report of the Ottawa Beach meeting of the Central Electric Railway Association, July 8 and 9, one session was devoted to a recital of noteworthy accomplishments of the past year. The prepared reports of these are abstracted herewith:

Power Plant Economies

BY SAMUEL WAGGONER
Superintendent of Power Plant Indianapolis & Cincinnati Traction Company, Rushville, Ind.

WITH a view of reducing our coal consumption and other operating expenses, we instituted early last year a very comprehensive and exhaustive study of our power plant operating conditions. After duly digesting the information that we obtained from this study, it was decided that we would make a few of the many needed improvements to bring the operation of the plant to a more efficient and economical running condition. Up to that time we had been experiencing considerable difficulty with maintaining a uniform temperature of our boiler feed water; the best we could do with the equipment as it stood was to maintain a temperature of 180 deg. F. This condition was not brought about from the fact that the heater was too small, but was attributable to the unavoidable leaks in the condenser tubes, etc. In order that we might relieve this condition, it was decided that we install a hotwell tank on the outside of the power station proper, into which all condensation and other returns are piped. The tank is equipped with a closed coil, through which is passed a portion of the exhaust steam from the pump and other auxiliaries, bringing the feed water temperature up to 125 deg. at the tank before it is delivered to the feed water heater proper. This arrangement has brought the feed water temperature up to 210 deg. and effected a saving in the over-all operation at the plant of at least 4 per cent.

Other economies that were effected by this arrangement were the ability to recover the condensate from all over the station into this one central reservoir for boiler feed purposes, thereby eliminating the necessity of having to use such a large percentage of fresh water. This in turn holds down the amount of incrustable matter in the boilers, thereby enabling us to run our boilers for longer periods between cleanings.

It has been our policy for the past three years to give closer attention than ever before to the physical condition of all power station apparatus and appurtenances thereto, and especially to all auxiliaries that are using steam. It is my opinion that there is no source of so great a waste and that there is nothing that tells so heavily on the coal consumption as leaky pump valves, and that more attention than heretofore should be given to each piece of auxiliary equipment in our station operation.

Another thing we have done that has proved a source of great gratification to us is the thorough inspection and overhauling of all valves and cutouts in connection with the boiler equipment every time a boiler is out of service for cleaning. We thus do away with all hissing of steam and dripping of condensate, which makes conditions in the boiler room intolerable for the man who has to make his living by working there.

In addition to the above improvements, we have installed S. C. water regulator, damper control, etc., and with a careful check-up of each day's operation we have been able to show a decrease in the cost of the fuel for 1919 of $7,578.55 and for the first four months of 1920 of $2,077.18. On an investment of not to exceed $10,000 this would mean an interest return of at least 76 per cent.

Our average daily load amounts to 24,000 kw., average daily coal consumption 96,000 lb., average daily power factor 70 per cent, water used daily, from and at 212, 120,000 United States gallons, giving us an evaporation of better than 8: 1, which we consider very good, under our operating conditions.

We have also been able to show a very gratifying economy in our power station lubrication. In the past we experienced considerable difficulty on this question, but in spite of the ever increasing cost of oils for power station lubrication in the past three years we have been able to show a steady decline in our monthly and annual cost. In the year 1919 we showed a reduction of $341.96, and for the first four months of this year we show a reduction of $269.48 over the same period of last year. This has all been brought about by making a few very necessary observations from day to day and keeping a close record of operating conditions from hour to hour.

Experiences on the Interstate Public Service Company's Lines

BY L. M. BROWN
Superintendent, Columbus, Ind.

Freight Service

FOR a number of years the freight business on the lines operating between Indianapolis, Ind., and Louisville, Ky., was regarded as one of the necessary evils and was discouraged in every possible way. Up to and including the year 1917 the total revenue from freight transportation was less than 8 per cent of the gross earnings, but there has been a steady growth since that time, until now more than 16 per cent of the gross revenue is from this service. It is felt that this steady growth can be further increased if the proper facilities are provided and adequate service maintained.

At the present time six local freight trains are operated daily on this system and through freight is handled in trail cars on these local trains. It is the plan further to improve this service as soon as the voltage for the entire system can be made uniform and some of the equipment rebuilt and equipped to handle a larger number of trail cars. The plan is to operate only a local freight service during the daytime and to put on a through freight train at night from each terminal in each direction, so that shipments received one day will be ready for delivery the following morning at every station on the line. The operation of a through train will give the shipper quicker delivery and will facilitate the movements of trail cars and increase the business.

The present freight equipment consists of six motor cars and thirteen box trail cars. Each of the motor cars will handle one or two trailers and one is of steel construction with four 125 hp. motors and capable of handling as many as ten trail cars. An electric locomotive has been purchased and will be placed in service this month which can handle from ten to twenty trail cars. Most of the trail car equipment has been secured within the last two years, five of the cars being secured in November, 1919, at a cost of $2,500 each. Within the last year fourteen flat cars, formerly used as service equipment, were placed in the freight service, and the revenue from this equipment amounts to more than $5,000 per month.

Believing that the best methods of increasing the revenue to meet the high cost of operation is in the long haul passenger travel and in the freight business eight modern steel passenger cars are now being built and should be ready to be placed in service within the next few weeks. When this is done the cars now being used in limited passenger service will be rebuilt into passenger trail cars and the motors placed under some of the present freight motor cars, and these geared down so as to be able to pull five or six trail cars at a time.

The business now seems to be limited to the amount of equipment available. With the limited amount of equipment and inadequate terminal facilities the gross freight revenue for five months of 1920 has amounted to $94,731, or more than the total gross for the year 1917, and an increase of 50 per cent over the same period for 1919. While we know that a large percentage of this increase is due to the inability to secure equipment from the steam lines, yet we believe that the point has been reached where the freight earnings can be made a very profitable part of the business.

Previous to this year most of the freight handled has been less carload shipments, but during the months of January and February, 1920, 88 carload shipments were handled, 125 in March, 147 in April and 192 in May. These carload shipments have practically all been local to our own line and had we been able to furnish cars for shipments to connecting lines this number could have been increased several times. The principal commodities handled on these cars consisted of cement, logs, canned goods, syrup and glucose. A number of industrial switches have been built into several large manufacturing plants and others are in progress, which will tend to increase this volume of business very much.

A number of improvements at stations have been made. A new freight station was built in Louisville last year at a cost of $30,000 and a combined freight and passenger station was built at one of the smaller towns at a cost of $10,000. The present facilities are to be increased, sidings lengthened for the handling of trains and other improvements are to be made as the expenditures can be met.

It has been the plan of the company to have a number of new box cars built, but owing to their increased cost, the inability to obtain labor and materials and the recent financial difficulties this plan has been temporarily deferred. Efforts are now being made to secure box car equipment and several additional cars will no doubt be added in the near future.

This company has a well organized traffic and freight claim department which co-operates with the operating department in every possible way. Immediate attention is given to OS&D reports and many claims are eliminated in this manner. The best men available are used as freight trainmen, agents, checkers, truckers and helpers. Frequent meetings are held with these men and a recent campaign has reduced the claims for lost and damaged freight so that the claims account is less than 2 per cent of the gross freight revenue.

Tariffs are on file naming through rates to points on connecting lines and the tonnage from this is very heavy and could be considerably increased if carload shipments were accepted. The rates charged are practically the same as those on steam lines. No steam road connections are maintained and no interchange of steam road equipment has ever been made.

No attempt has been made in this article to furnish the actual net revenue from freight transportation, as no separate records are kept of the expenditures chargeable to the freight department, and these figures could not be secured in the limited time in which this paper had to be prepared.

It seems that one of the best ways to reduce the expenses to the freight business is in the handling of carload shipments, thus eliminating labor costs and congestion at stations. To do this it is necessary that industries be served by private sidings. If it were possible to work out some kind of an arrangement whereby sidings could be constructed from city street car tracks into industrial plants in the larger cities it would put the electric lines in position to compete better with steam lines and give superior service in the territory served.

Power Plant Abandoned

In November, 1919, for the 62 miles of the line operating between Indianapolis and Seymour, Ind., the use of the company's power plant at Edinburgh was abandoned and arrangements were completed for the purchase of power from the Merchants' Heat & Light Company of Indianapolis. The abandoned power plant was very inefficient and in addition to furnishing power for the line supplied a large manufacturing establishment. The plant was equipped with steam driven engines that had been in service several years and the current generated was carried on the transmission line at 15,000 volts, 25 cycles, alternating current and on the trolley at 600 volts, direct current. Under this change the transmission line for the entire system is being standardized, carrying 33,000 volts, 60 cycles, a.c. on the high tension line and 600 volts, d.c., on the trolley.

This transmission system has been extended to a number of public utility plants which are owned by the Interstate company and power is being distributed to the various communities in this territory. It has also been connected with the steam and hydro-electric plant of another subsidiary, the Southern Indiana Power Company, and is almost completed into Louisville, Ky. This system will, by interconnection with other operating companies, ultimately be a part of a great transmission system extending from the large hydro-electric power plant on the Mississippi River at Keokuk, Iowa, across Illinois into Indiana and ultimately connecting with Indianapolis and Louisville.

The necessary work in changing the transmission line so as to carry 33,000 volts instead of 15,000 volts and the purchase and installation of six new 60-cycle substations was made at a cost of $135,000. The following actual figures for the first four months of 1920 compared to the same period for 1919 show the saving in the cost of power which has been accomplished by this change:

	First Four Months	
	1919	1920
Net power costs	$36,371.14	$20,791.65
Kw.-hr. to feeders	1,550,900	1,318,238
Power costs per kw.-hr.	2.345	1.577
Kw.-hr. per car-mile	4.3	3.5
Car-miles operated	360,952	376,700
Power costs per car-mile	10.75	5.52

These figures for 1920 show a reduction from 1919 figures of 0.768 cent per kilowatt-hour. Applying this reduction to the kilowatt-hour consumption for 1920 (1,318,238 kw.-hr.) gives a saving of $10,124, or an annual saving of $30,372. Allowing 4 per cent for depreciation ($5,400) and 7 per cent for return on the investment ($9,450) leaves a net annual saving of $15,522.

Under this plan three power dispatchers working in eight-hour shifts are located near the middle of the line and they receive hourly meter readings from all generating stations and issue such orders as are necessary to keep the voltage uniform and the system economically operated. The connections with the local power stations along the line enable their use in peak-hour periods or when necessary, or, in the event of a failure at one point, the other plants can carry the load until repairs can be made. When the demand for current is light all the small plants can be closed down and current furnished from the station where it can be produced at the least cost. With this system the voltage is more uniform at all times than formerly and trains are kept on much better time. This is particularly noticeable when traffic is heavy and additional service is provided.

The work of changing the 41 miles of line of the Indianapolis & Louisville Traction Railway between Seymour and Sellersburg, Indiana, from a 1,200-volt, d.c. line to a 600-volt, d.c., with 33,000-volt, 60-cycle, a.c. on the transmission line, is practically completed. This makes the voltage of the entire line from Indianapolis to Louisville uniform and will enable the use of all equipment on any part of the system.

The Welding of Flanges on Steel Wheels

BY E. B. GUNN
Master Mechanic Western Ohio Railway, Wapakoneta, Ohio

DURING the period of the war, when it was almost impossible to get steel wheels, it became a very serious question of how to get along and extend the life of the wheels in service.

I had had some experience in welding flanges on city car wheels and it had worked out satisfactorily on this class of work, and as our company had purchased an arc electric welding machine for use in track bonding, I started in July, 1918, to weld the flanges on our wheels in interurban service. Since July, 1918, we have carried this process through and up to June 1, 1920, have welded 114 wheels. We have had unusually good success, having had only three wheels to "shell" and these very slightly.

The method that we use is very simple and is carried through our shop by our usual shop workmen. We put the wheels through the turning lathe and take the smallest possible cut from the tread of the smallest wheel. After making this cut we shape the flange as though we had stock enough for a full flange and leave a groove on the side of the flange toward the tread, varying in size according to the condition that the wheel was in when removed from the car. Ofttimes, of course, the opposite wheel of the pair will be in condition so that the flange will not have to be welded. The wheel is now ready for the welding operator, who carries the first weld in the bottom of the groove and welds this some deeper than the balance of the welds, and carries this at least 10 in. ahead of the balance of the welds. This allows the operator to inspect his work better, and I believe gets a better amalgamation by allowing the first weld to cool before putting the balance of the welds in the groove.

The greatest care must be taken to have a steady voltage, as a slight variation will cause a poor weld. Or if the operator is not careful in keeping his arc to the proper slant and length it will cause trouble. For this reason a welding machine that uses the grid for resistance and uses the direct-current arc is not so successful for wheel work as the machine that uses the alternating-current arc, as it is almost impossible properly to regulate the intensity of the current with the d.c. arc, and this will cause a burning of the steel, where, by using a stabilizer, the arc can be regulated and the depth of the weld controlled. Our operator is very careful to see that this work is not being carried on when cars are being moved in the shop or around the yard, as a variation of voltage as small as twenty volts will cause trouble.

The expense of welding flanges is so low for the results obtained that it is hardly worth mentioning. The machine we use requires 9 amp. on 650 volts, direct current, the average time to weld a wheel is four hours and it will require an average of about 25 lb. of welding metal per wheel. The following would be the average cost of welding the flange per wheel:

24 kw. at 3 cents per kw.	$0.72	
Four hours labor at 70 cents per hour	2.80	
25 lb. grade D welding steel	3.00	
	$6.52	
Plus 25 per cent for overhead	1.63	
Total		$8.15

On a basis of increasing the mileage 125,000 miles per wheel the cost would be 6½ cents per thousand miles. We are increasing the mileage of our wheels by the introduction of the welding process by more than 125,000 miles, as the cut that is taken off from the tread of the wheel will average $\frac{5}{16}$ of an inch, while if a new flange would be required under the old method a cut would have to be made of from $\frac{5}{8}$ to $\frac{3}{4}$ of an inch, depending, of course, on the condition of the flange.

After all is said in regard to the success of flange welding, the greatest factor in it is a good careful operator, one who takes an interest in his work and tries to make a good record by being careful and conscientious.

In addition to the welding work that we have, such as armature shafts, axle building and other repairing, our welder takes care of the babbitting of the bearings and goes out on the bonding work when required, so that we do not have to charge his time up to the wheel welding except when he is directly employed in this work.

Experiences in Power Plant Operation

BY FREDERICK L. RAY
Union Traction Company of Indiana

ACCIDENTS cannot always be prevented, as hidden defects will develop to the breaking point before they can be detected. Proper inspection, however, will prevent most accidents and careful planning for the future will eliminate 80 per cent of what inspection fails to find.

The cost of a great deal of maintenance work can be lessened by doing the work before the life of the material is all gone, but a great cost can be burdened on a property by replacing machinery just because it has been in service for a certain number of years. We are justified in replacing the axles of the high-speed interurban cars after they have been in service for a given number of miles, for we know by experience that there is an average life of an axle beyond which we ought not to go because of the great danger to life and property if they should break, but we would not be justified in renewing all the tubes of a boiler just because they have been in service twenty years, for they may give many years of service, and even if one should give way it seldom results in more than the loss of the one tube.

The renewal of a few rows of blading in a turbine at an expense of say $2,000 may easily prevent an accident in which perhaps all of the blading is ruined and which will cost many thousands of dollars, with a possible interruption of service.

How much better it will be to take a boiler off at stated intervals, thoroughly testing, cleaning and repairing, so that when it goes on it will be in first-class order, than to keep operating it until the efficiency drops to 30 per cent or a tube splits wide open with possible loss of life and interruption to service.

Just a few of the experiences of the writer are given below which I trust will be of interest to you.

Belts for Ash Handling: There have been a great many installations of belts for the handling of ashes, but in the writer's experience every installation has been a failure. One installation that we have in mind is where there were sixteen boilers and a system of 24-in. belts was put in to deliver the ashes to an elevator. This system consists of five different belts, four of these running parallel with the boilers and delivering to a cross belt which delivered to the elevator. This system was operated about one year and then discarded and the Irish buggy used in its place. During the period of operation about $7,000 worth of belts were used, with about 30 per cent efficiency in labor while operating the belts. There was excessive maintenance of these parts in the few months' use of this system besides the belts, so that all together it was a very expensive experiment.

The one great trouble with the system was to keep men from pulling hot ashes onto the belt. All kinds of schemes were tried for quenching the ashes, but in spite of all that we could do by threats and discharges the men would persist in burning the belts so that in a short time they would have to be renewed. Of course while we were working on the belts or machinery the most of the laborers would be idle, waiting for the system to start. Sometimes the basement would be nearly full of ashes and then it would take excessive labor and several days' time to get cleaned up again.

On account of the small capacity of the ashpits it was necessary to run two crews, night and day, on this work and this required about twenty-five men. After the belts were taken out and wheelbarrows used we decided to get more capacity in the ashpits, which was done. Now on a twenty-four-hour run one crew of nine men takes care of all the ash handling, using wheelbarrows, where formerly we had twenty-five men on the belt system.

There was also another feature of great importance in connection with this story, and this was the burning of stoker dump grates, due to shallow ashpits and the failure of the belt-handling system. However, the capacity of the ashpits was increased and the method of handling ashes was more efficient, our troubles disappeared entirely, so that we had much more satisfactory operation with a splendid saving in cost of labor.

Engine Crosshead Failures: Cast-iron crossheads on engines that have been in service for fifteen to twenty years should be closely watched, for there is very likely to be a failure of the threads in the crossheads where the piston rod screws in.

Taking charge of some old engines, I have found some conditions that were startling and proved to be narrow escapes from serious accident. Just one illustration is all that is necessary, which was on a 26-in. cylinder operating at 150 lb. steam pressure, where we found the threads in the crosshead practically broken off, just a few threads holding, so that the least shock from water or foreign matter would have stripped the rod out of the crosshead, with the result that we would have had an engine wreck of serious nature and possibly loss of life. Piston rods should be screwed out of crossheads often enough to make sure that they are in good condition.

Condenser Suction Pipe: Long lines of suction piping on jet condensers often are the cause of a great deal of trouble with the pumps attached to this line, as a very small leak of air into this line will cause serious trouble. The writer has had two separate systems of piping that were the cause of a great deal of trouble. One of these lines was a 20 in. riveted sheet iron pipe with steel wrought flanges, partly underground and about one-half exposed, but in the basement and in close quarters. To this line was attached four marine type condensers, and just as soon as we began to have trouble with our condensers our first thought was of the suction line and there was where we usually found trouble.

In another case we had five marine type condensers connected to an underground section line which was made up of bell and spigot pipe with lead packed joints, where we could not get any of the condensers to work satisfactorily. Investigation was started and before we completed the work we had dug up every joint on this pipe and caulked and packed every one of them. After this was done and the condensers overhauled either one of the condensers would pull down the required vacuum without any trouble at all.

Our method of discovering the leaks was to put a blind flange in as close to the source of water supply as possible and by having a water connection we could pump up about 40 lb. of pressure on the line and keep on making these tests until everything tested tight. Suction pipe to any kind of a pump should be absolutely tight, but where it is used for condenser purposes it is necessary that it be kept in perfect condition all the time.

Feed Water Treatment: Water for boiler purposes should be as near pure as it is possible to get it; in fact, if we could get distilled water it would be much better.

Water softeners, either hot or cold process, will give good results; neither one of them will give absolutely pure water, but will give water that will enable a plant to operate satisfactorily, even with very bad water before treatment. Care must be exercised in starting a softening plant where the boiler has been in service a number of years, using bad water, for every time the water is started in too soft the scale will be thrown from the tubes and great damage done by the consequent burning of the tubes.

As an illustration we cite one case where soft water has caused a great deal of harm. The softener system had been operating for some time, using a certain amount of lime and soda ash to take care of a creek water under certain conditions. It happened that a rainy season came on and it rained for about a week, with the result that the hardness in the creek was reduced considerably, but there was no change in the amount of lime and soda used. The result was that the water was reduced to a very soft state with a surplus of soda ash going into the boilers, which resulted in the throwing down of a lot of scale, which lodged in the lower tubes of Babcock & Wilcox boilers. The result was that a large number of them were burned and several boilers were put out of commission, so that the plant ultimately was in danger of interrupted service.

The remedy was to stop the treatment for several days, which at once cleaned up the situation and our tube trouble was stopped, the softener was put back in operation again and the treatment watched closely. Water softening systems are just like everything else about power plants, they must be closely watched, and it must be by some one experienced in the business if you expect to get results.

Increasing Capacity of Ashpits: In a certain plant the writer found that the ashpits under a certain grate stoker had not more than a four-hour run capacity, so that two crews of men were needed to handle coal and ashes, one crew for day and one crew for night, the men working in ten-hour shifts.

These ashpits were worked over and the capacity was increased so that they will hold a thirteen-hour run. After the change was made one crew of eight men and foreman do all the work in a ten-hour shift, saving the wages of seven men. This is a case where the saving in labor pays for the cost of making the improvement in four months' operation.

We do not often find where it is possible to make such valuable improvements in operating conditions as in this case. but there are no doubt cases of a similar nature where if the operating men would only present the matter in a correct manner the management would be only too glad to make the improvements.

In closing I wish to suggest to you that if you would but look about your power plant you will find where you can make changes in methods of operation or in changes of equipment that will save money, and if you are working for a public utility, whether it be an interurban, street railway, light and power, gas or heating, you should be even more diligent in this matter, for these interests are trying to serve the public under adverse circumstances and are expected to give service with a limited provision for the paying of the bills. Every operating man should have before him the slogan of safety, service and economy, and the greatest of these is service.

Utilities Present Coal Arguments

Representatives of Utility Associations Urge Continuation of Priority Order for Coal—Commission Extends Order to Aug. 19

NOTHING short of assigned cars at the mine will meet the serious situation in which public utilities find themselves as a result of the condition of the coal market. This was the point which representatives of the public utilities tried to impress upon the Interstate Commerce Commission on July 10 when a hearing was held on the supply, exchange, interchange and return of open-top equipment. As the commission was entirely familiar with the situation, only brief mention was made of the restrictions under which public utilities operate and which prevent them from competing with the luxury manufacturers or other consumers whose costs for coal bear a much less important relationship to their profits than is the case in furnishing public service. It was pointed out that deliveries on contracts are lagging behind from 40 to 50 per cent. Since these contracts were made to cover practically the entire fuel needs of the year, the public utilities are in no position to protect their fuel supplies except to make purchases in the open market at prices which are almost prohibitive, when their fixed income is taken into consideration.

The presentation for the American Electric Railway Association was made by E. B. Burritt, for the National Electric Light Association by J. W. Lieb and for the American Gas Association by Oscar H. Fogg.

The industries which use open-top cars made strenuous appeals for modification of the order, so as to allow the use of a limited proportion of open-top cars for their more essential purposes.

Representatives of the coal operators contended that the only way to meet the present situation is by mining more coal, which can be done only when the mines have an adequate car supply.

On July 13 the commission extended the life of the coal priority order for an additional thirty days from July 21. The extension is amended so as not to include flat bottom gondolas of certain measurements, these cars being automatically released to the service of steel building trades and certain other industries, but not to buildings, roads and some other construction industries. There is to be discrimination as to the assignment of the cars, public service utilities being preferred, and reconsignment is condemned except in unavoidable circumstances.

Bituminous coal interest representatives agreed that with the exception of the amendment the order is a good one and will do much toward solving the present serious coal problem.

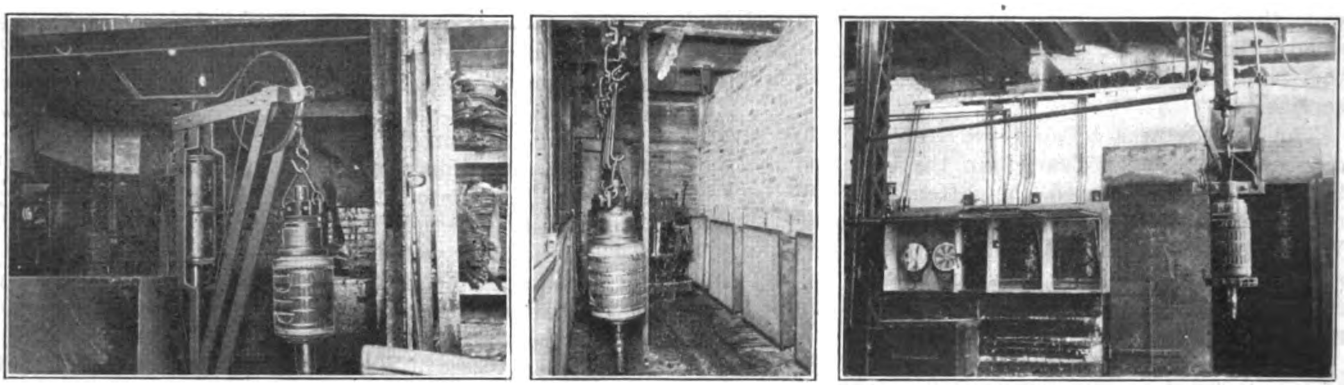
The Schuylkill Railway, Girardville, Pa., is installing a telephone dispatch system over its entire property. The wires are being placed on the 6,600-volt high tension poles and are properly protected with fuses ahead and behind. Telephone instruments are being located at each turnout in an iron box with the proper switch lock, to which each conductor carries a key. When completed jack boxes will be located at convenient points between the regular telephones and each car will carry a phone with an extension cord. The Kellog 2,500-ohm 5-bar ringer instruments are being used.

Repair Shop Has Efficient Armature Bake Oven

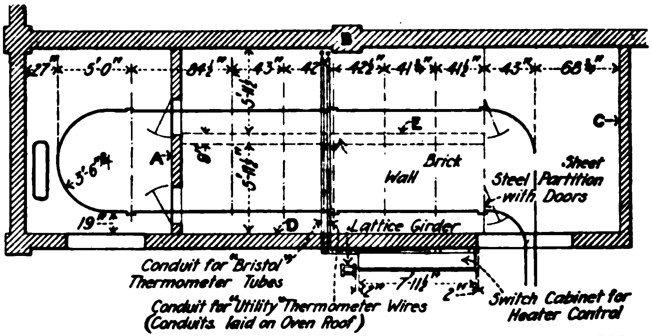
Pittsburgh Railways Reconstructs Armature-Coil Drying Room into High Temperature Armature Bake Oven

AT THE Homewood shops of the Pittsburgh Railways there has recently been put into service a drying, dipping and bake-oven combination which is simple, handy and very satisfactory. The former practice of the company was to dip and dry the armature coils in a room heated by steam before placing them on the armatures under repair. The present arrangement has been built in the same space formerly occupied by the coil-baking chamber.

Referring to the accompanying floor plan, all of the brick walls shown there with the expection of the one marked *E* were already built as a part of the coil-drying plant. The coil-drying room was the one bounded by the walls *A, B, C, D*. The floor of this room is an iron grating, under which are installed a large number of steam pipes. When it was decided to make an armature bake oven, to operate at higher temperature, the wall *E* was built and also the sheet-steel partition with doors. Electric heating was then installed in both of the small rooms thus formed, one room being for drying the armatures before dipping and the other for baking them after dipping.

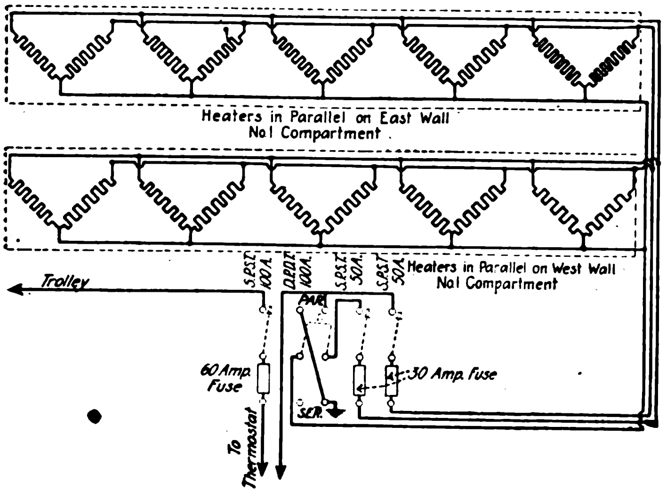


AT LEFT, TURNTABLE WITH AIR HOIST IN DIPPING ROOM. IN CENTER, DRYING ROOM. AT RIGHT, GENERAL VIEW OF ENTRANCE AND SWITCH AND INSTRUMENT CABINET


27"
5'-0"
84½"
43"
42"
42½"
41¼"
41½"
43"
68¼"
5'-4½"
5'-4½"
8"
5'-6¼"
19"
7'-11½"
2"
A
B
C
D
E
Brick Wall
Sheet Steel Partition with Doors
Lattice Girder
Conduit for "Bristol" Thermometer Tubes
Conduit for "Utility" Thermometer Wires (Conduits laid on Oven Roof)
Switch Cabinet for Heater Control

PLAN OF DRYING AND BAKE-OVEN INSTALLATION

In order to facilitate the handling of the armatures a trolley rail was installed as shown. Armatures are brought to this rail by the usual air hoist and transferred to hangers which follow the trolley rail. Armatures are left hanging on these hangers from the trolley rails in both the drying rooms and baking rooms for the necessary baking period. In the dipping room a turntable with an air hoist is installed. This takes the armature from the hanger, lowers it into the dipping tank, which is large enough for three armatures, and is then available for raising from the dipping tank to the hanger when the armature is ready to go ahead into the baking room. This turntable and hoist have proved of great convenience.


Heaters in Parallel on East Wall
No1 Compartment
Heaters in Parallel on West Wall
No1 Compartment
Trolley
S.P.S.T. 100A.
D.P.D.T. 100A.
S.P.S.T. 50A.
S.P.S.T. 50A.
PAR.
SER.
60 Amp. Fuse
30 Amp. Fuse
To Thermostat

WIRING DIAGRAM OF HEATER CONNECTIONS

The practice is to dry the armatures in the drying room for about six to ten hours at a temperature of 90 deg. C. The armatures are left in the dipping tank about fifteen minutes and are then taken to the baking room, where they remain approximately eighteen hours at a temperature of about 120 deg. C. The temperature in these two rooms is regulated by means of ten heater units, such as shown in the accompanying sketch. Five of these heater units are on each wall of each compartment, the five in each case being connected in parallel. The heaters themselves consist of six Cutler-Hammer space-heating units, connected three in series, and the two sets thus created can be connected either in series or parallel for high or low-temperature regulation. Switches and temperature-recording instruments are mounted in a cabinet near the entrance door to the bake oven, as is also the equipment necessary for effecting heat regulation.

Since this outfit was put in operation, Nov. 1, 1919, the Pittsburgh Railways has found the results to more than justify the installation. The arrangement has also served as a model for two or three other railways whose equipment superintendents have happened to hear about it and see it and these details are given in hopes that they will be of assistance to others.

Convenient Circuit-Breaker Calibrating Outfit

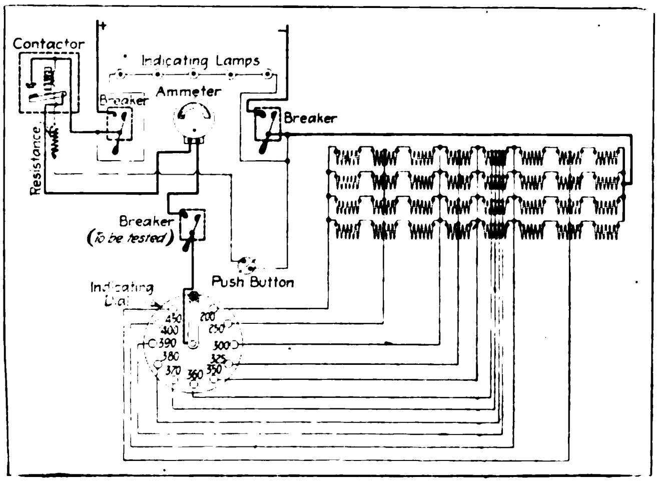
The Third Avenue (New York) Railway Has Replaced a Temporary Water Rheostat with a Permanent Circuit-Breaker Calibrating Apparatus Using Grid Resistors

By H. J. KROMBACH
Assistant General Foreman Third Avenue Railway, New York City

FOR years the circuit breakers used on the cars of the Third Avenue Railway of New York City were tested by means of a water rheostat. The success obtained was only partial and depended to a large extent on the man who was making the test. The difficulty encountered was that after testing one or two breakers the water in the water rheostat would become so hot that it had to be drawn off and replaced with fresh, cool water. If too much water was added the resistance would be too great and it then had to be reduced by the addition of salt. As the water increased in temperature more of the salt would be taken into solution, with a resulting decrease in resistance. Under these conditions it was practically impossible to get an accurate reading of the ammeter, as it was absolutely necessary that the time when current was flowing through the water rheostat be made as short as possible. Often the breaker under test would "blow" before the hand of the ammeter could reach its proper point. When an experienced man made the test conditions were not so difficult, but to break in a new man on this work was difficult, and many complaints were received from car operators that the breakers would not hold in or that they would not blow at all.

To remedy these conditions a new circuit-breaker outfit was constructed and installed in the Sixty-fifth Street shop which has proved entirely satisfactory. Accompanying illustrations show the apparatus used, the method of supporting the resistors and a diagram of connections for the outfit.

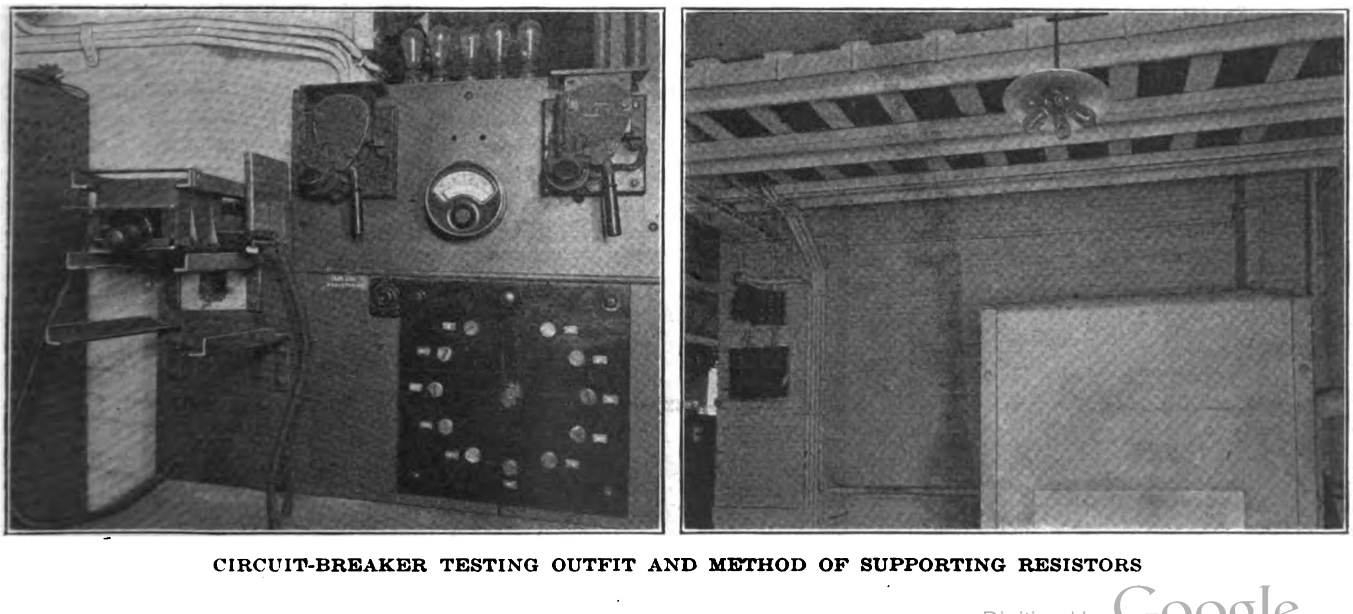
Referring to the diagram of connections, the path of the current may be followed from the positive line to a circuit breaker, installed as a matter of precaution, and then to a contactor whose operation is controlled from a push button by the man making the test. He can thus open and close the circuit readily and without danger of the current remaining on too long. With the controlling contactor closed the path of the current is from this contactor through an ammeter showing the value of the current and then to the circuit breaker under test. From this circuit breaker the current passes to the contact arm of an indicating dial rheostat. This contact arm can be turned to any contact desired. The value of the current that will pass through the breaker with the contact on any point is stamped on a small brass plate and fastened near the contact.



CONNECTIONS FOR CIRCUIT-BREAKER TESTING

By means of this dial the various steps of grid resistors are cut out. These grid resistors are some car resistors which were available. After passing through the resistors the current passes through another circuit breaker installed on the negative side of the line and then to ground.

The indicating dial was constructed in the railway shop and is made of 1 in x 18 in. x 18 in. slate. Threaded brass contacts pass through this slate and



CIRCUIT-BREAKER TESTING OUTFIT AND METHOD OF SUPPORTING RESISTORS the wires for connecting to the resistors are fastened to the contacts. With the first installation a snap switch was used for energizing the contactor, but it was found that occasionally the operator would forget to turn off the switch and the contactor would thus remain closed, so this was later replaced by a push button having a rather heavy spring. It is thus necessary to hold the push button closed to hold the contactor in. At the top of the illustration showing the circuit-breaker test five incandescent lamps will be seen. These are connected as shown in the diagram and their purpose is to warn the operator whenever current is on.

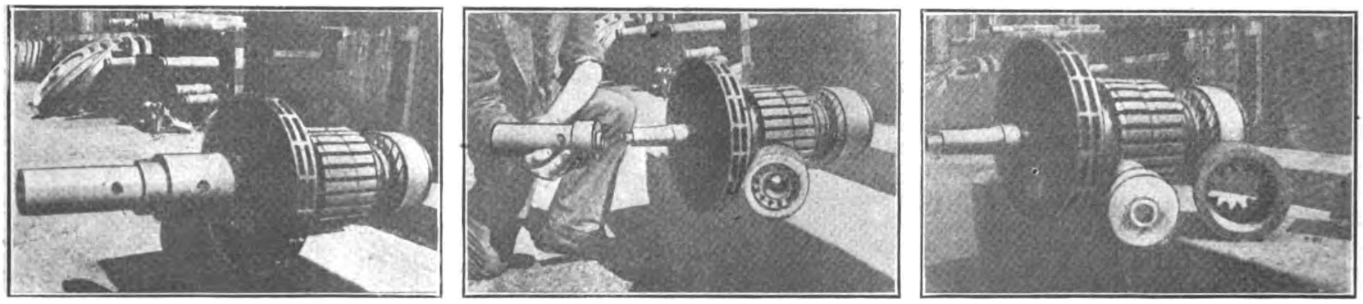
The rheostats are placed on three I-beams which rest on girders near the ceiling. In this location they are out of the way and any heat generated is made use of in heating the shop. The connection of the grid resistors is shown in the diagram. Five hundred and seventy-six resistance grids, each of 0.074 ohm resistance, were used.

It will be noticed that the circuit breaker shown as being under test in the illustration is located in a position in which it would ordinarily be if installed on a car. Additional brackets will be seen just underneath the circuit breaker. Some cars have the breakers hung in an upright position, but on most cars they are suspended with the face downward. Experience has shown that breakers should be tested in the same position in which they are installed on cars, as the effect of gravity on the moving parts is sometimes quite marked, and by testing breakers in their regular operating position danger of wrong calibration is eliminated. All breakers on the Third Avenue Railway equipment are set to blow between 390 and 400 amp.

With the new testing outfit any shopman can be used for this work, while previously it was necessary to have an experienced man. No complaints have been received regarding the setting of circuit breakers since this test outfit was installed.

Pulling Pinions Off Safety Car Armatures

ACCOMPANYING illustrations show a type of pinion puller which is being used by the Connecticut Company for the removal of pinions from General Electric type 258 armatures. The pinions on these armatures are so close to the end bearings that it is difficult to get anything back of them which will assist in their removal. This type of puller is arranged to slide over the pinion and by giving the puller a slight turn the notches in the puller slide behind the pinion teeth. By screwing the puller in it is pressed against the pinion seat of the armature shaft and will not damage the threads or the center of the shaft. When this has been screwed down fairly tight the pinion can easily be loosened with a tap of a light hammer.



REMOVING A PINION FROM A SAFETY CAR ARMATURE WITH NEW TYPE PINION PULLER

Auto Truck for Track Repairs

Analysis of Work Done and Cost of Using a Truck for Emergency Repair Jobs and Minor Track Maintenance

BY W. L. WHITLOCK
Superintendent of Way the Denver (Col.) Tramway Company

THE Denver Tramway Company has been using a 1-ton Ford Form-A-Truck for emergency track repairs and minor track maintenance work since 1916 and has found this a very useful addition to the way department equipment. This truck normally carries a crew of two men, but at present has in addition an apprentice track foreman, whose duties were outlined in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 21, 1920, page 380.

This crew takes care of the majority of emergency track repairs and has in addition a regular order of work on minor track repair jobs. The emergency work comprises the usual jobs confronting any track department and consists of repairing broken rails, broken culverts, spread track, water on track, high paving, switches in bad order and items of similar nature. The minor track maintenance work is routine trackwork covered by authorized work orders or instruction sheets and includes replacing bad order rails, repairing joints, repairing special work, guard rail repairs, culvert replacements, cleaning track drains, cutting jobs by use of oxyacetylene torch, replacing mate tops, small paving jobs and other items of regular track maintenance work. Sometimes a job arises that requires more than two men; in such cases extra trackmen are furnished. The track truck carries the following equipment:

1	oxyacetylene cutting outfit
1	low hack saw frame
1	high hack saw frame
1	"oldman"
3	11/16-in. bits
7	13/16-in. bits
1	¾-in. bit
6	15/16-in. bits
1	1-in. bit
1	⅞x½-in. S wrench
1	⅞x¾-in. S wrench
2	¾-in. track wrenches
2	⅞-in. track wrenches
1	1-in. track wrench
1	scratch hammer
2	2-in. machinist's hammers
1	100-ft. tape
1	ratchet
1	frame for ratchet drill
12	hand chisels (2 bent for mate tops)
5	track chisels
1	center punch
1	monkey wrench, 12 in.
1	¾x14-in. round file
1	1x½-in. round file
2	oil cans
1	gas pipe pliers
2	⅞-in. drift pins
1	⅝-in. drift pin
2	¾-in. drift pins
4	shovels, 2-lb.
1	lining bar
2	tamping bars
2	torches
1	hand saw
1	water bucket
2	¾x30-in. switch bars
1	trowel
1	gage, 56½ in.
1	track broom
1	sledge
2	spike mauls
1	¾-in. track punch
4	picks
2	claw and nipping bars
2	track jacks
2	red lights
1	axe
1	adz
2	scrapers
1	gage, 42 in.
1	grease bucket and dauber
1	"Jim Crow"
1	chisel bar
4	doz. hack saw blades
1	⅞-in. track punch

The truck was weighed recently to determine exactly how much load it was carrying and it was found to weigh 5,200 lb., which is "going some" for a 1-ton truck. Certain material was removed to lighten the truck, but it still carries a heavy overload. Periodical checking up by the department head is recommended, as trackmen are human and accumulate things they "may need some time."

Experience demonstrates that a 1½ or 2-ton truck should be purchased to replace this 1-ton truck in a very short time.

The following is a summary of the operation of this truck during December, 1919, and January, 1920:

TABLE SHOWING MONTHLY RECORDS OF MOTOR TRUCK

	December, 1919	January, 1920
Performance data:		
Days worked	28	29
Locations worked on	96	105
Total hours worked	599	730
Average locations per day	3.42	3.75
Average hours per locations per day	6.23	6.95
Total number man-hours per day	21.39	25.17
Work done:		
Broken rails repaired	31	31
Spread track repaired	8	3
Special work repaired	27	28
Cutting torch jobs	24	18
Miscellaneous	15	35
Total	105	115
Operating data:		
Total cost operation, maintenance and depreciation	$170.53*	$ 72.01
Miles run	603.00	568.00
Cost per mile	$0.2828	$0.1268
Gallons of gasoline consumed	82	72
Miles per gallon	7.36	7.89
Average miles per day	21.53	19.58
Average miles per job	5.74	4093

* Heavy repairs included in this item.

The cost of operation and maintenance for the years 1918 and 1919 was as follows:

TABLE SHOWING YEARLY DATA OF MOTOR TRUCK

	1918	1919
Miles run	4,984	5,551
Cost per mile	$0.1422	$0.1856
Gallons gasoline consumed	829	697
Miles per gallon	6.01	7 9
Total cost per year	$708.85	$1,030 48

New Signals at Anderson

Union Traction Company of Indiana Installs Overhead Contact Type Signals with Car-Counting Control on Busy Line

THE Union Traction Company of Indiana has a single-track block in Anderson, which is on the main line to Indianapolis. The block extends on Nichol Avenue or Eleventh Street, between Johns Street and Meridian, which is the principal business street of Anderson. This block is used jointly by a local one-man car line carrying the sign Hazelwood, giving frequent service, and also by interurbans between Indianapolis and Muncie, there being often following movements through the block. The two ends of the block are not mutually visible, and there is, furthermore, a railroad crossing within the block near the west end. To protect this traffic the railway company installed permissive signals of the overhead contact type having car-counting control, made by the Nachod Signal Company, Inc., Louisville, Ky., and known as type CD.

Referring to the accompanying plan, at the Meridian Street end the standard signal layout is used, with contactor 3 on the curve in advance of signal B, and contactor 4 on Eleventh Street, cars ordinarily entering the block by contactor 3 and leaving by 4, although both these contactors are directional and may be operated either way if desired.

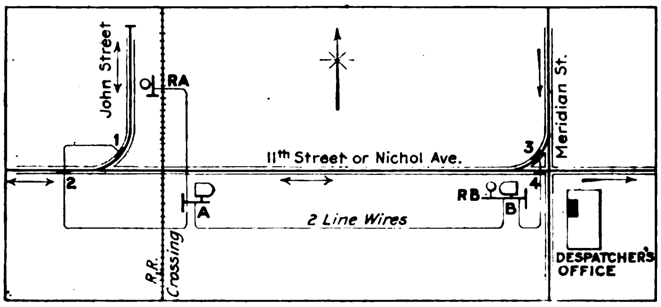
The office of the dispatcher for the interurban cars is on the sixth floor of an office building near Eleventh and Meridian, as shown, from which he can view a great part of the block, though from his elevation he cannot see signal B itself. A repeater RB of signal B is therefore mounted considerably higher up on the same pole and directed along the dispatcher's line of vision.

At the west end of the block at Johns Street the signal layout is suited to the reversed single end passing switch used there, with contactor 2 on the main line in advance of signal A, contactor 1 on the spur, and repeater signal RA to repeat the indications of signal A, so placed as to be observed by the motorman while he is on the spur.

A westbound car, for instance, enters the block, and in passing under contactor 3 sets signal A at "stop" and signal B at "permissive," the normal indications of both signals having been "neutral." This change takes place in the sight of the motorman. Should an eastbound car now approach Johns Street the motorman will observe signal A at "stop," and will, therefore, take the siding, passing under contactors 2 and 1 in succession. These contactors are so connected that a car passing eastward under 2 counts into the block and eastward under 1 counts out again. On account of the reversed direction of the spur it is necessary for the car to pass through the part 2-1 of the block in order to get in the clear and this is the novel feature of the layout.

SIGNAL INSTALLATION AT JOHNS STREET

The motorman of the second car waits until the first has passed westward under contactor 2 and cleared the signals, which he observes on repeater signal RA. As he backs further under contactor 1 he sets the block for his direction of movement, setting signal B "stop," signal A "permissive," and observing this on signal RA. He passes through the switch and goes eastward on Nichol Avenue without touching contactor 2, which is set sufficiently far from the switch point.



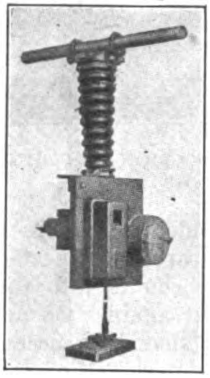
TRACK DIAGRAM OF SIGNAL INSTALLATION

The signals are car-counting, and if the Hazelwood local follows the interurban the signals will not clear or permit an opposing movement until both cars are out of the block, the counting relay having a capacity of 15 cars. The signal indications are given by lights behind colored lenses, reinforced by opaque color disks behind clear glass roundels, both indications are relay, being enclosed in a cast-iron case and hung on a leveling bracket attached to the wood pole, as shown in the accompanying illustration. All power to light the signals and operate the relay is taken from the trolley and the relays are operative down to a line voltage as low as 250. A junction box is mounted lower down on the pole for manual control of the signals if desired, to localize the circuits for test through disconnecting switches and to house the fuses.

The contactors are of the electrical type, being merely contact strips supported near the wire, but insulated from it and bridged by the flanges of the wheel on the trolley wire as it passes under the contactor. Two line wires run through the block connecting signals A and B and two wires run from the contactors to each local signal.

High-Voltage Overload Relay

FOR the protection of high-voltage alternating-current circuits of 100 amp. or less the Westinghouse Electric & Manufacturing Company has developed the type CB overload relay, which precludes the use of high-voltage current transformers. The relay is designed for indoor use and is arranged for pipe mounting, as shown in the accompanying illustration. It consists of a circuit-closing element operated by means of a standard current transformer, an overload relay and a special transfer relay through a micarta chain of such length as to provide ample insulation for the voltage in use. The three units just mentioned are mounted on one base, which is in turn supported from an insulator. The overload relay has a 4 to 12 amp. range and a 2-second inverse-definite-minimum-time limit. The operation of this relay serves to close the circuit of the releasing coil on the transfer relay.



A.-C. OVERLOAD RELAY

The current transformer can be used on all voltages, since it is thoroughly insulated from ground and from the remainder of the system.

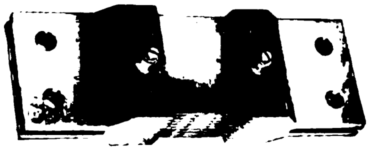
Section Insulators for Reversed Potential

WHEN certain sections of the trolley were changed over to reverse polarity in connection with the extensive electrolysis investigation made in Omaha, Neb., in 1917, the positive and negative trolley sections were separated by a double installation of section insulators with a piece of dead trolley between, making a separation from live wire to live wire of 6 ft. This rather long dead section was installed to meet the objections of the linemen, who felt that they needed unusual protection in view of the 1,200-volt difference of potential between adjacent sections of the overhead. The insulators used were made of wood and it was found that they would sometimes carbonize and break down. The long gap was also a source of much trouble in operating the cars.

W. O. Jacoby, superintendent of electric lines Omaha & Council Bluffs Street Railway, has now replaced these section insulators with a single fiber insulator which gives a separation of only 14 in. from live wire to live wire. The objections of the men were satisfied when they were shown that in case of a trolley break at the section insulator they have to place their blocks to span the dead section anyway in order to make the repair, and that the use of a single section insulator of better grade would also mean they would have one less insulator to maintain.

New Shunts for Switchboard Use

ALTHOUGH the type G ammeter shunts recently developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., are designed for use on horizontal busbars, they will operate in any position without overheating. The terminal castings of the 300 amp. shunts are slotted, to receive one ¼-in. copper bar per slot. Sizes ranging from 10 to 300 amp. are mounted on a light micarta strip which takes all strain from busbar distortion, from the terminal lug and manganin plate joint. These shunts operate at a temperature rise of 30 deg. C. if connected to busbars of ample conductivity when carrying two-thirds of their rated current, which should correspond to the normal full-load rating of the circuit. They are adjusted for 50 millivolt drop at full rated current and are interchangeable with other standard makes of the same rating.



AMMETER SHUNT

The resistance plates of the type G shunts have a negligible temperature coefficient and thermo-electromotive force, thus avoiding errors due to heating, which may amount to several per cent in other resistor materials.

Handling Hot Clinkers on Rubber Conveyor Belts

THE Standard Portland Cement Company, Leeds, Ala., uses a rubber conveyor belt for handling hot cement clinkers with a temperature of 200 deg. F. and over. In order to prevent scorching of the belt it was operated at an incline of 12 deg. and the lower pulley runs in a trough of water so that a film of cold water is carried upon the belt. It is impossible to cool the clinkers sufficiently before they are deposited in the loading hopper.

The joining of the belt ends to withstand the extremes of temperature and prevent wear of the pulleys is accomplished by the use of Crescent belt fasteners. The ends of the belts are brought tightly together in a snug joint, which makes the belt practically endless on the pulley side and there is no opportunity for clinker ash to get into the joint and cause abrasion of the belt ends. By the use of these fasteners no metal comes in contact with the pulleys to cause wear and a permanent joint is established.

In six months' operation this conveyor has carried 61,000 tons of clinkers. The belt used is Goodyear "Hy-Temp," which is made particularly to withstand high temperatures and is adapted for work on conveyor jobs where heat resistance and the ability to withstand hard wear are essential.

Bridgeport Restricts Jitneys

Important Meetings of City Council and Chamber of Commerce Precede Passage of Ordinance Eliminating Motor Buses from Streets with Tracks—Connecticut Company Agrees to Continue Service for Thirty Days

BRIDGEPORT, CONN., will not lose its trolley cars; that is, not at present. The Connecticut Company will hold off for at least thirty days on its threat to withdraw pendin a trial for that period of regulatory ordinance passed by the Council in the early hours of July 13 after a session which lasted five hours. The regulatory ordinance was passed by a vote of fifteen to seven. It eliminates the jitneys from the principal streets of the city, giving the jitney men routes running parallel in some cases with the trolleys.

The new ordinance took effect on July 15, the date on which the Connecticut Company had indicated it would abandon service unless some measure of relief was extended. The ordinance is an amendment of Section 3 adopted by the Common Council on June 23, 1919, by which the power to fix traffic routes in the city is placed in the hands of the Board of Police Commissioners.

President L. S. Storrs of the Connecticut Company said that the company would continue to operate for thirty days to see whether the jitney restrictions enabled the company to do business without a loss. The jitney men say they will fight to a finish. Mr. Storrs' statement to the Mayor follows:

> Having given full consideration to your suggestions and having communicated with those of the trustees who can be reached, in reply I will say that we are uncertain whether such regulation of the jitney will in fact fully protect the company, but that if such ordinance be passed and be made immediately effective the company will postpone the discontinuance of service for one month in the hope that the ordinance, aided by strict enforcement of its provisions and of other existing traffic regulations, may prove effective and in the further hope that the citizens of Bridgeport may realize that patronage and fair treatment of the trolleys are essential to a final solution of the transportation problem of the city.

CONDITIONS OF NEW REGULATORY MEASURE STATED

Section 3 of an ordinance entitled "An Ordinance Fixing Traffic Routes for Public Service Motor Vehicles as defined by Sec. 1523 of General Statutes of Connecticut, Revision of 1918" adopted by the Common Council at a meeting held on June 23, 1919, is amended by the Council to read as follows:

> Sec. 3. The Board of Police Commissioners shall have power to fix the route over which public service motor vehicles shall operate in the city of Bridgeport, except in its public parks; and upon receipt of an application as above provided shall grant a written consent to operate over any one of the routes applied for as fixed by said board; provided, however, said written consent to operate over any route applied for may be denied by the Police Commissioners if, in their opinion, the granting of said written consent will result in excessive and unreasonable traffic on said route. If consent, as above provided, to run over any route is denied, the applicant may amend his application by specification of another route or routes, and such amended application shall be granted or denied by said board as above provided. But said board shall not deny to any applicant consent to operate on some route if applied for; provided further that no consent shall be given to the owner of any public service motor vehicle to operate as such upon the following named streets within the designated limits: [Ordinance then designates streets.—EDS.]
>
> Any written consent given by the Board of Police Commissioners heretofore for the operation of any public service motor vehicle, within the limits of these streets, from which said public service motor vehicles are excluded by the terms of this ordinance, is hereby revoked.
>
> When granting such written consent the Board of Police Commissioners shall furnish to the applicant a number plate bearing the number of said consent, which the applicant shall display conspicuously upon his motor vehicle, when the same is operated in the city of Bridgeport, and said applicant shall pay to the city the cost of said number plate, said written consent to operate shall remain in force and effect until the first day of January next following the date when such consent was granted, and shall be renewed for a period of one year by the Board of Police Commissioners upon application of said owner or owners, for operation on route named in said consent, unless said Board of Police Commissioners, at time of such application for renewal shall be of the opinion that the issue of such renewal will result in excessive and unreasonable traffic on said route. Such consent shall be granted only to the bona fide owner of the vehicle, for which such consent is asked, and shall not be transferable. Such consent shall not be granted until the applicant has satisfied the Board of Police Commissioners that he can read and speak the English language sufficiently well to understand traffic rules and regulations and spoken directions of traffic officers. Such consent may at any time be revoked by the Board of Police Commissioners whenever such board shall be satisfied that the driver employed by the consentee does not understand the English language in compliance with the foregoing test.
>
> Provided, however, that nothing herein contained shall prevent the holder of any such license from making application to the Board of Police Commissioners and securing as herein before provided, a written consent to operate a public service motor vehicle over such route or routes as are not denied by this ordinance.
>
> This ordinance to take effect July 15, 1920. All ordinances or parts of ordinances inconsistent herewith are hereby repealed.

History has been made fast in the Bridgeport bus case since the company announced that the buses were carrying more passengers than the railway and that unless the conditions of competition were made more nearly equal the company would withdraw its cars from service. With the matter thus squarely put before it, the Council called a special meeting for the evening of July 12 to act on the matter. The Chamber of Commerce called a meeting for the same evening.

A special message was read to the Council by Mayor Wilson. In his message the Mayor expressed the belief that the motor bus would in time supplant the trolley. When that time arrived it would mean the granting of franchises to corporations for operating motor buses on city streets, but that "in the absence of such a responsible corporation for motor bus transportation in Bridgeport it is highly necessary, I believe, to retain primarily the trolley service." He thought that a *modus vivendi* could be arrived at between the motor bus operators and the company without detriment to either and that the types of motor bus or jitney permitted should be those with a seating capacity of twelve persons or more. He further believed that in the city there were a large number of incompetent drivers and recommended the appointment of inspectors to examine and certify drivers. He then suggested a list of streets from which the jitneys should be eliminated. He said that he had been assured that the restrictions he had outlined would enable the railway to continue the operation of cars. In conclusion he said:

> The trolley company was granted a franchise by the State Legislature and in the nature of that grant it has a monopoly, and if it is to function in accordance with its intended purpose it must be relieved from unfair, unregulated, irresponsible competition.
>
> With these restrictions put into effect Mr. Storrs advises me that the Connecticut Company will at once render adequate trolley service to the city.
>
> It may be desirable to change some of these restrictions and I know that the jitneys and the Connecticut Company are both in a conciliatory attitude and will be pleased to meet in conjunction with such committee as your honorable body may deem wise to create, for the purpose of providing better transportation facilities for our citizens.
>
> I recommend the appointment of such a committee.
>
> It has been said very aptly that the 5-cent fare is an "accident in coinage," and in order to arrive at what would be a proper operating cost I would recommend that your

honorable body authorize the Mayor to appoint a committee of such size as he may deem wise for the purpose of considering and advising with the Connecticut Company in ascertaining what such fare should be. The Connecticut Company advises me that it has not, for the Bridgeport district, the per capita mile cost of its operation, which of course such committee must have. When this is arrived at the adjustment of the fare question is a simple matter.

After considering the matter of regulation in executive session the Council threw the meeting open. Mr. Storrs restated the case of his company substantially as he had done a few hours previously at the meeting of the Chamber of Commerce. The jitney men also had their session.

CHAMBER OF COMMERCE HOLDS MEETING

The meeting of the Chamber of Commerce was open to the general public. It was addressed by President Storrs of the Connecticut Company, John Schwartz and William Clancy, representing the jitney men, and Walter Jackson. The chairman of the meeting explained Mr. Jackson's presence by saying that he had been retained by Mr. Lashar, a member of the Chamber and a prominent Bridgeport manufacturer, to report on the railway and jitney matter and that Mr. Jackson was present at the personal request of Mr. Lashar to summarize for the benefit of the audience the facts contained in his detailed report.

Mr. Storrs, the first speaker, said that his company had been invited to enter Bridgeport and had invested $7,000,000 in that city, $1,000,000 of which was tied up in street paving. He enumerated the various obligations of the company to the city with respect to monetary payments and said that up to 1916 the company had been able to operate at a profit in Bridgeport. Last year, however, the outgo exceeded the income by $170,000. The deficit of the company in Bridgeport for the first six months of this year was $300,000. The company must be permitted to earn sufficient to keep going. The company could not compete with the jitney on unfair conditions. He urged one regulated utility. In no other way could the city get adequate service. The only States in the East where cities had unrestricted jitney competition were New Jersey and Connecticut. The company wanted the jitneys restricted to the territory not now served by the electric railway and also wanted the jitneys eliminated from the central section of the city.

Mr. Schwartz asked that Mr. Clancy, though not a member of the jitney association, be permitted to address the meeting. Mr. Clancy's remarks were confined almost entirely to the drawing of a parallel which indicated that the doom of the electric railway was sealed. He said that any utility that saved time, developed industry, and could be operated at a profit eventually would prevail. From 70 to 80 per cent of the people in Bridgeport used autos. He considered that the conclusive proof of his argument.

Mr. Schwartz characterized the service of the Connecticut Company as unreliable. He also quoted the Mayor to the effect that it was the jitney that filled the bill in the war period. As for the burdens which the jitney now bore, Mr. Schwartz referred to the necessity of the jitneys paying a license fee for the chauffeur and a vehicular license and the owner paying a revenue tax. He also said that the owners of the 300 jitneys, costing from $2,000 to $6,000, were paying a property tax. Jitneys operated last winter during the snow and ice when the cars of the electric railway were not in service. Mr. Schwartz said that 80 per cent of the traffic between Bridgeport and Norwalk was handled by jitneys. While the trolley to Norwalk was tied up for four days during the winter the jitneys got through without serious interruption. The jitney men were responsible. They put through a liability bill themselves at the last legislative session. The jitneys settled accidents promptly. As for regulating the jitney Mr. Schwartz said that the factories were at the east and west ends of the town. There were only two streets on which the jitneys could run from one end of the town to the other and on both of these there were trolley tracks. He explained that the success of the jitney in Bridgeport was due to the fact that the Connecticut Company had not served the city adequately and that it had raised its fares in some instances to a point that became prohibitive.

Mr. Jackson said that if the trolley service had been adequate in Bridgeport there would probably have been little jitney competition. A large proportion of the traffic was for short distances, and short-distance riding had been greatly fostered by the jitney. He said that many industries in Bridgeport were at considerable distances from trolleys, and this fact had served as an opening wedge for the autos. He suggested the use of the auto as a complementary service to the railway. Should the trolleys be eliminated from Bridgeport the 5-cent fare on the bus would undoubtedly not remain. The present scheme of fare charges in effect on the lines of the Connecticut Company was not the most logical. It had been thrust upon the company by the Public Utilities Commission. For this the company should not be blamed. With restriction of the jitney to a supplementary service, the trolley could be run at a higher schedule speed with a possible reduction in fare. Mr. Jackson said that the base schedules of the electric railway should be provided with one-man cars; that all indirect service should be by motor buses operated in connection with the electric railway, and that most rush-hour service should be given with two-car trains.

At the conclusion of the meeting the following ballot was mailed to all the members.

Instructions—Please answer "yes" or "no" to the questions and return by next mail.

1. Do you favor action which would result in the cessation of trolley service and make us dependent on motor bus transportation?

(Answer) ....

2. Do you favor legislative action as recommended by the Mayor to the Common Council, which, in effect, will eliminate active jitney competition from the streets about the city's center on which the Connecticut Company operates trolley cars—this to be on guaranty of adequate trolley service.

(Answer) ....

3. Do you favor the ordinance under discussion by the Common Council as this referendum is being mailed, details of which will appear in papers of July 13?

(Answer this question only if ordinance shall differ materially from the Mayor's recommendations).

(Answer) ....

CONNECTICUT MAYORS CONSIDER MATTER

The executive committee of the Mayors' Association of Connecticut has also taken up the jitney matter. At a meeting in the Hotel Taft, in New Haven, on July 13 two self-explanatory resolutions were adopted and will be submitted for approval to the State association. They read as follows:

Resolved, That it is the sense of the Mayors' Association of Connecticut that the public must be protected and the best interest of the community conserved. To that end the public service vehicles should be regulated as to service, schedules, rates, routes and liabilities as are the trolley companies. All municipalities should guard carefully their vested rights to regulate traffic and thus protect the safety of the general public; and be it further

Resolved, That the Mayors' Association of Connecticut invites co-operation with all municipal organizations and semi-public bodies interested in the welfare of their respective communities throughout the State to the furtherance of this end.

At a meeting of the Board of Aldermen at Waterbury on July 12 a committee was appointed to hold a hearing on July 14 to learn the views of representatives of both the electric railway and the buses. At the meeting on July 12 petitions were received from employees of the Connecticut Company in Waterbury, representing sixteen different departments and 600 employees, asking that the jitneys be restricted in their routes to streets not covered by trolley cars. The men argued that this step should be taken in defence of the company, which has threatneed to abandon service unless the competition of the jitney is restricted.

In New Haven it is said that the employees of the Connecticut Company, backed by the Connecticut Federation of Labor, with which the union of trolley men is affiliated, are also prepared to protest to Mayor Fitzgerald against the competition of the buses.

Restriction of buses somewhat similar to that intended to be imposed in Bridgeport went into effect recently in New London. The terms of the jitney ordinance in New London were reviewed in the ELECTRIC RAILWAY JOURNAL for July 3, page 34.

The Hartford Board of Aldermen, on the evening of July 12 passed a resolution proposed by acting Mayor C. D. Alden, Jr., "that the transportation problem of the city in regard to electric, taxicab and jitney service be referred to the standing committee on railways of

Trolley Service or Auto Busses?

How much longer will the People of New Haven, and Vicinity, and the Connecticut Company be subjected to the impositions of Auto Busses? What is going to be done about this very outrageous local transportation condition? It's high time to ACT!

Last winter!—Do you remember it? Do you remember how the Connecticut Company kept the tracks clear so that You could ride on the cars?

Do you remember how the snowplows struggled through the streets to keep the paths open? Do you remember how the car crews bravely stuck to their posts despite the freezing weather? You admired them, didn't you?

We did.

But—do you remember how the auto busses came out after we had cleared the tracks and deliberately ran in front of the trolley cars? How many busses were there on the streets of New Haven during the storm? Remember that?

How many auto busses are there on the streets of New Haven during any rainstorm? If auto busses are a logical means of local transportation why are they only on the streets when the sun is out or the streets dry?

If auto busses are a logical means of local transportation why have they been ruled from the streets of some of America's largest cities?

You give the trolley car company an exclusive franchise to operate a local transportation service—a trolley car system. The trolley car company lays expensive steel rails, erects trolley wires, puts cars on the tracks, and before the company has barely had an opportunity to pay a dividend—you allow auto busses to unfairly compete with the trolley.

Where's the justice of that?

Have you built a house on the outskirts of New Haven and had full city service and advantages? Have you thought about your taxes?

When a new addition to the city is opened up it is the trolley car company that is called upon to build a track to the new section to "help build it up." When it's built up who gets the benefit of the pioneering?

Do you suppose that you could call on an auto bus owner to operate his bus to and from some sparsely populated section of the city through Spring, through Summer, through Fall, and through WINTER? Would you practically ask him to operate at a loss until that section is a "paying" section?

It's been done with the Connecticut Company. And the Connecticut Company DID IT! Did it not from an altruistic standpoint, to be sure, but nevertheless DID IT, and because the Connecticut Company DID IT has the continued growth of New Haven in some sections been made possible.

The busses, of course—they're a bit "faster" you know.

And, too, it costs "less" to ride in an auto bus.

Does it?

No, it does NOT. If anything it costs a great deal more!

The Connecticut Company lays its tracks, puts up its wires, puts on an army of trolley cars. When the tracks wear out who puts new ones down?

The public?

No, the Connecticut Company.

The auto bus man buys a bus—either good, bad, or indifferent, and he's "ready for business." All he has to do is to follow behind, or as usual, run ahead of a trolley on any of the Connecticut Company's main lines. When the heavy, cumbersome auto busses wear out our streets—yours and ours—who pays for THAT?

The auto bus man?

No, not the auto bus man, but—YOU! The public pays for that. When they wear out a little more than usual then a little more taxes than usual is paid—that's all.

When the pavement between the tracks and for a distance on the outside of the tracks of the Connecticut Company are worn out by the auto busses who pays for the repairing?

The auto bus man?

The public?

NO, the Connecticut Company pays for it, even if never in its history it used that necessary pavement.

Where's the justice in THAT?

New Haven certainly does not want the same thing to happen that happened in Bridgeport—the issuing of a notice of removal of street car service. There is no sane reason why that should happen in any progressive city.

The Connecticut Company is sincere in its desire to serve the public. It is sincere in its wishes to serve quickly, courteously, economically—and SAFELY.

If the Connecticut Company must come to the same decision here as was made at Bridgeport it will do so, not because it wants to, but because it was FORCED to.

The Connecticut Company has always endeavored to give 365 days of uninterrupted trolley service every year.

It does not run on a haphazard, sunshine, intermittent schedule.

And this coming winter, if the Connecticut Company is still operating its trolley cars in New Haven, we will again try to keep the lanes of street car traffic open. We will again do our very best to give the very best for the very least.

We will in the future, as in the past, try, in so far as our finances will permit, to replace our rails as they become worn, and replace our cars as they become worn, in order to continue giving you service. REMEMBER that trolley fares are the only source of revenue the Connecticut Company enjoys from its passenger service.

And the Connecticut Company will go on paying for that work THEMSELVES, and they will go on paying the taxes levied on them by the city.

Now, what are YOU going to do? You've our side of the story. Are you going to remember past performances? Don't forget the story of the grasshopper —he didn't prepare for the winter.

Do you realize that the unfair competition of the Jitney has been one of the largest factors in bringing the Connecticut Co. face to face with bankruptcy and has therefore forced it in self-defense to increase its fares?

Don't forget last winter! If there is no trolley service this winter, what will you do?

The Connecticut Company

TEXT OF A FULL PAGE ADVERTISEMENT CARRIED BY THE CONNECTICUT COMPANY IN THE NEW HAVEN PAPERS LAST WEEK. SIMILAR ADVERTISEMENTS APPEARED IN OTHER CITIES, SUCH AS HARTFORD AND WATERBURY the board with instructions thoroughly to consider the situation, to hold such hearings and make such reports from time to time . . . as the said committee shall deem desirable in connection therewith, it being the intention hereof that any such regulation or problem be treated with moderation and deliberation and in a manner fair to all involved in any such regulation or problem."

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Exhibit Committee Optimistic

THE association exhibit committee met Tuesday, July 12, at the association headquarters in New York City. Although late in getting out the space application blanks this year, the returns have come in promptly. More than 40,000 sq.ft. of space has already been sold. This amount is two-thirds of the total area sold last year. Old exhibitors are taking additional space and indications point to a very successful exhibition. In order to expedite freight deliveries each member of the committee proposed to co-operate with the manufacturers in his district for making shipments in groups and to facilitate deliveries to the pier.

Fred C. J. Dell and George W. Wells were appointed members of a sub-committee on space assignment. The space rate this year is 60 cents per square foot. A subcommittee on decorations was appointed, consisting of S. D. Hutchins, chairman; L. W. Shugg, A. M. Robinson and A. N. Davis.

Those present were Frank H. Gale, chairman, General Electric Company; John Benham, International Register Company; Frank C. J. Dell, National Railway Appliance Company; S. D. Hutchins, Westinghouse Traction Brake Company; John B. Kilburn, Hale & Kilburn Corporation; J. C. McQuiston, Westinghouse Electric & Manufacturing Company; A. M. Robinson, J. G. Brill Company; E. F. Taylor, Texas Company; L. W. Shugg, General Electric Company; Secretary E. B. Burritt, and George W. Wells, manager of exhibits.

Committee on Code of Traffic Principles

A MEETING of the Transportation & Traffic Association committee on code of traffic principles met Wednesday, July 13, at the association headquarters in New York City.

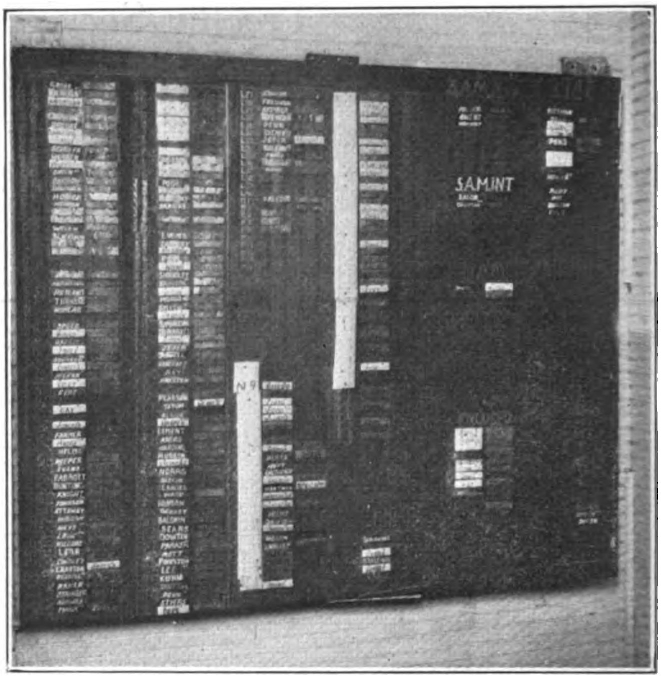
The committee put in a long day's session discussing the elements of a model traffic ordinance by comparing ordinances proposed by committee members and those of representative cities and expects to present valuable material to the convention. Those present were H. B. Flowers, chairman, and W. H. Maltbie, Baltimore, Md.; Fielder Sanders and P. E. Wilson, Cleveland.

Announcement has been made that the midsummer meeting of the Illinois Electric Railways Association will be held at Springfield, Ill., July 30, 1920. A tentative program calls for a business meeting in the morning, a convention luncheon at noon and a handicap golf tournament in the afternoon. The detailed program will be announced later.

Trainmen's Assignment Board

Complete Record of Men and Their Daily Activities Available at a Glance in Houston Electric Company's Office

THE Houston (Tex.) Electric Company has found it valuable to both the trainmen and the superintendent to maintain a bulletin board on which the names of all trainmen are so posted that the duties or assignments which they have for the day can be seen at a glance. This consists simply of a blackboard hung in the superintendent's office, on which the numbers of all runs are painted and rows of pegs provided for attaching the small cards bearing the trainmen's names opposite the run number to which they are assigned. Odd run numbers on the board designate daylight runs and even numbers night runs. There is also a color scheme of cards and lettering which assists in classifying the men. A black card with white lettering designates a conductor; a black card with yellow lettering designates a motorman; a white card with black lettering indicates a safety-car operator who was formerly a conductor; a yellow card with black lettering indicates a safety-car operator who was formerly a motorman.



TRAINMEN'S ASSIGNMENT BOARD USED IN HOUSTON, TEX.

At 5 o'clock each afternoon the cards are properly arranged on the board to indicate the assignments for the next day. As the men come in off their runs they consult this board and note the run assignment for the next day and the time at which they must show up the next morning. When they report in the morning there is a form ready for their perusal on which is written, opposite the run number, the car number, leaving time, carhouse track on which the car is located and a check column in which they sign.

In addition to the run number assignments, the trainmen's board shows the unassigned extra men, men excused from duty, on sick leave, etc., so that every employee of the train service can be accounted for by observing the board.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

$1,000,000 Transmission Line

Toledo Railways & Light Company Has Awarded Contract for Twelve-Mile 60,000-Volt System

The Toledo Railways & Light Company, Toledo, Ohio, has closed contracts for the building of a high-tension overhead power transmission line to circle the city of Toledo for the most part adjacent to the right-of-way of the Toledo Terminal Railroad, which at the present time connects up all of Toledo's twenty-three railroad lines into one system for interchange business and factory development. The new transmission line will be carried on specially constructed steel towers, averaging 65 ft. in height and consisting of two circuits designed for about 65,000 volts and 80,000 h.p.

WILL ENCIRCLE THE CITY

The power will be manufactured at the Acme Power Company's plant on the East Side. The line will extend from there to the corner of Front and Dearborn Streets in the city, thence to the Terminal Railroad. It will cross the Maumee River on high towers approved by the United States government. From the river it will extend along the Terminal belt line to Fitch, a station at the intersection of the Terminal and Toledo & Western Railroads. This is a distance of nearly 12 miles and is almost half of the city circle. From this point it is joined with the line extending to the city filtration plant in the southwest corner of the city. The closing of the gap in the rest of the belt will be made as soon as industries develop in the southeast part of the city.

The new line will furnish the power for the city's water system and also for a new sewage disposal plant to be built soon.

The new line is estimated to cost approximately $1,000,000, and although plans and work of securing right-of-way have been in progress for almost a year, the actual work will be started this summer.

AUTO COMPANY LARGEST USER

The city of Toledo at the present time probably has more mileage of underground high-tension cables and transmission system than any other city of its size. By building a duplicate high-capacity line, the Rail-Light feels that it will provide Toledo industries with the maximum safeguard for continuous power supply so essential to efficient operation.

Most railroads and industries have shown a spirit of co-operation in the work of getting the right-of-way for the new power line. A few pieces of property will have to be condemned.

The new line will furnish power for practically 85 per cent of Toledo's industries. The largest user is the Willys-Overland Automobile Company.

Power for the operation of the Ohio Electric Railway between Toledo and Lima and for the Toledo & Western Railroad between Toledo and Pioneer and Adrian, Mich., will be transmitted over the new overhead high tension line. Many cities along these lines are supplied with light and power by the Rail-Light through these connections.

The steel towers are being built by the American Bridge Company, a Toledo concern, and the work of construction has been awarded to A. Bentley & Sons Company and several other Toledo contractors.

Missouri Short Line Arranges for New Terminal

The Kansas City, Clay County & St. Joseph Railway will use a new passenger terminal in Kansas City, Mo., now being equipped. It is located in the Railway Exchange. During the war the ground floor was occupied chiefly by the railroad administration's joint ticket office. Since the war ended tenants not connected with steam railroad enterprises have been eliminated. The Kansas City, Clay County & St. Joseph Railway had its headquarters in a suite on the fifth floor of this building; its passenger station was at Thirteenth and Walnut streets, six blocks south. A five-year lease of the Railway Exchange has been secured.

The company has leased four rooms on the ground floor of the building, facing Seventh Street, including a corner room on Grand Avenue. All entrances from the large lobby of the Railway Exchange are being sealed, so that patrons will enter the station from the street fronts only. The interurban company is equipping excellent waiting room facilities, with toilets and washrooms for men and for women. The baggage room is being provided with manual trucks, so that baggage will be handled direct from the baggage room to the car.

The freight terminals of the company are only a few blocks north of the new passenger terminal, where the company has its own tracks; its shops and carhouses are a few blocks further away, across the Missouri River, in North Kansas City.

Another advantage is that practically all passengers will hereafter board the cars at the passenger terminal.

Terms of Akron Settlement

City Council Outlines to Railway Amendment to Franchise as Basis for Compromise

On July 10 the utilities committee of the City Council of Akron, Ohio, sent a communication to the Northern Ohio Traction & Light Company, outlining an amendment to the franchise which it is willing to make to the main body. This provides for a straight 5-cent fare for three months, during which an effort will be made to arrive at some conclusion for a permanent franchise with a sliding scale to take care of the expenses and returns on the investment of the company. The proposal follows:

> Our committee will recommend to Council that the present franchise be amended by substituting a 5-cent cash fare for the present rate for a period of three months, after which the present rate shall again prevail; if a new franchise has not been agreed to by that time but progress has been made toward that end, the same arrangement shall be continued for a further period of three months.
>
> Our committee will further recommend to Council that when a new franchise is drawn it shall provide for an initial rate of fare of 5 cents and shall be increased or decreased at stated intervals, after sufficient time for and when an audit of the company's books and records is had, as the necessity for such increase or decrease may appear, having in mind finding a rate of fare at periodic increases or decreases of one cent each that will provide revenues sufficient to meet operating expenses, depreciation and a return on the investment.
>
> Such a franchise must contain ample provision for municipal control of service and extensions.
>
> Further, the committee will recommend to Council that a new contract be drawn with all possible dispatch.
>
> This proposal is conditional upon the company resuming operation immediately and of maintaining the same service as existed prior to the recent suspension of operation.

MR. BLINN NONCOMMITTAL

A. C. Blinn, vice-president and general manager, said he could not comment on the proposition until it had been submitted to the company.

Members of Council claimed that the men now on strike will return to work at once if the company accepts this plan. It is said that W. D. Mahon, president of the Amalgamated Association, has instructed them not to demand a wage schedule in excess of that granted recently by the board of arbitration.

The strike of the men on the local line at Massillon, called on July 8, lasted only one day. An understanding was reached between the men and the company. It is said that Council will pass an ordinance increasing the rate of fare from 5 to 8 cents in order to cover the additional wages granted the men by the board of arbitration recently. The company had asked for a rate of 10 cents.

Court Insists on Service-at-Cost Vote

Judge Killits Sends Measure to Toledo Council with a Valuation of $8,000,000—Dangers of Municipal Ownership Pointed Out

Toledo's service-at-cost plan for the settlement of the railway controversy was started through the legislative mill at Toledo last week. This controversy has been holding attention there ever since the famous ouster proceedings of nearly a year ago and was thought to be absolutely deadlocked when the Milner commission and Henry L. Doherty were unable to agree to the valuation figure in the measure after six months of negotiations.

FEDERAL JUDGE JOHN M. KILLITS, who appointed the commissions to draft settlement measures, and to whom the Milner draft was finally given, sent the measure to Council with a valuation of $8,000,000 for the initial capitalization which represents the present properties of the company. This figure is what the commission had agreed to place in the measure. It is $1,000,000 less than the lowest figure offered by Mr. Doherty and possible of fulfillment conditionally.

COURT SUMMONS COMMISSIONERS

Members of the commission were called in by Judge Killits. They agreed to the plan he presented. The measure was then sent to Council with a lengthy letter, in which the judge explained his position with reference to the measure and also offered some suggestions with reference to the municipal ownership measure now before the people for a vote at the primaries on Aug. 10.

The service-at-cost measure could have been passed by Council and carried on the same ballot with the twin municipal ownership ordinances, but there is a question of constitutionality coming in the variance of the city and state initiative and referendum provisions. When the measure came up in Council on July 9 that body was confronted with an appeal from the service-at-cost commission that action on the ordinance be delayed in order to assure the legality of the measure if finally adopted by the people.

The vote in Council was indicative of the desire of some of the members to bring the plan up regardless of the safeguards for constitutionality. The vote on adjournment without consideration was nine to six, so that it appears the ordinance will easily pass whenever it is brought up again.

Several members of the Council asked for the repeal of the municipal ownership ordinances so that both measures might be submitted at the same time, but the adjournment vote indicated that they were in a minority.

ELECTION MAY GO OVER

It is possible now that the cost-of-service franchise will be submitted at the presidential election in November, provided the vote on public ownership on Aug. 10 does not preclude any further action toward a franchise measure.

In his communication to the Council Judge Killits also took occasion to settle one remaining point of difference between the commissioners and Mr. Doherty. That was over the provision by which bonds providing additional capital for improvements to the system might be sold at a discount if necessary to get the funds.

Judge Killits held that the company contentions on this provision were valid and that so slight a difference in any advantage to the city would be made that it would help to yield this point if it might make the whole measure acceptable to the Doherty interests, if passed by the electorate.

The judge, speaking only as a citizen of Toledo, in his letter to the Council said:

> As a local paper pointed out a few days ago, the charter requires that the car rider, under municipal ownership, must bear all of the cost of service. The same thing is absolutely true under any possible franchise—a street car company can no more be compelled to contract for service under cost than a merchant can be forced to agree to sell his wares at a loss. If the provision for selling bonds at a discount should remain, the car rider would carry the burden of the discount. Six per cent on each dollar for which but 90 cents of improvement was bought would be added to the cost of service. The provision, it seems to me, has possibilities against the city also in that it furnishes a chance to juggle securities. It is plainly to the city's interest that a company which is to serve the community have a chance to transact its business in a business way. The commission was alive to these controlling principles, but offered the provision in question to anticipate a situation when a necessity for expanded service might occur with a bad money market—giving to the city the power to force an immediate enlargement. But such a condition would be a temporary matter only, wherefore it seemed to me that a balancing of considerations advised that the commission recede, if in fact it had not already done so.

MILNER ORDINANCE SAFER

In submitting the cost-of-service plan to the Council, Judge Killits undertook to show that the Milner ordinance offers a safer and a much more direct road to municipal ownership than do the twin measures to be submitted next month. Indirectly he expressed the belief that the municipal ownership ordinances are both futile and dangerous. He adds a little argument to show that the contemplated piecemeal condemnation proceedings in the general unwritten plan of the public ownership commissioners will meet with serious objections and a possible interruption of service for several months.

Judge Killits said in part:

> It is a sanguine man indeed who would expect a publicly owned transportation system to be in successful operation within eighteen months after Aug. 10. The acquirement of the company's lines for city ownership by condemnation proceedings means tedious litigation, with some special embarrassment, if it is proposed to take over selected portions of the company's property and cause it to suffer scrapping of the rest. It is not reasonable to expect the company to submit without exhausting all available resources of defence.
>
> If the city should determine to embark upon the experiment of utilizing, through city ownership, acquired by condemnation, some, only, of the company's lines, supplementing this partial supply of the city's needs by some other method of transportation, there is nothing to hold the company to service here until the new arrangement is ready for use. Even if the construction of the Milner law, which the federal court has held is correct, the Utilities Commission could not legally compel street car service until processes were complete to dismember the property and to render much of it mere scrap.
>
> With destruction of its system inevitable anyhow through the city's expressed purpose, it would be the company's privilege to leave us whenever departure seemed to be advantageous to it. Compared with what these delays and conflicts may mean to the city's development, what they may mean to the car rider in higher transportation fares, or deranged systems, the burden of a settlement figure of a million, or even two million dollars higher than we may think the property worth to buy, is insignificant.

In passing the ordinance and asking approval of the electors without the agreement of Henry L. Doherty, the judge declared that the city would then be in the position of offering a fair settlement and the company would not be liable to turn it down for sentimental reasons.

He also argued that the term valuation was used in connection with the service-at-cost plan as a term of agreement on how much would be the initial bond issue on which the return of the company is based.

The campaign for the municipal ownership ordinances is proceeding with open air street meetings addressed by members of the commission and others who favor public ownership.

City Restrained from Buying Buses

Justice Edward J. Gavegan, of the Supreme Court in New York, granted an injunction on July 1 in a taxpayer's action restraining the city from spending $1,000,000 for a municipal bus project, but refused to order that the existing city bus lines be discontinued.

The injunction issued was upon the application of Edward Schafer, made after the Board of Estimate and Apportionment passed a resolution, on March 12 last, authorizing the expenditure of $1,000,000 for the purchase of motor buses to be used upon several new lines which Grover A. Whalen, Commissioner of Plant and Structures, contemplated starting.

Justice Gavegan has had the matter under consideration for a long time. In the meantime the Supreme Court in Brooklyn has granted injunctions against the existing bus lines in so far as they parallel surface lines operated under franchises.

The Corporation Counsel has already taken steps to place the whole matter before the Court of Appeals, which will decide not only cases from Kings County but also from New York County, where the question of city buses competing with two crosstown lines running from Manhattan to Brooklyn already has been passed upon by the Appellate Division.

Justice Gavegan, while enjoining the city authorities from spending any of the $1,000,000 for buying a bus plant and equipment, does not try to stop existing lines of buses running with the permission of the Commissioner of Plant and Structures.

He also declares that should any new emergency arise by reason of the cessation of any surface lines, his injunction is not to be construed as preventing the Mayor from stepping into the breach to give transportation.

Corporation Counsel Burr will take an appeal from that portion of Justice Gavegan's order restraining the Comptroller from paying out any money to carry out the resolution of the Board of Estimate to have city owned and operated buses.

I. U. T. Safety Banquet

Superintendent of Transportation Turns Cook — Other Officials Entertain with Songs and Hornpipe Dance

The semi-annual safety banquet of the Union Traction Company, Anderson, Ind., for which all members of the various safety committees on the property were invited for one good round of fellowship, took place on June 21.

"JERRY" THE COOK

This affair has come to be an event of some note in the company's annals, and one at which attendance is much coveted. In general, it is a dinner at which there is a little talk about safety and a lot of fellowship, the officials from president down throwing off the cloak of reserve and formality and entering into the event as "one of the boys."

On this recent dinner, "Jerry" Keever, the superintendent of transportation, became cook. In the basement of the Methodist Church he prepared a dinner which, all reports have it, was a wonder. "Jerry" started them with grape fruit, and went the route with fried chicken, ending with strawberry shortcake. After the dinner, Mr. Keever and his division superintendents started off the lighter side of the program with a "sextette." He then announced that the department heads were to sing a song. They favored the men, much to their delight, with the song:

I'm a little prairie flower,
 Growing wilder every hour;
No one cares to cultivate me—
 I'm as wild as wild can be.

At the end Mr. Brady, the president; Mr. Nichols, the general manager, and all the other department heads danced the hornpipe as they sang. Then everybody joined in and some one shouted "everybody dance." The whole crowd fell into the hornpipe.

A SERIOUS SIDE, TOO

This simply characterizes the good fun and fellowship which is entered into in these safety banquets. Of course the president and general manager had something to say about the serious side of the safety work to begin with, but on the whole, the meeting is probably more important from its value as a "get acquainted" event, wherein workmen down in the ranks find out that the fellows up above are just humans after all.

Hydro-Radial Scheme Halted

Government to Appoint Commission of Full Inquiry Before Allowing Any Further Expenditure

E. C. Drury, Canadian Premier, on July 7 notified Sir Adam Beck, chairman of the Hydro-Electric Commission, in response to a letter from Sir Adam, that the Government, after full and careful consideration, had decided to defer any action in regard to the acquisition of the Niagara, St. Catharines & Toronto Railway, the Toronto Suburban Railway and the Guelph Radial Railway by the Hydro Commission until such time as the Government had satisfied itself by means of a thorough inquiry as to the advisability of going on with the project. Meanwhile the Government requested that, pending the result of such inquiries, further expenditure on the roads should not be made.

THE official statement by Premier Drury was as follows:

> When the Government goes ahead, the province will be committed not only to the present proposals but to a province-wide, publicly owned radial electric scheme operated by the Hydro-Electric Power Commission, involving an ultimate mortgage of the province and of the municipalities interested of scores of millions of dollars.
>
> The Government has therefore decided to appoint a commission to go into the whole problem from every point of view and present a report for its information and guidance.
>
> In the meantime all action in the direction of further outlays or the assumption of further responsibilities in radial matters by the Hydro-Electric Commission will be stayed.

SIR ADAM'S RECOMMENDATIONS

Sir Adam had previously stated he hoped to be in a position to announce to the Ontario Government that the Dominion Government had accepted his offer to take over the three electric railways in Ontario owned by the Canadian National Railways. The terms on which Sir Adam Beck recommended the taking over of the railways in question were as follows:

Toronto & Eastern Railway—Price $706,000; payable by Hydro Power Commission 4½ per cent fifty year bonds, guaranteed by the Province of Ontario.

Toronto Suburban Railway—On this railway there are $2,628,000 of outstanding 4½ per cent bonds due 1961. This is to be taken over by the Hydro Power Commission, and the Hydro Power Commission to assume the bonds.

The Niagara, St. Catharines & Toronto Railway—Price for this railway to be $3,544,374. On this road there are $1,098,000 of 5 per cent bonds outstanding.

GOVERNMENT'S MEMORANDUM

The memorandum referred to by the Government in its communication to Sir Adam Beck follows in part:

> The obligations of the province of Ontario now outstanding, approximately $65,000,000, or 52 per cent of its present debt, is represented by assistance given to the Hydro-Electric Commission. . . . It will in the near future have to supply between $32,000,000 and $33,000,000 more in cash to complete the Chippawa, Nepigon and other electrical power works in process of construction. In all, there are guarantees to a total of more than $103,000,000 which the province and the municipalities are bound to repay.
>
> Hydro-radial projects, while they may to some degree facilitate the distribution of power as incidental to the operation of the railways, are entirely new and separate from the main object and scheme of the commission.
>
> The debt of the province will within two years amount to $160,000,000 or more. If the radial scheme is gone on with and kept strictly limited (which would be practically impossible) to the lines mentioned, the obligation of the province will approximate $210,000,000. The annual interest charges would be almost equal to the total direct debt of the province in 1908, and the finances of the province would be seriously crippled and great confusion and hardship created for the municipalities if the scheme were not to meet the expectations of its promoters.
>
> The province must not, of course, come into competition with the Canadian National Railway system, as Ontario, by taxation, must provide for from one-third to one-half the C. N. R. annual deficits. Then too, the vast amount that must be annually raised in Ontario to take care of the proportion of Dominion taxation cannot be overlooked.
>
> The province must be assured that the new scheme will be at least self-supporting. It is contended by representatives of certain of the municipalities to be served by the projected roads that the covenant of the municipality relieves the Government of responsibility. If the municipalities were required to furnish the moneys for the construction of the roads this might to a large degree be true, but the fact is that the municipalities look to the province to supply all the money required.

Other points cited as worthy of careful consideration are:

> The shortage of Hydro power; that many radials now, with cheaper construction, do not pay; that the experience of U. S. electric railways is financially unsatisfactory, and the municipalities would find it difficult, if not impossible, to float bonds for the projected roads, unless with the guarantee of the Government; that for medium and short distances good roads will serve the public better; that every few years new bond issues would have to be made to pay for additional rolling stock, new sidings, double tracks and many other betterments; that it is fairly open to question whether added responsibility for radials should be placed on the Hydro Commission.

In conclusion the report says:

> Some of the foregoing arguments may not be valid and none of them may be conclusive against the ultimate adoption of the proposals. They are, however, as it appears to the Government, conclusive against their adoption at the present time and until the whole subject has been fully and exhaustively examined. The matter is of far too great importance to be dealt with hastily or lightly. A commission will be appointed, and requested to proceed immediately with its task, to hold public inquiries and to report without unnecessary delay.

As matters stand now the Hydro-Radials are tied up until the Royal Commission, to be appointed by the Drury Government, reports on the plans of Sir Adam Beck and the Hydro-Electric Commission.

The announcement of the Government's policy was made just two days before the annual meeting of the Ontario Municipal Hydro-Radial Association, which was held in Toronto on July 9. The meeting was thoroughly representative of all interests embraced in the association. Naturally the policy of the Government as announced came in for strong discussion. Sir Adam Beck was present and outlined the present position of the Hydro-radial and other undertakings.

Electrical Workers Forced to Arbitrate

High-Handed Tactics of Special Force Alienate Sympathy of Other Organized Workers

Electrical workers and other craftsmen in the employ of the Wheeling (W. Va.) Electric Company, the Wheeling Public Service Company and the Wheeling Traction Company returned to work on May 28, after having been on strike since April 30. The men had previously refused to arbitrate. In consequence the companies announced that unless the men did return to work by May 28 their positions would be filled. This resulted in the company being notified that if such a course were followed the other employees would go out on strike in sympathy. The companies felt firmly convinced that the other men were too fair minded to violate their contract by any such procedure, but they laid the facts before the public in a full page advertisement so that the public would be fully informed.

FOR SEVERAL years the companies made concessions to the electrical workers. In the first place it was difficult to secure men to do this class of work and then the total number of employees belonging to these unions was relatively small. This resulted, apparently, in the men arriving at the conclusion that any demands which they might make on the company would be met. A summary of the steps in the controversy follows:

The contracts with the men expired on May 1 each year. They contain a clause which requires either party to have a memorandum of changes in the hands of the other party not later than April 1. In accordance with this clause, the companies submitted to the men on April 1 a contract such as it proposed and the men in turn handed back to the company a contract which they insisted should be accepted prior to May 1. The contract submitted by the men was objectionable in almost every paragraph. About April 10 the companies started a series of conferences with the committee representing the Electrical Workers' union. It soon became evident that the men not only proposed to insist on their demands but also proposed to strike unless their demands were met in their entirety.

The company offered to arbitrate any differences existing on which agreement could not be reached, but the men declined arbitration and on the night of April 30 went on strike on one hour's notice and did everything in their power to force the shutdown of the property. Fortunately, the companies, through the co-operation and support of their loyal employees, were able to operate without serious interruption of any kind.

MEN TOOK ARBITRARY STAND

About May 17 the companies notified their former employees that unless they were back on the job by the morning of May 17 the companies would proceed to fill their places with other men. On about the morning of May 18 the Chamber of Commerce of Wheeling asked the companies to postpone the date on which they proposed to bring in other men until May 26. This the companies agreed to do and later agreed to extend this time to May 28.

When this time came and the electrical workers had made no concessions the companies notified the representatives of the other unions on their property that the companies would expect them to co-operate in securing other employees for the electrical department. In consequence the representatives of these unions forced the electrical workers to go back to work under the terms of the contract which the companies had submitted to them, with the understanding that if there were any sections of the contract which were not acceptable to them the companies would agree to arbitrate any sections of the new contract which differed from the contract under which they worked last year.

It is generally conceded in the Wheeling district that these men took an arbitrary, unreasonable stand from the very beginning and that when the smoke cleared away they had received about as severe a setback as any of the unions in the valley have received in a number of years. The opinion prevails that if the electrical workers had refused to go back to work under these conditions, the other unions would have refused to support them. The companies are hopeful that the entire matter can be settled without the need of arbitration between the contract under which these men went back to work and the contract which existed last year.

The large joint power house of the American Gas & Electric Company and the West Penn Power Company, located at Windsor, W. Va., and all of the Ohio side lines of the American Gas & Electric Company have always been handled as strictly open shop properties. The electrical workers have been trying to force the unionizing of these properties. It was their hope to use the Wheeling Electric Company's plant, which is a subsidiary of the American Gas & Electric Company, and the Wheeling Traction Company, which is a subsidiary of the West Penn Traction Company, to secure this result.

Company Seeks Relief

Denver Tramway Wants Case Decided Which Prevents Company from Reducing Wages

The Denver (Col.) Tramway on July 1 petitioned the Colorado Supreme Court for a writ of prohibition against District Court Judge Greeley W. Whitford, the District Court of the Second Judicial District and the city and county of Denver in the tramway injunction case. Owing to the short time interval which remained before the date set for the adjournment of the Supreme Court for the summer vacation, the case was not heard on its merits but simply on the application to file the petition and for the issuance of a rule upon the city to show cause why further proceedings in the lower court should not be stopped.

Permission was granted by the Supreme Court on July 6 to file the case and the order to show cause was issued. The further condition was attached that the lower court should not proceed further in the case except to enforce, if necessary, the provisions of the present temporary injunction against the company, and also to take up the matter of the issuance of a temporary writ against the local division of the Amalgamated Association. Dates were set for the filing of briefs by the parties at interest and oral arguments will be heard on Sept. 13.

The injunctive proceeding was instituted by the Mayor of Denver following the refusal of the City Council to pass a 7-cent fare ordinance and the announcement by the company of a reduction in wage scales which was to have become effective on June 1. The employees had announced their intention of striking as soon as the wage reductions became effective. Upon the application of the city and county of Denver, District Judge Whitford on May 29 issued a restraining order against the tramway and the local division of the Amalgamated Association. Under its provisions the company was estopped from taking any action which would interfere with continued railway service.

This literally compelled the company to continue in force the higher wage scales granted its employees by a local board of arbitration on March 18, 1920, even though its revenues are insufficient by about $1,200 a day to meet the same. Judge Whitford on June 26, after a hearing, granted a temporary injunction against the company.

That part of the restraining order directed against the Amalgamated Association which prohibits it from calling a strike is still in effect, as the representatives of the association through continuances delayed the pleading date until after the company's part of the injunctive proceeding had been disposed of. The city's position is that the restraining order against the men has the same effect as a temporary injunction and is for an indefinite period, or at least until the District Court acts either to dissolve the same or change it into a temporary injunction. Counsel for the union on July 7 filed a demurrer to the city's complaint and a motion to dismiss the proceeding on the grounds of lack of jurisdiction, but apparently it will be necessary for them to endeavor to substantiate their claims by a direct appeal.

Without awaiting final decision by the courts regarding the present points involved the representatives of the men's union are endeavoring to confuse the issue still more by demands made on the company on July 2. They are seeking to establish a wage scale for trainmen of 70 cents the first three months, 73 cents the next nine months and 75 cents thereafter, with corresponding increases for the employees in the other departments. Demands are also made that negotiations be started looking toward a new working agreement to replace the one which expired by limitation on May 31, 1920. This the company elected not to renew. The union representatives insist that final action on these demands be taken by the company not later than Aug. 1. A copy of the demands was also filed with the Colorado Industrial Commission in compliance with the law creating that body which requires that thirty days' notice be given of any contemplated action by employers or employees which might result in stoppage of work. Jurisdiction over the case has not been taken as yet by the Industrial Commission.

$332,500 for One-Man Cars

Norfolk Company, Planning Rehabilitation of System, Secures Approval of One-Man Cars

The City Council of Norfolk, Va., on July 8 granted permission to the Virginia Railway & Power Company to operate fifty one-man cars in the city of Norfolk, and an ordinance was enacted making this possible.

This decision on the part of the Council was reached after a lengthy public hearing. This permission was granted the company on the urgent recommendation of A. Merritt Taylor, traction expert employed by the city several months ago to make a survey of Norfolk's public utilities and determine what must be done to get better service. Mr. Taylor's recommendation for the "one-man" cars had previously been presented to the Council in executive session and decision was withheld until the public could be heard.

It was necessary to make a quick decision, Mr. Taylor pointed out, because an option on sufficient money to finance the proposition would expire July 9 at noon. The fifty cars, as approved, will cost $332,500, and as a result of the Council's approval of the project, the money can now be secured.

The Virginia Railway & Power Company admitted it must have at least thirty double-truck cars or thirty-eight single-truck cars, to operate its normal schedule this coming winter with closed cars exclusively. The company secured bids for the construction and delivery of twenty double-truck closed cars and ten closed trailers, to cost $420,000. It also secured bids for the construction and delivery of fifty safety cars to cost $332,500.

The thirty double-truck cars, Mr. Taylor pointed out, could not be delivered until from five to six months after signing a contract and furnishing complete information and details of design and construction. The fifty safety cars, however, can be delivered during the month of August, if the order be placed promptly.

The company arranged to finance, by car trust certificates, the purchase of either twenty double-truck closed cars and ten double-truck closed trailers or fifty safety cars and requested the Public Utilities Commission and City Council to determine whether the city desired thirty double-truck cars or fifty single-truck cars. The company took the position that it would proceed at once to provide whichever type of car the municipality selected. It found itself unable, however, to finance the purchase of more than thirty double-truck cars. Mr. Taylor's recommendation follows:

> As the city's representative, I have carefully considered all relevant factors involved and emphatically recommend that the company's proposition to provide fifty safety cars be promptly accepted for the following reasons:
>
> 1. Cost of operation of fifty safety cars will be much less than operation of forty double-truck cars, which would be their practical equivalent. Thus the burden of car riders of Norfolk would be lightened to the extent of at least between one-half cent and 1 cent a passenger.
> 2. Operation of safety cars will furnish more frequent and efficient transportation at less cost than the operation of double-truck cars; frequency of service will be increased by safety cars at least 25 per cent and schedule running time will be materially decreased owing to quick stopping and quick starting of safety cars, which is impracticable with the heavy double-truck car.
> 3. Operation of safety cars with at least 25 per cent greater frequency than double-truck cars in giving the public better service will increase the riding habit and gross earnings of the company, in addition to decreasing the cost of furnishing transportation, and thereby tend to keep the rate of fare down to a minimum by providing more and better service which will induce more rides per capita.
> 4. I shall recommend as a part of the rerouting plan now being developed that Lamberts Point line be re-routed from Lamberts Point via Thirty-eighth Street, Killam Avenue, Thirty-fifth Street, De Bree Avenue, Broadway, new tracks on Granby Street, Eighteenth Street, Church Street to Plume Street, Atlantic Street City Hall Avenue, Granby Street, Main Street, to Church Street, returning via the same route, instead of as at present through Ghent and the business district of Granby Street.
>
> My opinion is, the city authorities should emphatically decline to burden the people of Norfolk with the proposed thirty double-truck cars which will tend to increase car fares from one-half to 1 cent per passenger; they would restrict the frequency of service and thereby retard the necessary increase in the riding habit which will be generated by more frequent service which the one-man car will give.
>
> The success of the co-operative undertaking between the city and the company will depend largely upon the action taken today with respect to this subject by the municipal authorities. If the safety cars be approved, promptly ordered and placed in operation, the results will enable the working out of your transit problems in a way which will promptly bring to Norfolk first-class street railway facilities and give the Public Utilities Commission, City Council and citizens all they have hoped for in the way of transportation facilities, at a fair price.
>
> There yet remains much to be done If this important step is taken in the right direction, the way is clear and the success is assured.
>
> My recommendations which are now being formulated will involve the expenditure of a vast amount of money by the company in building new tracks through district now lacking service, in rebuilding such of its present tracks as are worn out, in making new track connections required for necessary re-routing and in improving its facilities in general.
>
> It is essential to aid the company in providing most efficient service at minimum cost in order to keep the rate of fare down and to build the company's credit up, so that it can meet the city's requirements at minimum cost to the car riders.

The *Ledger-Dispatch* said editorially:

> Council is to be thanked and congratulated for having taken a courageous step in opposition to what seemed to be a large volume of popular clamor; the company is to be congratulated for being able to deal with a small body of courageous and quickly decisive men, instead of with an unwieldly bicameral body which generally kept its ear to the ground and frequently heard a false tone, and the city is to be congratulated because its representatives and the representatives of the company now place all their cards face up on the table.

Municipal Road Seeks Talent

The Board of Street Railway Commissioners of the city of Detroit, empowered by a vote of the people to construct a municipally-owned and operated street railway, is interested in receiving applications for the major executive positions, especially the position of general manager. Communications include a brief but complete history of the writer's experience. Ross Schram, secretary of the Board of Street Railway Commisioners, Detroit, Mich., may be addressed.

Detroit Awarding Contracts

City Going Steadily Ahead with Its Plans for System to Compete with D. U. R.

With contracts awarded for foundations, ties and steel for about 30 miles of municipal railway, Detroit has about one-third of the Class A lines (the first lines to be built under the Couzens plan) now under way.

Shortly after the awarding of the contracts, Judge Arthur J. Tuttle of the U. S. District Court dismissed the suits which were filed by the Detroit United Railway and the New York Trust Company, last May, in which it was sought to enjoin the enforcement of the Municipal Street Railway ordinance.

The suits were based on the alleged claim that the city's program included the contemplated purchase of certain of the Detroit United Railway lines at less than their actual value and therefore were confiscatory. The dismissal of these suits removed the last legal question concerning the proposed municipal lines.

Judge Tuttle held that while the ordinance adopted by referendum on April 5 did not provide the city with the power to purchase any of the Detroit United Railway lines, the ordinance was valid and operative for the construction of a municipal street railway system.

MAY AVERAGE DOWN ON PRICES

According to present estimates by the street railway commission, the cost of the newly contracted portions of street car lines will exceed the Mayor's original estimate of $70,000 per mile by $5,000 to $10,000 per mile. This present cost of $75,000 to $80,000 per mile is based upon contract prices for excavating, concrete foundation, ties, steel, and paving between rails.

It is believed that the highest point in construction charges has been reached and that the remaining portions of the 101 miles of lines can be laid under more favorable conditions and at prices which will bring the general average for the whole system down to the original $70,000 per mile estimate.

Detailed estimates of the cost of paving between tracks are being worked out by the commission's engineer, and will embody analysis of costs of various grades of paving material that may be used. The kind of paving between tracks will depend somewhat upon the kind of pavement in the streets lining the tracks.

The steel rails for the road were contracted for at $71.90 per ton, or approximately $25 per ton below the next highest competitive bidder and at a price which is considered much less than the prevailing market. Contract was awarded to the Lorain Steel Company, and the low bid is attributed to the policy of the company to stabilize prices at a lower level than can generally be obtained at the present time. No delay is anticipated in getting the steel delivered by the mills as rapidly as it is needed.

Omaha Case Closed

Men Withdraw from Investigation—Acrimonious Passages at Arms Mark Hearings

The hearing of a wage controversy between the Omaha & Council Bluffs Street Railway and its men, before the Nebraska State Railway Commission, was concluded when counsel for the men withdrew, after presenting the following statement:

> Early in the hearing the men learned that the commission was not concerned with what was a just and proper measure of the value of their services, but only with the price for which that service could be bought in the open market. They were told that a jurisdiction grounded on the interest of the public in a public utility was purely the mercenary interest of how much labor could be bought for the least money and that the wages necessary to meet living conditions would not be inquired into. Refusing to accept the principle underlying the decision of the commission, that labor is a commodity, the union withdraws from the hearing and their counsel will not participate further in direct or cross-examination in the so-called inquiry.

Members of the state commission came from Lincoln to Omaha a month ago in response to an application of the union and at a time when the men made a demand of 13 cents an hour increase, holding a strike vote in suspension. The hearings have been marked by bitter controversies. Excerpts are illustrative. Counsel for the men said:

> Why discriminate against testimony to show undue power exerted by an outside organization in Omaha, when this commission permitted cross-examination of union men on the power wielded by the Amalgamated Association outside of Omaha?

To this Commissioner Thorne Brown replied:

> Only because the testimony on the strike vote by the union was pertinent to the question of impairment of service, whereas the courts have established the right of an employer to employ or to refuse to employ whomsoever he pleases, irrespective of the source of that policy.

R. A. Leussler, vice-president and general manager of the company, asserted in testimony that he was opposed to the closed-shop policy because it was un-American. When asked by counsel for men what standard he used to judge Americanism, Mr. Leussler replied, "The constitution of the United States."

"These investigations are necessitated by the autocratic tyrannies of unions led by counsel," retorted Alvin Johnson, counsel for company, addressing A. H. Bigelow, counsel for the carmen.

Mr. Leussler testified that the average pay received by trainmen of his company during the last nine months was $155 per month; that during May of this year the average of all of the men was $125, and that the May average of those who worked twenty-five days or more was $152. He also stated that he had compiled a list of 325 cities and that only twenty-nine showed a higher scale of pay than Omaha. The present Omaha scale is 53, 55 and 57 cents an hour. This official of the company also testified that he has repeatedly told the men that the company's present problem is to maintain the existing schedule of pay. He also advised the commission that during a recent period of two weeks the company received 107 applications from men anxious to become conductors and motormen at the present rate of pay.

The commission has taken the matter under advisement.

Chicago Shopmen Strike

Insist on Closed Shop—Company's Wage Offer Satisfactory to Majority—Intimidation Used

A strike of shopmen at the south shops and of linemen and substation operators called very suddenly early on July 15 brought about almost a complete tiup of the Chicago Surface Lines. About 300 men were involved. The thirty-two substations were of course the key to the situation. At four o'clock a great many of the night cars were left stranded on the system without power. Later sufficient substation capacity was put in operation by officials to return these cars to the carhouses.

By noon with the help of the Commonwealth Edison Company and what company stations could be manned, about 300 cars out of the normal midday schedule of 1,400 cars were running. This made it possible to give full service on some lines. An effort was being made at 10 a.m., July 15, to place the remaining substations in operation.

So far the trainmen and the west shop employees and all other employees have remained loyal. They all reported for duty as usual, the trainmen taking cars out as fast as power was made available.

The wage offer made by the company is considered generous in comparison with wages being paid by other companies. In fact, the company's offer was acceptable to a majority of the men, who are said to have been intimidated into striking.

The real issue of the strike is the refusal of the company to grant a closed shop at the south car shops. The trouble has been further stirred up by "Umbrella" Mike Boyle, business agent of the electrical workers' union, who was convicted of conspiracy by a Federal Court a few years ago and recently pardoned by President Wilson.

Wage offers made by the company average a 25 per cent increase with no change in working conditions. The union leaders have stated they would not consider anything until the closed shop was conceded. The strike has not affected the elevated system. A large amount of the morning rush traffic on July 15 was thrown on the elevated and the suburban steam trains.

Mr. Ford's New Car on His Own Road

Purchase of the Detroit, Toledo & Ironton Railroad by Henry Ford and his son, Edsel B. Ford, was announced on July 10 by E. G. Leibold, secretary to Henry Ford. The purchase price was not disclosed. In providing passenger service it is intended, according to the announcement, to utilize the new gasoline driven car of the interurban type which Ford engineers have developed.

News Notes

Vetoes Philadelphia Buses.—Mayor J. Hampton Moore of Philadelphia, Pa., has vetoed an ordinance recently passed by the City Council granting a franchise to the Philadelphia Transportation Company to operate a line of motor buses in Broad Street, Philadelphia. The company proposed to place between twenty and thirty buses in operation by Sept. 1 and to operate at a 5-cent fare, in competition with the Philadelphia Rapid Transit Company. It is pointed out that a subway under Broad Street is at present an important unit in the city's own program for transit development, and that a bus line on the same thoroughfare would be in direct competition with the city's own utility as developed by the present rapid transit plans.

Would Operate Frankford "L."—Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, has notified Mayor Moore of that city that he will recommend to the company's board of directors that a lease be made with the city whereby the company will operate the Frankford elevated line now in course of construction, paying a rental equivalent to 5 per cent of the city's investment. Mr. Mitten points out that the Frankford line operated independently cannot be made to pay operating costs, without considering earning interest on the investment. He holds that the P. R. T. can operate the line as a part of its general system with greater economy, but that even then it cannot be made to earn operating expenses and carrying charges at the rate of 5 per cent per annum.

Check Assumes Five-Cent Fare as Inadequate.—A check reproduced in the Interborough *Bulletin* shows a gift received by the Interborough Rapid Transit Company, New York. It was for the amount of $2.50 and was signed by F. B. Maloy of 714 Grandview Avenue, Pittsburgh, Pa. Mr. Maloy had been on a visit to New York and had ridden over the different transportation systems of the city the usual number of times. He does not consider a 5-cent fare as sufficient and in order to back up this statement he inclosed the check. Mr. Maloy assumed that while he rode in New York the company lost on each ride. The $2.50 was forwarded with the statement to the effect that, "if it does not cover all the deficit, in any case it is at least an evidence of good will." Frank Hedley, president and general manager of the Interborough, in his reply was much gratified with the spirit with which the gift was sent. The money has been placed in the welfare fund.

Financial and Corporate

Lake Erie Sale Decree

Court Lays Down Conditions Under Which Buffalo Interurban Property Will Be Disposed Of

Bids for the purchase of the property of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., between Buffalo and the Pennsylvania state line, with the exception of the Dunkirk-Fredonia division, will be received by the receiver, George S. Bullock, until Sept. 15. On that day the interurban line will be discontinued as the result of an order granted by Justice Wheeler in the Supreme Court at Buffalo. As a pledge of good faith bidders must deposit part of the purchase price in advance of the sale.

The application of the receiver to dismantle the road will be held in abeyance by the court until after the court is advised of the bids received for the property. Bidders can bid on the property as junk or can bid on it as a going proposition.

Justice Wheeler cites a number of decisions holding that a public service corporation cannot be compelled to continue service indefinitely at a loss. The company at hearings before the court contended that to continue any longer would result in exhaustion of the road's assets.

The line between Dunkirk and Fredonia is not included in the order. The court rules this can be successfully operated by the company. This is the old Dunkirk & Fredonia Railroad taken over by the Buffalo & Lake Erie Traction Company soon after the latter was organized. If that road also is to be abandoned the court ruled that it would have to be a separate application, and the intimation was drawn that such an application would be denied.

The Buffalo & Lake Erie Traction Company operates through express, freight and passenger cars between Buffalo and Erie, Pa., a distance of almost 100 miles. Part of the line is double tracked. Local service also is given in the city of Dunkirk. The road connects at Westfield with the Jamestown traction line running south into the Chautauqua County fruit country. The discontinuance of service affects workers of the Lackawanna Steel Company living in Buffalo. The Buffalo & Lake Erie Traction Company operates the Buffalo & Lackawanna Traction Company and serves commuters between summer resorts on the south shore of Lake Erie and Buffalo.

Interborough Rapid Transit Shows Improvement

After deducting interest, rentals, etc., the Interborough Rapid Transit Company shows a net income of $26,152 for the month of May, 1920. This is contrasted with a deficit of $153,793 in May, 1919. For eleven months ended May 31 there was a deficit of only $1,953,664. This was a decrease of 45.8 per cent over the same period ended May 31, 1919. For the month of May, 1920, the passengers carried increased more than 10,000,000. This was an increase of 14 per cent over those carried in May, 1919. Over the longer period of eleven months, the number of revenue passengers increased from 739,000,000 to 875,000,000, or 18.4 per cent.

SUMMARY OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY.

Month ended May 31, 1920	1920	1919	Percentage Change over 1919
Total operating revenue	$4,597,479	$4,019,001	+ 14.4
Total operating expenses	2,721,661	2,353,366	+ 15.7
Net operating revenue	$1,875,818	$1,665,635	+ 12.6
Total taxes	221,575	238,576	— 7.14
Operating income	$1,654,243	$1,427,059	+ 15.9
Non-operating income	57,752	50,875	+ 13.5
Gross income	$1,711,995	$1,477,934	+ 15.8
Interest, rentals, etc., including Manhattan guarantee	1,685,843	1,631,677	+ 3.3
Net income	$26,152	$*153,743	—117.0
Operating ratio (per cent)	59.20	58.55	+ 1.1
Revenue passengers carried	85,941,348	75,455,737	+ 13.9

Eleven months ended May 31, 1920	1920	1919	Percentage Change over 1919
Total operating revenue	$47,186,555	$39,294,196	+20.1
Total operating expenses	28,963,080	23,904,732	+21.2
Net operating revenue	$18,223,475	$15,389,464	+18.4
Total taxes	2,402,385	2,919,142	—17.7
Operating income	$15,821,090	$12,470,322	+26.9
Non-operating income	535,813	542,331	— 1.2
Gross income	$16,356,903	$13,012,653	+25.7
Interest, rentals, etc., including Manhattan guarantee	18,310,567	16,624,228	+10.1
Net income	$*1,953,664	$*3,611,575	—45.8
Operating ratio (per cent)	61.38	60.83	+ 0.9
Revenue passengers carried	875,108,977	738,912,604	+18.4

* Deficit.

New Financial Plan

American Railways Outlines Scheme for Taking Care of Obligations Now in Default

A grave situation confronts the American Railways, Philadelphia. Van Horn Ely, president of the company, ascribes this largely to the result of conditions imposed by the late war, which necessitated large expenditures of capital to meet the demands for power and transportation in the district served, large increases in the cost of maintenance and betterments, and made it impossible satisfactorily to market the securities of the subsidiaries owing to the changed money conditions, especially as to interest rates.

Mr. Ely says that in his opinion it is imperative that the company be provided with $4,400,000 in order to protect the holders of the common stock. The company has a funded debt aggregating $12,700,000, all of which is secured by pledge of various collaterals. The company has ample earnings to provide for the interest charges and no immediate steps are required with respect to such indebtedness for the protection of the common stock. The company owes about $3,500,000 upon its own notes and upon the notes of subsidiary companies indorsed by it. The company and its subsidiaries also owe approximately $900,000 for supplies.

OUTLINE OF PLAN

The company has worked out a plan whereby it is believed that the indebtedness now represented by notes of approximately $3,500,000 can be funded into a five-year secured 8 per cent loan. Many of the holders of the present notes of the company have agreed to accept the new notes, but the extension is based upon the placing in the company's treasury of about $900,000 to take care of the other floating debt.

This $900,000 the company proposes to take care of by the issue and sale of second preferred 7 per cent stock. The company turns to the holders of the common stock as the purchasers of this second preferred stock. This is the same as turning to the holders of the 4-6 per cent bonds of the National Properties Company. Under the arrangement proposed the present 4-6 per cent bondholders by putting up $17.50 with respect to each $100 of bonds, would take all of the rights which will arise from the foreclosure of the 4-6 per cent bonds pledged, to the entire exclusion of the underwriting syndicate.

Mr. Ely explains that the bondholder will conserve his own interest by this payment of $17.50 and will receive 80 to 90 per cent of the amount paid in second preferred 7 per cent stock of the American Railways, and will also receive more than the face of his bonds in American Railways common stock.

The committee representing the 4-6 per cent bonds of 1916 has submitted a plan based upon an offer from an underwriting syndicate. This offer must be accepted by the committee and the holders of a majority must deposit their bonds on or before July 26.

Operating Ratio Increasing

Reports of Roads in Rhode Island Show Expenses Outstrip Gains in Earnings

According to the seventh annual report of the Public Utilities Commission of the State of Rhode Island for the year ended Dec. 31, 1918, there were ten companies reporting and three operating. This neglects the Bay State Street Railway, which at that time operated a small percentage of its lines in Rhode Island.

SUMMARY OF RHODE ISLAND OPERATIONS

	1918	1917	Percentage Change Over 1917
Number of companies reporting	10	11	— 9.1
Number of companies operating	3	4	—25.0
Assets:			
Investment in road and equipment	$49,066,860	$48,502,335	+ 1.15
Other investments	3,169,703	3,100,670	+ 2.22
Current assets	1,223,846	1,691,620	—27.70
Unadjusted assets	224,202	236,841	— 5.32
Total assets	$53,684,611	$53,531,466	+ 0.28
Liabilities:			
Capital stocks	$28,835,596	$28,694,596	+ 0.49
Long term debt	15,884,700	15,884,700	......
Current liabilities	4,700,716	3,888,575	+20.91
Deferred liabilities	45,579	103,029	—55.75
Unadjusted credits	866,042	785,217	+10.30
Corporate surplus	3,351,978	4,175,349	—19.71
Total liabilities	$53,684,611	$53,531,466	+ 0.28
Operating revenues:			
Revenue from transportation	$7,431,868	$7,058,470	+ 5.28
Other railway operations	154,088	161,440	— 4.57
Total operating revenue	$7,585,956	$7,219,910	+ 5.07
Total operating expenses	5,849,527	4,742,887	+23.35
Net revenue railway operations	$1,736,429	$2,477,023	—29.93
Net revenue auxiliary operations	15,886	6,835	+132.30
Net operating revenue	$1,752,315	$2,483,858	—29.40
Taxes assignable to railway operations	684,245	535,257	+27.85
Operating income	$1,068,070	$1,948,601	—45.30
Non-operating income	1,087,563	1,083,582	+ 0.37
Gross income	$2,155,633	$3,032,183	—28.90
Deductions from gross income	1,954,486	1,930,592	+ 1.24
Net income transferred to profit and loss	$201,147	$1,101,591	—81.80

OPERATING REVENUE INCREASING

The net income for 1918 transferred to profit and loss decreased over that of 1917 by about $900,000 or approximately 82 per cent. This large decrease in net income was due to the increase of 23 per cent in operating expenses. The operating revenue increased only 5 per cent. The operating expenses increased more than $1,000,000 but the operating revenue increased only $360,000. Taxes were $150,000, or 28 per cent more than the preceding year. Items going to make up the income practically stood still.

Of the total operating revenue the revenue from transportation increased slightly to a total of $7,432,000, whereas the revenue from other operations such as freight decreased.

The report shows that the total number of revenue passengers carried during the year was 144,336,765, of whom only 15,636,219 were free transfer passengers. This was an increase of 1.8 per cent in the total passengers and a decrease of nearly 10 per cent in the free passengers. The average fare paid by each revenue passenger was 6.22 cents, or a decrease of 4.16 per cent, while the average fare for all passengers was 5.90 cents or a decrease of 6 per cent.

It cost the companies 26.6 cents to run a car a mile. This was an increase of 22 per cent over 1917. The cost per car hour was $2.07. This was an increase of only 2.5 per cent. The company's receipts were 34.6 cents per mile. This was an increase of 4 per cent. The operating cost per car hour was $2.69 or a decrease over 1917 of 13.5 per cent.

The operating ratio increased by 17.5 per cent. The miles of road owned and operated decreased very slightly as did the total track owned and operated. There were forty more new passenger cars purchased than in 1917 and seven new freight or express cars. This makes a total increase in all types of rolling stock of 3 per cent.

STATISTICAL INFORMATION—RHODE ISLAND

	1918	1917	Percentage Change Over 1917
Total car mileage	21,937,067	21,668,037	+ 1.24
Total car-hours	2,820,345	2,318,385	+21.63
Ratio C.M. to C.H. (speed m.p.h.)	7.78	9.37	—16.96
Passenger traffic:			
Regular fare passengers	128,700,546	124,463,949	+ 3.4
Free transfer and other free passengers	15,636,219	17,332,532	— 9.8
Total passengers carried	144,336,765	141,796,481	+ 1.8
Passenger revenue	$6,959,992	$6,632,900	+ 4.9
Average fare per revenue passengers (cents)	6.22	6.49	— 4.16
Average fare per all passengers (cents)	5.90	6.28	— 6.04
Operating ratio (per cent)	77.2	65.7	+17.5
Car-mile statistics:			
Revenue from transportation (cents)	33.9	32.5	+ 4.3
Operating revenue (cents)	34.6	33.3	+ 3.9
Operating expenses (cents)	26.6	21.8	+22.0
Net income (cents)	0.9	5.1	—82.3
Passenger traffic (total)	6.58	6.54	+ 0.6
Car-miles per revenue passenger	0.170	0.174	— 2.3
Car-hour statistics:			
Revenue from transportation	$2.64	$3.05	—13.4
Operating revenue	$2.69	$3.11	—13.5
Operating expenses	$2.07	$2.02	+ 2.5
Net income	$0.07	$0.47	—85.1
Passenger traffic (total)	51.2	61.2	—16.3
Taxes—per cent of gross revenue	9.0	7.4	+21.6
Percent of net operating revenue	39.0	21.5	+81.4
Gross income earned on stock outstanding	.19	.27	—29.6
Mileage statistics:			
Miles of road owned	184.98	186.12	— 0.61
Miles of road operated	546.47	556.24	— 1.76
Total all tracks owned	196.85	197.97	— 0.57
Total all tracks operated	658.27	668.01	— 1.45
Total single track (owned or operated)	332.32	340.96	— 2.53
Rolling stock owned:			
Passenger cars	1,237	1,197	+ 3.32
Freight and express cars	114	107	+ 6.54
All other cars	222	223	— 0.45
Electric locomotives	4	4	......
Steam locomotives	4	4	......
Total equipment—all classes	1,581	1,535	+ 3.0

Gross Increased 16 per Cent

Illinois Traction Company Has Increased Earnings from All Types of Public Utilities

According to the sixteenth annual report of the Illinois Traction Company, Peoria, Ill., the gross earnings from railways were $9,927,872. This was composed of the earnings of the interurban lines of $5,930,523, and the city lines of $3,997,349. The earnings from the interurban lines increased over 1918 by $1,190,444, or 25.1 per cent. Compared with 1918, the earnings on the city lines increased $646,032, or 19.3 per cent. The total gross earnings of the company, which, in addition to the railways, includes gas, electric, heat and water companies, was $17,756,584. Total expenses, including taxes, amounted to $12,544,181, thereby allowing a net income from operation of $5,212,403. The surplus for 1919, after deducting for interest on bonds, depreciation, etc., was $1,335,394.

PACKAGE EXPRESS SERVICE INAUGURATED

The traffic department of the interurban lines was entirely reorganized the first of the year, and its headquarters moved from Springfield to Peoria. On June 1, 1919, an express service was inaugurated on the interurban lines and the revenue from this source will offset the loss sustained when the American Railway Express withdrew its service.

The Illinois Traction Company controls fifty-five companies, of which number thirty-two are railways.

Driving It Home

Newspapers Told That Public Utilities, Like Themselves, Must Have a Living Wage

Electric railway managers are often put to it to find a means of presenting their needs to the public through the newspapers. The raising of the price of many periodicals, however, offers an opportunity of getting "under the skin" of newspaper editors. At least one utility body is taking advantage of this increasing cost of subscribing to periodicals to point out the fact that public service companies have been forced to raise their charges to stay in business.

The Illinois Committee on Public Utility Information, Chicago, is driving home to newspaper editors the needs of Illinois utilities. To a notice of an increase in the price of a periodical to which it subscribes, the committee replies by drawing a parallel between its own case and that of the newspaper. In effect it says to the editor: "You have had to raise the price of your paper. You were entirely justified in so doing. You should therefore be tolerant toward us. We, like yourselves, must have a living wage."

The letter used by the committee for this purpose runs as follows:

> Enclosed find check covering renewal of our subscription for the coming year.
>
> While we note by the bill of practically all Illinois newspapers to which we subscribe that the price has been largely increased, we appreciate that newspapers have been confronted by the same after-the-war dilemma as the public service companies: that of having a fixed price for their commodity and no strangle-hold on rising costs of production. We appreciate that if a newspaper proprietor continues to stay in business—to buy paper, ink, machinery, pay current labor costs and serve his community and patrons as capably as in the days when production costs were not so high—he must have revenues commensurate to meet the increased prices, just as we have been insisting in behalf of the utilities over the last year. And we believe his customers should be fair with him about it.
>
> Were a newspaper "starved" we would not renew our subscription to it, for the inefficient service it would render in the way of presenting the news of the community would be dear at any price. Our belief is that a well-supported newspaper can do a much more constructive and useful work in the community than a poorly supported one.
>
> We have been gratified to find the press of the State, with but few exceptions, appreciates the problems of the utility industry in these difficult times and is fairly presenting to the public what under-development, resulting from "starvation" of electric light and power, gas, electric railway and telephone service would mean to the growth and prosperity of the State and to all business. Liberal use has been made of material contained in the weekly news bulletin issued by the committee, but this is not extraordinary as Illinois newspapers can usually be counted upon to aid in promoting any movement which is for the public good and intended to stimulate development of the State. The news service will be continued and we hope you will find increased use for it.

Municipal Road Reports a Profit

The passenger receipts of the Pekin (Ill.) Municipal Railway for June were $3,233, the largest yet recorded. An additional $11 was received from advertising, making a grand total of $3,244. The total disbursements were $2,054, leaving excess earnings of $1,190. A 5-cent fare is charged.

Financial News Notes

Small Georgia Road to Suspend.—The Albany (Ga.) Transit Company has announced its determination to abandon service and scrap the equipment.

Wants to Issue $313,000 Bonds.—The Little Rock Railway & Electric Company, Little Rock, Ark., has applied to the Arkansas Corporation Commission for permission to issue $313,000 of bonds, of which $263,000 is for improvements to the present water plant and $50,000 for purchase of transformers, meters and other electrical equipment.

Service Resumption Planned.—The Council of Lockport, N. Y., has adopted a report of the streets committee approving a ten-year franchise to the International Railway, Buffalo, N. Y., for the resumption of local and interurban service on the Grand and Gooding Streets lines. Service on these lines was abandoned a year ago. The franchise was granted upon the condition that the company make certain track improvements suggested by the city.

Employees Paid for Selling Stock.—In connection with the campaign for the wider distribution of its stock locally, the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, is offering a special inducement in the shape of a substantial commission to such of its employees as sell the company's preferred stock to their friends and neighbors. One month recently one of the employees received $200 as compensation for his work in selling stock. Another man received $100.

Protective Committee Formed.—A protective committee has been formed to represent the holders of the $5,000,000 of Lexington Avenue & Pavonia Ferry Railway first mortgage 5 per cent bonds of 1993. The members of the committee are: F. J. Fuller, vice-president of the Central Union Trust Company, New York; A. R. Horr, vice-president of the Equitable Life Assurance Society, and Reginald Foster, general counsel of the New England Mutual Life Insurance Company. Charles E. Sigler, 80 Broadway, New York, is secretary of the committee; the Central Union Trust Company is depository and Alexander & Green are counsel. The road is included in the system of the New York (N. Y.) Railways.

More Than One Ride per Capita per Day.—The May financial statement of the Des Moines (Ia.) City Railway shows an improvement over the month of April. Net profits for the month of May were $7,577, as against $362 for April. The number of passengers in May totaled 3,863,443, compared with 3,689,006 for the previous month. Rush-hour traffic is falling off in Des Moines if the May figures are a criterion. A drop of from 74 to 69 passengers per car is reported. Sunday and park riding is showing a considerable gain. During May there were more passengers per day than Des Moines has population, as the new census figures give Des Moines a population of 126,468 and 127,852 daily rides were registered by the city railway.

Notes Extended at 7 Per Cent.—Holders of more than 98 per cent of the 6 per cent two-year gold notes of the Birmingham Railway, Light & Power Company, Birmingham, Ala., due on April 1, 1919, have deposited the notes under an agreement dated Feb. 15, 1919, and the committee has approved the extension of the notes at 7 per cent to April 1, 1921. The committee has made arrangements for the payment of overdue interest on the notes deposited with it together with interest on such deferred payments up to May 10, and holders of the undeposited notes who now decide to send their notes in for deposit with the committee will receive their back interest on the same basis. The time for deposit has been extended to Oct. 1 for the benefit of those who have not yet come in under the plan.

Seven per Cent Notes of Michigan Company Offered.—Edgar, Ricker & Company and Marshall & Ilsley Bank, Milwaukee, Wis., are offering at a price to net 8 per cent, according to maturity, $200,000 of secured convertible serial 7 per cent notes of the Escanaba Power & Traction Company, Escanaba, Mich. They are dated May 1, 1920, and are due $50,000 each May 1, 1922, to 1925. The notes are secured by deposit of $400,000 of general and refunding mortgage 5 per cent bonds. The company is the successor to the Escanaba Traction Company organized in 1909 as a consolidation of the Escanaba Power Company and the Escanaba Electric Street Railway. The present appraised valuation is $1,910,500. The company has $729,000 of bonds and $200,000 of notes outstanding.

Sees No Hope of Service Resumption.—In a letter to the Public Service Commission John G. Morgan, general manager of the New York & North Shore Traction Company, Roslyn, N. Y., states in part: "We have endeavored to interest outside capital, but with no success. It is our conviction that there is no money to be had for electric railway enterprises in this city. There appears to be no further steps the officials of the company can take toward obtaining a resumption of operation. It would, therefore, seem that if the road is to resume operation, it can only come about by persons interested in the development of the community served putting on foot a plan to secure this service. Any such movement will have our fullest co-operation, and we have no doubt that the property can be acquired at a very small figure."

Traffic and Transportation

Referendum on Fares

Seattle Municipal Railway Advance May Be Held Up—Suspension of Service Likely

If the fare increase on the lines of the Seattle (Wash.) Municipal Railway, set to become effective on July 19, is delayed by the circulation of the referendum petition calling upon the Council to submit the fare problem to the voters, the railway may be tied up and 2,300 employees may be unable to cash their pay warrants after July 25.

Ed Terry, City Treasurer, has stated that if the new 6¼-cent and 10-cent fare schedule is not put into effect on July 19 he will place the railway on a warrant basis on July 25, the bimonthly payday of city employees, and that warrants issued to the railway employees on that date will be stamped "not paid for want of funds." It would then be necessary for the employees to cash their warrants at local banks.

Representatives of the Seattle Clearing House Association have informed Mr. Terry that they will not honor railway warrants unless they can be assured the paper will not accumulate without being redeemed at some fixed date. As the matter stands now, according to Mr. Terry, the city can give the bankers no such assurance.

Since the railway began to run behind, the city treasury has been cashing warrants as pay to railway employees with the result that the overdraft against the railway on the treasurer's books now stands at approximately $500,000.

Mr. Terry cited on this point the clause in the ordinance providing for the acquisition of railway lines, which reads as follows:

> The city of Seattle further binds itself to establish and maintain rates for transportation upon such municipal street railway system which shall provide sufficient revenue to permit such sums being paid into such special fund which the city has pledged to be set aside semi-annually for interest, and annually for principal, to be applied for the payment of principal and interest of the bonds herein authorized, until such bonds have been paid in full, and in addition thereto all costs of operation and maintenance, and all bonds, warrants and indebtedness for which any revenues of such system have heretofore been previously pledged.

Mr. Terry says:

> On the strength of this stipulation the banks have been advised that moneys cannot be raised by taxation for the operation of the railway, or payment of the bonded indebtedness without the direct vote of the people. That is why they will not honor railway warrants, if it comes to that. They have no assurance that the money could be raised by taxation.

A petition calling upon the Council to submit the fare increase ordinance to a vote of the people was begun one week ago, and if approximately 6,800 signatures of qualified electors are placed thereon, the Council will be required to submit the fare ordinance either at the next regular municipal election or at a special election called for that purpose. According to the charter, the petition, if filed before July 19, the date the fare bill would otherwise become effective, will postpone fare increases on the railway until such time as the election is held on the matter.

Will War on Jitneys

Jitney competition must cease in Kansas City, Mo. This is the decision announced by the management of the Kansas City Railways after an exhaustive study of traffic conditions throughout the city. The traction officials have come to the conclusion that if the company is to continue to furnish adequate service at a reasonable rate of fare the jitneys must go. They have announced that the company will use every legitimate means at its disposal to drive the jitneys from the streets, and that to accomplish this end they will "fight to a finish."

Announcement of the company's new policy follows the completion of traffic checks by John A. Beeler. These checks showed that the buses were largely responsible for congestion in the business district of the city. Jitneys cause, by actual count, from 37 per cent to 52 per cent of the downtown vehicular congestion. Such a situation is, according to the company, not to be tolerated.

The City Council on May 24 passed an ordinance providing for a "jitney trail" around the downtown business district. Under the terms of the measure a line is established which the buses will be compelled to follow. The area within specified boundaries is described as the "congested district," from which jitneys will be barred between hours of 6 a.m. and midnight. The measure prescribes the same routes for jitneys as now exist until they reach this "congested" zone, when they will have to "hit the trail" and circle the control district.

The company announced its Anti-Jitney Campaign in a statement in a recent issue of the *Railwayan*, its official publication. This statement was concluded as follows:

> In the end the public must choose between transportation monopoly or transportation furnished by a street railway company charging the minimum fare, with universal transfers on a basis of actual service at cost, operating non-paying lines for the benefit of the growing residence districts, continuing non-rush and wol car service, and supplying the transportation needs of the city from the standpoint of the greatest good to the greatest number. The other is transportation competition. In the final analysis it will mean abolishing non-paying lines and the elimination of all unprofitable service, such as owl cars and non-rush. It will mean an increased fare without transfer privileges. It will mean transportation conducted not for the public good nor for public convenience. . . .

No Action on Louisville Request

James P. Barnes, the new president of the Louisville (Ky.) Railway, assumed his duties on July 8. Previous to his arrival the executive committee reported to Mayor Smith following three months' trial operation of the properties. The Council has been asked for an initial 7-cent fare on a service-at-cost plan. The ordinance also provides a $2,000 salary increase for the chairman of the Board of Public Works, and $1,500 for each member, this additional salary to be paid by the railway and the board to become an executive body to aid in the management of the company.

The members of the Board of Councilmen and Aldermen appear to be strongly opposed to the plan. After a meeting of the members of the upper and lower boards on July 8 with nine Aldermen present and twenty-one of the twenty-four councilmen in attendance it was reported that practically all of the thirty men opposed the ordinance. Several members contend that service-at-cost is good for the company, and not the public. Objection was also raised to the city going into the railway business. Another objection was that under the service-at-cost arrangement the Board of Public Works would practically be placed in the position of employees of the railway.

No action is expected before the next regular meeting on July 20. The matter is now in the hands of the railroad committee of the General Council.

City Appeals Milwaukee Fare Increase

An appeal by the city of Milwaukee, Wis., from the recent order of the Wisconsin Railroad Commission granting the Milwaukee Electric Railway & Light Company an increase in the rate of fare within the single fare area was filed on July 8, 1920, in the Dane County Circuit Court at Madison. According to the City Attorney of Milwaukee the appeal is brought to preserve old questions that are pending before the courts. These are the claims that the company has $4,500,000 in excess earnings and that the 1900 franchise, which provides that the fares shall not exceed 5 cents, is a contract.

An additional point which will be raised in the appeal, according to the City Attorney, is that the earnings of the electric lighting and steam heating departments should be considered as earnings of the company as a whole in determining whether or not it is making a reasonable return on the value of its railway property. The contention is that these departments are mere agencies for the merchandising of byproducts. If it is found that in all of these departments taken together the company will be making a reasonable return, with new wage scale in effect, an increase in fare is not justified.

The order appealed from was reported in detail in the ELECTRIC RAILWAY JOURNAL of July 3, page 42.

New York Situation Complicated

Recent Decision by Court of Appeals Appears to Have Added to Rate Uncertainty

The decision on July 7 by the New York Court of Appeals on the B. R. T. fare case has complicated the situation in New York City as regards fare increases. The decision denied the jurisdiction of the Public Service Commission over fare clauses in franchises granted between Jan. 1, 1875, and July 1, 1907, with three exceptions. The first reaction of the interested parties, the Brooklyn Rapid Transit Company, the Public Service Commission and the city, was one of satisfaction, according to published statements, in that each party considered it had won.

THE decision closely follows the Niagara Falls case and the International Railway where the vital clause reads as follows:

> We are now urged to hold that the Legislature intended to delegate the power to the Public Service Commission to modify the rates prescribed in the contract between the local authorities and the railroad company, against the protest of the municipality, notwithstanding the refusal of three successive legislative bodies to accede to such demand for delegation of power. This we are not prepared to accede to.

The court in rendering a decision on the B. R. T. fare case states:

> The petitions of the appellants to the Public Service Commission requested an order authorizing the appellant to charge and collect a cash rate of fare of 8 cents for the transportation of passengers "between any two points of any of said lines of railroad" of the company. We construe this as an application for an increase of fare on the entire route and so the record shows that it was construed by counsel.
>
> We think the following classes of franchises fall outside the scope of our decisions in in re applications of the City of Niagara Falls vs. Public Service Commissions of the State of New York for the Second District and the International Railway Company, decided herewith;
>
> Matter of Quimby vs. Commission, 223 N. Y. 244:
>
> 1. All franchises granted directly by the Legislature.
> 2. All franchises granted by municipal authorities prior to Jan. 1, 1875. Such franchises are subject to proper legislative regulation.
> 3. All franchises granted by municipal authorities subsequent to the passage of the Public Service Commission law on July 1, 1907.
> 4. The following franchises granted between Jan. 1, 1875, and July 1, 1907:
>
> (a) The franchise granted in and by the consent of the Common Council of the city of Brooklyn to the Atlantic Avenue Railroad, dated March 13, 1882 (now a part of the Nassau Electric Railroad Company).
>
> (b) The franchise granted in and by the consent of the Common Council of the city of Brooklyn to the Prospect Park & Coney Island Railroad dated Dec. 21, 1885, consenting to the construction of a line on Park Avenue and other streets in Brooklyn.
>
> (c) The franchise granted in and by the consent of the Common Council of the city of Brooklyn to the Nassau Electric Railroad dated June 19, 1893, covering a number of lines as therein stated.
>
> The orders, therefore, should be affirmed without prejudice to the right of the relator to make separate applications as to the franchises which come within the jurisdiction of the Public Service Commission as herein indicated.

According to one interpretation of this decision many complications will result, as the decision seems to indicate fare increase hearings on individual parts of a system with resultant delays and costly litigation and, in case fare increases are granted, a question as to a workable plan for applying the increases to the system as a whole.

In commenting on the decision Corporation Counsel John P. O'Brien stated:

> The franchises which fall outside the scope of the Rochester ruling are so few and so interwoven with franchises, which are plainly controlled by the decision, as to make it practically impossible to work out any increase in fares upon any of the systems of the street railways within the city.

Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, commented on the decision as follows:

> It is impossible, in the short time now at my disposal, to apply the decision of the court to each of the lines and separate the different franchises so that the one class which is not under the jurisdiction of the commission can be put by itself. All but a very few of the franchises of these three companies are held to be without the jurisdiction of the Public Service Commission. I shall immediately comply with the privileges extended to me by the court and present to the commission proper application for action in respect of the franchises over which the commission has jurisdiction. Of course, the opinion of the court only dealt with surface lines because only applications of surface line companies were under review. The decisions, therefore, do not directly affect the subway or elevated lines.

The New York *Times* of July 9 editorially says of the decision:

> The first prospect is for more litigation and more decisions in some years more, years having been wasted in finding out how to begin. It is certain there is no use in expecting permanent benefits by orders contrary to good business management of a matter which is rightly more a matter of business than of law. Nothing prevents reasonable men from altering a contract, and when a contract cannot be altered because one of the parties to it will not consider the matter for reasons outside the contract, that is unreasonable conduct. By standing immovable on its subway contracts the city has stopped the construction of the very roads on which it demands that a nickel fare shall be charged. The one sure thing is that, whatever the law in any particular case, the people will not long get more than they pay for, including a profit to the suppliers of the service, which is valued more as it takes its flight.

Public Service Commissioner Lewis Nixon stated that the decision was a complete victory for the commission. He believed that twenty-four companies in the city in whole or in part would be under the jurisdiction of the commission as regards rates.

Asks Increase in Illinois

Facing a greatly increased labor charge from the 70-cent-an-hour wage scale allowed trainmen by a board of arbitration recently, the Tri-City Railway of Illinois has been forced to petition the Illinois Public Utility Commission for an emergency fare of 8 cents and for a permanent fare of 10 cents with three tickets for a quarter.

This action was predicted by C. E. White, who represented the company on the board of arbitration. He refused to sign the majority report of the board, holding that the 70-cent wage scale would compel a raise in fares.

This increased revenue must be secured or the current payroll with its big advance cannot be met, company officials state. They asked that the emergency fare take effect July 10 and that the hearing on the permanent fare be set as soon thereafter as possible.

Only recently the commission granted the company an extension of the 7-cent fare to Sept. 30.

The municipalities of Moline, Rock Island and East Moline, Ill., which will be affected by the increased fare, while not objecting to the 70-cent wage award, have announced that they will fight an increase in fare.

The company will have to ask for an increase in fares in Davenport, but will take no action until the audit and appraisal now being conducted by the city on all public utility companies is completed.

Company officials hold that the City Council of Davenport must grant increased rates at that time, as their own figures will indicate both the railway and other local utilities are not receiving a sufficient return on the investment under present rates.

Eight Cents Now Proposed

Detroit United Railway Would Change the Fare on Non-Franchise Lines —Company's Books Opened

The Detroit (Mich.) United Railway has given notice that it will establish a new rate of fare at 8 cents for cash fares and seven tickets for 50 cents, effective at midnight on July 31. The new rate is asked on all non-franchise car lines in the city in an amendment filed to its bill in the case pending before Judge Jayne in the Circuit Court.

The court is asked to decide whether or not the proposed rate of fare is reasonable. An injunction is asked by the railway to restrain the city from passing on the reasonableness of the rate of fare and it is also asked that the city be enjoined from urging the people not to submit to the fare.

The company's action is considered by Corporation Counsel Wilcox as a step in following out the agreement reached by the city and the company in recent conferences with the court. The action is taken, it is believed, to establish a legal issue in Judge Jayne's court on which the court can determine if it has the authority to pass on the reasonableness of any fare, and if such authority is vested in the court a uniform rate of fare for all city lines can be fixed which will yield revenue sufficient to pay the company a fair return on its investment.

The city will file an answer to the company's amended cross bill before July 31 asking that the company be enjoined from charging the proposed increased rate of fare, according to Mr. Wilcox. The legal issue thus established will be threshed out in the court.

In accordance with the agreement, the Detroit United Railway will open its books for examination by the court. A uniform rate of fare will be suggested by the court to apply on all lines, both franchise and non-franchise. Both the city and the company have agreed to abide by the court's decision, although both sides reserve the right to cancel their agreements at any time. Neither side is to forfeit any of its existing rights by this agreement.

Transportation News Notes

Six Cents Asked in Wichita Falls.—The Wichita Falls (Tex.) Traction Company has applied to the City Council for permission to increase fares 1 cent. The present fare is 5 cents.

Eight Cents Asked in Bangor.—The Bangor Railway & Electric Company, Bangor, Me., has applied to the Public Service Commission to increase its rates of fare from 6 cents to 8 cents. The commission fixed on July 14 as the date for a public hearing.

Asks Seven-Cent Rise.—The Northern Ohio Traction & Light Company, Akron, Ohio, has applied to the City Council of Massillon, Ohio, for permission to raise fares on the Massillon city lines from 5 cents to 12 cents. The company proposes to sell five tickets for 50 cents.

Must Have More in Marshall.—The Marshall (Tex.) Traction Company has made application to the Marshall City Commission for authority to increase its fare from 7 cents to 10 cents. The fare was increased from 5 cents to 7 cents about a year ago on authority granted by the commission. The company asserts that it is operating at a monthly loss of $645.

Fares Increased at Calgary.—Higher fares are in force on the Calgary (Alta.) Municipal Railway. The new schedule provides for a 10-cent cash fare, and a system of tickets graduated up to twenty tickets for $1. It was adopted in an endeavor to avoid the deficits that would be shown if a sufficient sum for depreciation were charged.

Supervisor for Trenton Utilities.—The office of supervisor of public utilities has been created by the city of Trenton, N. J. The supervisor will have as his duties the work of inquiring into complaints relative to the operation of electric railways and other public service corporations. No appointment has yet been made for the position.

Ten Cents Asked in Aurora.—The Aurora, Elgin & Chicago Railroad, Aurora, Ill., has petitioned the Illinois Public Utilities Commission for an increase in fare on its lines in Aurora and Elgin from 8 cents to 10 cents. The fare increase is asked to enable the company to meet the new wage scale recently granted the employees of the system.

Tokens in Buffalo.—Arrangements are being made by the International Railway, Buffalo, N. Y., for the substitution of metal tokens instead of the tickets now issued at the rate of four for 25 cents. It is planned to make the change about Aug. 1. The metal tokens would be placed in the fare boxes. The high cost of printing tickets is given as one of the reasons for making the change.

Seven-Cent Zones Allowed. — The Board of Public Utility Commissioners of New Jersey has issued an order allowing the Monmouth County Electric Company to increase fares from 6 cents to 7 cents in each of its zones. The rate was originally 5 cents, but was increased by the order of the commission last October. The company had asked for an 8-cent fare. The railway is in the hands of receivers.

Special Edition of "Two Bells."—The patriotism of the employees of the Los Angeles Railway is reflected in the Fourth of July edition of *Two Bells*, the railway's publication. Both in appearance with its red, white and blue border and in its contents, where the brave deeds of its men during the World War are heralded, No. 5 is an interesting pamphlet for those inside and outside of railway concerns.

Wants More on Narrow Gage.—The Boston, Revere Beach & Lynn Railroad has petitioned the Massachusetts Department of Public Utilities for authority to discontinue the commutation tickets it is now selling on its narrow gage electric line in Winthrop at the rate of ten rides for 85 cents. As two tickets are now collected for each ride between Boston and Lynn, the change petitioned for would entail a 20-cent fare.

Seeks More on Penn Line.—Notice of an advance in fares from 8 to 10 cents and of an increase in the rate for workmen's tickets from 5⅓ cents to 7 has been filed with the Pennsylvania Public Service Commission by the Lykens Valley Street Railway operating between Lykens, Dauphin County, and Reinerton, Schuylkill County. The new rates become effective July 1 and remove all limitations on workmen's tickets, making them good until used.

Asks Ten Cents in Lewiston.—An increase in fare from 7 cents to 10 cents is asked in a petition filed recently with the Maine Public Service Commission by the Androscoggin & Kennebec Railway, Lewiston, the successor to the Lewiston, Augusta & Waterville Street Railway. The company's petition points out that there was a deficit of $62,682 during the first five months of the year and that the increase is necessary to the continued successful operation of the road.

Hearing on Rate Petition.—H. C. Dillon, examiner for the Illinois Public Utilities Commission, recently heard petitions of the East St. Louis & Suburban Railway, East St. Louis, for permission to increase rates. The value of the company's property was placed at $1,988,962 by H. E. Bartlett, engineer for the commission. Officials of the company stated this valuation was too low. This petition for permission to increase rates has been before the commission since 1918.

Wants Youngstown Fares Reduced.—Street Railway Commissioner W. L. Sause has demanded that fares on the Youngstown (Ohio) Municipal Railway be reduced from 9 to 8 cents as the result of alleged disclosures made by the arbitration proceedings to determine an operating and maintenance allowance for the railway, which operates under a "service-at-cost" franchise. The carfare was raised to 9 cents about four weeks ago.

Increase on Interurban in City Sustained.—The Appellate Division of the Supreme Court declared on July 2 that the New York, Westchester & Boston Railway has the right to charge a 7-cent fare within the limits of the city of New York. It operates lines between the Harlem River and points in Westchester County. The court decided that the Public Service Commission has authority to permit the collection of such fare within the boundaries of this city.

Troy Lines Going Behind.—The United Traction Company, Albany, N. Y., has filed a petition at the city clerk's office in Troy, asking that the Troy Common Council repeal the ordinance limiting the fare to 7 cents and enact one that will allow the company to petition the Public Service Commission for an increase. The amount was not mentioned. It is believed in Troy that the company will ask a 10-cent rate. In its petition the company notified the city that it has a deficit of $100,841 so far this year.

Ten-Cent Fare Put Off.—On June 16 the period of five months expired in which the city was to agree with the Tacoma Railway & Power Company, Tacoma, Wash., upon a new rate of fare. When notified by the Public Service Commission that the time limit set by it was up, the city obtained from the company an extension until July 2, when the matter will go before the commission for argument. In view of these circumstances, the plan to put the 10-cent fare into effect has been postponed for the present.

Bus Compromise Reached.—As the result of an agreement reached between Grover A. Whalen, Commissioner of Plant & Structures of New York City, and John J. Kuhn, receiver of the Richmond Light & Railroad Company, operating on Staten Island, municipal bus routes paralleling the company's lines will be allowed to continue operation for the present. The buses will also be permitted to run on the viaduct where the company has exclusive rights. The arrangement was made with a view to serving the needs of the Staten Island public.

Fare Increase Necessary in Syracuse.—So far as the Syracuse lines of the New York State Railways are concerned the wage award referred to in the ELECTRIC RAILWAY JOURNAL for July 3 will add $361,000 to the platform expenses of the company for the coming year. The present 6-cent fare will be inadequate to meet this added charge.

The company has estimated that at least 8 cents from each passenger will be required. As an alternative to such charge a service-at-cost arrangement has been suggested.

Fares Up on Interurban.—A ruling by the Missouri Public Service Commission on June 10 granted an increase of rates to the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, on the Savannah interurban line. The company is authorized by the commission to put into effect for a period of seven months from July 1 the following schedule: St. Joseph to county line, 10 cents; to Avenue City stop, 16 cents; to Holland stop, 24 cents; to Young stop, 30 cents, and Savannah, 36 cents. At the end of seven months the schedule must be reduced to the present rates.

Seven Cents in Grand Rapids.—A 7-cent cash fare was placed in effect on the lines of the Grand Rapids (Mich.) Railway on June 24. On the same date the company began rerouting a number of its lines. Tickets are sold on the cars and in drug stores throughout the city at the rate of sixteen for $1. The fare formerly was 6 cents. The increase was authorized by the City Commission on May 24, the company at the same time being ordered to improve its service. The commission reserves the right to revoke the higher fare grant if the service furnished by the railway is not improved.

Accepts Six-Cent Fare Grant.—The Texarkana Traction Company, operating in Texarkana on both sides of the Texas-Arkansas State line, which recently sought authority from the city governments of both parts of Texarkana to increase its fare from 5 cents to 7 cents, has declined to accept the 6-cent fare offered by the Arkansas side of the city. The proposed increase is to remain in effect for six years, and then the fares were to revert to 5 cents. The Texas side of the city was also disposed to offer a 6-cent fare to be effective for six years, but it has as yet taken no official action to that effect.

Auto Drivers Warned.—Automobile owners of San Diego, Cal., have received from the San Diego Electric Railway a circular letter advising them that they are liable for damages suffered by occupants of their cars involved in an accident. The company points out that it has been determined by the court that the owner of an automobile who invites another to ride with him is personally responsible for his safety. Although the company's financial condition has improved considerably since the introduction of the two-zone system last January, it is at present running short of actual operating requirements by $500 a day.

Wants Fare Increase in Sandusky.—A 7-cent fare, with four tickets for a quarter, is facing the citizens of Sandusky, Ohio, on the city lines there operated by the Lake Shore Electric Railway. City Commissioners have been asked to ratify this change in fare at their next meeting. The present fare is 5 cents, with six tickets for a quarter, and free transfers. The transfer privilege would be continued under the new fare arrangement. F. W. Coen, vice-president of the Lake Shore, declares the company cannot meet the running expenses of its city cars unless the increase is granted by the commissioners.

Wants 10 Cents in Durham.—Claiming that it lost $61,452 on its investment during 1919, the Durham (N. C.) Traction Company has filed a petition with the State Corporation Commission asking that it be allowed to increase its fares to 10 cents, or sell three tickets for a quarter. The petition of the company points out that in 1915 the net income from operation of its system in Durham lacked $16,000 of meeting the 8 per cent allowed for its investment. These figures were doubled in 1916. A slight reduction was registered the next two years due to the increase of the fare from 5 cents to 7 cents, but the figures again jumped in 1919 when the total loss on the investment value was about $61,000.

Mayor a Central Figure at Hearing.—Hearings have been resumed in the petition of the Georgia Railway & Power Company, Atlanta, Ga., before the State Railroad Commission, in the company's quest for increased fares and increased rates for gas and electricity. The case seems to have developed into a two-cornered fight with the company on the one side and Mayor James Key and Joel Hurt, a former president of the railway which was acquired by the reorganized corporation, on the other side. Preston S. Arkwright, president of the company, testified that the Mayor's enmity toward the company dates from 1904. The company is seeking to increase its fares from 6 cents to 8 cents.

New York Transfer Charge Continued.—Alfred M. Barrett, Acting Public Service Commissioner, signed an order on July 6 continuing indefinitely the permission given a year ago to the New York Railways to charge 2 cents for transfers at 99 of the 113 points of the system throughout the city where free transfers once were issued. In continuing the privilege Commissioner Barrett acted upon a report by officials of the commission that an additional charge for transfers was still necessary for the prosperity of the company. Instead of extending the privilege for a year, however, the commissioner made it for an indefinite period so that it could be withdrawn at the will of the commission.

Beach Riders to Pay More.—The Atlantic City & Shore Railroad, Atlantic City, N. J., has received permission from the State Board of Public Utility Commissioners to raise its fare from 6 cents to 7 cents. The Central Passenger Railway, operated by the Atlantic City & Shore, has also been authorized to raise its fare and to sell tickets good for 100 rides between Atlantic City and Longport for $7.50. The new rates went into effect on July 1. The board has refused permission to the Jersey Central Traction Company, Keyport, to raise its fare from 7 cents to 10 cents in each zone. The board has also denied an application of the Monmouth County Electric Company, Red Bank, for an increase in fare from 7 cents to 8 cents.

Court Refuses to Restrain Fare Advance.—Supreme Court Justice Tierney has denied the application of the city of New York for an injunction to restrain the Richmond Light & Railroad Company, Staten Island, N. Y., from charging more than a 5-cent fare. Under an order of the Public Service Commission, which the Corporation Counsel asserts is in violation of city contracts, the railroad is now collecting an 8-cent fare on its lines. Justice Tierney also handed down a decision refusing the city's petition for a writ of prohibition to forbid the Public Service Commission from entertaining the application of the Staten Island Midland Railway which has not operated its cars since Jan. 2, to permit the company to charge an 8-cent fare. The court held that some of the franchises under which the companies in Staten Island are operating do not require the carrying of passengers over all parts of the line for a single fare of 5 cents. Some of the franchises have no condition as to fare.

"Jim Crow" Law Upheld.—The Supreme Court of the United States has handed down a decision upholding the provision of a "Jim Crow" law of the State of Kentucky so far as it affects the lines of the South Covington & Cincinnati Street Railway and the Cincinnati, Covington & Erlanger Railway, a subsidiary, Covington, Ky. The company was indicted for violating a statute requiring companies operating railroads in the State to furnish separate coaches or cars for white and colored passengers. The company appealed to the United States Supreme Court from the Court of Appeals of the State of Kentucky, alleging that it was an interstate carrier and so did not come within the provisions of the act. In support of this contention it was stated that the company was engaged in interstate commerce, carrying passengers between Cincinnati and the cities across the Ohio River, and that 80 per cent of the passengers carried were interstate. The reply made by the State and expressed by the Court of Appeals was that the railway is a Kentucky corporation and by its charter was given authority "to construct, operate and manage street railways in the city of Covington and vicinity." The Supreme Court held that there was a distinct operation in Kentucky, authorized and required by the charter of the company, and it was that operation which the act in question regulated, and, therefore, the latter was not a regulation of interstate commerce.

Legal Notes

ARIZONA—*Liability for Negligence Resulting in Aggravation or Recurrence of Disease.*

Where a person suffering from tuberculosis was thrown from a car, the railway cannot claim immunity for its negligence resulting in recurrence or aggravation of the disease, because the passenger was already suffering from it; the gist of the action being the loss suffered by the injured person, caused by the defendant's negligence. [Tucson Rapid Transit Company vs. Rubiaz, 187 Pacific Rep., 568.]

CONNECTICUT—*Employment of Incompetent and Inexperienced Trainmen Not in Itself Negligence.*

In an action for injuries to a man on the track, an instruction authorizing the finding of negligence because of the employment by the railroad of inexperienced and incompetent trainmen, without regard to whether the accident was the result of some negligent act of the trainmen, was prejudicial error. [Carlson vs. Connecticut Company, 108 Atlantic Rep., 531.]

MINNESOTA—*City Collecting Cost of Street Paving from Property Owners Cannot Recover from Railroad.*

After a city has assessed the cost of repaving a street on abutting property owners and has thereby become fully reimbursed for its expenditure it cannot require a railway company to pay the cost of the paving done on the portion of the street occupied by its tracks. [City of Duluth vs. Duluth Street Railway, 176 Northeastern Rep., 47.]

MISSOURI—*The Creditor of a Corporation Whose Assets Have Been Transferred to Other Creditors Without Consideration Could Follow Assets.*

Where a corporation took over the assets of another corporation having the same officers and almost identically the same directors and stockholders without payment of full consideration therefor, and where the difference between the amount paid and the actual value of the assets received was in excess of the claim of a judgment creditor of the latter corporation, the judgment creditor could have his claim satisfied out of the assets of the first corporation. [Johnson vs. United Railways, 219 Southwestern Rep., 39.]

MARYLAND — *Obstruction Caused by Newspaper Bundle Thrown from Car.*

In an action against an electric railway company for the death of a motor-truck driver, the wheel of whose truck ran upon a bundle of papers thrown from a north-bound street car, where the real issue in the case was whether the truck driver was guilty of contributory negligence in that the periodicals were lying in the street long enough to have given him an opportunity to avoid them, the court did not err in charging the jury to render a verdict for defendant if they should find "that there was no north-bound car immediately opposite or ahead of the truck at the time the truck struck the bundle of papers." [Kaufman Beef Company, et al., vs. United Railways of Baltimore, et al., 109 Atlantic Rep., 191.]

KANSAS — *Passenger in Automobile Who Could Have Seen Approaching Car in Time to Warn Driver, But Who Did Not, Cannot Recover for Injury.*

A mature person, who attempts to cross an interurban railroad track without taking any precautions for his own safety, while riding in an automobile with another who is driving, cannot recover damages for injuries sustained in a collision with a car on the track, when by looking he could have seen the approaching car in time to have warned the driver of the danger. [Kirby vs. Kansas City K. V. & W. Railway, 186 Pacific Rep., 744.]

MASSACHUSETTS—*Railroad Held Not Negligent in Moving Car Past Place Where Chemical Solution Was Dripping.*

Unless the motorman and the inspector of an elevated railroad knew that chemical compound dripping from the scene of a fire on the elevated structure would probably cause harm to any one it touched, they were not negligent in ordering an open surface car with a passenger aboard to go forward under scene of fire, though drops of solution had not ceased to trickle from structure. [Flaherty vs. Boston Elevated Railway, 126 Northeastern Rep., 798.]

NEW YORK—*Accident to Person on Crosswalk.*

A pedestrian having waited until an approaching street car stopped a yard away, it could not be said as a matter of law that she was guilty of contributory negligence in advancing to cross ahead of it, on a cross-walk, as she could assume the motorman would look before restarting the car. [Lipshitz vs. Third Avenue Railway, 179 New York Supp., 631.]

ILLINOIS—*Presence of Banana Skin on Stairway Insufficient to Support Recovery for Injuries.*

The mere presence on a stairway or stairway landing leading to a station of an elevated railway, of a banana skin on which a passenger leaving the station slipped, did not show negligence, in the absence of evidence of actual knowledge of its presence, or evidence that it had been permitted to be there for a sufficient time that notice might be implied. [Davis vs. South Side Elevated Railway, 127 Northeastern Rep., 66.]

New Publications

Direct Current Motor and Generator Troubles: Operation and Repair

By T. S. Gaudy and E. C. Schacht. Published by McGraw-Hill Book Company, Inc., New York, N. Y. 265 pages.

A practical work for engineers and operators. The book gives a very thorough treatment of motor and generator troubles with remedies and is written in an able manner by experienced men. The book should appeal to the operating engineer and electrician and be useful as a reference book in the technical schools.

Proceedings of Canadian Safety Leagues' Convention

Report of Toronto Convention, 1920, of Ontario Safety League and Canadian National Safety League. Issued by the leagues, 189 St., Toronto, Ont.

The two safety leagues mentioned have issued in pamphlet form the proceedings of a three-day safety convention held at the King Edward Hotel, Toronto, April 13 to 15, 1920. There were fifteen papers read on industrial safety, and an address on the safety movement was delivered by R. M. Little, director Safety Institute of America.

Visualizing Citizenship

By Ina Clement, Municipal Reference Library, City of New York, 32 pages.

In this pamphlet the author has included a list of motion picture films, devoted to civic education and classified according to subject. Its purpose is to give an opportunity to those interested to arrange for the presentation of films for educational purposes. Under public utilities are classified several reels on steam railroad electrification, and a reel on the large steam turbines in the Interborough Rapid Transit power station. "Fares, Please," under which title the safety car film is listed, is also mentioned.

United States Bureau of Standards, Washington, D. C.: Circular No. 83 on Specifications for the Manufacture and Installation of Railroad Track Scales. This circular comprises specifications for the manufacture and installation of railroad track scales to establish a standard for the ordinary railroad freight car weighing throughout the United States. They were prepared by a committee representing the American Railroad Association, the American Railway Engineering Association, the Railroad & Warehouse Commission of the State of Minnesota, the National Scale Men's Association, the Scale Manufacturers Association and the Bureau of Standards. This circular may be obtained upon request to the Bureau free of charge.

Personal Mention

Louisville Welcomes "Jim" Barnes

"Jim" Barnes, known the country over to electric railway men, has taken up his new duties as president of the Louisville (Ky.) Railway. He is making no predictions. Louisville has looked Mr. Barnes over and seemingly approves. To his many friends the following impression of Mr. Barnes from a Louisville paper should prove of considerable interest:

> Mr. Barnes looks business and means business. He is the typical "all business" New Yorker, talking just enough to be affable, bald except for a slight fringe of hair beginning to show touches of gray, wearing shell-rimmed glasses, somewhat heavy as to chin and jaw, possessing the comfortable rotundity of a Colonel, tipping the beam at 207 pounds and carrying his flesh well distributed over a height of six-feet-one.
>
> Mr. Barnes arrived in town last night, coming from Schenectady, N. Y., where he had been general manager of the traction system. He did not make any ill-considered statements about the street-car situation here, but indicated that he wished first to accustom himself to his new surroundings.
>
> The meeting of the retiring and incoming presidents was such as to make a lasting impression on the six or seven company officials who were present. Mr. Minary, with the good nature that has characterized him during the last four months and its important changes, gripped his successor's hand, looked up at his serious face and with a suggestion of a quaver in his voice, assured him of his utmost desire to co-operate with him, adding:
>
> "My heart goes out to any man who must take the responsibility of the management of a street-car company."
>
> Members of the executive committee who have had charge of operation of the system during the trial period of four months named by Mayor Smith expressed their confidence in the man whom they have selected as the head of the company.
>
> "We think he ranks not only next to the best, as one newspaper reported, but is absolutely the best street-car executive in America," said W. S. Speed, chairman of the committee.
>
> "Yes, that's why we got him," said John W. Barr, member of the committee.
>
> "He is the pick of the country, for we certainly looked them all over," said W. H. Kaye, member of the committee.

James Hamilton, Master Mechanic

James T. Hamilton, recently appointed master mechanic of the New York, Westchester & Boston Railway, was born in Howard, R. I. He received his education in the Cranston High School and the Bliss Electrical School of Washington, D. C. Mr. Hamilton has had broad experience in electrification work. During his summer vacations while at college he was on construction work for the Standard Electrical Company of Providence. In September, 1913, he entered the electrical department of the New York, New Haven & Hartford at the Van Nest Shops, Van Nest, New York. In this department he later was appointed electrical inspector. On May 1, 1917, he became chief inspector. It was in this capacity that he was assistant to the shop superintendent and later through changes in the organization he became assistant to mechanical superintendent. Before taking up work with the New Haven, Mr. Hamilton had been engaged on electrification work with the Westinghouse Electric & Manufacturing Company. Mr. Hamilton succeeds R. R. Potter, who has become connected with the Hudson & Manhattan Railroad, as noted in this paper for June 12.

Mr. Lamb Superintendent of Kansas Interurban

O. S. Lamb has recently been made general superintendent of the Kansas City, Kaw Valley & Western Railway, with offices at Bonner Springs, Kan. Prior to this Mr. Lamb was superintendent of the Union Depot Bridge & Terminal Company, resigning this position the last of April, 1920, to become connected with the Kaw Valley & Western Railway.

O. S. LAMB

Mr. Lamb is known to electric railway men as one of the most capable and efficient operators in the Middle West in his line. Before 1907, when Mr. Lamb entered the electrical field, he was a machinist in railway shops and held a number of responsible positions. In 1907 he joined the Waterloo, Cedar Falls & Northern Railway at Waterloo, Iowa, as master mechanic. Subsequently he took charge of the road as general superintendent, retaining his connection in this capacity until 1917, when he resigned to accept the position of superintendent of the Kansas City & Northwestern Railway. Later in the following year he became connected with the Union Depot Bridge & Terminal Company. Mr. Lamb, in accepting the position of general superintendent of the Kansas City, Kaw Valley & Western Railway, succeeded J. L. Moss, who is now acting as chief engineer of that line.

H. R. Mallison has been appointed purchasing agent of the Montreal (Que.) Tramways.

William J. Rausch has been made chief inspector at the Brooklyn Bridge depot of the Brooklyn (N. Y.) Rapid Transit Company.

V. R. Shick has succeeded G. M. Patterson as traffic manager and purchasing agent of the Fort Wayne & Northwestern Railway, Kendallville, Ind. Mr. Shick has also been made auditor of the company.

John Mooney, depot master of the Flatbush Avenue depot of the Brooklyn (N. Y.) Rapid Transit Company, has been promoted to the position of acting division superintendent at the Flatbush Avenue division.

Dennis J. Cullinan, track foreman, will soon retire from the employ of the Bangor Railway & Electric Company, Bangor, Me., after twenty-five years of service. He had previously worked for the Maine Central Railroad for sixteen years on track work.

William Walker, who recently became connected with the Hartford & Springfield Street Railway, Warehouse Point, Conn., has been given the title of general manager of the company. In an announcement of Mr. Walker's appointment published in the ELECTRIC RAILWAY JOURNAL for June 26, it was stated that he had been made superintendent of the road.

Joseph A. Lyons returned from New York City to Marlboro, Mass., on July 1 to retire from business. Mr. Lyons has accomplished some very big tasks in electric railway construction. Among big contracts handled by him were the Fresh Pond Yard of the Brooklyn Rapid Transit Company, a housing plant at Pelham for the United States Government and the construction of an electric railway from North Adams, Mass., to Bennington, Vt.

Dr. Royal Meeker, United States Commissioner of Labor Statistics, has resigned and will leave for Geneva, Switzerland, July 31, to take up the duties of editor in chief of the monthly bulletin of the International Labor Office of the League of Nations. Dr. Meeker has been secretary-treasurer of the International Association of Industrial Accident Boards and Commissions since April, 1916. In June, 1919, he was appointed by the president a member of the Federal Electric Railway Commission.

Obituary

George A. Chapman, assistant general claims attorney of the Detroit (Mich.) United Railway, died on July 6. Mr. Chapman was a graduate of the University of Michigan, and before becoming associated with the Detroit United Railway was connected with the Cincinnati, Hamilton & Dayton Railroad and the Père Marquette. He entered the claims department of the Detroit United Railway in 1916.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Foreign Demand for Steel Towers Good

Deliveries Are Lengthening Because of Material Shortage, but Prices Are Steady

Steel transmission towers are reported in better demand for foreign work than for domestic. This is especially true of the large units. At the same time there is a fair demand for smaller towers, both tubular and fabricated, and in amounts for use over relatively short distances.

Although European exchange is rather unfavorable, there is some demand at this time from that source, while inquiries are good. Buying prevails in the Far East, Australia, South America and Canada.

Poor condition of traction companies and high rate of borrowing money is the reason advanced for a rather light domestic tower market. The railway companies are interested to the extent of inquiries, and are keeping their plans rather forward for new extensions, but at the last moment the signature is lacking on the dotted line.

There is a shortage of material available for poles, but more particularly for tubular poles. The pipe demand in the oil regions is tremendous, with a consequent reaction on the amount of stock that can be turned into poles. For fabricated poles, supply in some quarters is a little short because of transportation hold-ups.

Deliveries on this material are lengthening and in some cases are running up to six months. At the same time prices are holding rather steady.

Lower Prices on Window Glass Unlikely

Scarcity of Labor and Raw Materials, with Strong Demand, Have Caused Acute Shortage

Prospects of any reduction in window glass prices seem remote, according to reports from the recent annual convention of the National Association of Window Glass Manufacturers, held at Atlantic City. A 50 per cent reduction of domestic production during the war, together with a shortage of labor and certain raw materials and an almost total suspension of the industry in Europe while fighting was going on, has conspired to bring about a serious shortage of glass. This shortage would be so acute as to amount to a famine at present were it not for the bottom having dropped out of the building market.

One of the materials used in glass manufacture is salt cake, and the war led to the discovery of many new uses for this product, one of them being the production of paper pulp. Consequently, salt cake is very hard to obtain. The seriousness of the fuel problem has also been further intensified by proposals to limit the use of natural gas in territories where the supply of this commodity was formerly thought to be illimitable.

Foreign countries are generally clamoring for glass from the United States to be used in their construction programs, but the policy of American manufacturers has been to meet home demands first. European competition is little feared as yet, since slow recovery is being made abroad from the paralysis of the glass industry induced by the war. One encouraging factor, however, is the wonderful progress being made with glass production by machine. A type which has demonstrated its practicability draws cylinders 42 ft. in length up to 31 in. in diameter at the rate of one every twenty minutes. The utmost efforts of men have only produced cylinders up to 6 and 7 ft. in length by hand. A number of machine-equipped plants are being operated during the summer in an effort to catch up with the volume of unfilled orders.

The discount for window glass, single strength, A quality, first three brackets, is 17 per cent; for the same in B quality it is 37 per cent, and for double strength, A quality, all sizes, the discount is 79 per cent. These figures compare with discounts of 77, 77 and 79, respectively, on April 1 last.

Strong Demand Features Market for Special Trackwork

Prices Are Steady and Foresight in Ordering Raw Material Has Enabled Manufacturers to Make Prompt Deliveries

A vigorous demand for special trackwork, coupled with steady prices and excellent deliveries on standard products, characterizes the market for this class of material. One of the representative manufacturers in this field informed the ELECTRIC RAILWAY JOURNAL this week that by ordering raw material six to eight months ahead he has sustained little embarrassment in production and that deliveries can be made on standard layouts in from four to six weeks. This is a very satisfactory situation compared with that prevailing in many other branches of the traction industry. It is not possible to make as good deliveries as the foregoing on special orders, corresponding to unusual or particular layouts in street networks, but even here no serious delay appears to be holding back the completion of necessary output.

Labor conditions are believed to be better in this field than in many others. Wages increased 10 per cent this last spring in one representative mill, but the management states that the output per man is well maintained and the turnover in labor is much below that experienced in some other manufacturing plants of the vicinity. Night work is being done in this plant about three times a week, and the steady conditions prevailing are a great help to both management and workmen. Part of the output of the plant goes to other than electric railway customers, but it is understood that railway payments are being received on good credit bases. The volume of business, both in inquiries and orders, is holding up to normal figures.

Prices are now about 100 per cent above pre-war figures and there seems to be no immediate prospect of their going lower in view of the high cost of labor. In 1918 the raw material prices rose to about 120 per cent above the pre-war figures, but since the armistice a reduction of about 16⅔ per cent has been attained. A good deal of renewal business is being entered on the books of special work manufacturers, and new construction held up by the war bids fair to keep up the sale of this class of equipment for some time to come. It is not customary to maintain factory stocks of special trackwork, so far as can be learned, but the railway companies make a practice of carrying more or less extra material for use in case of emergency calls. Considering the transportation situation between the steel mills and the special material mills, it is surprising that deliveries have been so well maintained to electric railways themselves. Foresight in ordering is the answer.

Electric Locomotives for the Swiss Federal Railways

The first of the fourteen electric locomotives ordered by the Swiss Government in the latter part of 1918 for the Federal Railways (Guebe Valley and Berne-Schwarzenbourg lines) has just been delivered by the builders, S. A. Brown, Boveri & Company, Baden. The new locomotive has successfully passed the tests it was subjected to before acceptance. The average force developed by the locomotive is 1,000 hp. at a speed of 25 miles per hour. The maximum speed attainable is 37 miles per hour. The current used is single phase, alternating at 15,000 volts.

Of the fourteen electric locomotives that have been ordered, seven were to be made by the Swiss Machine & Locomotive Works at Winterthur, Switzerland, and seven by S. A. Brown, Boveri & Company, Baden, Switzerland.

Trolley Cord Market Firm Under Steady Buying

Demand Prevents Quick Deliveries in Quantity—Prices Firm Despite Fluctuating Cotton Quotations

Recent ups and downs in the price of spot cotton have had little effect on the trolley and bell cord market. A representative manufacturer informed the ELECTRIC RAILWAY JOURNAL last week that the cost of yarn to him has not shown much change and that the only recent factor of importance materially affecting prices has been wage advances in the textile field. A price readjustment averaging about 5 per cent increase was put into effect by this concern a few weeks ago. Another large producer of trolley cord and bell rope has made no change in prices since February. Buying on the part of electric railways continues steady, with little increase or decrease over the first half of last year. No immediate price changes are in sight beyond those above mentioned, but in some quarters the opinion is current that if the present dullness in the textile field continues easier quotations may find their way into this branch of the supply market.

Deliveries are running about sixty days on trolley cord, although small shipments can be made very quickly in case of necessity. Factory stocks are very low. Raw material is coming to hand well, both by water routes and by rail freight, in comparison with conditions earlier in the year. Some difficulty is experienced in outward transportation from rope factories.

The higher grades of trolley cord seem to be most in demand at present. The tendency toward purchasing braided cotton cord instead of leather for bell cord continues to be a feature of the market, records of wear and tear showing satisfactory results for the braided material. Approximately the prices of trolley rope and bell cord range from 85 cents to $1.10 per lb., depending on quantity and quality of material. Inquiries are well maintained and there appears to be no present scarcity of labor worth mentioning in this particular field. One of the factors which bears a direct relation to production, however, is the partial shutdown of New England textile mills, with a consequent freeing of supplies of raw cotton needed for bell cord.

Lead Cable Being Bought in Good Volume

Some Mills Booked So Far Ahead Utilities Hesitate to Order at This Time

Power cable orders are being received by the mills in good quantities. Shipments are being quoted in increasingly longer terms, running from three to eight months for paper and lead cable and from six weeks to four months for varnished-cambric and lead cable. A tendency is noted for the orders to run into larger sizes of cable, which forms some check on reports that fiber-conduit orders are also running to larger sizes.

The Middle West is providing the best market, but fair-sized orders are coming from New England, the Atlantic States and the South. Some good orders are coming from electric railroads and street railway companies in the East, South and Middle West.

In at least one case paper-cable producing capacity is sold throughout the best part of the present year, and no orders will be booked beyond Jan. 1, 1921. At the same time, many utilities are unwilling to book orders for shipment as long as six months. Utilities of regular standing at the mill, however, are generally able to squeeze in an order, if necessity warrants, where an outside customer would have to wait his turn.

An interesting trend toward standardization is found in the orders from utilities. Former habits of specifications all their own are being changed, and the engineers are coming to see that they can use cable built on A. I. E. E. specifications as well as that built on their own. The mills are refusing to accept special orders in many instances, and this is helping in the standardization.

New Canadian Firm Will Manufacture Hydraulic Turbines

Rather than import much of their machinery and other apparatus from the United States and Europe, as has been done in the past, power and paper manufacturing interests in Canada have organized the Dominion Engineering Works, Ltd., of Montreal, Que., which has entered into an agreement with the William Cramp & Sons Ship & Engine Building Company of Philadelphia for the exclusive use in Canada and the British Empire of the I. P. Morris designs for waterwheels and other hydraulic machinery. Through this association the Dominion Engineering Works expects to be in a position to supply most recent designs in such equipment and of any size to meet Canadian requirements. Other lines of manufacture will include hydraulic valves, governors and other accessories involved in hydraulic installations, and centrifugal and other pumps. An almost complete independence of Canada in supplying power machinery and equipment is expected to result.

Rolling Stock

Birmingham Railway, Light & Power Company, Birmingham, Ala., will purchase nine side-entrance double truck trailers from the Sheffield Street Railway at a cost of $4,000 each.

Northern States Power Company, Fargo, N. D., placed an order with the National Safety Car & Equipment Company for fifteen new safety cars in the early part of June.

The Connecticut Company has received five more safety cars at Norwich, Conn., for use on the line taken over from the Shore Line Electric Railway of that city.

Track and Roadway

Eastern Massachusetts Street Railway, Boston, Mass.—As soon as it is approved the Eastern Massachusetts Street Railway will start at once laying double tracks on Hyde Park Avenue. It is estimated that the cost will be about $75,000.

Eastern Massachusetts Street Railway, Boston, Mass.—Repairs have been started on the Whitman line of the Eastern Massachusetts Street Railway. This section of rail was in such poor condition that immediate work on it was necessary. The many repair jobs have given an opportunity for work to the men who were thrown out of employment by the discontinuance of freight service.

Municipal Street Railway, Detroit, Mich.—The street railway commission of Detroit has given its final approval to the $1,400,000 worth of grade and steel work for the Detroit city system. This is the first step toward the municipal street railway construction as outlined in Mayor Couzen's $15,000,000 plan.

East St. Louis & Suburban Railway, East St. Louis, Ill.—Harland Bartholomew, City Plan Engineer of St. Louis, Mo., has submitted a survey of the railway situation in East St. Louis to the East St. Louis & Suburban Railway, East St. Louis, Ill. He recommended the construction of a cross-town line and the rerouting of the Rosemont line over the Eighteenth Street route, connecting at Twenty-fifth and Lynch Streets with the tracks of the cross-town line.

Northern Texas Traction Company, Fort Worth, Texas.—The Northern Texas Traction Company will double-track its interurban line between Fort Worth and Dallas, about 35 miles.

Northern Texas Traction Company, Fort Worth, Texas.—The Northern Texas Traction Company has begun the work of installing new steel and special construction at the intersection of Front and Main Streets. New track work between Sixth and Weatherford on Commerce, the Railroad Avenue and Wheeler Street connection and double tracking on the Polytechnic, Hemphill and Summit Avenue lines will be begun shortly.

Northern Texas Traction Company, Fort Worth, Texas.—The building of a car line from the present terminus of the Rosen Heights line to Lake Worth, a distance of three miles, is proposed. The matter has been taken up with the officials of the Northern Texas Traction Company. The company now maintains a line of automobile buses from the end of the car line to the lake.

Northern Texas Traction Company, Fort Worth, Texas.—The Northern Texas Traction Company is making extensive improvements on the interurban line between Fort Worth and Dallas. Ultimately a double-track line between Fort Worth and Dallas will be built. Already more than one-half the line is double-tracked, and the company is now double-tracking another long stretch and straightening curves. The work is being done at a cost of several hundred thousand dollars.

Burlington Traction Company, Burlington, Vt.—The Burlington Traction Company expects to relay two miles of track with 70-lb. steel rail, 33-ft. and 70-ft. lengths.

Monongahela Valley Traction Company, Fairmont, W. Va.—Plans are under way for the removal of the tracks in Mannington on East Market and Main Streets.

Power Houses, Shops and Buildings

Evansville & Ohio Valley Railway, Evansville, Ind.—The power house of the Evansville & Ohio Railway, located 10 miles beyond Newburgh, will be dismantled shortly and shipped to the Monterey Steel Company, Monterey, Mexico. This steel company has recently purchased same.

Schuylkill Railway, Girardville, Pa.—The Schuylkill Railway has recently constructed a new substation at Girardville, and will obtain power at 66,000 volt. The station contains two Westinghouse 500-kw. rotaries with the necessary transformer and switchboard apparatus. The transformer is a 31,000-kva., 66,000-volt to 6,600-volt. A new 500-kw. rotary has also been installed in the Frackville substation with new switchboard and transformer.

Public Service Commission of Indiana.—The Public Service Commission of Indiana has approved the schedule of power rates proposed by the city light and traction power companies. That is, for each five cent increase in the average monthly cost of coal above $3.60 per ton delivered at the power stations there will be added to the monthly bill 15-100ths of a mill per kw.-hr. over and above present power rates. There will be a similar decrease when coal is delivered at a cost less than $3.40 per ton. This coal clause became effective July 1.

Trade Notes

The Roller-Smith Company, 233 Broadway, New York City, held its annual sales conference at its works at Bethlehem, Pa., on June 14, 15 and 16.

The Habirshaw Electric Cable Company, 10 East Forty-third Street, New York City, is planning an extension, 60 ft. x 100 ft., one story, to its plant at Glenwood, Yonkers, N. Y., to cost about $30,000.

The Carborundum Company, Buffalo Avenue and Eighteenth Street, Niagara Falls, N. Y., has made arrangements for rebuilding the portion of its works recently destroyed by fire. The cost is estimated at about $50,000.

The Ajax Electric Specialty Company, St. Louis, Mo., is issuing $100,000 in 8 per cent cumulative preferred stock and $5,000 in common stock in order to permit the company to increase its facilities to handle the business in view.

The Hopewell Insulation & Manufacturing Company, Hopewell, Va., will soon place in operation a plant for the manufacture of hard-rubber, composition and molded insulated parts and high-tension insulators for wireless and transmission purposes.

J. E. Jennings, vice-president and secretary of Milliken Brothers Manufacturing Company, New York City, has recently sailed for Europe for an extended tour. The company has recently secured a large European contract for galvanized-steel transmission towers.

The Wagner Electric Manufacturing Company, St. Louis, has established a general service station at 501 Broadway, Milwaukee, Wis., in charge of S. B. Moyer. The sales office in the First Wisconsin National Bank Building, Milwaukee, under the management of F. T. Coup, will be continued.

The Westinghouse Electric International Company, East Pittsburgh, Pa., has appointed the following as foreign managers: F. M. Rodgers, London, England, European manager; J. W. White, Royal Bank of Canada Building, Havana, Cuba, manager for Cuba, and L. T. Peck, Bartolome Mitre, 754, Buenos Aires, manager for Argentina.

J. H. Williams & Company, Brooklyn, N. Y., announces that the drop-forging business and plants of the Whitman & Barnes Manufacturing Company at Chicago, Ill., and St. Catherines, Ont., Canada, have been combined and are operated by that company. The organization includes the individuals heretofore identified with both concerns.

The General Electric Company, Schenectady, N. Y., has awarded contract for construction of a one and two-story machine shop, 230 x 900 ft., at Erie, Pa. The total cost is estimated at about $1,000,000.

The Midstates Engineering Company, Westminster Building, Chicago, has recently been incorporated as consultants, specializing in industrial power and plant engineering. The engineering work will be in charge of R. J. Gaudy, president, who is known through activities with the Sessions Engineering Company and his connection with many engineering projects.

The American Insulator Company, New Freedom, Pa., with sales offices at 30 Church Street, New York City, and Detroit, Mich., announces the opening of another factory at Norwalk, Conn., in addition to expansion in production capacity at New Freedom, to meet the requirements of its rapidly increasing business.

American Brake Shoe Foundry Company stockholders have approved the plan calling for a readjustment of the company's capitalization. The proposal of the directors provides for an issue of $10,000,000, 7 per cent cumulative preferred stock redeemable at 110 at option of the company, and 400,000 shares of common stock of no par value.

Parsons, Klapp, Brinckerhoff & Douglas, formerly Barclay, Parsons & Klapp, announce the removal of their general and engineering offices from 60 Wall Street to their own building at 84 Pine Street, New York City; also the executive offices of their subsidiary and operated corporations and properties and the Parklap Construction Corporation.

The Electric Tool Manufacturing Company, Petersburg, Va., has purchased the business of the American Electric Tool Company, including patents, manufacturing equipment, good will, etc. The complete line of electric hammers will continue to be manufactured on a greatly increased scale. Louis Paulero will remain in charge as chief engineer.

The Differential Car Company, New York City, has purchased from the United States government the plant formerly operated by the Grant Motor Company, Findlay, Ohio, for the manufacture of munitions. The company, it is understood, will equip the plant for the manufacture of electrically operated dumping cars, dumping bodies for motor trucks, etc.

The Worthington Pump & Machinery Corporation, 115 Broadway, New York, announces the purchase from the Platt Iron Works, Dayton, Ohio, of their drawings, patterns, jigs, templates, special tools, good will and name on the following lines of product: Oil-mill machinery, hydraulic turbine and waterwheel line, feed-water heaters and high-pressure air compressors.

New Advertising Literature

The Metal & Thermit Corporation, New York, N. Y., has issued the third edition of its pipe welding pamphlet, No. 16. The new edition describes and illustrates how pipe welds are made and gives tensile strength and comparative cost data of Thermit pipe welds against ordinary flange connections.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
C. FRANCIS HARDING, Special Editorial Representative L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative
GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Asst. News Editor

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Lest We Forget, Let's Do It Now

NOW is the time to underline the dates Oct. 11 to 15 and to order reservations at Atlantic City. That resort is very popular and its hotels are always crowded. Hence, to avoid trouble and delay, those who intend to go to the convention should make their reservations with the hotels immediately.

Every indication points to a banner convention. There is a get-together spirit manifested this year that is very encouraging. All the committees of the association have been working hard and valuable material is certain to be presented at the meetings. Our "Daily" will be on hand as usual for the benefit of those in attendance.

Car Reconsignments Aid Coal Speculators

EVIDENCE submitted to the various committees investigating the coal situation shows that a very vital element in the situation is introduced by the speculations of coal operators and dealers through the manipulation of markets by reconsignments of coal cars.

With no reserve stocks on hand the demand for coal is so great that, even though production is almost normal, the transportation facilities are taxed to their utmost, yet evidence tends to show that speculators in the New York and Chicago districts have been keeping "tight" markets by locally reconsigning cars and barges in order to aggravate the shortage and realize large profits. While no direct action has been taken, the Interstate Commerce Commission is on record as to the desirability of the railroads prohibiting reconsignments and increasing demurrage rates.

It seems to us, in view of the coal shortage, car shortage and threatened railroad strike, that an immediate order forbidding the speculative reconsignment of cars would aid greatly in relieving the situation. The fact that coal stocks are low should not offer opportunity for profiteering in a national necessity.

The Industry Has No Disease Which a Reasonable Fare Will Not Cure

SOME curious aberrations appear in the public mind because of the demand for higher fares from the railways. Even such an astute writer as Richard Spillane takes the text of a recent paper by a railway manager as indicating the trolley car is doomed because the manager said that yearly the costs of operation and maintenance of railway operation have gone up, leaving virtually no opportunity for the operating companies to lay aside reserves. But there is no dependable substitute for the trolley car, as the citizens of Toledo and certain cities in Connecticut and eastern Massachusetts can testify, and as people can hardly be expected to walk it is safe to say that the car is not "doomed." It is still the cheapest means for popular transportation in cities, as Mr. Pardee showed in our issue of July 10 and as other competent observers have testified. All that the trolley interests want and ask for is a fair deal and that their increased expenses should be recognized in an increased fare. Statistics show that more people are riding on trolley cars than ever before. The industry is afflicted with no disease which a reasonable fare will not cure.

"Watch Your Step" Can Be Applied at Home

WE RECENTLY said that it is the sore spots in the fare situation rather than the good ones that stand out now, and this fact of itself is a healthy sign. At the same time we warned against undue optimism and decreased effort and urged those who healed the sore spots in the railway industry to be sure that they were well healed.

Now a word can well be said to those companies which at present are enjoying higher fares as the result of a realization of the facts by the public, and that is "to keep faith." We were just about to pen these words when there came to our attention a like message in a daily journal whose past record shows that it is in sympathy with the electric railways as well as conversant with the problems of the industry. It is therefore friendly, not critical, comment.

In commenting on the Bridgeport jitney situation the New Haven (Conn.) *Journal-Courier* of July 15, 1920, attributes the support given the jitneys by many people as due, at least in part, to resentment caused by remembrance of old faults in electric railway administration. "It has not been easy," the paper says, "for people to forget the arrogant attitude of trolley managements and their cold indifference to public opinion; their confidence in legislative protection rather than in public support." The passage of the Bridgeport ordinance restricting jitneys is attributed to the public's consciousness of the embarrassments which would result from a cessation of trolley service rather than any special tribute to the company. The editorial then tells the public that to nurse a grievance for past errors is useless and both public and trolley company should learn the lesson that in the future there must be a perpetual square deal. The protection now given the railway, it points out, will be worse than no protection unless in return the company maintains high efficiency with lowest possible cost. Finally it says that the company's "future must depend upon the service and the spirit in which it performs it, and not upon explanations and excuses. This we take to be the understanding that is tacitly formulating itself as the result of this struggle. The company is to do its best and the public is to keep an eye on it."

As in previous cases, we do not wish to apply this merely to the company in question, all of whose officers and men have already seen it, but for the benefit of all.

An instance of an act which, though probably merely careless, might well be taken by the public as the opposite of playing fair also came to our attention recently. It was a statement or argument which urged that, irrespective of future changes in price level, the electric railways do all in their power to maintain any increased rates of fare obtained at the present time. At the same instant, and rather incongruously, the speaker argued in favor of the service-at-cost principle, so far as it related to rate increases.

This sort of support is disingenuous and productive only of distrust of our motives on the part of the public. A perpetual square deal is needed, without equivocation.

The Electric Railways Need More and Better Publicity

WHY does the public still misunderstand the electric railway situation? This question is one which many friends of the industry find it hard to answer. During the past few years a great deal of effort has been devoted by railway men and others to explaining the issue, but a great part of the public still does not understand. Many men in responsible and authoritative positions seem bent upon distorting the facts. "I cannot understand," writes one of our readers, "why it is so hard for the railways to secure justice when the situation is so obvious and the future welfare of the communities served is so largely dependent on the fairness of the treatment which they give to their utilities."

The facts are undoubtedly obvious to railway men, but that does not mean that they are equally apparent to their neighbors who are engaged in other lines of work. They are the men to reach. Little is to be gained from publicity directed to men acquainted with the situation. Conventions at which railway men tell each other how bad the situation is do not advance materially the desired public knowledge of the situation, no matter how valuable they may be in other ways.

As we have said many times before, there is nothing mysterious in publicity work or the way of getting the facts to the public, and the message will get across finally if it is a worth-while message and it is pushed. But people are so much interested in their own affairs that they will not pay much attention to the affairs and troubles of other people, unless those who have the message to transmit assume the initiative and take some interest in becoming evangelists.

Through Service Should Be Extended, Not Disintegrated

THE advantage of through service over various connecting interurban properties has been referred to from time to time as a very desirable thing, particularly in connection with the haulage of freight by electric railways. The value of this interchange of freight between electric railways was particularly emphasized during the outlaw strike of the switchmen a few weeks back. In our issue of May 8, 1920, we commented on the extent to which freight had been shipped by way of the electric lines in the central territory and pointed out how the building of one or two surprisingly short pieces of track would greatly facilitate such through shipments. In fact, it may be said that the development of freight business in connection with electric railway lines hinges in an important way on interconnection of lines and interchange between companies. The possibilities of the development of through freight shipments has scarcely been touched.

With these thoughts in mind it is with a good deal of regret that we note that the receiver of the Buffalo & Lake Erie Traction Company has made application for and received permission from the New York Supreme Court to discontinue its lines within New York State after Sept. 1. This company's line runs along Lake Erie from Erie, Pa., to Buffalo, N. Y., and forms the connecting link between the great electric railway network of the Middle West and the lines east of Buffalo. While we fully appreciate that an electric railway property cannot be kept in operation out of sentiment if there is not enough business to justify its existence, yet in view of the possibilities of through freight development in the future it does seem that the electric railway industry should take enough pride in interconnection possibilities and in the future aspects of the freight business to find some way to keep this piece of line in operation. We regret exceedingly to see the abandonment of an important connecting link in the greater electric railway system.

Lessons from and for the Motor Bus

THOSE who have hitherto curtly dismissed the motor bus with a sniff, snort and sneer, based upon their observations of the improvised jitney breed, will find a different kind of animal when they come to the productions of the high-grade manufacturers of motor trucks and, even more perhaps, to the specialized design of the experienced Fifth Avenue Coach Company of New York.

Our overdevelopment of trackage and underdevelopment of paved highways may not yet call for any such extended interoperation of trolley and bus as is the case abroad, but we do not think it is any too early for electric railway operators to begin acquainting themselves with the best practices in the newer form of transportation. For this reason we are presenting in this issue a comprehensive abstract of the paper on "Motor Bus Transportation" by G. A. Green, general manager and engineer Fifth Avenue Coach Company, at the summer meeting of the Society of Automotive Engineers. Discussion of this frank contribution might well be divided into what the electric railway can learn from the motor bus and what it can teach to its junior in the business of transportation.

It is in discussing the possibilities of a gas-propelled car that Mr. Green says bluntly of present trolley cars: "They are as a whole built as strong as possible, not as weak as possible, which is a much more logical and economical procedure." It is true that safety-car development has been a big help toward producing a lighter car, but we still expect car designers to secure automobile weight without using automobile materials. There is also something worth thinking about in Mr. Green's remarks about one-man buses and double-deck buses. We are far from having exhausted the possibilities of the automatic one-man car. On the average interurban, for example, a short-headway service would keep the Ford on the farm a greater part of the time. Nor is it beside the mark for electric railways to consider the use of either trackless electric or gasoline one-man buses for lighter traffic conditions. As for Mr. Green's other extreme, the double-decker, we feel that if a two-story bus can be built low enough for our viaducts the same thing can and really has been done (at New York and Pittsburgh), with trolley cars. For use in ordinary traffic we have never been enthusiastic for the double-deck car, believing it slow compared with other designs of cars. But with the increases which have been taking place in the wages of the platform man every means, whether safety car, train or double-decker, which promises to increase the output per man must be kept in mind.

The splendid research organization of the Fifth Avenue Coach Company fortunately is an expense from which electric railways are almost entirely free because of the more than generous experimental work of many of our manufacturers. We would pause to add, however, that in such a matter as fuel the electric railway would do well to study the almost meticulous methods of the Fifth Avenue Coach Company. To paraphrase Mr. Green, power is the second largest item of expense. It is to be observed that every step in the use of this company's power, gasoline, is studied so that there shall be no waste in the generating (engine) or use (driving) thereof. How many electric railways are paralleling this company's practice by following up their power from coal pile to controller handle?

What now has the trolley car to teach the motor bus? First, that the flexibility which is of so much value in handling shifting or sudden traffic movements is more harmful than helpful when traffic over an always busy route has to be handled to assure maximum carrying capacity. A large motor bus has about as much chance to cut past or around flocks of automobiles as a lumbering crow has to fly rings around a kingbird. In no case could the bus do so without taking unwarranted chances. A vehicle that must stop and turn to the curb at every corner almost is quite as bad a blockader as any trolley car could be. We wish that certain bus promoters, or rather the "widows and orphans" they seek to beguile, understood this point as clearly as Mr. Green, who says that "No type of bus designed up to the present is capable of properly handling peak loads." We would make an exception to this, however, where it is possible that buses of the sightseeing *char-a-banc* type might be used by electric railways to carry part of the peak loads on express schedules through short cuts away from congested thoroughfares. Service of this kind would not be justified in itself, but would be worth trying if it afforded a substantial relief to congested railway traffic points and was subsidized by a higher fare or in some other way by the people who are especially benefited by the service.

The second lesson for the motor bus is the demonstrated absurdity of a fixed fare. The Fifth Avenue Coach Company, with its 10-cent franchise rate for any distance, is facing trouble in view of ever-rising gasoline and wages as surely as any electric railway which is trying to make ends meet on 5, 6, 7 or even 8-cent fares. Only the combination of unexcellable riding territory, a large volume of business permitting a small margin of profit per bus-mile and experienced management have kept the company's financial head above water. The failure of the Chicago Motor Bus Company, aside from any questions of bus design or operation, indicates that the field for *de luxe* service is highly limited, and in any case such service must have a flexible unit if not a flexible distance fare to be successful. Mayor Hylan of New York, with his notions of a 5-cent universal transfer bus system, might well ponder Mr. Green's statement: "The theory that the car systems in any of the larger systems can be supplanted by any standard type of bus now obtainable is absurd and not worth any serious discussion." So, quoting for the last time, as "The bus is not more economical than the trolley car on the basis of cost per passenger carried, which is the only real basis," we must conclude that the best way to exploit the bus is to use it to supplement rather than supersede the electrically operated car.

Squandering Money Badly Needed for Constructive Purposes

WHAT an absurd position is being taken by the city hall politicians of Chicago, and what a wanton waste of money! The municipality is so hard pressed for funds with which to meet its payrolls and other necessary expenses that at the present time it faces a shortage of several million dollars before the end of the year, with no practical plan in sight to meet the deficit. Nevertheless, the City Council recently approved the expenditure by the Mayor of $421,985 additional to fight the increases in elevated and surface line fares and telephone rates. This is in addition to previous appropriations amounting to $323,858, making a total of $745,843, which may be spent before Jan. 1, 1921.

No reference to this waste of money would be complete without comment on one or two other features of the situation. The Mayor has appointed a special traction commission for the purpose of working out a "people's ownership" plan, which seems doomed to failure from the beginning, although it has a certain vote-getting appeal. The appropriation for this commission is $250,000. The counsel for this commission is also counsel for the Mayor in traction matters before the Public Utilities Commission and receives for his services on each a per diem payment of $150, although, in the opinion of those competent to judge, in all of the hearings in the Chicago fare cases he has never presented a pertinent constructive suggestion. This is not only wasting money but "rubbing it in."

Leaving the financial side for a moment and turning to the absurdity of the fight, one cannot avoid being concerned over the unwarranted attack. When the supreme legislative authority of the State has set up a tribunal such as the Illinois Public Utilities Commission, and provided all the necessary machinery and authority to safeguard the interests of the people in their dealings with the public utilities, it would seem that the decision of such a body would be satisfactory to the public. We believe that to be the case, and that the expenditure by the city hall of Chicago to fight these decisions or for any other similar purpose is unwarranted and a waste of the public's money. This belief is made more apparent in the case of Chicago when it is recalled that the city hall is continuing its fight against the decisions of the commission, despite the fact that the city has repeatedly lost its cases in contention with the Illinois Public Utilities Commission; that the commission has been upheld in every decision fought by the city in every court save one, and that this unfavorable decision was later reversed by a higher court and the lower court rebuked.

Yet this legal brawl goes on and on, utterly without hope of any good save the discreditable appeal that any fight for lower fares makes to the ignorant and unthinking.

This is Number Five of a Series of Articles on Salient Phases of the Electric Railway Situation

Detroit Muddles Along

By Edward Hungerford

MR. HUNGERFORD tells in this issue how the transit situation in Detroit has long been the football of politics. Various solutions of the question, involved through the expiration of some of the franchises of the present company, have been suggested, including service-at-cost and municipal ownership. The latest plan of the city is to own and operate an opposition system, which has many disadvantages from the standpoint of both the taxpayer and car rider.

For at least a quarter of a century now the Detroit traction system has been the making—or the unmaking—of the local politicians. In all that time, beginning with the rule of the late Hazen S. Pingree as Mayor of the Motor City, there has not been a year or a month or a week hardly in which the community has not been torn with doubts and perplexities as to its trolley service. It has been told, and in all probability has believed, that the Detroit United Railway, which is almost the sole purveyor of that service, is not only merely bad but sin-filled; far past the point of any possible redemption. Yet Detroiters who wandered far from their firesides and perhaps into less favored communities have been apt to return home feeling that their street railway service was far and away better than that of many of the cities which they had visited. But their local newspapers quickly informed them of the error of such thinking. Detroit trolley service was bad. It was hopeless. The company itself narrowly escaped being completely criminal. At least so the newspapers said.

Some day some one is going to have the ability and the courage to write of certain public prints as they in turn have written of certain American industries and utilities which have not chanced to be numbered among their large and generous advertisers. It is my personal opinion that such an analysis will be almost certain to show that there are good and bad newspapers, just as there are good and bad trolley companies, as well as other public utilities. The problem will then remain to separate the sheep from the goats in newspapers fairly, just as certain folk have endeavored to separate them in the transportation business, with varying degrees of success. To my own mind, even this last is passing difficult. Seemingly the point might be reached by an exact and accurate comparison of the different traction service in cities of the same general type—their fare charges, the service rendered and the like. As a matter of actual practice, however, such a method would be both inaccurate and unfair, because one might find two American cities of almost exactly the same area and population and still differing widely in their transit necessities because of their topography or conformation or peculiar type of industry or of population, or any one of a dozen other characteristics or the temperaments of the traction operators themselves, which it seems might be allowed a fair degree of human variation.

But none of these things, I think, should permit the city transit ques-

BOND'S
DRIVE SAFELY

This view was taken at the corner of Monroe Street and Woodward Avenue, in front of the City Hall and at the downtown civic center of Detroit.

tion to be the mere football of politics, as it has so long been in Detroit. There, as in neighboring Toledo, the city should do one of three alternatives: It should cease criticising the service rendered —such criticism will inevitably have a calamitous effect upon the *morale* of the trolley patrons as well as the employees—or it should permit a fair rate of return, or it should buy the property itself. In the case of Detroit the company long since signified its willingness to sell its city lines—at a fair valuation, of course. It is hardly two years since a commission appointed by the present Mayor, James Couzens, agreed upon a physical valuation of $29,000,000 for these lines. The company wanted something for the good will of a going concern. After some deliberation Mayor Couzens expressed his willingness to add $2,500,000 to the foregoing figure for this asset.

Unfortunately, however, Mayor Couzens did not have the last say in the matter. If he did the D. U. R. might today be a matter of mere history in the city of Detroit. Outside, it probably still would be a large factor in the traction situation in the United States, inasmuch as but 300 miles of its 900 miles of trackage are situated within those city limits. It is an interurban property of real importance, in addition to owning the city systems of Flint, Pontiac, Ann Harbor, Port Huron and one or two other fairly important Michigan towns. The remarkable recent growth of them, due to the rapid expansion of the automobile industry, has given greatly increased earning capacity and value to the larger long-distance lines of the Detroit United Railway. Of themselves they are today to be classed at the head of the few prosperous interurbans remaining across the land. And grouped together they would form in almost any event a going traction property of no small dimensions. The D. U. R. is far from being at death's door.

The Detroit traction question apparently could not be permitted so simple a solution, however, as a choice between the three pathways which I now just indicated, in accordance with the terms of the city charter. Such an important civic matter must necessarily be submitted to the electorate for its approval. So it was that the street railway purchase plans could only become effective upon a 60 per cent vote being cast in its favor.

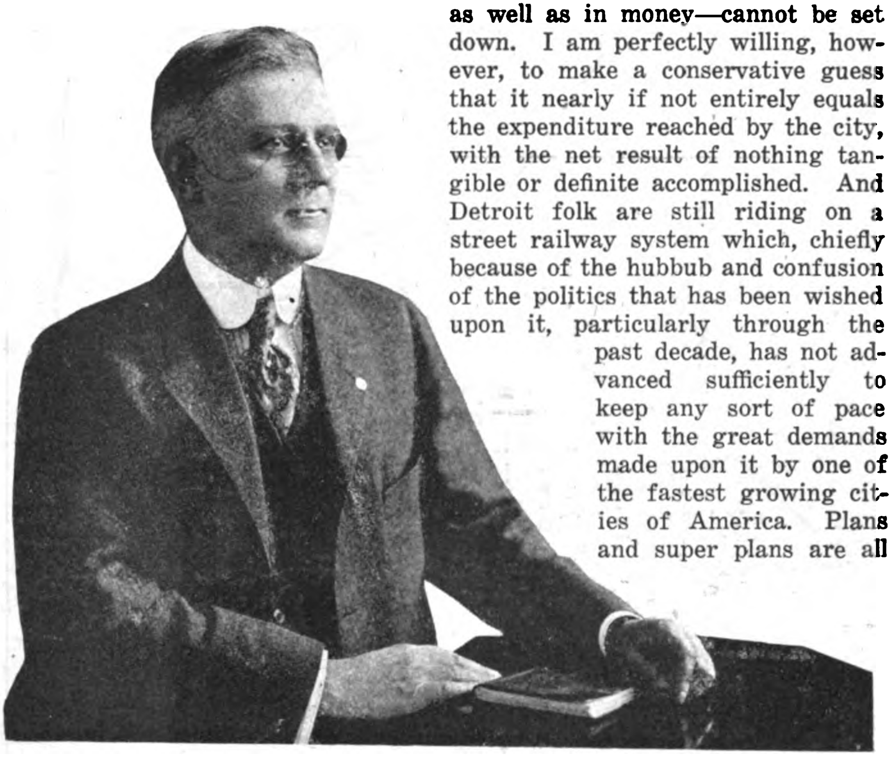
In all probability the electorate of Detroit does not differ greatly from that of a good many other large industrial cities in the United States, particularly those of recent rapid growth. It does very little thinking for itself. It prefers to let its politicians, and the newspapers which they control, do its thinking for it, while it hies itself to the perennially popular movies or for automobile rides off into the country. In this particular instance, however, the City Hall had approved of the D. U. R. plan. But the newspapers for once apparently were not in accord, it seemed, with this font of wisdom. At any rate, the proposal was voted down.

Company Offers Various Solutions

The traction company then turned toward the well-known Tayler plan of Cleveland as a possible pathway out of its troubles. In conjunction with the then existent street railway commission of Detroit it sought to work out an adaptation of this scheme which would be best suited to the needs of its own community. For the moment, a charter mandate looking toward a genuine municipal city railroad was overlooked. Perhaps Uncle Sam's experiments with the steam railroads, the telephone and the telegraph were bearing some sort of real fruit up there in Michigan.

Once again the Detroit United's experts turned their patient attention to a workable and possible permanent solution of a problem that had begun to seem well-nigh unending. In this connection it is perhaps worth noting that in the past eleven years upward of $750,000 has been spent by the city of Detroit alone in attempts to work out a solution of this one problem. What the D. U. R. has expended—in time and in worry as well as in money—cannot be set down. I am perfectly willing, however, to make a conservative guess that it nearly if not entirely equals the expenditure reached by the city, with the net result of nothing tangible or definite accomplished. And Detroit folk are still riding on a street railway system which, chiefly because of the hubbub and confusion of the politics that has been wished upon it, particularly through the past decade, has not advanced sufficiently to keep any sort of pace with the great demands made upon it by one of the fastest growing cities of America. Plans and super plans are all right in their way. But they are neither tracks nor trolley cars.

Yet plans, by the dozen and by the score, have been made. Some of them are ingenious, some remarkably simple, the most of them highly practicable. Experts of nation-wide prominence, William Barclay Parsons, H. M. Brinckerhoff and Bion J. Arnold among them, have worked side by side with local men of no mean ability. The street railway commission which was appointed to work out the service-at-cost plan, based upon the Tayler plan of Cleveland, was itself composed of three Detroit men of long business

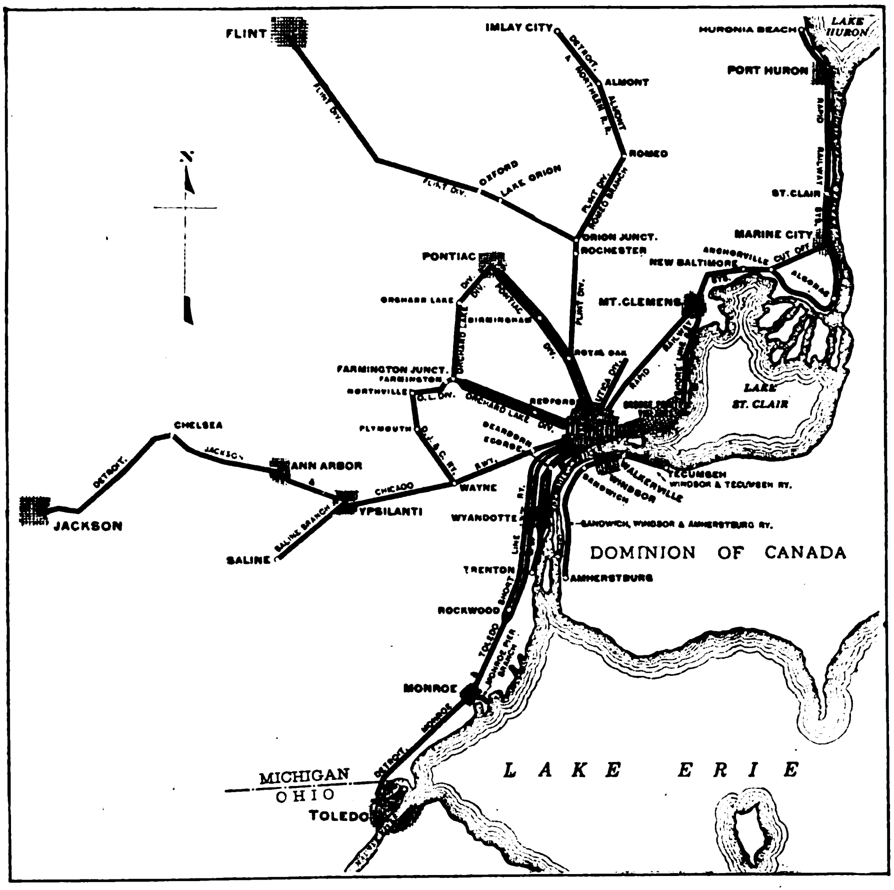


FRANK W. BROOKS

President and general manager of the Detroit United Railway, from his most recent photograph. Mr. Brooks is both steam and electric road trained from the ground up, his having been no flowery bed of ease. He can talk in engineering terms with the company engineers, in electrical terms with the power men, in construction terms with the track department and he knows car building from trolley wheels to truck wheels. He is equally familiar with publicity, having in his younger days been connected with the detail workings of a newspaper. Golf and fishing constitute Mr. Brooks' recreation.

experience and sagacity. They worked long and faithfully on the problem.

But when they too were done the results of their labor also was *nil.* Mayor Couzens flatly refused to commit the city to the service-at-cost plan. He announced that he was for a straight municipal railroad and that at once; maintained stoutly that this was the spirit of the city charter which Detroit adopted two years ago. Therefore, despite stout demands on the part of many folk, he refused to put the plan to the referendum. The company, however, was not daunted by the doughty Mayor. It went right past his office and into the hall of the Common Council. To that august body it put its necessities—and its plan. The Council inclined toward the plan, passed the necessary enabling resolutions and ordinances, which the Mayor promptly vetoed. The Council then moved to pass the measure over the Mayor's veto. And nearly did it. The vote of a single Councilman prevented this practical and wise compromise measure coming into effect—the practical solution of a vexing problem. And Detroit still was without transit relief.


FLINT
FLINT DIV.
IMLAY CITY
DETROIT & NORTHERN R.R.
ALMONT
ALMONT
ROMEO
HURONIA BEACH
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PORT HURON
RAPID RAILWAY SYS.
ST. CLAIR
MARINE CITY
ANCHORVILLE CUT OFF
ALGONAC
NEW BALTIMORE
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FLINT DIV.
OXFORD
LAKE ORION
FLINT DIV.
ROMEO BRANCH
ORION JUNCT.
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PONTIAC
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BIRMINGHAM
FLINT DIV.
MT. CLEMENS
ROYAL OAK
UTICA DIV.
RAPID
RAILWAY
SHORE LINE
LAKE ST. CLAIR
FARMINGTON JUNCT.
FARMINGTON
NORTHVILLE
O. L. DIV.
ORCHARD LAKE DIV.
ORCHARD LAKE
REDFORD
PLYMOUTH
D. J. & C. RY.
DEARBORN
ECORSE
CHELSEA
JACKSON
DETROIT
ANN ARBOR
&
CHICAGO
RWY.
WAYNE
JACKSON
YPSILANTI
SALINE BRANCH
SALINE
WYANDOTTE
TECUMSEH
WINDSOR & TECUMSEH RY.
WALKERVILLE
WINDSOR
SANDWICH
SANDWICH, WINDSOR & AMHERSTBURG RY.
LAKE SHORE RY.
DOMINION OF CANADA
TRENTON
AMHERSTBURG
ROCKWOOD
TOLEDO
MONROE PIER BRANCH
MONROE
MONROE
DETROIT
LAKE ERIE
MICHIGAN
OHIO
TOLEDO

Detroit is the center of one of the largest and most important interurban systems in the country. All of the lines shown on this map are controlled by the Detroit United Railway

I wish that I might accurately depict how much the new fourth city of the United States needs this relief; not elaborate subways or subway terminals such as Cleveland now seems bound to build for herself—although Detroit has already planned a subway terminal to relieve the almost interminable congestion in her civic heart—but new surface lines in her great outlying sections, which have come from truck gardens yesterday to acres upon acres of small, neat new homes today, as well as the main-stem and crosstown lines to concentrate and to distribute these new outlying routes.

A man who rode beside me one day not long ago in the fast limited car on the interurban down from Flint complained bitterly of the lack of crosstown service.

"I live over on Grand River Avenue," said he, "and when this car comes by the Ford plant on Woodward Avenue I will be within 3 miles of my house. But there is no way to get across to it, other than walking. So I am compelled to ride 6 miles down into the heart of the city at night, transfer there and ride out 6 miles again. All for the lack of a well placed crosstown line."

Unquestionably Detroit is as badly a laid out city for a million folk today as she was well designed for the two or three hundred thousand that was thought would be her maximum possible size—up to ten or twelve years ago. Her ingenious plan of radiating streets, shooting out like spokes of a double wheel from her two civic centers downtown, was very good for a city whose homes and factories could be comprised within a radius of 3 miles or so. For one demanding a radius of 6 or 7 or 8 miles it is of little practical use; far inferior, in fact, to the straight checkerboard pattern of so many of our American cities. Yet her badly devised and much overgrown city plan could be fairly taken by crosstown lines—lines such as my friend, the fellow passenger down from Flint, needed to get him over to his home and supper.

Now what has happened in regard to these crosstown lines? For a long time past the Detroit United has stood ready and willing to finance and to build them. A route that it chose for one of these was through High Street. That was all of seven years ago. The very suggestion met with great acclaim on the part of the residents of one of the most rapidly growing and poorest served new sections of the city. People really want it. Was the line built? Answer: It was not. One of the then members of the Common Council was reputed to own property on another cross street which might have been used for a crosstown line, although, in the judgment of traction experts, not as effectively as High Street. The obdurate Councilman, even if he failed to get a new trolley route past his own holdings, did succeed in preventing any other being built. And the Detroit folk who walked long blocks in bad weather getting to and from the nearest trolley cars did not understand why they could not have genuine transit relief.

A TEST PERIOD OF FARES

With the service-at-cost plan buried—and seemingly without the slightest hope of resurrection—the harassed and perplexed traction company turned toward at least temporary relief in its fare situation. Its term franchises expired on the downtown section of two of its main-stem streets—Woodward Avenue and Fort Street—and yet with its cars operating on those tracks merely as a public necessity and on a day-to-day basis, it still possessed nearly 300 miles of other trackage in Detroit, to say nothing of those 600 miles of interurban line that we have already seen. Yet even if *all* of its city franchises had expired it still would be in need of fare relief—of a definite sort. For Detroit has by no means been exempted from the causes and conditions that have jammed up the cost of street car operation in the towns big and little all the way across the land. On the contrary, her local industrial situation has made her a remarkably difficult and expensive town in which to conduct a business of any sort.

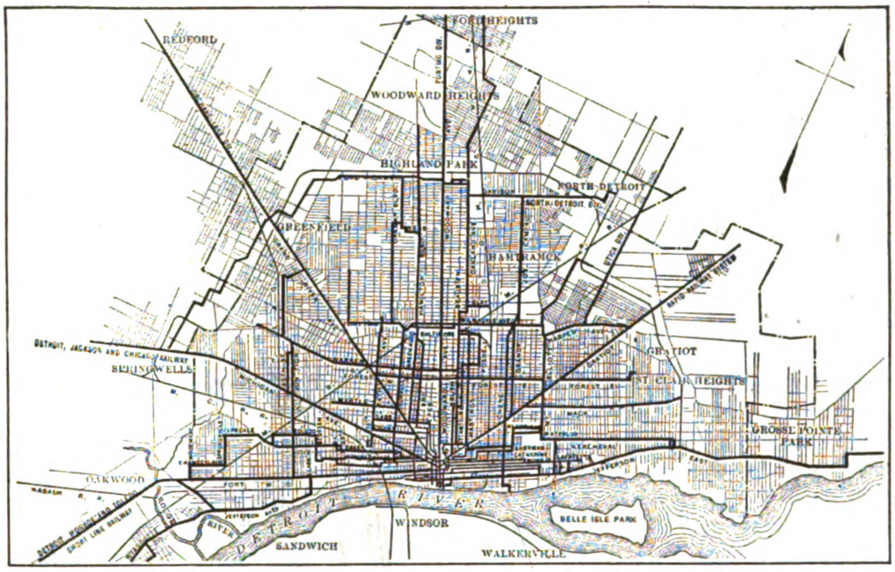
Mayor Couzens, under the pressure of a real traction crisis, announced his perfect willingness to put this question of increased fares up to arbitration. Mr. Couzens may be radical, but he does not seem to be mean. His attitude is one of extreme generousness. He is pledged, however, to the idea of a municipal street railway for Detroit and is nothing if not consistent.

So it was that the question of increased fares—the D. U. R. had intimated that the retention of the 5-cent fare, but with a charge of 1 cent for transfers, would give it a breathing chance. In fact it went so far as to endeavor to put such a fare into effect—with the almost usual accompaniments these days of a strike of its platform men for additional wages and a three-day suspension of trolley service and great expense and annoyance to the citizens of the town. Out of the protests of these bewildered folk, in fact, came the Couzens agreement to arbitrate the entire fare question. Arbitrators were appointed and a test period of three months chosen to see if the company needed the raises in fare.

Once again the Detroit United played out of luck. It almost seems fated—hoodooed is perhaps a still more expressive word. In the three test months—July, August and September, 1919—it did a humming business. The flush after-the-war period was well upon the city by the straits. People rode upon the trolley cars of Detroit—in dull hours as well as the busier ones—as they apparently had never before ridden. The company failed to make its hard-up showing and its fare remained at 5 cents with free transfers. And so still remains.

PLANS FOR A MUNICIPAL RAILWAY BECOME DEFINITE

In the meantime Mayor Couzens had not been idle. He is not of the idle sort. In these repeated failures of the various plans of the D. U. R. he saw the hour of his own opportunity looming large. He decided last spring that the time had come to make his plans for a municipal street railway definite. So more experts and more engineers were imported and, with the aid of the city's own engineering department, a scheme was evolved for the construction of 163 miles of new trolley line. In addition to these the Mayor planned to take as downtown main stems the lower portions of the Woodward Avenue and Fort Street lines of the Detroit United Railway, upon which you will remember the term franchise had expired and where the company was, and still is, operating without franchise and under a so-called day-to-day agreement as a public necessity. There are 55 miles of this last type of line, including a few miles of new trackage built as an emergency and also operated on a day-to-day basis, which brings the mileage of the proposed municipal system to nearly 218 miles.

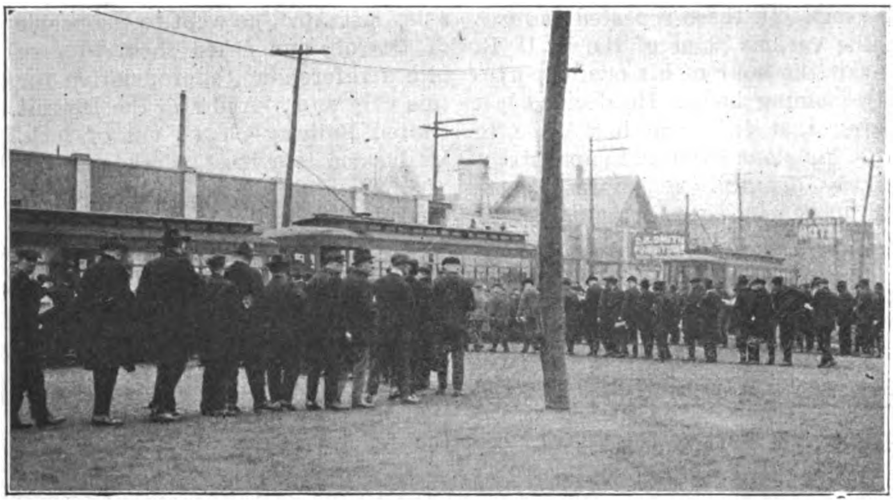


With its system of radiating avenues from the civic center, Detroit is well adapted for street transportation

The new trackage of this civic railway is practically all of it located in the outlying sections of the city. It is divided into three groups—for convenience lettered alphabetically—and of which the third grouping, Group "C," about 59 miles, is not planned to be built at the present time. That leaves about 103 miles of actual new trackage to be constructed. To build this new line, as well as to equip it with cars, carhouses, shops and power houses, Mayor Couzens' engineers have estimated will cost $15,000,000, and on a day last April he went to the people of Detroit and asked them to give him a referendum appropriation for this very sum. And still the Detroit United Railway played out of luck. Its hoodoo is a most persistent sort of bird. Only about 45 per cent of the intelligent electorate of the town voted, but more than the required 60 per cent of the actual voters approved of the Couzens plan, whereupon the Mayor proceeded toward actual construction of his street railway—until the existing company stepped in and tied up the matter in an action in the federal court. It claimed that there were doubts as to the validity of the election; as to the way in which it was held and the manner in which the votes were cast. All of which are technical questions and will be finally decided by the Federal Supreme Court, in due course.

POSITION OF CAR RIDERS IN JEOPARDY

In the meantime let me attempt a final analysis of this most perplexing Detroit question. The Couzens railway scheme if carried out as planned provides a traction system of most unusual appearance. It is forced by that self-same peculiar street conformation of the city to use the expired franchise routes of the Detroit United in Fort Street and Woodward Avenue to bring its new lines, builded almost entirely in the new outlying sections of the city, downtown. In the case of Woodward Avenue this is particularly unfortunate, for with the utter lack of foresight, common to so many of our American cities, Detroit failed a dozen years ago or more to widen this street to the



This photograph shows the men leaving work at the Ford plant lined up to board cars. In this way rapid loading of cars has been obtained

dimensions that its real importance as the chief thoroughfare of a city of more than a million folk demanded. Now it is too late. Great and permanent new buildings of a type not easily removed or altered line it upon either side. Yet through Woodward Avenue there pours today a trolley traffic that is reputed to be greater than that of any other street of the United States, although the D. U. R. pours no feeding lines whatsoever into this main thoroughfare, reserving it for the cars of the Woodward Avenue service alone and an occasional interurban in from Ann Harbor, Pontiac or Flint.

WHAT THE COUZENS PLAN MEANS

With the Couzens municipal plan in effect four outlying surface car lines to the west and one to the east of the outer sections of this street will have to be poured into and through its narrow and congested downtown section—between the Boulevard and the Grand Circle. And congestion worse congested.

"But how about the Detroit United's service and that of the interurbans too?" you interrupt. "How are these to be brought down into the heart of the city with the downtown Woodward Avenue section taken from the old company

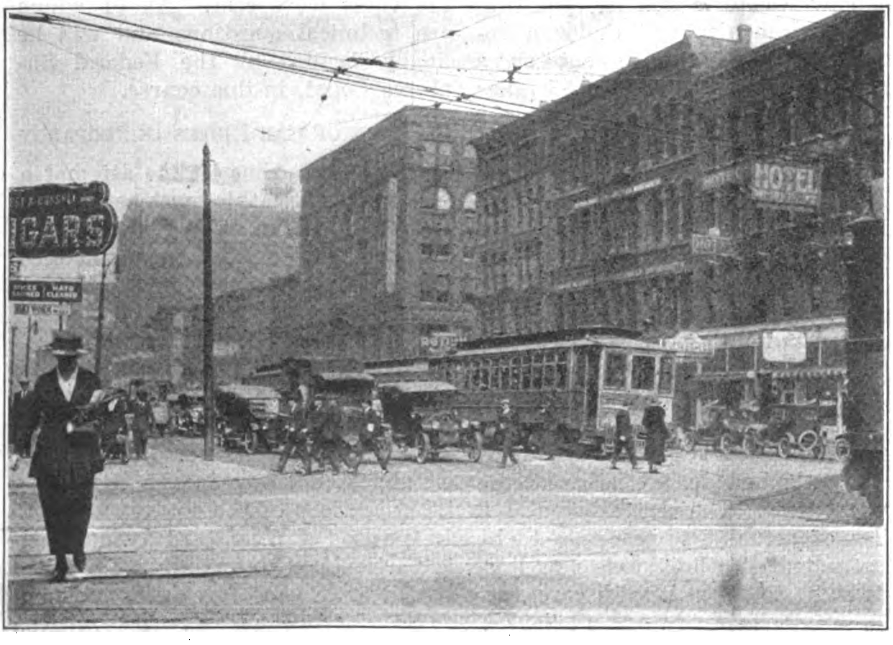
Please do not worry about the interurbans. The local merchants will see to it that they are not disturbed in getting to downtown Detroit. They bring too many millions of dollars in trade to their stores in the course of a twelvemonth to be easily turned aside. And as for the D. U. R. cars in outer Woodward Avenue, they can also be taken care of, quite easily. The company, perhaps with an anticipation born of real foresight, long ago paralleled Woodward Avenue with double-tracked relief routes; one on each side of that great main-stem street. Its position is quite secure.

It is the position of the car riders, of the million or more Detroit folk, which is most in jeopardy, it seems to me. With two systems their general system of universal free transfers, such as they are enjoying at this moment, becomes an impossibility. Two fares, in some cases three, will have to be paid where they now ride for one, and could continue for a long time to ride for one, with the possible addition of a penny or two for transfers. The burden of the worry has been shifted to their shoulders.

For impressive as the Couzens plan is in all of its maps and prospectuses, it is somewhat less so when one comes to examine its financial outlines. According to the Mayor's plan, as outlined to the Council, the sum to be expended reaches $15,022,000, divided as follows: $2,220,000 for the 55.5 miles of trackage now being operated by the D. U. R. under the day-to-day agreement, $7,052,000 for the new trackage, $4,000,000 for 400 motor cars, $750,000 for 150 trailers and $1,000,000 for carhouses, tools and equipment. Analyze these figures for a moment. Start with the second item. Mr. Couzens proposes to spend $7,052,000 for 103.05 miles of new track—the Class C group of 59.7 miles being, as we have already seen, deferred for the present—which figures close to $68,432 a mile. Yet, coming back to the first item, the Mayor of Detroit only proposes to pay the D. U. R. $40,000 a mile for its 55.5 miles of line.

"The Mayor counts without his host," said President Brooks of the Detroit United to me the other day in referring to this very point. "He has no right to assume that we would sell at this or any other price yet fixed. He is proceeding upon an entirely unwarranted assumption."

To an unprejudiced outsider it might seem a little inconsistent that the city should expect to buy existing line at $40,000 a mile when it proposes to pay $68,000 to build new trackage. Assuming for the moment that it could force the D. U. R. actually to tear up its tracks in the franchiseless streets—although I am quite sure that such a stroke would



This view was taken on Jefferson Avenue, which runs nearly parallel with the Detroit River. The photograph was taken near the junction with Woodward Avenue bring down almost interminable legislation—it immediately would be forced to the latter figure of expenditure.

In fact, it is interesting to notice that Parsons, Klapp, Brinckerhoff and Douglas in making their estimates of an enlarged transit for Detroit placed the cost of new surface lines there at an average of $75,327 a mile—considerably ahead of Mr. Couzens' figure. At these figures the Mayor's 103 miles of brand new track would cost $7,762,447, or about half a million dollars in excess of the budget which his own engineers have prepared and which was used as the basis of the special election.

It would look as if Mayor Couzens has been equally conservative in some of the other items of his estimate. It allows $10,000 apiece for modern motor cars and $5,000 for trailers. The Mayor may have an inside line on the equipment market such as the D. U. R. does not possess. Its current prices on the first of these is $15,000 each, on the second $9,720. Applying these to the Mayor's car necessities, we find his rolling stock item increased from $4,750,000 to $7,458,000, a mere matter of some $2,700,000. Similarly, I have been assured that the Mayor's items for carhouses and shop equipment show equal if not greater conservatism. This is not the day of low building cost, particularly in the city of Detroit.

I am setting these facts down without any rancor or prejudice whatsoever. It may be that the time has come for Detroit to own if not to operate her city transportation service. I talked with a pretty big business man of that town within a fortnight after its most recent traction election—a man, incidentally, whose business affiliations do not ally him with or against its street railway organism—and he expressed his opinion that the city should now buy the D. U. R. and then turn it over to that company for simple and efficient operation. His thought was that a plan which would be somewhat similar to that of the operation of the New York subways would best meet the present necessities of the Detroit situation.

"I know Jim Couzens and like him very much," said he, "but for the life of me I cannot see why he should want to expend $15,000,000 or more for a parcel of indifferent suburban trolley lines when by an expenditure of hardly more than twice that figure he could have the whole city traction system—lock, stock and barrel—and by the expenditure of a very few extra millions the essential feeding lines from the outer districts could be laid down."

Another view at the Ford plant. Queue loading has been employed at congested points in Detroit for some three years and has been applied even in the heart of the city

DETROIT MUST WORK OUT ITS OWN PROBLEM

For myself, I think that this hard-headed Detroiter has much the right point of view. The problem for him—and really not so much for him as for the trolley riders of that big and overgrown town—is to give proper expression to it. It is not a matter in which the traction interests of the city can help him in the slightest. Their turn is over. They have had their hour in the court of public opinion.

The courts of justice are their final resource. In the meantime their cue is silence. They must sit back. Detroit must work out her own salvation—in this as in her other great and grave civic problems. No one can do that for her. If she fails in this she will have no one to thank save herself. If she succeeds, it will be she herself who will reap the full results of her triumph.

In his next two articles Mr. Hungerford will describe interesting situations on the Pacific Coast. In San Francisco there is actual competition between a municipal line and one privately owned and this will form the topic of the first article by Mr. Hungerford.

Maxwell Chalmers
GOLDE CLOTHES $20
GOLDE CLOTHES $20
ELMER'S
GOOD CLOTHES

The junction of Woodward Avenue and Michigan Avenue. The trolley line on Woodward Avenue carries a traffic almost as heavy per mile of track as that on the New York elevated lines

C. E. R. A. A. Meets at Ottawa Beach

Daily Versus Weekly or Monthly Freight Settlements Chief Subject of Discussion at Accountants' Convention

FOLLOWING the meeting on July 8 and 9 of the parent association, the Central Electric Railway Accountants' Association met at Ottawa Beach, Mich., July 10 for a half-day session. Those present were A. R. Baxter, vice president of the association, who presided; Secretary Neereamer and assistant and Henry Friede, Toledo, Ohio; F. A. George, Kokomo, Md.; W. E. Livingston, N. M. Viergwer and Miss L. E. Jones, Grand Rapids, Mich.; F. Pantel, Michigan City, Ind., and J. P. Longon, Dayton, Ohio.

The small attendance of this and several preceding meetings led to the passing of a resolution by the executive committee, later ratified by the general body, instructing the executive committee to address a strong letter to all members urging attendance and stating that unless greater interest were taken and unless the next meeting were attended by 60 per cent of the members it would seem that the association should be abolished and that steps probably would be taken in this direction. It was pointed out in the discussion that a great many of the members show a distinct interest in the work done by a meeting, but are unwilling to give any time or effort to the association.

Two amendments to the constitution, one defining who shall be members of the executive committee and the other changing the number of regular meetings of the association from four to two a year, were adopted.

It was decided that the next meeting will be Jan. 21 and 22 at Dayton, Ohio. The following nominating committee for report at the January meeting was appointed by Mr. Baxter: F. Pantel, chairman; J. P. Longon and L. T. Hixon.

The remainder of the meeting was devoted to the reading of two papers on daily rather than weekly or monthly freight settlements, by Mr. Longon and H. F. McColgin. The latter was read by the secretary in the absence of the author. These papers are printed below.

Mr. Pantel discussed the subject briefly, pointing out the practice of his company, the Chicago, Lake Shore & South Bend Railway, of making a weekly settlement to conform with steam road practice, this company being a member of the American Railroad Association. He said there was great difficulty in getting even weekly settlements made, the agents contending there was not sufficient time to make out these reports. He thought the expense of daily settlement would be too great.

Daily Reporting of Freight Accounts

By J. P. Longon

Auditor Cincinnati & Dayton Traction Company, Dayton, Ohio

THE question has come up several times relative to the merits of daily reporting of freight and express business by agent to auditor, and as a means of ascertaining the true merits of the daily system a committee was appointed at the last meeting of this association, held at Indianapolis, Ind., April 24, 1920, consisting of J. P. Longon, Orin A. Small and H. F. McColgin. The committee sent out a request for a set of forms and an expression from the various auditors as to the merits of their systems and the approximate amount of clerical energy expended in the carrying out of their respective systems. Only a few of the auditors responded to the request and to the ones who responded the committee extends its thanks; to the ones that ignored it we feel that the spirit of indifference or procrastination kept them from conforming with the wishes of the committee. It was found that of thirteen companies which replied to our request five used the daily system and six used the monthly, while one used a semi-monthly system and one used the weekly. It was found that of the companies using the daily system most all were the smaller companies, while the larger companies used the monthly system. The clerical energy used was in most cases the same, as more labor is required in checking daily reports in the same amount of volume than is required by monthly checking, as the monthly audit is a comparison of totals from one station against the total of other stations, and where they agree no further checking is required, while where they disagree it is necessary to check back to locate errors. We find that the monthly system is the cheapest for large companies, but the question of economy is sometimes open to argument, for it has been the experience of the writers that very often an agency is located in a country store where the railroad work is a side issue and the agent is paid on a commission basis and the agent withholds the company's cash to run his store business until the end of the month, while if a daily system were used he would have remitted all of the cash to the auditor daily. On one line that the chairman of this committee was sent to systematize he found a comparatively fair-sized station located in a village post office. It was arranged with the United States postal inspector to audit this station on consecutive days. The government inspectors found that no segregation of cash was kept, which was contrary to government rules, and this postmaster only escaped serious trouble by his plea of ignorance and the influence of his friends. His real trouble was encountered the following day when his railroad accounts were audited, for he had taken all of his cash to satisfy the post office account and was considerably short in his railroad accounts. He had been speculating in stocks and was using the railroad company's funds, using the argument that he did not have to settle up but once a month, although a daily cash remittance was expected and was made, but same was short daily.

The most meritorious feature of the daily system is the fact that it compels all agents to remit in full for each day's work and it enables the auditor to drop in at any station for a surprise check, needing only the last day's report. This cannot be done with the monthly system in vogue. With the daily system the agent shows the balance due from yesterday and all debits and credits affecting the current day's business and balance due company; this balance is supported by uncollected expense bills on hand. It is a wonderful aid to an agent, for he gets his corrections daily and can take them into account the same day as received. A summary book is kept by some companies using the daily system, into which the agent enters the totals of all his books, which in turn must agree with the totals of his various debits and credits on his daily balance sheet; the totals of this summary book are the figures he uses on his monthly balance sheet. It is possible to have the agency account at all stations clear by the 5th of the following month, as his monthly totals are ready as soon as his last day is balanced; as sub-totals are carried in his summary book, all that is then required is to draw off a list of his uncollected expense bills. This could be ready by the 3d of the month, but it is good practice and saves listing of many current bills by allowing the agent to withhold his list of uncollected until the 5th, listing all bills open on that date and showing the amount of cash remitted to auditor between the 1st and the 5th as transit cash; the total of both these items must agree with balance due company on monthly report.

The agent should not have any ancient items on his list of uncollected if auditor will issue reliefs promptly upon proof of agent's request.

Statement of differences are not required, as agent gets reports of his differences daily, and if he takes these into account daily he should balance clean at the end of the month.

Agent should stamp off his cash book postings against his received collect and prepaid forward, so that in event of his uncollected not balancing with amount due company he can check his list of uncollected against the unstamped items in the received and forwarded books.

The freight accountant keeps a register on file of all corrections sent to agents and as soon as agent takes same into account he removes his copy of corrections from this file, so that at all times he has file of corrections issued and not taken into account. Copies are sent to agent if not taken into account in due time.

Another feature of daily reporting is in furnishing the traffic department with information relative to the movement of freight daily both c.l. and l.c.l. On some lines considerable car-load business is done and special reports are kept on these movements.

In Cincinnati during the barleycorn days the steam lines made a special effort to get the whiskey business between Cincinnati and Toledo. The daily reports divulged a falling off of whiskey shipments and investigation was begun before the end of the month in question, and not only did the interurbans regain the lost business but were successful in procuring considerable new business.

Again we were short on trail car equipment and it was necessary to refuse carload shipments, and within a few days the daily reports divulged a falling off of business from Middletown station. This was pointed out to our traffic department and it found the tobacco companies closed for inventory and repairs. The equipment used in this service was pressed into Cincinnati service and daily revenue again picked up. It follows that in many instances the agent will pursue the course of least resistance and will not report the falling off of business, but the daily report is the "telltale." It follows also that a telltale that points out daily a decrease in revenue is far more valuable than one which acts but once a month.

It appears to us that the economy effected by the monthly system is of a false nature, inasmuch as it does not give the operating officials the information which enables them to regulate their service to the best advantage. It does not show up any falling off of business from any specific station until the end of the month. It does not show the loss of certain kinds of shipments, as often happens through failure of some one along the line to give the kind of service expected, until possibly a month after it occurs. It also does not show the fruits of solicitation or advertising.

In this age of motor transport it behooves the interurban railroad to be on the alert and give the shipper 100 per cent efficiency in service, for that is our stock in trade, as this is all we have to sell; let us be ever on the alert to keep our shippers satisfied, and the daily system is our ace card, for it tells the daily progress of our transportation department; it enables us to tell, by passing records and abstracts, the daily movement of each and every piece of freight from station to station, which reduces tracing and claims, also the clearing up of O.S.&D. items, and these also tend to retain your shippers by giving satisfactory service.

The wise business man today is he who knows what he is doing in volume today, not thirty days from now. It behooves us to give careful and scientific study to our work, and if we are to be properly recognized the system of accounting installed in our departments must give the best results, not merely the "getting by," but the furnishing of the most valuable information in time to be of value, and not to be rendered as ancient history, with the time-worn label of "too late" to be good.

Daily Freight Settlements by Agent to Auditor

BY H. F. MCCOLGIN
Auditor Indianapolis & Louisville Traction Railway

THE question of the daily freight settlement is advocated by some and opposed by others. The writer, being a believer in the daily method, will attempt to show in a brief way the grounds for his belief. Having been at one time connected with the Pennsylvania Railroad Company, I have taken its system as the basis for my arguments. In order to discuss the subject, I will divide it into two parts, the old and the new.

I will first take up the old plan of monthly settlements. I regret that I was unable to secure a set of the old blanks for exhibit, but will refer to them by their form number. Under the monthly form of settlement the agent filed his waybills each day, usually filing the larger stations separately and smaller stations in one file; by that I mean stations from which a number of bills are received daily would be kept separate, while stations from which only a few bills were received would be placed on the miscellaneous file. At the close of the month's business (by that I mean when all bills dated in the month for which report was being made were supposed to be in) the agent would separate his waybills, according to number and station order, and list them on what was called the "B" report, showing date, waybill number, freight advances and prepaid. These reports carried two columns of waybills, and the average station would have from ten to forty sheets of received business to total recap and balance with his freight received book, thus making twice that all bills were written up. All forwarded waybills were recapped each day, and at the end of the month were gone through again and all prepaid waybills listed on a "C" report and balanced. From these two reports the figures for the monthly freight settlements were taken. With this explanation, we will take up briefly the new or daily method.

METHOD WHEN DAILY SETTLEMENT IS USED

Under the daily settlement method a loose leaf system is used. When the extensions on the received waybills have been checked and any errors are corrected they are entered on the daily sheet, known as Form 723A, a carbon copy being made, which is retained by the agent for his permanent record. These copies are bound in binders furnished for that purpose. The original copy, balanced, and with all waybills securely attached, is forwarded to the auditor of freight receipts at the close of each day's business. Waybills for freight forwarded are handled in the same manner, except that they are listed on a separate form, No. 693A.

A day's business consists of the waybills actually issued and those actually received, with the exception that where the shipment is short the regular short report is made and the waybill is not taken into account until shipment is received. When these reports have been completed the totals are listed on a summary sheet, having a place for each day of the month, and, unless corrected by the auditor, the agent's record is finished. At the end of the month the summary is totaled and agent's report for month is complete and supposed to be in auditor's office on the third day of the succeeding month.

What is gained by the daily method:

1. A great saving in time to agents, who, as a rule, have more work than they can properly handle.
2. It gives the auditor's office a closer check on company's business and enables it to compile statistical information at any time it may be desired.
3. It practically eliminates, or, at least, greatly reduces, the amount of on-hand uncollected at close of month, owing to the fact that any waybill not received by the last day of the month is carried to the succeeding month's account.
4. It enables the auditor's office to close up monthly records much sooner.

It is claimed by some that this plan requires a great increase in office force. However, I am informed by the auditor of the Pennsylvania lines that it causes about 5 or 10 per cent increase in office force. This would mean that an office employing twenty clerks would need one more clerk.

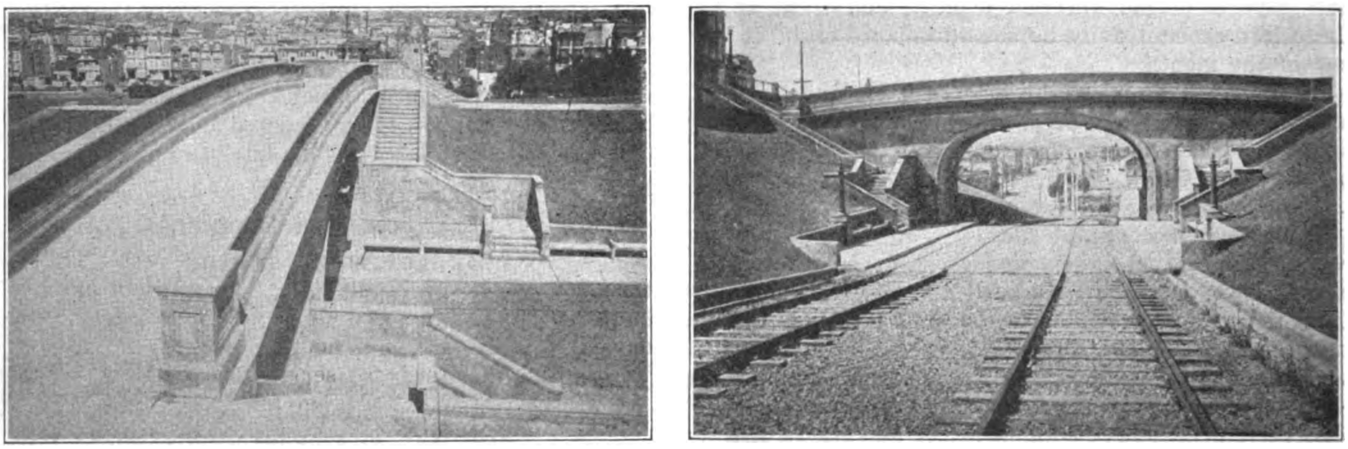
Combined Overhead Crossing and Landing Platform

San Francisco Municipal Railway Constructs Some Concrete Work Along Pleasing Lines—Mission Effect Used

THE accompanying photographs show an attractive reinforced concrete footbridge which was built by the Municipal Railway of San Francisco for carrying the Nineteenth Street pedestrian traffic over the line of the Church Street railway tracks, giving access to Mission Park from Church Street. In connection with this footbridge two concrete landing platforms were constructed. The entire structure is built in mission style.

One of the most interesting features of this construction is the electrical work. Two electroliers were installed alongside the landing platforms, each equipped with five 23-watt Mazda lamps burning five in series on 600 volts. A galvanized switch box installed on the face of the abutment wall and fitted with a G. E. combination switch and cutout permits control of the current for both electroliers.

Between the platforms 43-lb. guard rail sections were bolted onto the inside of both rails of both tracks with ¾-in. track bolts. The spaces between all of the rails of both tracks and between the rails and the concrete curbs of the platforms were filled with ballast and screenings and covered with an asphalt wearing surface 1 in. thick.



AT LEFT, FOOTBRIDGE AND LANDING PLATFORMS BUILT BY MUNICIPAL RAILWAY OF SAN FRANCISCO. AT RIGHT, LOOKING DOWN ON THE CHURCH STREET TRACKS FROM WALK LEADING TO MISSION PARK

All concrete floors and walks, stair risers, etc., were finished with a ¾-in. top coat composed of one part cement and one part fine gravel, hand troweled to a smooth finish. Lamp black was used to give the finished work a uniform dark slate color.

The entire inside surface of the arch from face to face and all exposed concrete surfaces of the bridge were finished with two coats of cement mortar. The first coat, ⅜ in. thick, was composed of one part cement, hydrated lime equal in volume to 10 per cent of the cement, and three parts sand. The second coat was applied by means of the cement gun. It consisted of cement mortar in the proportion of one part cement to two parts of sand.

An open-joint drain is carried through Mission Park, laid between the tracks. Concrete gutters also parallel the tracks through Mission Park. At landing platforms these gutters connect with pipe that extend under the platform, as shown in one of the illustrations.

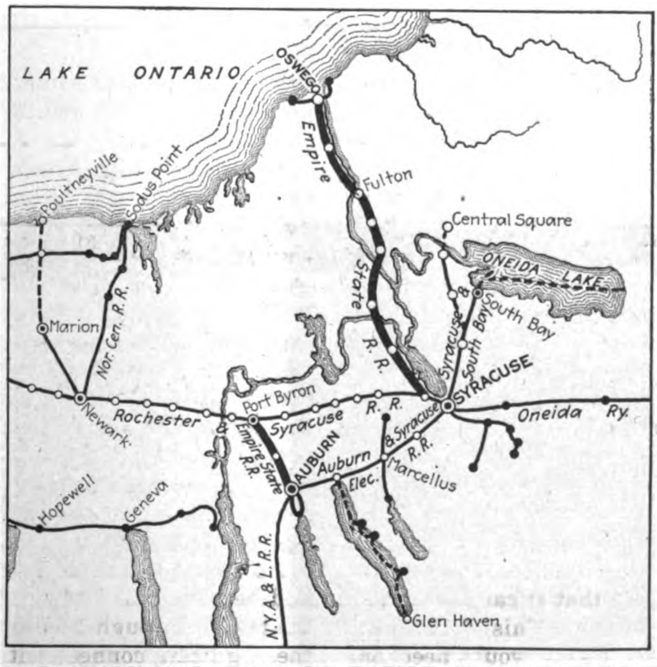
OFFICE BUILDING

Some "Empire United" High Spots

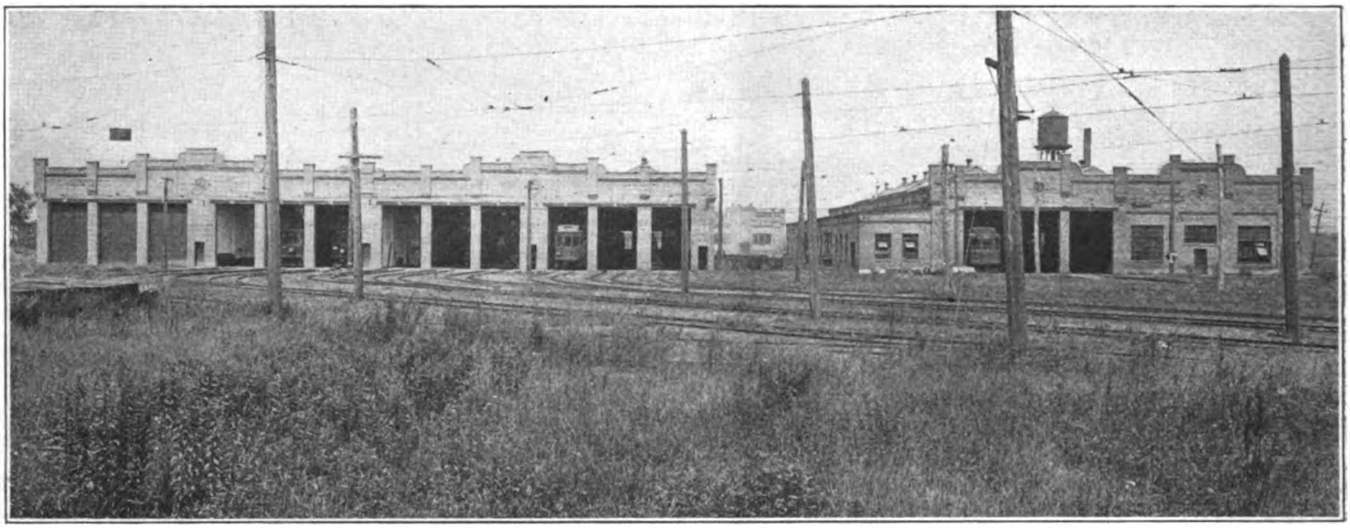
On a Recent Visit the Writer Was Favorably Impressed by the Operation of This Interurban Road in Central New York

By M. C. TURPIN
Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

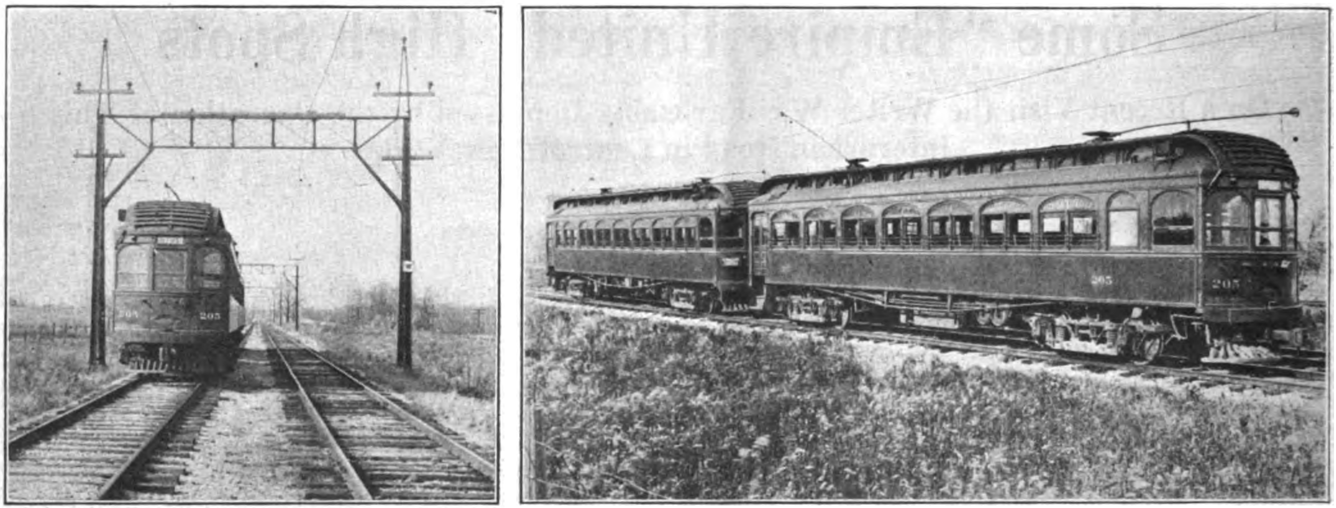
A REFRESHING example of an electric railway property that is successfully endeavoring to reduce operating expenses and at the same time furnish better service is to be found in the Empire State Railroad. This property was formerly a part of the Empire United Railways, Inc., which a few years ago was reorganized and divided between two companies. The Empire State Railroad Corporation, with its main office at Syracuse, N. Y., assumed the ownership of the line from Syracuse northward to Oswego and the line between Auburn and Port Byron, connections being made with the New York State Railways, the Auburn & Syracuse Electric Railroad and the Rochester & Syracuse Railroad, as indicated on the accompanying map. The territory served, which includes the cities of Syracuse, Auburn, Baldwinsville, Phoenix, Fulton and Oswego, has a population of approximately 250,000. It is an unusually fertile country as well as one supporting many industries, forming withal one of the most attractive sections of a state noted for its scenic beauty. The line between Syracuse and Oswego, a distance of 40 miles, is paralleled by both the New York Central and Delaware, Lackawanna & Western Railroads, but through superior service the electric line gets a good share of the business. The distance is covered by regular electric trains in one hour and forty minutes and by "limiteds," operated on Saturdays and Sundays, in one hour and twenty minutes. In addition to the interurban service the company operates city cars in Fulton and Oswego and handles an extensive summer business between Syracuse and Long Branch Park, a pleasure resort on Onondaga Lake. The advantages of handling freight traffic are fully appreciated by the company, which operates two two-car trains each way every day, except Sunday, between Syracuse and Oswego for handling local freight between these and intermediate stations. Handsome, stucco-type, combination passenger and freight stations are located at Syracuse, Baldwinsville, Fulton and Oswego, at each of which an agent is maintained. Attractive stained-wood shelter stations are located at various numbered stops along the lines. An effort was made to heat these shelter stations with electric heaters, but owing to the destructive proclivities of children and maliciously inclined adults who made a practice of breaking up the heaters, these efforts were abandoned.



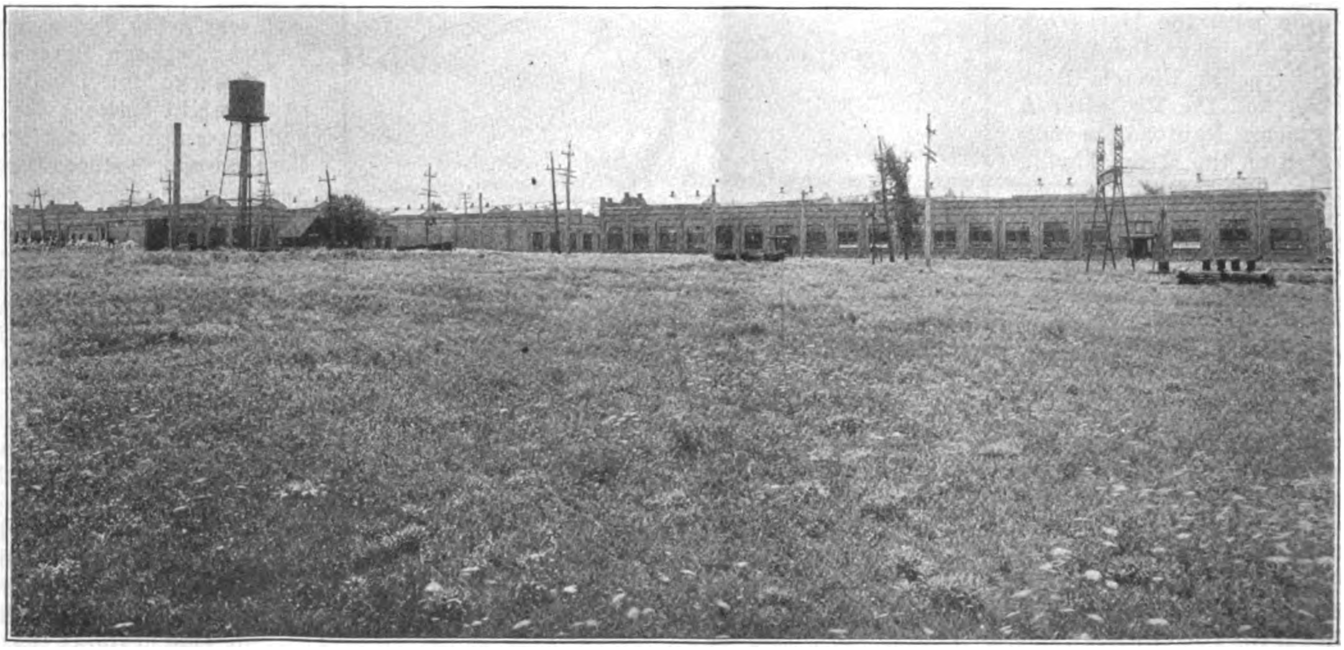
MAP SHOWING LAYOUT OF EMPIRE STATE RAILROAD AND SURROUNDING TERRITORY



AT LEFT, CARHOUSE; AT RIGHT, SHOP



AT LEFT, VIEW OF THE TRACK, CAR, TRANSMISSION LINE AND CATENARY LINE CONSTRUCTION; AT RIGHT, TWO-CAR TRAIN



LEFT TO RIGHT—SHOP, CARHOUSE AND OFFICE BUILDING

The length of road operated by the company is 57.6 miles, the trackage being 83.9 miles, about 50 per cent of the route being double-tracked. The rolling stock consists of seventy-four cars, apportioned as follows: Interurban, closed, eighteen; open motor and trailer, fifteen; city, closed, seventeen; city, open, six; freight, four; work, two; snowplows, four; sweepers, two, and miscellaneous, six.

The original closed interurban equipment consisted of twelve cars, each having four Westinghouse-119 motors, the electrically heated cars having a seating capacity of fifty-eight passengers and the stove-heated cars a capacity of fifty-six passengers. Appreciating the saving to be made by operating lighter weight cars, the company converted six trailer cars into motor cars by installing vestibules, sash, electric heaters, etc., and equipping them with four Westinghouse 101-B motors, which were in use under open motor cars. These converted trailer cars weigh approximately 56,000 lb. completely equipped, as compared with a weight of 95,000 lb. for the original interurban equipment.

The lighter cars are generally used for the shorter runs and extra service. In the summer these motor cars draw the open cars, from which the motors were taken, as trailers. The company estimates that by the use of this equipment approximately $1,000 per month is saved in the cost of power.

Power for the operation of the road is obtained from the Niagara, Lockport & Ontario Power Company at 33,000 volts and distributed to four substations, with a combined capacity of 2,900 kw., located between Oswego and Syracuse. Power for operating the Auburn-Port Byron branch is obtained from another substation receiving power from the same power company. Three of the substations are equipped with two 400-kw. Westinghouse rotary converters, and one with a 500-kw. converter of the same make, with the necessary transforming and switching equipment.

With the exception of about 7 miles, the line to Oswego is of catenary steel-bridge type construction, a 500,000-circ.mil feeder cable being used as a messenger wire. This construction was described in the ELECTRIC RAILWAY JOURNAL for Oct. 14, 1914. In the process of rehabilitating the road, the company has installed twenty miles of new No. 0000 trolley wire. The lines are protected throughout by automatic block signals.

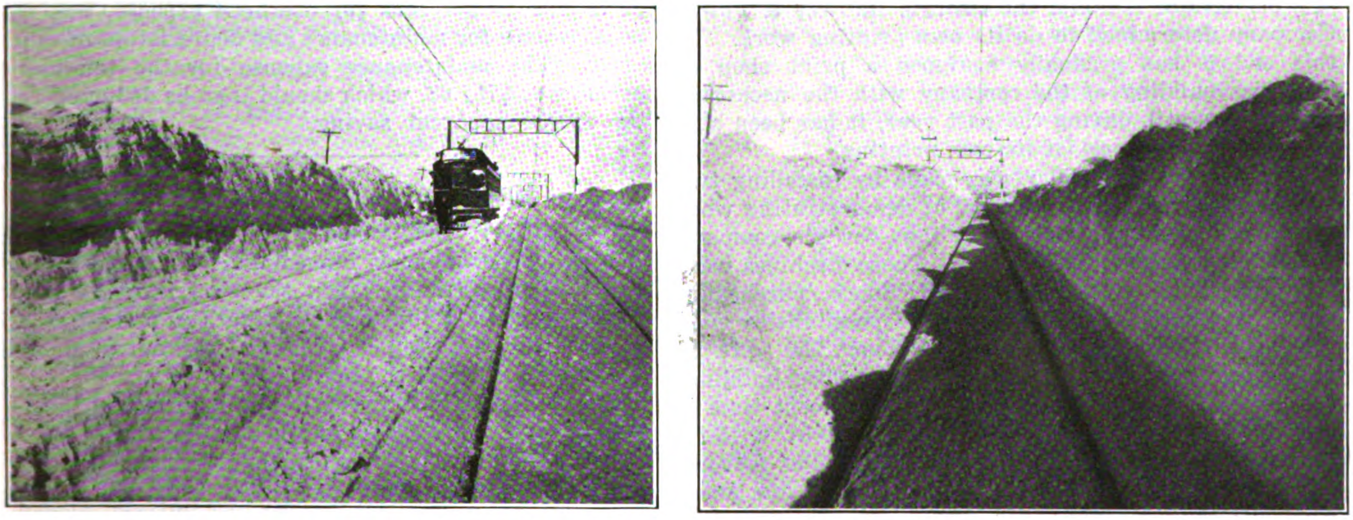
The writer, on a recent visit to this property, could not fail to be impressed with a number of features connected with the operation of the road that seemed to indicate a progressive spirit on the part of the management, and not only a laudable purpose of reducing operating expenses but also one of furnishing better service and catering as well to the needs of the employees. A few of the "high spots" among these features may be mentioned.

Every passenger car is washed at frequent intervals, at least every week. This not only keeps the paint on the cars in good condition, but improves their appearance and creates a much better impression of the road among the passengers. The company believes in furnishing service as well as transportation and believes that the average passenger, as a rule, will not notice a clean car particularly, but he or she will notice a dirty or ill-kept car and will not hesitate to condemn it in no uncertain terms. Therefore, every effort is made to keep the cars clean and sanitary. They are also painted at regular intervals, the company having adopted the Pennsylvania Railroad red as the standard color for all of its cars.

As fast as is practicable all the cars are being thoroughly rehabilitated, the equipment overhauled, new toilets installed and the present side horizontal-burning lamps changed over to center vertical-burning ones. The relays for operating the control system have been mounted in the motorman's cab under a glass case so as to protect them from snow, dust and dirt.

Another progressive feature adopted by the company is the use of what is known as the queue, or single file, method of loading men on the cars at industrial plants located on the lines. This plan was put into effect as far back as 1917, at an army camp located near Syracuse, where considerable trouble had previously been experienced in loading soldiers on the cars. This method has been adopted by the Holcomb Steel Company and other industries along the lines with most satisfactory results. It entirely eliminates crowding and the fighting which frequently ensues, permits a quicker "get-away," and consequently improves traffic conditions.

As previously mentioned, the company does a good summer business to Long Branch Park on Lake Onondaga, which is greatly augmented by the handling of a large number of picnics. The regular excursion rate



1920 SNOW SCENES ON THE EMPIRE STATE

from Syracuse to the park is 25 cents per round trip, whereas the company sells tickets in lots of 200 or over at 20 cents, allowing the organization holding the picnic to make the extra .5 cents. Nor does the company overlook the needs of its employees. The offices and shops are located in a well-built and well-lighted, spacious group of buildings, about four and a half miles from the center of the city. This location is, therefore, not well situated in regard to lunching facilities. The company has installed in the office building a diner and cafeteria open to all employees. Food is bought in town, brought out over the company line, cooked on an electric range and served by girl employees. It is supplied practically at cost prices. An electric dishwasher is included.

The management of the company is under the supervision of Ford, Bacon & Davis, engineers, with J. C. Nelson, recently elected president, in direct charge.

Saving $900 a Month on Printing

The Railway and Electric Company of Atlanta Has Cut Its Printing Costs in Two by Doing Its Own Work

UNABLE to get satisfactory composition from the printers of Atlanta, the Georgia Railway & Power Company determined to do its own printing work. To this end it has gradually equipped a print shop in the office building of the company with the necessary machinery until, during the past year, it has been able to do the greater part of its own printing.

The start on this policy was made by installing two multigraph machines as a means of demonstrating what could be done in the way of savings for the company without too great an investment. These machines were used for about a year, and W. H. Smaw, purchasing agent, was satisfied that there were possibilities warranting further investments. With about 750 sq.ft. of floor space available in the company's office building, equipment has been added until at the present time it includes one Kelly automatic press, two 10-in. x 15-in. Chandler & Price presses equipped with Miller feeders, one 8-in. x 12-in. job press, one large and one small wire stitching machine, one power paper cutter, one power punch, one power perforator, two make-up stones and a large supply of type of various kinds and sizes. The investment involved is about $8,000.

With this equipment, it is possible to do practically all such printing as the various office forms, the trip sheets, bills of lading, cash fare receipts, etc. There is, in addition, a certain amount of matter which has to be let out to the local printers. All linotype work is also done outside. The forms used by the company alone represent a very large amount of work, for there are more than 500 of them for the two companies, electric and railway, all of which are done in the company's own plant. The number of different jobs handled is shown, by months, in the accompanying statement of the plant operation. Transfers and tickets are printed only in emergency, but the company has the necessary plates always in readiness.

As a means of keeping an account of the savings which the printing plant makes for the company, as compared with the cost of having the work done outside, the cost of each job is figured according to outside printing shop unit figures, and this compared with the actual cost plus 40 per cent for overhead of doing the work in the company's own shop. Figured in this manner, the print ship showed an apparent earning for the first ten months of 1919 of $9,000.

The unit figures used in figuring the outside cost of a job are frequently checked up by submitting jobs to outside bidders. The company lets enough work out so that the local printers are always willing to bid, and by this means the foreman of the shop is able to arrive more accurately at the outside estimate for all jobs. An effort is made to figure the estimates very closely and to hold them down so that there will not be an unduly favorable showing for the company's shop.

JOBS HANDLED IN COMPANY'S PRINTING PLANT

1919	Number of Jobs	Estimated Outside Cost	Actual Cost	Approximate Earnings
January	100	$1,284.85	$687.56	$597.29
February	79	1,100.75	564.33	536 42
March	52	770.65	360.20	410.45
April	96	2,090.95	1,134.01	956.94
May	94	2,086.67	1,055.17	1,031.50
June	94	2,266.60	1,067.49	1,199.11
July	92	1,777.10	709.32	1,067.78
August	98	2,044.30	1,148.77	895.53
September	85	2,580.09	1,267.73	1,312.36
October	95	2,055.95	1,062.90	993.05
Total	885	$18,057.91	$9,057.48	$9,000.43

The actual cost figures include time and material only, plus 40 per cent for overhead expense, but with no allowance for maintenance and depreciation of equipment. The maintenance expense for the ten-months period was $751.68, which should then be deducted from the $9,000 apparent saving.

Belgium Plans Electrification

A RECENT Belgian government report on electrification recommends immediate electrification of the Brussels-Antwerp line, then the electrification of the Luxemburg main line and its branches, and at a later date the electrification of various radials out of Brussels and the Brussels Belt Line.

On the Brussels-Antwerp line it is proposed to use a two-unit train for passenger service, each unit consisting of a motor car with multiple-unit control equipment and two trailers. Each motor car is to be equipped with four 275-hp. direct-current motors. About 87 km. of main track and 15 km. of branch track are to be electrified and the service proposed is thirty-eight trains daily in each direction. Later developments recommended are double tracks between Brussels and Antwerp, with electrification for express, freight and omnibus trains in each direction. The maximum speed is to be 90 km. (56 miles) per hour with an average express speed of 83 km. (52 miles) per hour.

The freight locomotives are specified to haul 1,000-ton trains on a level at 45 km. (25 miles) per hour and are rated 1,650 hp. The freight and passenger traffic on the Brussels-Antwerp line is heavy and the power consumption is expected to exceed 100,000,000 kw.-hr. per year.

The proposed electrification of the Luxemburg lines is similar to the Brussels-Antwerp line as regards passenger equipment, but heavy grades require two freight locomotives per 1,000-ton train. The power consumption is estimated at 400,000,000 kw.-hr. per year.

Direct current will be used on the system but the specific system, whether third rail or overhead trolley, is left in abeyance until the French decision is made regarding their electrification in adjacent districts.

Motor Bus Transportation in New York*

Organization and Operating Details of a Successful Company Are Outlined — Discussion Also Given of Present and Future Possibilities in Motor Bus Transportation

By GEORGE A. GREEN
General Manager and Engineer Fifth Avenue Coach Company, New York

THE motor bus industry is of very recent growth, but is rapidly establishing itself in popular favor. Unquestionably, the so-called "jitney" is merely a forerunner, but it is fulfilling a useful purpose, since it is creating a desire for a real bus service. I am expected to give my views on motor bus operation, and since the Fifth Avenue Coach Company is the only successful one of any size in the United States it necessarily follows that a rather lengthy description of the company's systems and methods must be given.

The three main divisions of the Fifth Avenue Coach Company are the engineering, mechanical and transportation departments. There are, of course, departments concerned with finance, auditing, disbursements, publicity, claims, etc., but these follow conventional lines and no further reference will be made to them.

ENGINEERING DEPARTMENT

At the head of the engineering department is a mechanical engineer, who has charge of all designs, research and experimental work. His duties follow closely along conventional lines. In regard to design, there is a rather general impression that the average truck chassis can be successfully employed for motor bus operation. We do not hold this view, for the average truck chassis is unsuitable for passenger transport, because the weight is excessive, particularly the unsprung weight; the center of gravity is too high, the gear ratios are unsuitable, the springs are too rigid, the spring and axle tracks too narrow, the radius too wide, the steering too stiff, etc. Briefly, it would be just as unsatisfactory to attempt to use a high-class twelve-cylinder touring car for general truck purposes as it is to expect the average truck to give efficient and economical service when used to haul human freight. The development of a new type of vehicle is an exceedingly slow process, for aside from the matter of design, an immense amount of time is necessary to prove the value of the product. Approximately 25,000 miles of operation is required to find out what is wrong after samples have been placed in operation.

We have since 1907 operated nineteen different types of chassis produced by domestic and foreign manufacturers, also twelve different types of bodies, and we have tested nearly all suitable standard engines from four to eight cylinders, as well as many different types of radiators, clutches, transmissions, axles and chassis frames. In none of these instances did we meet with entire success. Of course, our lack of standardization proved a very severe handicap. The net result of our effort was the production of complete buses that have today covered more than 20,000,000 miles. The performance of these vehicles is so remarkably superior to our previous models that no comparison is possible. In general, any large operating company will require at least two distinct types, the double-deck for large loads and the single deck for smaller loads, faster operation, express service, etc.

Assuming good roads, wide thoroughfares and reasonable freedom from overhead structures, the fifty to sixty passenger, very low hung double-deck vehicle, capable of handling a trailer, seems to have great possibilities. This class of vehicle, jointly operated with the single-deck, one-man controlled type, pneumatic-tired bus, appears to me as being a logical scheme, especially where peak loads must be handled largely without surface car or subway aid.

There are those who believe that the trolley car propelled by a gasoline power unit may supersede the present equipment. In my opinion this theory will not bear close analysis, for the greatest asset the trolley car has is cheap power, and if you take this away the structure falls to pieces. A gasoline-propelled trolley car is a bus, minus nearly all the advantages of the latter. It is, of course, true that a much lighter and better design of trolley car could be produced and a gasoline power unit embodied in it. It is equally true that the cost of operation of such a vehicle might be less than that of existing types of trolley cars, but my contention is that if the same care and attention to design were applied to the conventional article still better results would be achieved. The fact is the present design of trolley cars is more or less crude and out of date, for they are as a whole built as strong as possible and not as weak as possible, which is a much more logical and economical procedure. To sum up, trolley car design has not marched with the times.

RESEARCH DEPARTMENT

This department co-ordinates the work of the design, repair and operating departments. Briefly, the duties and responsibilities of a research department are as follows: (1) Analysis and recording of all breakages, failures, etc., (2) operation of the dynamometer, (3) continual study of the fuel situation, (4) testing of materials, such as fuels, oil, etc., (5) perusal of all trade journals, (6) standardization program. We regard the analysis and recording of all breakages, failures, etc., as of great importance. The research department spends a great deal of time in studying the fuel situation, in testing devices for improving economy and in testing fuel and oil purchased by specification.

We believe it is essential that especial care and attention be taken in this matter of fuel economy. Throughout the year we average about 6.5 miles per gallon of gasoline. This figure takes into account all shrinkages, leakages and losses of every kind. There are a very large number of high individual averages, some as high as 15 miles per gallon. We have a number of men who can average 10 miles per gallon for a week at a time. High gasoline averages from our standpoint mean economy first, well designed and maintained equipment second, and skilled and contented operatives. Gasoline is our second greatest item of expense. Our yearly bill is, in round figures, $500,000. Since 1 per cent of this amount represents $5,000 annually, it can readily be seen that losses of even 1 or 2 per cent must be remedied, regardless of whether these losses are due to mechanical or physical disabilities. Increased labor and material expenses, and gasoline falls under the latter head, cause us much greater anxiety than if we were manufacturing in the ordinary sense of the word, for we are selling a commodity which has a fixed price regardless of production costs. This means that every addition to our labor and material bill must be parallel with some form of economy. If this were not done we would soon find our expenses in excess of our income; for example, in 1911 our gasoline consumption averaged 2.9 miles per gallon and at that time gasoline cost much less than it does today, and if it had not been possible to increase our gasoline efficiency it is quite possible that the Fifth Avenue Coach Company would now be out of existence. Not only is our gasoline bill the second biggest item of expense but it is capable of greater reduction with less effort than any other single item. Our rising and falling gasoline averages are in effect the barometer on which we base our predictions. The gas barometer tells us in the most unmistakable language what is in store for us. Bad gasoline consumption means big fuel and repair bills, with the prospect of still bigger bills in the future; possibly also labor unrest, due to general dissatisfaction.

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*Abstract of paper presented to the Society of Automotive Engineers, Ottawa Beach, Mich., June 23, 1920.

To attain high averages in fuel economy it necessarily follows that well designed and maintained equipment must be used. Our vehicles cover an average of more than 100 miles per day and are required to start and stop about 1,000 times each day, with several thousand gear changes, brake applications, etc. Furthermore, the vehicle is handled by several different drivers daily, so that none but the best material will stand up under such conditions.

TRANSPORTATION DEPARTMENT

The superintendent of transportation has charge of selecting all men for the transportation department, supervision of their training, administration of discipline. elimination from service, promotion, general study of traffic conditions, collection of statistics from which running time and schedules are prepared, supervision of inspectional forces, receivers, timekeepers and mileage departments, division foremen, etc. In this work the superintendent has a supervising force of forty-five men, comprising foremen, heads of various departments, inspectors and starters.

The chief of the department bureau is responsible for all men employed. Applicants are generally recommended by employees and are principally married men, twenty-five years or over, and with army or navy training.

Applicants must be inspected for weight and height and all applicants are interviewed by an examiner, who questions them as to their previous experience. Those who qualify are permitted to fill out applications and are then passed on the the chief, who questions them further as to their general knowledge of the city. If accepted, the applicant is sent to the company doctor for physical examination and eyesight test. The applicant's references for five years are then investigated, and those references within 25 miles of New York city are checked up by a personal investigation. Only 20 per cent of all applicants qualify for positions.

Each applicant accepted is then sent to the conductors' school and given various forms of descriptive matter and instructed in detail on his duties. The applicants are assigned to conductor instructors on the road to receive practical working knowledge and then returned to the school for a final examination. Those passing the oral, blackboard and written examination with a proficiency of 75 per cent are recommended for appointment. Others receive further instruction until they are 75 per cent proficient. On an average the instruction period covers four days. After completion of the course the student is then outfitted by the company tailor and finally assigned to a division, where a get-together talk is given by the foreman. All new men are on probation for ninety days and during this time the chief conductor instructor rides with them as often as practicable for follow-up instructions.

The men who man our buses, including instructors, inspectors, starters, etc., must all graduate from positions as conductors.

Based on averages a conductor has an opportunity to become a driver after eight months' service. We attach great importance to the educational value of this position, for a driver without a conductor's experience can scarcely realize what a conductor must contend with and would be less likely to co-operate with the conductor. Promotion to driver involves an increase in pay of 13 per cent and is determined by seniority and operating record.

After passing another examination and being recommended by the foreman the drivers are sent to school to learn the duties they are required to perform. They are then shown on a stripped chassis the various units and the relation these units bear to the operation of the bus. They are then sent to a divisional instructor and receive practical experience in driving on the road without passengers. Upon passing the state examination and a license being granted, the student is permitted to drive a bus carrying passengers, under guidance of an instructor. He then is given a test by the chief driving instructor and if found stisfactory is assigned to a position as a regular driver.

On an average the instructional period covers sixteen days of ten hours each, the total of 160 hours being divided into forty-five hours of mechanical instruction, the same amount of driving instruction without passengers and seventy hours of driving instruction with passengers. From the time each man files his application for a position as conductor to the time he is made a driver the expense to the company for instruction is about $200.

Complete records are kept of each man. These are in folder form and consist of application, reference blanks, photographs, doctor's examination and certificate, complaints, violations, accident settlements.

When a conductor becomes a driver the same record is continued and there is attached thereto his record of instruction as a driver, the doctor's re-examination certificate and the employee's contract, also a sheet showing entries of all delays, together with a report covering their investigation. In the instructional period students are paid. It is in reality a loan, and a contract is made in which it is stipulated that if he remains as driver six months or longer the loan is discounted.

Buses are run in accordance with time-tables very similar to those of any steam railroad. The construction of our time-tables is a most difficult and expensive matter, much more so than with steam railroads and electric systems. Because of the varying traffic conditions along our routes, we are obliged to have no less than six different running times. Of course these are based on average conditions, since it would be impracticable to meet every variation. Any simplification of our time-table arrangements must immediately result in decreased speed, which would be unsatisfactory to the public and would be costly for us. Our annual payroll for drivers and conductors is in round figures $1,000,000, therefore a 1 per cent decrease in speed represents $10,000 added to our working expense. There are also schedule changes in the different seasons of the year and to take care of the various conditions of riding. This change in riding must be closely watched and passenger counts be taken at various points to determine just what service is necessary. Altogether there are ten time-table changes throughout the year and minor changes almost weekly.

There are nine separate lines in our system, all of which converge on Fifth Avenue below Fifty-seventh Street. At the different periods of the day we at present operate the following number of buses:

Period	Buses per hour	Headway, seconds
Morning rush	193	18
Mid-day	107	33
Evening rush	184	20
Sunday	144	25

Foremen, chief instructors, inspectors and starters patrol the routes for the purpose of regulating the operation of the buses and give follow-up instructions to new conductors and drivers. We also employ an average of twenty operatives in civilian clothes in our inspectional bureau to inspect general operations on the route. Inspectors make out hourly checks of schedules, report defective equipment and pavements, check conductors' register readings and talk to the men on minor violations. Serious infractions of rules are reported to the respective foremen of transportation and they in turn give the man four chances before sending him to the superintendent of transportation. We have also instituted the right of appeal, so that a man who feels an injustice has been done can take the case to the general manager and if necessary to the president.

Crews are allowed ten minutes each morning and night for an inspection of their buses. The depot dispatcher is responsible for seeing that the buses leave the garage on schedule time. As soon as a bus reaches the terminal it is under the direction of the starters and the inspectors, who direct the buses in accordance with schedules, which are provided in small book form.

Parades must be always looked out for. New routes must be selected and inspected for overhead obstructions, pavement conditions, etc.

We maintain a fleet of thirty-eight snowplows and five sand cars, with which we keep our routes open during the winter. The snow-fighting force is patterned after the fire department. Each section of our routes has its allotted plows, in charge of a captain, and our organization is arranged so that, regardless of the time of day or night a snowstorm starts, the required men automatically report for duty.

We have a sunshine nurse and sunshine committee to take care of those who are ill or in trouble, and in addition we maintain a pension fund. We often give free legal advice to our employees through our attorneys. Lunch and recreation rooms are maintained for employees at each garage, as well as barber and tailor shops, and the garages provide sleeping accommodations in the winter for men who cannot get home on account of unfavorable weather conditions, so that a man can practically live at the plant with all the various accommodations provided.

FUTURE POSSIBILITIES OF THE MOTOR BUS

It has already been pointed out that motor bus operation is a comparatively new art. The possibilities of improvements are practically unlimited. This applies to design for greater comfort and convenience as well as to economy of operation. The bus requires a minimum investment in garage and repair facilities, and its low unit cost is a powerful argument in favor of its adoption. Unquestionably if a motor bus service is to realize its possibilities of financial success it must be backed up not only by ample resources but it must also develop a highly specialized organization. The engineering force and the management must have specialized experience, for the motor bus traffic demands are distinctly special.

Employees must be trained in a branch of motor vehicle operation with many distinct and unique peculiarities, for which the operation of neither the automobile nor any form of transportation affords suitable experience. One of the chief differences between the bus and other forms of transportation is the matter of flexibility. As a matter of fact we prefer to train men for drivers who have never had automobile driving experience. Furthermore, we find that railroad operatives, while they possess useful knowledge, must forget so much that on the whole it is more satisfactory to employ men without this experience.

In my opinion the wisest policy, both from a financial standpoint and the service results to the city, is to entrust a single, well organized and equipped company, possessing ample resources, with the development of a unified motor bus service. Parceling out streets to two or more companies will never provide the Pullman car service which the true motor bus can give. The actual result of any form of competition must be multiplied fares and no transfers. With a unified system there can be no harmful monopoly, for the fare should be determined by the authorities and the company should be under public regulation, but so-called competition from a public utilities standpoint means bad service and financial failure. Cities cannot be prosperous without efficient utilities and utilities cannot be efficient without prosperity.

No satisfactory motor bus service can be given with seats for all on the basis of the 5-cent fare. It costs the Fifth Avenue Coach Company about 8½ cents for each passenger carried. A large proportion of our daily mileage is operated at a loss. Checks show us exactly where these losses occur, but we do not try to avoid them, as we are satisfied that by careful management on the whole a profit can be made and we should lose if we cut service to suit local conditions.

We know our success depends on the good will of the public and it has always been our aim to give in exchange for our earnings an equivalent measure of helpful service.

Unquestionably in the large centers it is desirable that the workers should be able to get away from the busy centers of industry and into the more wholesome surroundings of outlying districts and everything should be done by city authorities to encourage this. Nothing is of more importance in this respect than providing expeditious, healthy, comfortable and easy means of public conveyance to and from these districts, for of course the development of the outlying districts raises values, so that the city will in this way obtain increased income from taxation.

Clearly, where car tracks do not already exist, the most careful thought should be given before they are installed. Quite apart from this, from a public service as well as an operating point of view, there can be no question as to the possibility of using buses for (a) extending the service of existing car lines by bus system into the outlying districts through the introduction of transfer privileges between the two, (b) extending service, the conditions of the streets permitting, into the outlying districts without transfer service between buses and cars and without disturbing the present local business or business logical to the existing car lines, by permitting the buses to operate beyond the present outlying terminus of street cars and by diverting the buses to other parallel routes after reaching such outlying terminus.

In my judgment, no kind of bus designed up to the present is capable of properly handling peak loads. In my opinion the theory that the car systems in any of the larger cities can be supplanted by any standard size of bus now obtainable is absurd and not worth any serious discussion. No man with any elementary transportation knowledge would back such a statement. The bus is not more economical than the trolley car on the basis of cost per passenger carried, which is the only real basis. Obviously it is useless to compare the cost per mile of two vehicles with such vastly different seating capacity.

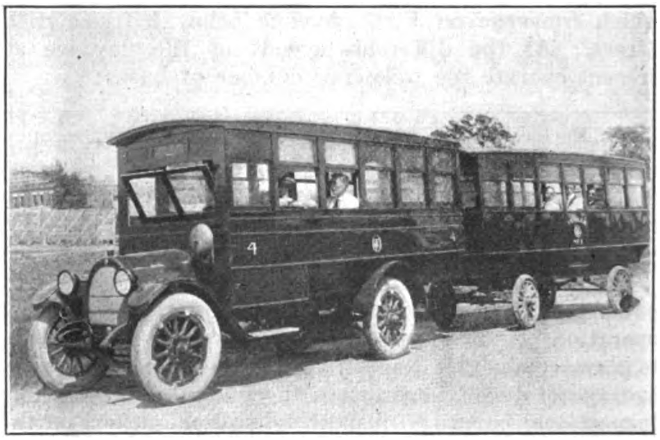
It should be borne in mind that the financial success of the Fifth Avenue Coach Company is largely due to the 10-cent fare. On a 5-cent basis its development would have been absolutely out of the question. The extra fare is willingly paid by the public to the bus company because of the greater ease and convenience of bus travel.

The policy of the Fifth Avenue Coach Company may be summed up in two words—"service and courtesy." From an inside viewpoint we try to give every member of our organization a square deal in all the word implies. With us the word justice is not merely an empty phrase. The "right of appeal" guarantees this. The doors of the executive offices are always open and the heads of the departments as well as the rank and file have free access at all times. Our staff officers are carefully trained and are taken into our confidence where matters of policy are involved and their views are eagerly sought. Our working conditions are just as good as we know how to make them. The net result is that labor troubles are conspicuous by their absence and practically every member of our staff has worked his way up from the ranks. Our organization is not a one-man proposition in any sense of the word, as each man is willing and anxious to do more than is expected of him and to subordinate his personal interest. We all believe in the theory and practice of teamwork, so it naturally follows that the operation of our business is extraordinarily free from petty jealousies and other forms of industrial unrest. We are extremely proud of our equipment and organization, with its personnel that knows not the word "failure." There is nothing at present to indicate any change in the future.

Buses Supplement Electric Railway

A FLEET of six motor buses and four trailers is being used by the Okmulgee (Okla.) Traction Company to supplement its regular railway service. Regular schedules are being maintained over two through routes which reach into all four parts of the city. Fifteen-minute service is maintained. The buses are operated on paved streets only, with the exception of special service furnished to the ball park when regular games are being played. Each of the routes reaches from 1½ miles to 2 miles from the center of the city.

For this service Oldsmobile trucks are being used. The cars are equipped with special bodies designed by M. M. Simons, general manager of the Okmulgee Traction Company, and built by the Lantz Carriage & Motor Works, Muskogee, Okla. The trailers are Trailmobiles. They are also equipped with specially designed bodies. The motor buses are of the one-man, pay-as-you-enter type with the entrance at the front. They are equipped with electric bells, lights and heaters. The trailers are entered from the side. The motor buses have pneumatic tires, while the trailers have solid tires. The car and trailer combined seat forty-two persons. Their capacity in rush hours, however, is sixty persons. The fare is 10 cents cash, with three fares for 25 cents, and free transfers are given between routes. School children and school teachers are carried on special tickets for 5 cents each during the months schools are in session.


MOTOR BUS AND TRAILER USED BY OKMULGEE, OKLA. TRACTION COMPANY

The Okmulgee Traction Company is still operating the full complement of electric railway cars, but it is said to be the intention of the company to abandon the railway, tear up the tracks and substitute a complete motor service if the present experiment with the buses proves successful.

Okmulgee is the county seat of one of the large agricultural and cattle growing counties of Oklahoma. It is also the center of a rich oil, coal and natural gas field, to which industries are being attracted by the enormous supply of all kinds of fuel which is available here. The gasoline with which the traction company's motor cars are driven is a product of one of the five big oil refineries located at Okmulgee.

The estimated production of bituminous coal in 1919 is 458,063,000 short tons. The amount of coal used by electric public utility plants during 1919 was 7.6 per cent of the total produced.

Coasting Recorders Give Striking Results

The Experience of One Year on the Lines of the Capital Traction Company Indicates Savings in All Directions—Transportation Department Must Take Active Interest to Realize Fully on Power Saving Installations

BY J. E. HEBERLE
Assistant Secretary the Capital Traction Company,
Washington, D. C.

NEXT to the cost of labor, the largest item of expense in the operation of a street railway company manufacturing its own power is the coal bill. Railways that purchase their power find this cost reflected in their power costs. With the constantly mounting price of coal, the importance of using every measure of economy is emphasized. One field of economy that deserves the attention of every railway man and that has been entered by a number of roads is the conservation of power through the installation of some one of the various forms of checking devices on the cars, recording or indicating the performance of each motorman, and accomplishing its purpose by a thorough follow-up system, including the instruction of trainmen in the most efficient and economical operation of their cars.

In 1919 the Capital Traction Company entered the ranks of companies which have adopted this measure as a means of increasing efficiency, and it is with the thought that our experience may be of interest and possible benefit to the industry at large that this article is written.

	Per Cent		Per Cent
June, 1919	28.1	December	32.1
July	30.0	January, 1920	32.1
August	30.6	February	31.8
September	30.6	March	35.0
October	30.5	April	35.7
November	31.8	May	36.5

The necessity of conserving coal, both as a patriotic measure during the war and as a means of economy, was recognized, and in 1918 an order was placed with the Railway Improvement Company for coasting recorders to equip all of our cars. The skip-stop system had been instituted in April, 1918, on the railway lines in the District of Columbia, and in August our schedules were revised and tightened up to absorb the slack occasioned by the new stop system. The coasting recorders were installed in the spring of 1919 and the entire system was equipped by June 1.

Briefly stated, our first year's operation with the recorders resulted in an increase in our coasting percentage of about 15 per cent and an estimated saving in fuel and brake shoes alone of $36,717. This was accomplished with an investment of $38,852 and an expense of $7,913, giving a net return in twelve months of $28,804, or 78 per cent of the outlay for recorders. At present our net saving in coal and brake shoes is approximately $3,600 per month. Other benefits accruing are touched on later.

IMPROVEMENT IN COASTING

Our first week of operation with the recorders showed a coasting average for the system of 26.4 per cent. This was after the initial instruction and after several lines had been operating with the recorders for from two to three weeks. From the first few days' performance of each division we estimate that our coasting percentage prior to the recorder installation was approximately 20 per cent. The system coasting percentages for each month from June, 1919, to May, 1920, inclusive were as shown in the table in the first column.

The building up of our coasting to 30 per cent offered no particular difficulties, the issuing of general instructions, posting weekly and monthly lists at the division barns showing the individual coasting records and periodic visits of the coasting instructor readily bringing this percentage. It required more strenuous measures to reach a higher mark. Starting with the last week of October, 1919, an intensive coasting campaign was inaugurated, with 35 per cent set as the goal. Coasting was "sold" to every member of the transportation department and the aid of the mechanical department was enlisted to see that the cars were maintained in good rolling condition. Our motormen so entered into the spirit of the campaign that they reached the coveted 35 per cent in March, 1920, increasing this to 36.5 per cent in May.

The individual records in the early period showed a vast range, some motormen having records as low as 8 per cent. A surprising feature was that many of the low records were turned in by men who in all other respects were excellent motormen. An idea of the improvement in this respect may be gained from the following table, showing the number of our men with various coasting percentages during the week ended June 7, 1919, and the last week of May, 1920:

	Percentages of Total Motormen Weeks Ended	
Motormen with Records of	June 7, 1919	May 28, 1920
10 to 15 per cent	4.2 per cent	....
15 to 20	18.1	....
20 to 25	28.7	..
25 to 30	22.8	4.8 per cent
30 to 35	11.4	34.2
35 to 40	7.8	38.7
40 and over	7.0	22.3

It will be noted that the first week our system was fully equipped, which represented a better condition than before the coasting clocks were installed, 73.8 per cent of our motormen coasted less than 30 per cent, compared with 4.8 per cent during the week ended May 28, 1920.

EFFECT OF INCREASED COASTING ON KILOWATT-HOURS PER CAR-MILE

Beginning with the first month the recorders were in operation a marked reduction in kilowatt-hours per car-mile became apparent. This is best shown by the following table, giving kilowatt-hours generated per car-mile operated for two years prior to the installation of recorders and one year with the coasting recorders in use. The figures in italics represent the mean temperature for each month, obtained from the Weather Bureau.

KILOWATT-HOURS PER CAR-MILE

	Without Recorders 1917–18	Without Recorders 1918–19	With Recorders 1919–20	Percentage Reduction 1919-20 vs. 1918–19	1919–20 Coasting, Per Cent
June	3.45 *73*	3.59 *71*	3.25 *74*	9.3	28.1
July	3.33 *77*	3.49 *74*	3.15 *77*	10.2	30.0
August	3.27 *76*	3.42 *78*	3.14 *74*	8.2	30.6
September	3.50 *64*	3.49 *64*	3.23 *69*	7.6	30.6
October	3.63 *52*	3.57 *61*	3.26 *63*	8.7	30.5
November	3.97 *43*	3.67 *46*	3.265 *47*	10.9	31.8
December	4.29 *28*	4.02 *42*	3.59 *33*	10.7	32.1
January	4.60 *24*	4.12 *38*	3.799 *29*	7.9	32.1
February	4.22 *37*	4.22 *37*	3.82 *33*	9.6	31.8
March	3.84 *48*	3.84 *46*	3.37 *46*	12.3	35.0
April	3.77 *53*	3.72 *54*	3.20 *53*	14.0	35.7
May	3.55 *70*	3.50 *65*	3.09 *60*	13.8	36.5

A detailed study made over two comparative periods, one preceding and the other subsequent to the installation of coasting recorders, showed that a greater proportionate reduction in kilowatt-hours occurred at the time of peak load than occurred during the non-rush period.

SAVINGS EFFECTED

The results of the reduction in power demand for car operation, both in kilowatt-hours and equivalent coal value, are shown in the following table:

	1919-20 Versus 1918-19 Increase in Car-Mileage Operated		1919-20 Versus 1918-19 Increase in Kw.-Hr. Generated		Saving, Kw.-Hr.	1919–20 Fuel Value
June, 1919	81,496	11.6%	29,923	1.2%	261,987	$2,219
July	94,400	12.9	42,017	1.6	295,665	2,540
August	106,275	14.7	130,673	5.3	233,628	2,000
September	117,135	17.0	194,293	8.1	214,361	1,828
October	159,234	23.3	306,412	12.6	262,043	2,233
November	92,896	13.2	20,967	0.8	319,540	2,636
December	106,538	14.6	67,759	2.3	360,774	3,070
January, 1920	85,012	11.9	79,390	2.6	269,158	2,261
February	86,907	12.8	56,837	2.0	306,072	2,562
March	111,881	14.8	17,483	0.6	412,785	3,802
April	72,902	9.6	161,614*	5.7*	463,689	4,516
May	32,758	4.1	229,424*	8.2*	403,815	4,050
Totals	1,147,434		554,916		3,803,517	$33,717

* Denotes decrease.

Our coasting campaign has had the effect of increasing the life of brake shoes from an average of 459 miles over a five-year period previous to the installation of recorders to an average of 699 miles during the past twelve months, or 52 per cent. The gross saving in brake shoes during the year of operation with the coasting recorders was approximately $3,000, making a total gross saving in coal and brake shoes of $36,717. The total cost of operating the recorders for the year was $7,913.

Accompanying the saving in brake shoes was unquestionably a reduction in wheel wear, which should be reflected in a greater life of car wheels. As the average life of car wheels is from two to five years, we are not able at this time to approximate the amount of this saving. Other equipment economies were undoubtedly effected, due to less wear and tear resulting from increased coasting, but these are not of a measurable nature.

The average cost per motorman of operating the recorders was $23.62 per year, divided as follows:

Coasting instructor	$6.25
Recorder maintainer	5.42
Office employees	9.10
Paper-tape for recorders	1.63
Envelopes and office supplies	.85
Recorder repair parts	.37
Total expense	$23.62 per annum
Fuel and brake shoe savings	109.60 per annum
Net saving per motorman	$85.98 per annum

We have 317 cars equipped with coasting recorders and the average number of motormen's records handled per day is at present 350. The operating force consists of one coasting instructor, one recorder maintainer, two clerks employed full time on detail record work and one clerk in charge of the record work, who devotes about one-half time to duties unrelated to coasting recorders.

EFFECT ON COLLISIONS

A close and continued study has been made to ascertain what effect a coasting campaign has on collisions, which has shown conclusively that such a campaign is not detrimental. Of the motormen involved in collisions during the first five months of 1920 63 per cent had coasting records below their division average. The total number of collisions of cars with persons, cars and vehicles during the first five months of 1920 showed a decrease of about 20 per cent over the corresponding periods of 1918 and 1919.

OTHER BENEFITS

Coasting records have been of considerable value in furnishing an additional vehicle for conveying to the management the relative efficiency and value of motormen. The economic value of coasting having been established, new light is thrown on the individual operating efficiency of motormen formerly classed as "good" motormen. We believe the effect of our coasting campaign has been beneficial in improving the general morale of our trainmen. We have been able to maintain a better inspection of our car equipment through following up claims of motormen that they were handicapped in their efforts to coast by cars not working properly. The recorders clearly demonstrated the economy of replacing trucks on thirty of our cars, and this work is now being carried out.

GENERAL

The ultimate success or failure of any form of power-saving device installed on the cars depends on the amount of interest displayed, particularly by the transportation department. We have established a fair coasting average as one of the requirements of the work of motormen. This standard must of necessity be flexible to fit the various individuals. The time of the coasting instructor is entirely devoted to instructing motormen who have not reached or who have fallen below this standard, and this instruction is almost invariably followed by an improvement. Our experience has been that a coasting campaign does not go very far of its own momentum, but requires constant attention from responsible officials, and the results are well worth the effort required.

An investigation, in co-operation with the National Electric Light Association, of the fundamental principles of inductive interference between power and telephone lines is under consideration by the United States Bureau of Standards. The bureau has not yet determined whether it could undertake such an investigation.

Federal Report Nearing Completion

Meeting of the Federal Electric Railway Commission Was Held on Thursday to Consider Final Draft

THE members of the Federal Electric Railway Commission met in Washington on Thursday, July 22, at the call of Chairman Elmquist to consider a draft of the report to be presented to the President. At the close of the meeting it was announced that it will be several days before the commission will have its report completed. The report will be submitted to the President before it is made public.

It will be remembered that the commission conducted a series of hearings last summer and fall on the electric railway situation. The first hearing was held in New York on June 19. All the other hearings were held in Washington, the last being in October. Altogether the hearings consumed twenty-eight days and more than a hundred witnesses presented testimony. In addition, a series of 174 questions was sent to mayors, chambers of commerce, boards of trade, central labor unions and state public utility commissions to obtain their views on the electric railway situation.

Shortly after the close of the open sessions the commission employed Dr. Delos F. Wilcox to assist the commission by making an analysis of the evidence presented. Originally it was expected that Dr. Wilcox could finish this analysis by Dec. 1. After getting into the work, however, and realizing the vast amount of evidence dealing with all phases of the question which had to be analyzed he saw that in order to make a report which he would consider worth while it would require a great deal more time. Accordingly, about the last of November he put the matter before the chairman of the commission, who authorized the enlargement of the scope of his analysis and the taking of whatever further time was necessary.

The task of studying the evidence relating to almost every possible phase of this question and covering the entire United States, as well as of digesting and analyzing all of this evidence, was such that with the meager help obtainable with the small appropriation of $10,000 it was found not possible by Dr. Wilcox and the secretary of the commission, Charlton Ogburn, who assisted Dr. Wilcox, to finish the analysis before the end of May. As completed the analysis of the testimony covers about 800 printed pages and is divided into chapters dealing with the following subjects:

The street railway an essential public industry.
Restoration of electric railway credit a fundamental necessity.
Fundamental importance of labor as a factor in street railway operations.
Credit and co-operation the co-ordinate needs of the electric railways.
Conditions in electric railway operation normally favorable to credit.
Conflicting evidence as to amount of new capital required annually in the electric railway industry.
Amount of new capital requirements not clearly shown, but necessity for restoration of credit proven.
Why has electric railway credit been lost?
Overcapitalization a cause of the failure of credit.
Neglect to amortize excess capitalization.
Failure to amortize normal accrued depreciation.
Payment of unearned dividends and neglect of ordinary maintenance.
Overbuilding.
Holding companies and banker control.
The uniform 5-cent fare.
Special taxation and franchise obligations.
Use of police power to compel more and better service.
Public regulation of stock and bond issues.
Shares of companies and public in responsibility for loss of credit.
Effect of automobile and jitney competition on credit.
Increasing demands of labor.
The war and the dollar.
How can credit be restored?
The pros and cons of public ownership.
Public co-operation and a new deal required.
Increase in margin available for capital.
Double purpose of unit fare increases.
Effect of fare increases upon traffic and revenues.
Table I—Analysis of traffic showing relation of revenue passengers to fare increases.
Table II—Analysis of gross passenger revenue showing relation of passenger revenue to fare increases.
Table III—Revenue passengers carried on principal urban street railway systems for the first six months of 1917, 1918 and 1919.
Table IV—Comparative summary of passenger revenues in relation to fare increases.
Table V—Comparative summary of traffic data in relation to fare increases.
Table VI—General summary of analysis of effect of fare increases upon traffic and revenues.
The zone fare or distance tariff.
Relief from taxation and other public burdens.
Efficiency in management and economies in operation.
Control or abolishment of jitney competition.
Co-operative relations between management and men.
Public subsidies.
Abandonment of unprofitable lines.
Financial reorganization.
No one remedy sufficient.
The valuation.
The rate of return.
Unrestricted state regulation.
Service at cost.
The use of public credit.
The electric railway labor problem.
Labor's public relations recognized.
Limitation of "The Right to Strike."
The program of the Amalgamated.
Labor's participation in management.
Electric railway employees as civil servants.
Service versus profits.
The four choices.
Abandonment of public interest no remedy.
Commission regulation not adequate as a solution of the problem.
Where "service at cost" falls short.
Public ownership and operation the ultimate solution.

One of the time-consuming parts of the work was the tabulation and then analysis of the traffic figures, *i.e.*, the number of revenue passengers and the amount of passenger revenue of virtually every company in the United States, month by month, for a period of three years. Special attention was given in this analysis to any factors, such as competition, strikes, and fare increases, which had a tendency to affect the volume of traffic, thus establishing a number of interesting relations.

Changes in Retail Prices of Food

THE cost of twenty-two articles making up the retail food index carried on by the Bureau of Labor Statistics of the United States Department of Labor attained a new high record in May. The increase on May 15 was 3 per cent over April 15 and 7 per cent over January 15, 1920. These increases are mainly accounted for by the great price increases of sugar, flour and potatoes. The cost of this food budget in May, 1920, had advanced 17 per cent over May, 1919, and 123 per cent over May, 1913. In June there was a further increase, the average family expenditure for these articles being 2 per cent higher on June 15 than on May 15. Figures by cities showed for the period increases in thirty-nine cities and decreases in twelve cities. Prices of food articles are reported to the Bureau of Labor Statistics every month by retail dealers in fifty-one important cities.

Letters to the Editors

July 10 Issue Is Commended

Letters from Manager, Manufacturer and Operative Present Different Points of View

Many complimentary letters have been received by the editors in regard to the issue of July 10. From them three typical communications, each representing a reader in a different group, have been selected and are printed below. The names of the authors are omitted, as the letters seem to have been written as personal communications and not primarily for publication.

Wants More of the Same Kind

July 16, 1920.

To the Editors:

Allow me to express my appreciation of the JOURNAL of July 10. Without any question it is the best issue I have ever read.

Although our troubles have been many and various, ranging from strikes to jitneys, we have always taken the position that the street railway industry was in the very nature of things bound to prosper. Urban transportation is absolutely essential to our modern civilization, and we have always felt that what was essential in this world would be supported. I am sure what we need now is more of the kind of stuff you gave us in the July 10 issue. "GENERAL MANAGER."

Thinks Business Men Fight Unfair Competition

July 16, 1920.

To the Editors:

I have just finished reading your issue of July 10, which is a splendid number and should accomplish a great deal of good in the industry. I cannot agree in every respect, however, with the sentiments expressed by "Engineer," who writes under the title of "Sell What the Public Wants." For example, in one place "Engineer" says:

> Success in an industry depends, outside of indomitable courage and unflagging energy, upon the production at a reasonable cost of an article which the public wants, either through a natural or a created desire, and upon merchandising that article so that it is kept sufficiently attractive to the public to insure that it is demanded in such amounts and ways as to make its sale profitable. And, incidentally, the wise merchant brings out the shortcomings of his competitor, not by direct attack, which always breeds a sort of sympathy for the object of that attack, but by setting up the virtues of his product in such a way that the comparison is sure to be made by the desired customer.

Now, the comparison drawn, though ingenious, is not an accurate presentation of the facts. In the first place, in practically no industry except the utilities is the sale price fixed by law, with no reference to the cost of production. What the average business man would do under such condition would be to get out of that kind of business and start in some other that is not so restricted.

A great many railway executives have, of course, been guilty of the things set forth in this article in that they have tried to destroy their competitor—the jitney—by legal restraints on the grounds of unfairness, etc. But it is not a fact to say that other business men do not resort to this sort of thing. Most of them, if they see a competitor using unfair methods, will do everything possible to stop it. The Federal Trade Board has been established for that very purpose, and if "Engineer" would review the complaints placed before this board by business men trying to curb the unfair practices of their competitors, he would find that the railway men have company in indulging in this sort of complaint.

On the other hand, "Engineer" is correct in that a great many railways have done nothing except make complaint, while other business men do resort to the things that "Engineer" sets forth.

"MANUFACTURER."

Let the Operatives Help

To the Editors:

Your article, "The Coaches Can't Do It All," in the July 10 number is to the point, but how many of the employees know the facts or understand them? I have often seen articles that have brought this same thought to me. The platform men in particular could do an inestimable amount of good, as they are the ones who meet the public and they are the ones who get the kicks. To say that the platform men get a thousand complaints to every one that goes to the office would, I think, be putting it mildly. And when the employee is not informed in regard to the facts and the reasons he will probably sympathize with the public, and this will make matters worse than they were before.

It is well worth while to educate the employees for their own good so that they may realize their duty more strongly, but when they are taught to become salesmen and representatives of the company a good job is done.

I suppose that where there are company sections of the A. E. R. A. this is done to quite an extent, but such companies are too few. If the company is not in a position to have an employees' club it might at least have the ELECTRIC RAILWAY JOURNAL and even other trade papers, such as the *General Electric Review*, on the table in the swing room so that the men could get the facts first hand. They are interested, I know, from their willingness to borrow my copies of the JOURNAL, and many of them are more than surprised when they find out that there are hundreds of companies in the country that are in the same position as their own.

Some companies, I know, have company papers, but the men are apt to think these are cut and dried—prepared for the purpose. They don't begin to know what a job the railways are up against. They think that if their run pays a few dollars more than platform expenses the road must be paying dividends. Officials should get the men posted and keep them so if they want to get in touch with the public. "CONDUCTOR."

Electric Welding of Rail Joints

ROBERT W. HUNT & COMPANY, ENGINEERS
CHICAGO, July 19, 1920.

To the Editors:

Your editorial in the issue of July 3 entitled "Making the Life of the Joint Equal that of the Rail" touches on a very important matter seemingly deserving of comprehensive study by the Electric Railway Association's track committee of the American Electric Railway Engineering Association. There is no doubt but that the electric welding of rail joints has been an efficient means of combating some of the troubles of bolted or riveted joints, but failures of them have occurred after comparatively little service. Considerable progress has been made in recent years with bolted or riveted joints, to which the use of oil-quenched and possibly heat-treated materials have contributed. Cast-welded joints constitute what may be termed the third type of rail connection that should be included in an investigation of the whole subject. Original costs are exceedingly pertinent today, but should by no means influence, to the exclusion of other details, the question of what type of joint to use.

Defects, of course, may develop in any type of joint. Thus, bolts may stretch due to their low elastic limit. Electric welding of high carbon rails may produce such a change of structure in the steel as to reduce its normal ductility and resistance to impact. Rails after some years' service in cast-welded joints have shown a very appreciable deterioration due to moisture seepage, and mechanical looseness has resulted.

What constitutes the best type of joint is a question fraught with many difficulties, and the time is ripe for a thorough study and discussion of all the facts and experiences.

C. W. GENNET, JR.

Desirability of Commutation Tickets

BROOKLYN, N. Y., July 14, 1920.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL dated June 26, 1920, you have an article on page 1291 entitled "Are Commutation Tickets Desirable?" in which you criticise a part of the report of the committee on public utilities on electric railway service in Camden, N. J. You seem to belittle the advantages to the railroad of wholesaling tickets. Personally, I believe it to be quite the reverse, especially when you consider the fact that most railroads selling commutation tickets allow thirty round trips per month, to be used only during that month, and only by the purchaser; also I believe some roads even have each ticket dated so that a passenger may ride "to and fro" only once per day. In numerous cases I know that passengers rarely use all their book of tickets during the month, and if there are any left, due to sickness or otherwise, they cannot be redeemed.

Furthermore, the commuters are the ones who make the traffic, because they ride regularly, their riding can even be counted on in advance. If it wasn't for the commutation traffic the passenger returns, I dare say, would not amount to very much.

The reduction in rate, even if small, and especially the fifty-trip ticket plan, that any member of the family may use, encourages riding, is convenient and means a certain good will among patrons, which is a thing not to be shunned nowadays. Taking it all in all, I don't think commutation tickets are such a losing proposition as you make it appear.

Further on in your article you lead your readers to believe that steam railroad commutation is less expensive to the railroad than electric commutation, due, as you say, principally to the fact that the steam coaches may be stored in a terminal during the day. You, of course, may have a specific case in mind, but you speak generally, and I should therefore like to know why an electric road cannot store its cars in a terminal also, as a good many electric lines running to suburban towns operate multiple-unit trains and have terminals located at their extremities, according to various articles that I have read from time to time in the ELECTRIC RAILWAY JOURNAL.

I should think that it would be much easier and economical for the electric road, inasmuch as it would require the switching facilities at the terminal necessary for the steam road, due to the fact that on the electric lines most of the cars are equipped with motors. From an operating standpoint the electric road must certainly be the cheaper. Not only is it possible to operate the electric car or train where and under conditions that would prohibit the steam locomotive, but it can also follow the traffic more closely, due to the ability to operate single-car units, or trains of any desired length, whereas the steam locomotive could not be operated alone, but must haul its tender and one car, anyway.

Another thing which ought to enable the electric railway to compete in rates with the steam road is the fact that the electric road, as a rule, does not offer the accommodations, such as upholstered seats, smoking compartments, lavatory facilities, etc.; neither is the riding usually as comfortable, due to the steam road's heavier equipment and better kept right of way. Then you finish by saying that there is no reason for an electric railway to reduce its fares during rush hours in order to get peak-load business. I don't think they should either; that is, any more reason than why a steam road should.

I should think, in conclusion, that as railroads in general claim there is no money made in passenger traffic alone they would try to develop enough riding so that it would pay, and I believe commutation tickets is a step toward that result.

HENRY B. DROWNE.

Burning Tie Rod Holes in Rails

CHICAGO & JOLIET ELECTRIC RAILWAY
JOLIET, ILL., July 19, 1920.

To the Editors:

I noticed an article on page 908 of your issue of May 1, 1920, regarding the burning of tie rod holes in rails. We are doing a considerable amount of work similar to this, and while I think the idea is rather absurd that these holes damage the rail to the extent of causing it to break, I would like, if possible, to know what experience other companies have had in this connection.

The web of the rail is subject to such a small amount of the stresses in the rail that I do not see where burning holes through the web very seriously affects the strength of the rail. It is true that the burning of holes may have more serious effect than drilling, due to the heating of the metal around the hole, which may cause additional stresses to be set up. But this heating is over such a small area outside of the hole that even if the entire area heated is considered damaged, still I cannot see how the strength of the rail is damaged to such an extent as to cause it to break.

I would appreciate very much any additional information you can give me.

JOHN B. TINNON,
Engineer Maintenance of Way.

(Note: We have received several letters similar to the above, seeking further information on the results that may be expected by this method of making tie rod holes. The economy of this practice makes it very attractive, but the experience of the company, as noted in the article referred to above, gives a doubtful aspect to this economy. In view of the general interest in the subject, we would welcome correspondence from other companies giving their experience along this line.—EDITORS.)

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Detroit Case Carried Up

Company Still Fighting—City Going Ahead with Its Municipal Railway Plans

The petition of the Detroit (Mich.) United Railway for permission to carry the judge's ruling to the United States Supreme Court was granted by Judge Arthur J. Tuttle after a ruling had been handed down dismissing the action in equity of the company against the city of Detroit. The action against the city followed the municipal bond election, the company charging that ballots of illegal type were used in the election.

COMPANY HAS LEGISLATED RIGHTS

The company sought by the action to stay the city from constructing lines provided for by the bond issue that was voted, or from interfering with the construction program of the Detroit United Railway.

It was held by the judge that the Detroit United Railway enjoys no contract rights through the lapse of time on day-to-day agreement, but has only those which have been actually legislated.

The City Council has asked the Street Railway Commission for a written report stating its reasons for not permitting the Detroit United Railway to finish the St. Jean Avenue line, one of the so-called day-to-day agreement lines. This line was started by the company last spring, but construction work was stopped by the police under the direction of the city officials.

Councilman Bradley, who instigated the Council's action, gave two reasons for making the motion. The line, he stated, was badly needed and he had been unable to understand why the city had allowed the Detroit United Railway to complete the Twelfth Street line but had halted work on the St. Jean line.

FUNDS FOR MUNICIPAL LINE

It was asserted that the Detroit United Railway alone was to be blamed for the fact that the line was not being completed, for if the company would sign an agreement to waive legal claims to rights in the streets, it would be permitted to finish the line at any time. It was also pointed out that the company allowed a year and a half to elapse after the Council had granted it permission to construct the line.

Authorization of the sale of $700,000 of the public utility bonds provided for at the April 5 bond election will soon be asked by the commission to furnish money to pay for the construction work and buy rails and ties for the first 30 miles of the municipal lines.

Approximately $1,400,000 in contracts have been let on the work for which plans have been drawn by the commission's engineers, and the $700,000 will bring the total of bonds offered for sale up to $1,000,000. No large amount has been sold to the public or to any one outside of the city itself. The first $100,000 issue authorized was purchased by the city Treasurer out of the city's "invested funds." The second issue of $200,000 was sold to the sinking fund commission at par and accrued interest.

Receivers Increase Wages

New York Railways and Brooklyn Rapid Transit Give Men Wage Increase of 10 per Cent

The operating force of the New York Railways, or approximately 3,500 persons, received on July 18 an increase in wages of 10 per cent. This agreement will run until Dec. 31, 1921. It will increase the operating expenses about $500,000 a year. The increase was allowed by Job E. Hedges, receiver of the company, with the approval of Federal Judge Mayer. Twenty-one representatives of the Brotherhood of New York Railways employees were parties to the agreement.

Lindley M. Garrison, receiver of the Brooklyn Rapid Transit System, also has announced a similar increase to take effect on Aug. 6, 1920. At the same time H. Hobart Porter, vice-president and general manager of the Brooklyn City Railroad, authorized wage increases by the same amount.

The present increases in New York and Brooklyn are the third since the companies passed into the hands of a receiver. They aggregate 35 per cent. The New York Railways is not making any money, and in order to meet this added expense it is probable that an increase in fare will have to be made. An 8-cent fare has been suggested.

Under the new rates the wages of motormen and conductors on the New York Railways will range between 57 and 67 cents an hour, according to the length of service; substation operators from 71 to 94 cents, machinists from 40 to 70 cents, cable riggers from 48 to 71 cents, storage battery motormen 53 to 62 cents, and other workmen in proportion. Ten hours is to be considered a day's work, with time and a half for all overtime.

The shopmen of the Brooklyn Rapid Transit are understood to have rejected the company's offer. It is said that they will demand an increase of 25 per cent over present rates. The trainmen were considering the wage offer as the ELECTRIC RAILWAY JOURNAL went to press.

Duluth Service Suspended

Men Quit When City Council Refuses to Heed Their Appeal for Fare Relief

Service on the lines of the Duluth (Minn.) Street Railway was virtually at a standstill on July 21. Following the sudden walkout of employees, not a wheel turned until 10.30 a.m. and then only one crew went out. Full service was resumed the following day, however, when the men accepted the proposition of the City Council for a second referendum election on the 6-cent fare.

COUNCIL REJECTED FARE APPEAL

The strike was precipitated by the refusal of the City Council to introduce or consider the 6-cent fare ordinance presented by the employees of the company, who urged that it should be passed in order that their wages might be raised. A strike vote was taken on July 20, the polls closing at 9 p.m. The vote was 383 for a strike on July 28, and fifty-three to initiate a referendum petition. When the report was read later to the mass meeting of the employees, calls for an immediate strike were made.

No formal vote was taken then, but it was so agreed, although Herbert Warren, general manager of the railway, who attended the meeting, urged the men to keep their heads and not strike. He said the company was entirely unprepared for a strike and that while strike-breakers probably would not be ordered, an effort would be made to re-establish service.

There was no disorder during the time service was suspended. Special policemen and deputy sheriffs were stationed at the carhouses. The strike did not affect service on the Superior lines of the Duluth-Superior Traction Company, which controls the Duluth Street Railway. The cars in Superior ran as far as the Interstate Bridge.

ANOTHER ELECTION LIKELY

The City Commissioners indicated late on July 21 that steps would be taken at the meeting of the Council on July 26 to call another referendum election. Three of the five Commissioners present at the meeting on July 21 favored this plan. The company officials said if the ordinance was carried at the second election an increase in pay of 20 per cent as demanded by the employees would become effective, retroactive to July 1. Representatives of the employees who attended the conference at the City Hall indicated that if this was done the men would be persuaded to return to work immediately.

At the open conference on July 12 President Robertson explained the situation which now confronts the company. He said, among other things:

> We cannot pay any increase in wages without an increase in fare. We are up against a stone wall. We simply haven't the money. The election showed that 6,000 of the citizens of Duluth are with us for an increased fare. We must not make threats or do anything that will cause them to lose the confidence they have shown in us. By the terms of our franchise from the city we are under a contract to provide street car service. If the worst comes to the worst—I want to make the matter clear as to our duty and not by any suggestion or threat—if the worst comes to the worst, and you gentlemen decide to strike, the company officials will go to the limit of their ability to keep the cars running. We realize that you men are entitled to more money, that you need it, and we are trying to point out the way by which we hope to be placed in a position so we can give it to you. Six hundred votes the other way at the election would have carried the ordinance we desired. I feel that if we could have said to you that we could grant an increase in wages if the fare ordinance carried there would have been more work done in behalf of the passage of the ordinance. But we could not say that. We are prohibited by the corrupt practices act of the state.

Mr. Doherty Appeals to Courts

Wants Toledo Restrained from Voting on Traction Settlement at Election on Aug. 10

Toledo may not get a chance to vote on the two municipal ownership ordinances which were drawn up by a commission appointed by Judge Killits, passed twice by Council and referred to the people for ratification. The measures providing for $7,000,000 were to go to a vote at the primary election on Aug. 10. On July 17 a bill of complaint was filed in the federal court at Toledo by Henry L. Doherty seeking to restrain the board of elections from submitting the ordinances. The case will now have to be heard in federal court. If Mr. Doherty's contentions are upheld the measures are dead for all time.

THE case is one of the most unique in the history of the Toledo traction disputes. The Toledo Traction, Light & Power Company, a holding company chartered in Maine, which owns bonds of the Toledo Railways & Light Company, has sued the county board of elections. The city is not made a party to the suit. The prosecuting attorney of the county must fight the legal battles of the board of elections.

CITY NOT INCLUDED IN SUIT

The elimination of the city entirely from the suit also eliminates its legal facilities from the fight which may be made against the granting of the injunction. However, Mayor Cornell Schreiber's first impulse was to ask the court that the city be made a party to the suit.

The bill recites the history of the present trouble beginning with the passage of the ouster ordinance last November and the consequent return of the cars under the joint protection of the federal court and a repeal of the ouster by Council. It outlines the plan agreed to for a settlement, but declares that the municipal ownership commission has "utterly failed to perform its function and duty of preparing a plan for acquiring or constructing a street railway system in the city of Toledo."

CITY BONDED FOR $7,000,000

The two ordinances bonding the city for $7,000,000—one for $3,000,000 for acquiring a transportation system and the other for $4,000,000 for constructing a transportation system—it is contended "do not designate what kind of a transportation system is to be acquired or constructed and do not contain any plan or suggestion with reference to where or what said transportation system shall be, or how same shall be acquired, constructed or operated."

It is pointed out that the service-at-cost ordinance which was intended to be presented to the people at the same election as the municipal ownership ordinance is now in the hands of Council with a valuation not agreed to by Henry L. Doherty. But it also charges that Council has taken no step toward negotiating a settlement of this one remaining difficulty and that should the municipal ownership measures go to a vote the people would not "have the opportunity to express their opinion as between the proposition to bond the city for $7,000,000 to be expended in some unknown way for some unknown system of transportation and the granting of a franchise for the operation of the street railway system in the city upon the service-at-cost plan."

ORDINANCE ATTACKED

The legality of the ordinance is also attacked. Section 121 of the City Charter is quoted and it is alleged that it was never complied with in the passage of the bond ordinances. This section provides that before an issue of bonds may be authorized the director of finance shall furnish to the Mayor, Council and publicity and efficiency commission a statement showing the condition of the city's bonded debt. The finance director is said to have made no such report and the company claims that the bonded debt of the city is now many millions of dollars.

It is shown that the Rail-Light now owns property for taxation in Toledo of a value of $13,700,000, of which more than $11,000,000 is real estate and $2,600,000 personal property, and that the company is now paying more than 3 per cent of all the taxes collected in the city of Toledo.

On this premise it is claimed that the passage of the ordinances calling for heavy bond issues for no specific purpose would cast a "cloud" upon the title of the property of the Rail-Light against which there are mortgages to secure the bonds held by the petitioning company.

The net earnings of the traction company now are declared to be inadequate to pay the interest on the bonds and provide the fair return to the capital invested. If taxes were increased the earnings would become so low as to impair the financial stability of the company. The holding company has pledged the Rail-Light bonds as collateral for $10,000,000 of notes which will mature on Dec. 1, 1921, and it is claimed that any cloud on the title of the property would make the difficulty of renewing or refunding these notes very expensive.

COMPANY MAKES DECLARATION

The bill claims that there is "design" in the submission of the ordinance which provides for $3,000,000 of bonds to acquire a transportation system. It outlines the plan which has been put forth by the advocates of municipal ownership—that of condemning the paying lines of the Rail-Light and ordering others to be torn up and removed from the city.

In its petition the company declares:

> Upon information and belief the plaintiff avers that the plan to submit the ordinance to the electors is but one step in the consummation of the wrongful and inequitable design and purposes aforesaid to ruin and destroy the property of the Toledo Railways & Light Company, and that should said purpose and design be carried out the security for the payment of the bonds owned by the plaintiff would be greatly reduced and impaired in an amount which the plaintiff cannot at this time calculate.

The two bond issues are $5,999,000 of 5 per cent first mortgage gold bonds of the Toledo Traction Company and $6,000,000 of 5 per cent first mortgage gold bonds of the Toledo Railways & Light Company.

Mr. Doherty declared that he felt it his duty to "save the people of Toledo from the enactment of a farce election seeking only to delay a permanent settlement of the street railway situation."

Judge Killits has been spending a vacation in northern Ontario. He did not intend to be in the city till Sept. 1, but has wired that he would come home to hear the case in court on July 22. Notice was served on Prosecuting Attorney Seney that the hearing would be held at this time.

If the injunctional relief asked for is allowed the ordinances providing for municipal ownership of "a transportation system" will never be submitted for a referendum vote.

Memphis Men Prepare New Scale

Preparation of a new wage scale for submission to the Memphis (Tenn.) Street Railway is being considered by the motormen and conductors. The present agreement with the company expires on Aug. 1. Both sides are said to have expressed themselves as prepared to arbitrate in the event the first scale is not accepted. Wages now range from 42 to 48 cents an hour. The maximum is paid to men who have been with the company for a period of eighteen months or more.

Service Resumed in Akron

Five-Cent Fare for Sixty Days Pending Permanent Settlement Basis —Wage Controversy Under Way Four Months

At a special meeting of the City Council of Akron, Ohio, on the afternoon of July 16, it was decided to amend the franchise of the Northern Ohio Traction & Light Company in such a manner as to allow the company to collect a straight fare of 5 cents for sixty days, with the idea that a permanent agreement on the rate of fare could be reached within that period. If this is found impossible, the time may be extended.

A. C. BLINN, general manager of the company, at once notified William Lemmon, business agent of the union, that the men would be granted the increase in wages allowed by the board of arbitration immediately on their return to work. Cars were put into operation the following morning, although many of the men were out of the city and it was thought that several days would elapse before the service would be complete.

ONLY ONE VOTE AGAINST

Gus Kasch was the only member of Council who voted against the amendment increasing the rate of fare. He declared that the Car Riders' League had not been informed of the movement to increase the fare and that none of its officers had been invited to the Council meeting. City Manager William J. Laub, who is president of the league, however, was privileged to be present at all meetings. Mr. Kasch threatened to invoke the referendum and expressed the belief that the recall might be exercised with reference to some of the members.

The controversy between the company and its men has been under way for four months. The men submitted a demand before the expiration of their contract on May 1 for a wage of 80 cents an hour with an eight-hour day. The company replied that this was more than could be paid and the matter was taken to arbitration. Based upon the condition that the company be allowed a rate of fare that would cover the increase, the board of arbitration awarded the men a wage of 65 cents an hour. Employees then notified the company that they would remain at work twenty-one days, in order that some agreement for an increase of fare might be reached with the city. Many conferences followed, but failure resulted in each attempt to reach an agreement. The men extended this period, however, because the last day fell on July 4, but left their cars on July 6.

UNION CONSIDERS MATTER ENDED

Officials of the union stated that the matter is ended as far as they are concerned, since the company has agreed to pay the wage awarded by the board of arbitration. It is understood that they will be given back pay from May 1.

Provisions in regard to transfers are to remain as they have been. Those who have tickets under the old rate may have their money refunded by returning the tickets to the office or the holders may add 1 cent to each ticket and tender the ticket and the coin in payment of fare.

The following statement was made by the public utilities committee of the City Council:

> As a result of wage differences between the company and its employees, the city, although not a party to the controversy, was drawn by arbitrators into the unfortunate situation where an award of increase in wage was made conditioned upon the city granting to the company a higher rate of fare.
>
> A threat made by the men to leave their cars unless the higher wage was paid by the company was carried out, leaving the public without transportation.
>
> The company then pressed on Council a request, first for a 7.4-cent fare and then for a 6-cent fare to meet the emergency that had thus been created.
>
> While Council was in sympathy with the request of the employees for an increased wage, it was out of accord with both the manner of involving the city in the dispute and the high fare requested by the company.
>
> Feeling satisfied that a 5-cent cash fare would provide the company with sufficient additional revenue to meet the wage increase, this offer was made the company.
>
> It was refused and the city began suit to enforce its contract with the company and compel a resumption of car service.
>
> Convinced that the public demands not only better service, but extensions to lines, negotiations had been taken up with the company in the meantime with a view of obtaining for the city a new contract in which such benefits could be secured.
>
> Progress along these lines had been made.
>
> Further, being satisfied that a new contract can be drawn within sixty days that will provide for better service and extensions, giving at the same time a large measure of supervision and control of operation by the city, we agreed to recommend to Council that a 5-cent cash fare be granted the company during the period for further negotiation and on the condition that resumption of service begin at once. The offer was accepted by the company.
>
> That the public has been liberal in its views, patient and good natured, and has made no complaint about the situation which had arisen and over which the city had no control, has aided very much in bringing the matter to so early a settlement.

At Massillon, where the company operates a local line, the City Council has passed an ordinance increasing the rate of fare from 5 to 8 cents. It provides that the company must station four watchmen at the railroad crossings in the city, build new tracks on Akron street, put on two daily cars between Massillon and Cleveland and provide for a special service between Massillon and Meyer's lake. The company agreed to place fifteen new cars in operation there when the ordinance went into effect on July 15.

Threatened Strike in Buffalo

The employees of the International Railway, Buffalo, N. Y., have asked for increased wages and a closed shop policy. The company has refused to grant either request, claiming that 60 cents an hour is an adequate wage. The dispute has gone to a board of arbitrators after several threats of a strike. On July 17 the men voted to put off indefinitely the calling of a strike, but gave their executive committee the power to act if it considered a strike necessary.

C. J. Joyce, Philadelphia, is the arbitrator appointed by the company and James H. Vahey the arbitrator appointed by the men. These two have agreed to the appointment of a third arbitrator by Governor Smith in the event a Public Service Commissioner will not serve.

In a statement to the men given to the press, President Tulley of the company said:

> The International Railway increased the wages of its men 12 cents an hour, from 48 cents to 60 cents, effective on May 1. 1920. The cost of this advance approximates $1,000,000 a year. The car fare was simultaneously increased from 5 cents to 7 cents, which is producing increased revenue of less than $900,000 a year.
>
> In granting the 12 cents increase the company has, therefore, already given the men more than the entire amount received by the company from the increase of from 5 cents to 7 cents in car fares, and can grant no further increase in wages without a corresponding increase in car fares.

East St. Louis Wages Advanced

The arbitration board appointed to settle disputes between the East St. Louis & Suburban Railway, East St. Louis, Ill., and its employees recently awarded the men increases ranging from 40 to 52 per cent. Conductors and motormen will receive an increase from 46, 48 and 51 cents an hour to 70 cents an hour, shop men from 48 cents to 63 cents an hour, and extras will be guaranteed $80 to $90 a month. The working day was fixed at nine and one-half hours, with time and a half for overtime. The new rates are effective May 1, 1920. The employees asked for a maximum of 87.5 cents an hour and an eight-hour day. They have voted to accept the award.

The award will affect about 310 men. It will mean an increase in the yearly payroll of approximately $250,000. The present East St. Louis fare is 6 cents and an application is pending before the Illinois Public Utilities Commission for an increase to 8 cents to meet the 12 per cent increase in wages allowed a year ago by the War Labor Board. In order to meet this last award officers of the company estimate it will require an increase in fares to 10 cents or more.

C. E. Smith, representing the railway, in the course of a long dissenting opinion, said:

> I was favorable from the very start to a reasonable increase and so stated, but I could not sign the award of the two other arbitrators, as the company's financial statements clearly showed that it could not pay any additional wages without increasing fares more than was necessary with past wages. I was unwilling to place upon the public the burden of paying the abnormally increased fares that will be necessary to give such an unfair and unreasonable increase in wages, especially at a time when all serious-minded men are engaged in efforts to reduce rather than to increase those expenditures that contribute directly and indirectly to the high cost of living.
>
> It is an amazing fact that the chairman, a graduate of a reputable state university, a member of the Illinois bar, practicing with fellow members of the bar, should, when entrusted with such an important case as this, render a decision not substantiated by the record, entirely outside of and beyond the evidence and without ad-

> vancing, in the deliberations of the board, a single fact or argument to substantiate his decision.
>
> There is no recourse left the company except to petition the Public Utilities Commission for permission to raise its fares sufficiently to meet the increase of more than 40 per cent in its payroll and to secure a reasonable return on the fair value of its property. If the commission does not grant such rates or if, having been granted, the public refuses to ride and adopts other means of conveyance, the result, to the company, to the industries and to the community, will be disastrous.

The wage demands of the men on the Alton city line and on the single-track suburban lines remain to be arbitrated. The Alton men are being paid from 46 to 51 cents. They are demanding 92.5 cents an hour. The interurban men are getting 48 to 53 cents and demand 95 cents an hour.

Staten Island Case Decided

Federal Judge Thomas J. Chatfield, in Brooklyn, on July 14, handed down a decision upholding the right of the city authorities of New York to declare the franchises of the Richmond Light & Railroad Company forfeited in view of the failure of the company to live up to contract obligations. In his decision, Judge Chatfield said:

> The Court of Appeals seems to hold that the action of the Board of Estimate in declaring by the passage of a resolution that a charter has been revoked is action of a legislative nature.
>
> The decision of the Court of Appeals is controlling over the present application in this respect, and it must be held that this court has no authority to determine whether the passage of a resolution forfeiting a charter is purely an executive act like the canceling of a contract by a single official involving possible judicial determination.
>
> The court, therefore, cannot grant the motion to enjoin the Board of Estimate from considering and passing a resolution declaring the franchises forfeited, and the temporary injunction order must be vacated.
>
> Under the decision of the Circuit Court of Appeals in the Manhattan & Queens Traction corporation case this court has no right to determine collaterally that the city of New York, through its Board of Estimate, might be acting with no foundation of law and entirely outside its authority in declaring the franchise in question forfeited, if the Board of Estimate should see fit, acting under the advice of its legal representative, to attempt to pass such a resolution. But no individual employee or agent of the city, even if a resolution of forfeiture should be adopted, can, under the general injunction, proceed to interfere with the operation of the receiver before this court has an opportunity to pass upon the validity of the resolution in question.
>
> Under the circumstances now set forth in the present case, the restraining order should be continued and the injunction applied for granted to the extent of specifically forbidding any physical interference with the operation of the receiver or any attempted action under or enforcement of the resolution declaring the franchises forfeited if the threatened action be taken until application has been made to this court for an order vacating the injunction forbidding such action.

Municipal Men Want $6 a Day

A group of employees of the San Francisco (Cal.) Municipal Railway appeared before Timothy A. Reardon, president of the Board of Public Works, on July 14, and demanded an increase in pay of from $5 to $6 per day. Mr. Reardon told the committee that such an increase at this time is impossible, as the lines are now showing a deficit. Following the refusal of Mr. Reardon to grant the increase, the spokesman for the men announced that he would appear before the Board of Supervisors and demand that the wages of the men be raised to meet their request.

Service Being Restored

New Orleans Company Re-establishing Schedule—Court Will Not Be Intimidated or Coerced

The car strike situation at New Orleans, La., remains practically unchanged. Transportation facilities, however, are resuming normal slowly. The recent outstanding event was the submission on July 15 by Receiver O'Keefe to a committee representing the strikers of a form of contract he is willing to sign. Receiver O'Keefe recognizes the right of collective bargaining, the right of employees to be represented by officers and committees of their choosing. He stands for promotion according to seniority and ability with no discrimination against union men or the men engaged in the present strike. Wages will be left to arbitration, but will be raised only as fare increases granted by the Commission Council of the city provide revenue for the increases.

THERE is no recognition for the Amalgamated Association, although the right of employees to membership in the Amalgamated Association is not denied. Some of the men in the Amalgamated had advanced as a reason for their refusing to relinquish membership in the association the fact that they were insured under the Amalgamated auspices. In consequence of this the receiver offered a better insurance inducement than the men now hold under the Amalgamated membership.

Judge Rufus E. Foster of the United States District Court has issued the following statement in regard to the strike:

> I notice the statement from J. B. Lawson, national executive officer of the Amalgamated Association, that the real question now is whether the company will renew the old contract with the understanding that the wage scale will be arbitrated.
>
> The issue goes far beyond this. The Constitution of the United States guarantees liberty of contract to all men. Every man has the right to belong to a labor union, or to remain out of it, or to withdraw from one after he has joined. The receiver also has the right to contract with an association in which he has confidence and not to contract with an association he believes to be arbitrary and unfair in its demands.
>
> The old contract referred to by Mr. Lawson has many objectionable features, apparent on simple reading, to any fair-minded man. The receiver has found it impracticable to operate the property to the best interests of the public under its terms and conditions. He is willing to enter into a contract with his former employees collectively, provided the contract is entirely removed from control of the Amalgamated Association.
>
> The order of court I issued when it became apparent to me that it was impossible for the receiver and the representatives of the Amalgamated to agree on a contract which gives the men everything they could fairly expect under a contract. It provides for collective bargaining, representation through committees of their own choosing and arbitration of wages. The men could return to work under its provisions without affecting their union affiliation in the least.
>
> The real question now at issue is, are the courts of the United States to be governed by the Constitution and laws of the United States in their decisions or be subjected to dictation from any organized group of men. This question is fundamental and paramount and superior to any temporary inconvenience the public may suffer, regrettable though that may be.
>
> I will not be intimidated or coerced in deciding this question by sympathetic strikes or political clamor. I expect all good citizens of New Orleans, whether laborer or capitalist or that vast majority which falls into neither class, to support the courts of the United States. A proper decision of the question is vital to the very existence of our government.

The differences of the contending parties are being aired in page advertisements in the local papers. On Sunday morning the men announced that they were firmly resolved to maintain relations between the Amalgamated Association and through this association their affiliation with the American Federation of Labor. This step apparently blocks all avenues to a reconciliation.

The matter of wages and hours of labor which precipitated the trouble are now forgotten in the fight for recognition of the union. There have been but few disturbances on the cars growing out of the strike, and violators of the federal court's order that the employees of the company must not be molested have had swift and summary justice meted out to them. Varying periods of imprisonment in the various parish (county) jails of the State have been given them. None has been sentenced to the New Orleans parish prison, where they could be seen and visited by their New Orleans friends, relatives and sympathizers. They have been scattered all over the State, one strike sympathizer, in particular, having earned the distinction of drawing a year and a day sentence in the federal penitentiary at Atlanta.

The allied unions have refused to go on a sympathetic strike, but promise moral support and advocate the advisability of operating a jitney service, in opposition to the car company, the funds derived therefrom to be used in aid of the striking car men. The union representatives also asked that Judge Foster remove the deputy United States marshals that man the cars now and that he also modify his court order permitting the receiver to contract with them through the Amalgamated Association.

The men have also enlisted the aid of both representatives of the New Orleans District in Congress, who have been interceding with Judge Foster. To all of these appeals the court has turned a deaf ear and refuses to allow the receiver to contract with the Amalgamated Association, in any form, though the men may contract with the receiver as a local union and still retain membership in the Amalgamated Association.

Mayor Martin Behrman filed a petition on July 20 in the U. S. District Court asking Judge Foster to permit the city to intervene in the receivership proceedings and to consent to a modification of the court's order whereby the only obstacle to a settlement of the strike—recognition of the Amalgamated Association—may be removed. The Mayor's action was based upon a resolution adopted by the Commission Council. The court consented to hear the petition, but no date was set. If the appeal is granted the strike may be ended at once. The court had not acted up to July 22.

Chicago Car Strike Ends

Men Gain Unionization of South Shops and Abolition of Piece Work, but Wages Are Those Offered Before Strike Was Called

The strike of the substation operators formed the crippling blow in a walkout of some 300 employees of the Chicago Surface Lines on the morning of July 13. The employees who ceased work included the shopmen employed at the South Side shops, the linemen and later the trackmen and West Side shopmen in addition to the substation operators. The strike was called by the notorious "Umbrella" Mike Boyle, the issue being primarily that the company would not concede a closed shop at the South Side shops, which have always been operated as non-union with a large amount of the work done on a piece-work basis.

As WAS noted in the telegraphic report of this strike which appeared in last week's issue of the ELECTRIC RAILWAY JOURNAL, the company had made an offer of liberal increases to the various crafts, but Mike Boyle staked everything on his determination to make the company grant a closed shop. Public opinion was thus aroused against the strikers and the company was fixed in its purpose to operate the cars despite the strikers.

SERVICE QUICKLY RESTORED

The strike began early Thursday morning and by Saturday sufficient substations had been manned so that normal service during non-rush hours was provided and about 50 per cent of rush-hour service. By Sunday practically normal service was being operated. The result was that at 4:45 o'clock Sunday afternoon Boyle and the other union heads, in the offices of the company, where they had earlier announced they would not appear for a conference, reached an agreement which ended the strike.

According to the terms of this agreement, the wages settled upon are practically those offered as the men went out. The South Side shops formed the bone of contention in the strike. They will be unionized, though on the open shop principle, thus placing these shops on the same basis as has applied to the West Side shops for years.

Work in the South Side shops was transferred from a piece-work basis to an eight-hour day basis, the hours to be equalized within the next ninety days. The result of this is that many of the men will now receive about $1 a day less than they have been earning on the piece-work basis. This peculiar angle of the strike is better understood by the knowledge that most of the men were very well satisfied with the piece-work system and were finally induced to strike only through intimidation.

SHOPS ON EQUAL BASIS

Overtime in both South and West Side shops was put on an equal basis, time and one-half. Trackmen and machinists were placed on the same ratio of pay, but a raise to 70 cents an hour asked is still under consideration.

The union heads were defeated on their demand for an increase for the two groups of Class B electricians to a standard rate of pay. The same was true of the tinners. Their wages will remain as heretofore.

Metal workers received an increase of 5 cents an hour on night shifts. Blacksmiths gained nothing by the strike. Helpers in these trades will receive 80 cents an hour instead of the 97½ cents demanded. Trackmen under the new schedule will be paid 54 cents an hour. Pavers will get 68 and 70 cents an hour, depending upon their length of employment. Workers in these trades employed in the shops will receive the same rate of pay as those outside. The rates offered by the company of $9 a day for linemen, $7 a day for helpers and $10 a day for foremen were accepted.

Substation men were given $120 a month during the first year of employment, $125 during the second, $130 for the third and $145 for the fourth. Operators will get $200 and $210, the same figure offered by the company before the strike, while the union demands were $225. The rainy day clause demanded by the linemen also was lost. It was disregarded in the settlement.

ELEVATED LINES NOT AFFECTED

An interesting sidelight on the strike was that the similar employees of the elevated system, who are unionized, were not called out by the union officials. The trainmen of both the surface and elevated lines have always worked in union in making their demands. The trainmen of the surface lines did not join in any way in the recent strike. The company paid them for full time for reporting and waiting in readiness to take cars out as rapidly as substations could be operated. The fact that the trainmen only recently received a handsome increase and signed a new contract with excellent feeling prevailing undoubtedly had much to do with their lack of sympathetic interest in the recent strike.

During the strike of the surface lines, the elevated lines put all of the cars available in operation in order to handle the enormous crowds which swarmed the elevated platforms.

Wage Jurisdiction Waived

Colorado Industrial Commission Declines to Exercise Jurisdiction in Denver Tramway Wage Case

On the grounds that its recommendations of May 10 have been totally ignored by the city authorities, and that it is therefore not for the best interests of the parties to the controversy nor of any advantage to the public that hearings or investigations be held, the Industrial Commission of the State of Colorado has declined to assume jurisdiction over the pending wage demands upon the Denver (Col.) Tramway by the local branch of the Amalgamated Association.

The employees were awarded an increase of 10 cents an hour by a local board of arbitration on March 18, which through inadequacy of revenues the company is unable to pay. Announcement by the company of contemplated reduction in wages and restoration of the National War Labor Board scales formerly in effect resulted in the Industrial Commission taking jurisdiction over the controversy. After investigating the matter the commission issued its findings and order on May 10, which substantiated in every detail the claims of the company and recommended

> that the proper local authorities at once fix and establish a fair rate for the services rendered to the public by the Denver Tramway. Such rate, in order to provide revenues with which to pay the wages fixed by the arbitration board in its decision of March 18, cannot be, at this time, less than 7 cents for adult fares and 3½ cents for half fare.

The City Council ignored the recommendations of the Industrial Commission and without making an investigation in its own behalf refused to pass a 7-cent fare measure which had been initiated by the company.

COMPANY MUST CONTINUE

Through a temporary injunction granted by the District Court upon the application of the city of Denver, the tramway is literally compelled to continue in force the wage scales established by the arbitration board, at least until decision is rendered by the Colorado Supreme Court, which has now assumed jurisdiction over the injunction case.

The pending demands of the union are for a wage scale for trainmen of 70 cents the first three months, 73 cents the next nine months and 75 cents thereafter, with corresponding increases for employees in other departments. In ruling on this case the Industrial Commission in its order of July 15 said:

> It now appears to this commission that its recommendations "that the proper local authorities at once fix and establish a fair rate for the services rendered to the public by said Denver Tramway Company" have been wholly ignored and said Denver Tramway is now operating upon the same fare as existed at the time of said award on May 10, 1920; that there has been no change in other conditions affecting the revenue and necessary expenditures of said Denver Tramway sufficient to alter or modify the said findings and award of said commission; that this commission has not investigated the question of a fair wage to said employees under present living conditions; that the ability of the said company to pay wages under a 6-cent fare and present conditions has been investigated by this commission as above set forth; that one of the primary objects of investigations by this commission of industrial controversies is conciliation between the parties and the discovery of a common ground upon which a settlement can voluntarily be made. In this case the difficulty between the employer and employee is not entirely the inability of the parties to reach an agreement upon the question of a fair wage, but the dispute arises over the inability of the parties to adjust for the employees a fair wage compatible with the ability of the company to meet such wage. The ability of the company to pay is not within the control of either party hereto nor this commission, but in the rate-fixing power of the public officers charged with that responsibility. Said company has refused to agree to the payment of a wage beyond its ability.

Six-Day Week Suggested

Plans Fast Being Lined Up for Thorough Inquiry at the Twin Cities

A six-day week has been suggested by a member of the Minneapolis arbitration board which is considering demands of the trainmen of the Minneapolis Street Railway for increased wages and an eight-hour day. The trainmen have postponed a referendum on this point until they learn what will be the status of their demands already before the board.

MANY TRAINMEN NEEDED

H. W. Ralph of the company's schedule department said it will require 14 per cent increase in number of trainmen. The plan was proposed because it was found that at $150 apiece to teach new men to operate cars there is a heavy expense due to the turnover in men.

The board held its first meeting July 7 to listen to replies to questions asked H. B. Warren, who is studying the company's financial statement for the board. Milo R. Maltbie, New York, is expected to arrive on July 19 to aid in the investigation.

The company reports that operating expenses in Minneapolis in May were $51,480 lower than the average for four months preceding. A net balance is shown for the St. Paul system of $25,586, offsetting a deficit for four months and leaving a five months' balance of $9,149. Reduction in payrolls, because not enough men could be had to man cars, is one reason for the increase in revenue. The St. Paul operating expense for May was $49,926 lower than the average for four months.

Byron Gifford, Grand Rapids, Mich., has been selected by the City Council of Minneapolis, Minn., to audit the books of the Minneapolis Street Railway. The purpose is to get a report on which the Council can base action if it finds that an increase in fare from 5 cents is necessary to permit the company to pay increased wages demanded by the trainmen. Mr. Gifford's staff of five assistants is headed by G. H. Mathews, chief statistician for the Wisconsin Railroad Commission. A specific report is not expected before Aug. 2.

EXPERTS AT WORK

H. B. Warren, local expert, is continuing his investigation to answer questions proposed by the arbitration board. Milo Roy Maltbie will go over the Warren figures for the board. The board expert is to determine what it will cost to put the Minneapolis service back to the standard of 1917.

In St. Paul Dr. E. W. Bemis, Chicago, has been retained to make a revaluation of the property of the St. Paul City Railway. There a similar arbitration board is endeavoring to determine whether St. Paul can allow the company an increased fare.

The Twin City Rapid Transit Company has asked for a 7-cent fare with four tickets for a quarter.

News Notes

Dissatisfied with Street Railway Service.—Since the railway service in Windsor has been taken over by the Ontario Power Commission, great dissatisfaction has been felt by the patrons of the Sandwich, Windsor & Amherstburg Railway. It is claimed that the service is inadequate and that municipal operation does not meet the needs of the people.

Municipal Operation of Bridge Cars.—The Board of Aldermen of New York has authorized Grover A. Whalen, Commissioner of Plant and Structures, to purchase without public letting the cars and equipment necessary for the city to operate the electric railway shuttle service over the Williamsburg Bridge after he has the necessary funds to carry out the plan.

Company Accepts Winnipeg Award.—The Winnipeg (Man.) Electric Railway will accept the award of the Myers board of arbitration granting the men a 10 per cent increase in wages. The acceptance of this award will mean an additional $300,000 in wages. The award has not, as yet, been accepted by the men, who had asked for practically a 50 per cent increase over present wages.

Platform Men at Columbus Refused Increase.—The Columbus Railway, Power & Light Company, Columbus, Ohio, has refused the demand of the motormen and conductors for an increase of 50 per cent in wages. In a statement issued by the company it was explained that no increase can be granted at this time. The men were scheduled to meet on July 13 to discuss the company's reply.

Road Unable to Purchase Cars.—Ralph Peters, president of the Long Island Railroad, in a statement replying to the order of the Public Service Commission requiring the company to buy 100 new cars, says that, under present conditions, the road is unable to purchase the cars, and that an increase of fares is the only solution. Mr. Peters says that the cars will cost $3,000,000 and that capital for them cannot be secured.

Preparing for Arbitration at Dayton.—The local branch of the street railway men's union at Dayton, Ohio, has selected J. E. Duncan, secretary-treasurer of Typographical Union No. 57, as its member of the board of arbitration to fix a permanent wage scale. The company officials are to name a second member and these two will agree upon a third, if possible. If they fail the third member will be selected by the State Industrial Commission.

Bus Franchise Forfeited.—An ordinance to repeal the fifteen-year franchise granted to the General Omnibus Company to operate in Newark, N. J., has been ordered by the City Commission of Newark. The franchise was issued Feb. 19, 1919. The company was given a year to begin operations, and the extension on that time has now expired.

White Plague Exhibit Car.—The Tuberculosis Society of St. Louis, Mo., has fitted up a public health street car to educate the public in the fight against tuberculosis. The car contains exhibits showing the effects of the disease and simple measures to be taken to prevent its spread. During a recent week 12,000 people visited the exhibits and 40,000 pieces of literature were distributed.

Wage Terms in Strike Settlement.—The strike of the employees of the Jersey Central Traction Company, Keyport, N. J., which began on June 26, has been settled and service has been resumed. The new agreement provides for added compensation for the men, but the company refused to recognize the union. Seniority rights were also granted which give the men the privilege of selecting their runs. The new scale provides for the payment of 46 cents an hour for the first nine months, with 48 cents for the remaining three months of the year. After a year of service the pay is 50 cents. Under the old scale the men were paid 41 cents an hour for the first nine months, 43 the next three and 45 cents after a year.

Philadelphia Men Forego Wage Increase.—More than 10,000 employees of the Phildelphia Rapid Transit Company on July 22 voted not to demand payment of their increase in wages of approximately 7½ cents an hour granted on June 1 until the company's revenue increases sufficiently to pay the advance. The action was taken after Thomas E. Mitten, president of the company, had outlined to a meeting of employees' representatives the financial condition of the company and said it could not pay the increased wages until additional revenue was obtained. Application has been made to the Public Service Commission for the abolition of free transfers, which Mr. Mitten estimated would increase the company's yearly revenue about $3,000,000. Under an agreement between the company and the men the wages are based on the average compensation paid electric railway employees in Chicago, Detroit, Cleveland and Buffalo. Wage increases granted in Detroit on May 16 and in Chicago June 1 necessitated under the agreement a wage increase by the Philadelphia company of from 65 cents an hour to 72½ cents.

Program of Meeting

Illinois Electric Railway Association

The mid-summer meeting and golf tournament of the Illinois Electric Railway Association will be held at Springfield on July 30.

Financial and Corporate

Mr. Stotesbury Resigns from P. R. T.

He and Two Other Banking Members of the Board Retire After Losing Fare Vote

E. T. Stotesbury, Horatio G. Lloyd and C. S. W. Packard all resigned as directors of the Philadelphia Rapid Transit Company at a meeting on July 19. They retired following the voting down of a proposal made by Mr. Stotesbury for a flat 7-cent fare. The other directors voted to withhold acceptance of resignations until the bankers had had an opportunity to reconsider their resignations if they desired to do so.

ANOTHER significant development at the meeting was the passing of the dividend. It was announced that the semi-annual dividend would be deferred because of lack of funds. A statement given out later said that it had been necessary to appropriate earnings for the first six months to meet expenditures and that as a result no action was possible in the direction of a dividend.

All accounts of the meeting seem to indicate that the breach between Mr. Mitten and Mr. Stotesbury has been widened and that there is little prospect of the chairman and the president of the company being able to reconcile their conflicting views on fare matters. It was over this question that the differences came about. At the meeting three different elements were represented: First, there were the bankers, led by Mr. Stotesbury; then came the stockholders, led by Mr. Mitten, and, third, the three city representatives, headed by the Mayor.

As soon as the matter of the dividend had been disposed of, Mr. Stotesbury, as chairman, passed on to the subject of fares. Mr. Lloyd, vice-president of Drexel & Company and the associate of Mr. Stotesbury in that firm, discussed the finances of the company and the fare proposition. He stated that the present application for higher fares on file by Mr. Mitten with the Public Service Commission was inadequate to provide for the financial needs of the company. This proposal provides for the abolition of free transfers and the curtailment of the 3-cent exchange in the downtown business district. It has been estimated that these changes would increase the revenue of the company $3,000,000 a year.

Mr. Lloyd moved the Mitten plan for higher fares be immediately withdrawn. In its stead he proposed that the company apply for a flat fare of 7 cents, with the understanding that the company issue rebate tickets for the 2-cent additional fare, so that the refund could be made at a future date if the fare increase were rejected by the Public Service Commission. In addition he proposed that the new fare increase be put into effect with the understanding that an appraisal of the company's property be presented to the city not later than Sept. 1. He maintained that the appraisal would justify the increase to 7 cents.

Mr. Mitten opposed this plan. He declared that the $3,000,000 revenue that would be received under his proposition would be sufficient to defray the operating costs and provide for the dividend.

Mr. Lloyd's plan, when put to a vote, was lost, six to five. The directors who defeated Mr. Lloyd's motion were Mr. Mitten, Mr. Moore, Col. Sheldon Potter, Ernest T. Trigg, William J. Montgomery and J. J. Sullivan, Jr. The resignations of the directors previously mentioned were then presented.

The company, in announcing its abandonment of the dividend for the first time in three and a half years, made public figures that indicate that the earnings up to date are $367,899 short of the amount needed to pay the dividend and meet the wage adjustments that are necessary. The figures of earnings are reproduced elsewhere on this page.

Mr. Stotesbury said that as soon as he was fully convinced that he should make a statement it would be forthcoming. He is quoted as follows:

> I will answer no questions, so there is no use asking any. I am still considering the proposition of issuing a statement setting forth my ideas on transit matters.

Mr. Packard said:

> I resigned. I did not tender my resignation. I can say the directors who resigned did not represent large holders of stock. but they did represent other interests that are large stockholders. That is all for the present. Anything else must come from Mr. Stotesbury.

In connection with the resignations it is now recalled that last February the voting trust expired which had been in operation for ten years. During the life of the voting trust Mr. Stotesbury was all powerful. Mr. Mitten seemingly considered the fare matter an operating problem. On the other hand, Mr. Stotesbury looked upon the fare readjustment as a matter of financial consideration, subject to action by the directors before any steps were taken by the operating committee.

A statement made by Mr. Mitten follows:

> The car riders of Philadelphia may rest assured that the management will continue to function to the very best of its ability. The record of achievement by the Mitten management in overcoming obstacles stands as an unmistakable index to the completion of the program adopted by the management.

STATEMENT OF EARNINGS OF PHILADELPHIA RAPID TRANSIT COMPANY

June:		1920	1919
Operating revenue		$3,177,848	$2,963,631
Operation and taxes		2,358,336	1,907,465
Operating income		$819,511	$1,056,166
Non-operating income		53,590	33,991
Gross income		$873,102	$1,090,157
Fixed charges		816,444	808,156
Net income		$56,658	$282,001
Amount necessary to meet June 1 wage adjustment	$187,500		
5 per cent return on P. R. T. paid in capital—one month	125,000	312,500	
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock		$255,841	
Six months ended June 30:		1920	1919
Operating revenue		$18,653,593	$17,174,965
Operation and taxes		13,436,291	11,709,077
Operating income		$5,217,301	$5,465,888
Non-operating income		251,901	264,513
Gross income		$5,469,203	$5,730,402
Fixed charges		4,899,602	4,853,801
Net income		$569,600	$876,600
Amount necessary to meet June 1 wage adjustment	$187,500		
5 per cent return on P. R. T. paid in capital—six months	750,000	937,500	
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock		$367,899	

Ordinance Allowances Increased

Board of Arbitration at Youngstown Increases Awards for Operating Expenses and Maintenance

The Youngstown (Ohio) Municipal Railway, the operating subsidiary of the Pennsylvania-Ohio Electric Company for the Youngstown, Ohio, city lines, recently found it necessary to submit to arbitration the matter of an increase in the allowances for operating expenses and maintenance under the terms of the service-at-cost franchise in effect there. This was referred to at length in the ELECTRIC RAILWAY JOURNAL for June 19, page 1277.

The board of arbitration, of which Col. J. H. Alexander, vice-president Cleveland Railway, was the company's member, after full consideration reached the decision whereby the operating allowance of the company was increased from 27 cents to 34 cents per car-mile for all cars equipped with motors and 60 per cent of this sum for trail cars. In addition to this flat rate, the award provides that the sum of 0.8 cents per car-mile shall be added for each $1 by which the average cost of coal per ton delivered to the North Avenue power house of the company shall exceed $5 per ton. In other words, if the average cost of coal per ton is $5.50 during any month the operating cost allowance per car-mile for that month would be increased by 0.4 cent, making the total operating allowance 34.4 cents per car-mile.

COMPANY PROTECTED BY COMPROMISE

The decision as to the allowance for maintenance, repairs and renewals increases the sum from 8 cents per car-mile for motor cars and 60 per cent of this amount for trail cars to 9 cents per car-mile.

During the proceedings the company asked for an operating allowance of 36 cents per car-mile and a maintenance allowance of 11 cents per car-mile. The operating allowance of 34 cents with an adjustment for the price of coal over $5 is practically the same as 36 cents.

Dividend Vote in August

Referendum Likely on Increase in Dividend of Cleveland Railway to 7 per Cent

The Supreme Court of Ohio on July 16 ruled that the case of Edwin D. Barry, who sought to prevent a referendum vote on the ordinance increasing the dividend rate of Cleveland Electric Railway stockholders from 6 to 7 per cent, was of wide public interest, but that, since there was no error intervening, a hearing must be refused. Unless some other step is taken, the referendum vote on the ordinance will be taken at the August primaries.

When the employees of the company were granted an increase in wages several months ago, the company asked for an increase in dividends to stockholders on the ground that many of them needed the additional 1 per cent as much as the employees needed the increased wage. Council granted this in an ordinance. Petitions for a referendum were circulated. Mr. Barry, a stockholder, brought suit for an injunction on the ground that the number of names on the petition was not sufficient. The case was decided in his favor in Common Pleas Court.

SECOND SUIT STARTED

New names were secured to the petition and a second suit was filed by Mr. Barry for an injunction on the ground that the time for filing petitions had expired. This time the case was heard before Judge Thomas in Common Pleas Court. He decided in favor of the city. An appeal was taken to the Appellate Court, where the decision was sustained. From this tribunal the case was taken to the Supreme Court.

Financial News Notes

Walla Walla Lines Suspend.—Two lines of the Walla Walla (Wash.) Valley Railway, the Prospect Heights and East Walla Walla branches, have been discontinued. The lines have not paid expenses for several years.

Service Resumed to Squantum.—Regular car service was resumed on July 1 by the Eastern Massachusetts Street Railway between Squantum and Atlantic after one year's absence of cars on this line. The operation was discontinued more than a year ago because the Squantum line was unable to meet expenses and the City Council of Quincy was not willing to bear so great a burden.

Guelph Road Taken Over.—The Ontario Hydro Power Commission took over the Guelph (Ont.) Radial Railway on July 1. W. W. Pope, secretary to the commission, says that application has been made to the Lieutenant Governor-in-Council for permission to run the road and that arrangements have been made for disposing of $150,000 of bonds, representing the purchase price of the road.

Mayor Asks Appropriation for Hyde Park Operation.—Mayor Peters has requested the City Council for an appropriation of $30,000 to be paid by the city to the Boston (Mass.) Elevated Railway under the authority of the special legislation act for the public operation of street cars in this district. The accompanying order provided that the $30,000 be raised by taxation in the city of Boston.

New Springfield Issue Approved.—The Department of Public Utilities of Massachusetts has authorized the Springfield Street Railway to issue twenty-year mortgage bonds to the amount of $2,954,000, with interest not to exceed 7 per cent. The use of $2,230,000 is approved for paying, refunding or retiring three loans maturing within three years, and balance for working capital, additions and betterments. The program of the company for carrying out local improvements has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

Common Stock Dividend Reduced.—The American Light & Traction Company, New York, N. Y., has declared a quarterly cash dividend of 1¾ per cent and a stock dividend of 1¾ per cent on the common stock, and the regular quarterly cash dividend of 1½ per cent on the preferred stock, all payable Aug. 2 to holders of record July 15. The company has been paying 2½ per cent in cash and 2½ per cent in common stock on the common stock each quarter for some time.

Successor Interurban Operating.—The Kansas City, Leavenworth & Western Railway has been authorized to do business in Kansas as the successor to the Kansas City-Western Railway, popularly known as the Kansas-Leavenworth interurban line. The company operates between Kansas City, Mo., and Leavenworth, Kan. The new company is the successor to the old under the terms of reorganization outlined in the ELECTRIC RAILWAY JOURNAL for March 13, 1920.

Dissolution Planned.—The Trenton (N. J.) Traction Company, organized as a holding concern in connection with the railway system of Trenton many years ago and inactive for approximately twenty years, is to be dissolved. A resolution to this effect has been passed by the board of directors, and a stockholders' meeting has been called for Aug. 13 for the purpose of completing the dissolution. John A. Rigg, Philadelphia, is the president of the company. Walter A. Rigg is vice-president, while T. W. Grookett, Jr., Philadelphia, is secretary-treasurer. These officials, together with F. W. Roebling, Jr., Dr. E. H. Ginnelly, Trenton, and R. L. Jones, Philadelphia, are the directors.

Amarillo System Resumes Under Municipal Ownership.—On July 1 the city of Amarillo, Tex., started the operation of the electric railway system of the Amarillo Street Railway under a lease from the owner of the system to the city of Amarillo, the lease running for three years with the option of extending under the same terms for a period of five years. The city of Amarillo assumes the responsibility of operating and the owner receives a rental for the use of the property. The system has been rehabilitated and the tracks and overhead rearranged so as to provide a more desirable system for the needs of the community. This system has not been in operation since October, 1917.

$4,200,000 Issue of Certificates Authorized.—Federal Judge Farris has authorized Rolla Wells, receiver for United Railways, St. Louis, Mo., to issue certificates of indebtedness amounting to $4,200,000 to provide for payment on bonds of the St. Louis Railroad which came due on May 1 last, and to take up receiver's certificates, due on Sept. 2, 1920. The issue may be dated and of such denomination to be decided upon by receiver and will bear interest at 7 per cent. The certificates will be a first lien on lines of railway properties and franchises of Union Depot Railroad, the St. Louis Railroad, mill tax judgment to city of St. Louis and liens of United Railways except liens executed by several companies whose lines were acquired by the receiver. The order also provides that the receiver shall make up the difference if discount and costs of selling certificates are not sufficient for this purpose. The War Finance Corporation went to the aid of the company with a loan during the war-time emergency.

Traffic and Transportation

Rhode Island Body Upheld

State Supreme Court Sustains Utilities Commission in Allowing Fare Increase

An opinion handed down by the Supreme Court of Rhode Island sustains the orders of the Public Utilities Commission allowing the Rhode Island Company, Providence, to increase its fares and to change the fare zones. Appeals were taken by the cities of Cranston and Pawtucket, and the towns of Warwick, Johnston, North Providence, Burrillville, West Warwick, Cumberland and East Greenwich at the time that the permission was granted the Rhode Island Company.

The appeals were taken from the order of the Public Utilities Commission entered Sept. 23, 1919. Arguments were made and briefs submitted by the City Solicitor of Cranston and the Town Solicitor of Warwick in behalf of those municipalities, and the cases of the other appellants were submitted without arguments or briefs.

COURT REVIEWS CASE

Judge Stearns, in his opinion, described the troubles of the Rhode Island Company leading up to the report of a special legislative committee presented April 2, 1918, together with an act authorizing the Public Utilities Commission to approve an increase of fares charged by the company from 5 cents to 6 cents.

On Sept. 23, 1919, the Public Utilities Commission entered an order whereby the Rhode Island Company was directed to file tariffs in modification of existing tariffs in accordance with "Plan B," so called. The effect of the order was to maintain zone limits existing at the time, to increase the fare from 5 cents to 6 cents in each zone and the charge for transfers from 1 cent to 2 cents. These tariffs were to remain effective during the receivership of the company and until otherwise ordered by the commission.

MANY TOWNS APPEAL

Various appeals were taken from the different orders entered prior to Sept. 23, 1919, and in each case the Supreme Court, on motion made, held that the appeal should not operate as a stay of the order. At the present time the receivers are operating the railway and are collecting the passenger revenue under the terms of the order of the Public Utilities Commission entered Sept. 23, 1919. The appeals from this order were the ones passed before the court. The court said:

> No question is raised in regard to the power of the Legislature to give authority to the commission to regulate the public utility in question, but the argument is made that it has not done so. We think there is no merit in this contention, and without detailed discussion of the matter we think the authority of the commission is clear and ample in regard to the subject matters under discussion.
>
> The general result of the order was to cut down the radius of the central zone about the traffic center of Providence to a radius of 2 miles, to make the fares in all zones, suburban as well as central zones, 5 cents, to fix a charge of 1 cent for each transfer issued. In its order the commission directed that the tariffs and supplements made effective on Oct. 23 should remain effective until March 1, 1919.
>
> That the State did not surrender unrestrictedly to the municipalities its governmental power of regulating rates is evidenced by the enactment in 1902 of the "Free Transfer Act." The paramount authority of the State to regulate rates of public utilities through the agency of a commission is well established.
>
> The orders of the Public Utilities Commission appealed from are sustained and affirmed. The appeals therefrom are denied and dismissed.

Ten Cents in Waterloo

Three cities do not make a State any more than a single swallow makes a summer. Dubuque, Des Moines and Davenport may not at the outset have extended the olive branch of peace to the utilities operating within their confines, but not all Iowa is to be blamed on their account. Recent comment in these pages was intended as a warning. Facts were stated merely as facts concerning these three cities. The city of Waterloo proves this to be so. There the board of arbitration appointed to settle the matter of fares has just announced an award of a 10-cent fare to the Waterloo, Cedar Falls & Northern Railway, with 8-cent tickets for working people, good between 6 a.m. and 8 a.m. and 5 p.m. and 7 p.m. Tickets for school children are to be sold at 5 cents each, good going to and coming from school. Waterloo proves that the spirit of live and let live is abroad in Iowa just as it has always been. That city, however, was quicker to sense a real public need than some of its sister cities.

Fare Increase Allowed

On June 25 the North Dakota Railroad Commission granted to the Fargo & Moorhead Street Railway, a subsidiary of the Northern States Power Company, increased fares effective in Fargo and the village of North Fargo, N. D. A similar schedule of fares had been granted by the voters of Moorhead, Minn., at an election held during the month of May by a vote of four to one. The new rates of fare effective in Fargo, village of North Fargo, N. D., and Moorhead, Minn., are as follows:

Cash fare	7 cents
Ticket fare	4 for 25 cents, 17 for $1
School tickets	20 for $1

This increased fare was put in effect temporarily for a period of one year by the North Dakota Board of Railroad Commissioners, pending their valuation of the property.

New Plan for Buses

Mayor Hylan Wants Privately Owned System with City Supervision—Railway Seeks Bus Grant

A city-wide system of privately owned, municipally supervised buses is now proposed by Mayor John F. Hylan of New York City as a solution of the transit problems of the metropolis. The Mayor's plan contemplates a bus service reaching all parts of the city. The fare would be 5 cents and universal free transfers would be given.

Mayor Hylan presented his new scheme to the Board of Estimate and Apportionment following the action of the State Court of Appeals in ruling that the city had no legal right to engage in bus operation. All the municipal bus lines paralleling the lines of the Brooklyn City Railroad are now out of business as a result of the court's decision. The new plan seeks to avoid legal difficulties by placing the operation of the buses in the hands of a private corporation under conditions of "the strictest municipal regulation and supervision."

FAIR RETURN PROPOSED

The Board of Estimate held a hearing on the matter on July 21, at which the Mayor explained his plan. Mayor Hylan would write the following conditions into the bus agreement:

> 1. An adequate and fair return to the security holders on an actual and honest investment for motor buses, garages and repair shops, but with a provision that there shall be no capitalization of franchise privileges granted.
> 2. A fair scale of wages for the employees.
> 3. An adequate, comfortable, sanitary, modern, safe and efficient service to the public for a 5-cent fare or less.

The Mayor said recently:

> Such an agreement should provide for a proper system of audit, control and supervision over the transactions and operations of any operator entering therein. Securities should be issued only for value received, excessive salaries and exorbitant overhead charges eliminated, and the property be economically and efficiently administered in the public interest. There is little doubt that such a system would be successful and would aid immeasurably in building up and adding to the prosperity of this city.

The Third Avenue Railway has applied to the New York City authorities for permission to establish a number of bus routes in connection with its electric lines. The buses would serve outlying sections of the city which now lack transportation facilities. A 5-cent fare would be charged, with a 3-cent charge for transfers to the company's railway lines.

Seven Cents in Dayton Soon

Car riders of Dayton, Ohio, will begin paying 7-cent fares on Aug. 7. The City Commission has formally approved an ordinance allowing the Dayton Street Railway, the City Railway and the other roads operating the local lines to raise their rates on that date. Four adults' tickets and eight half-fare tickets are to be sold for 25 cents. The companies are directed to file monthly reports of income and expenditures. The city is given the right to exact better service.

Jitneys Still Operating

Bridgeport Auto Men Secure Injunction Against New Ordinance—Trolleys Ready to Quit

Jitney operators of Bridgeport, Conn., have obtained a respite from the enforcement of the ordinance recently passed by the Common Council which would keep them off many of the city streets. Judge John W. Banks on July 22 refused to dissolve a temporary injunction, which he had granted on July 15, restraining the city from enforcing the terms of the jitney measure. Judge Banks held that while the Common Council had the right to fix bus routes, the clause delegating this power to the police commissioners was inoperative.

Judge Banks ruled as follows:

> In my opinion, the Common Council may fix the routes to be traversed by public service vehicles in the city of Bridgeport and exclude them from all streets not included in said routes. This, however, is not what the Council has done in the ordinance under consideration.
>
> The delegation to the police commissioners of the power to pick routes being inoperative, there is nothing left to the ordinance but a proviso that the commissioners shall not give their consent (which they would have no power to give anyway) to the operation of public service motor vehicles upon certain city streets.
>
> I do not see how the City Council can make this part of the ordinance effective as an exercise of the power to fix traffic routes. For these reasons I feel compelled to hold that the ordinance in its present form exceeds the power conferred on the city by Chapter 233 of the public acts of 1919, and is, therefore, void.
>
> The motion to dissolve is denied.

CITY'S PETITION DENIED

Previous to the issuance of the injunction, City Attorney William H. Comley, Jr., had applied to the court for an injunction to stop jitneys from operating on the streets named in the ordinace. The petition was denied after Mr. Klein had pointed out that the city had a remedy at law because it could make arrests for violation of the ordinance.

The court action was the outcome of a futile attempt to reach a compromise. There were at the conference Mayor C. B. Wilson, Mr. Klein, Mr. Comley and Lucius B. Storrs, president of the Connecticut Company.

Counsel for the jitney men said that section 30 of the public acts of 1919 regulating motor vehicles provides that a municipality may by ordinance fix traffic routes for public vehicles. The ordinance just passed, it is contended, is based upon an amendment of the ordinance passed in December of last year, which gives to the police commissioners the power to issue permits for certain routes. If too many jitneys run on certain streets the commissioners have the power to prohibit any more using these same streets.

The defense of the representatives of the jitney men was that the police commissioners of the city were delegated power which does not belong to them.

MR STORRS INSISTENT

Mr. Storrs insists that the jitneys shall be suppressed. In a letter to Mayor Wilson on July 19 he said:

> The trustees of the Connecticut Company are advised that a suit has been brought to test the validity of the ordinance recently adopted by the Common Council of the city of Bridgeport for the regulation of jitney transportation, and that the Superior Court has reserved its decision upon an application for a preliminary injunction in such suit.
>
> As you have been advised, the company is operating in the city of Bridgeport at an actual heavy loss and cannot continue for any extended period under existing circumstances.
>
> By such action of the Superior Court the ordinace has, for a time at least, been rendered ineffective, and as our agreement to postpone discontinuance of service was conditional upon the ordinance being made immediately effective, the Connecticut Company is free to discontinue its service, but is unwilling to do so without notice.
>
> As we are informed, however, that a decision upon the application for an injunction is expected within a very short time, we will continue operation, notwithstanding our losses, until July 26, but cannot undertake further operation if conditions remain unchanged.

The trolley-jitney situation in New Haven was brought before the Board of Aldermen of that city on July 21, when a message from Mayor Fitzgerald was read. The Mayor submitted a letter received from Mr. Storrs and a petition received from a committee of conductors and motormen of the company. At the suggestion of the Mayor, the entire subject was referred to a special committee.

Seven-Cent Fare Approved for Rochester

A 7-cent car fare will become effective on Aug. 1 on the Rochester lines of the New York State Railways. The Common Council of Rochester, at a special meeting on July 14, adopted the report of its law committee on the service-at-cost contract and this contract has been signed by both Mayor Edgerton and James F. Hamilton, president of the New York State Railways. Under the contract, the return to the company is determined, in a measure, by the rate of fare. The lower the fare the higher will be the rate of return.

The suggestion of James W. Routh, director of the Bureau of Municipal Research, that the contract be amended to include a provision for the easier discharge of the railway commissioner should he prove incompetent and the suggestion that some penalty be provided for raising the fare above the tentative figure of 7 cents were disregarded. In its report the committee says that there is adequate protection in the contract against unreasonable increases in fare, and that the committee believes the commissioner's service to the city would be impaired if provision was made for his arbitrary dismissal.

The contract was amended by the law committee by the addition of a provision for the appointment of a third arbitrator and appraiser should those appointed by the company and the city's representatives fail to agree on the third man. Provision is also made to prevent the renewal and depreciation fund from exceeding 2 per cent of the base value of the company's property at the termination of the agreement.

Zone System Rejected

Connecticut Company Operating 700 Miles of Line Wants Seven-Cent Fare—Hearing on July 29

The Connecticut Company on July 22 petitioned the Public Utility Commission to revoke the zone system imposed upon the company by that commission on March 30, asking as a substitute substantially the same distances as were used in determining rides under the 6-cent fare system, but with 7 cents as the base fare.

The Utilities Commission, whose zone plan for collecting fares superseded the company's own distance tariff plan which went into effect on Nov. 2, 1919, will grant a hearing to the company on July 29 at 10 a.m. daylight saving time.

The tariff proposed by President Lucius S. Storrs of the company is as follows:

> Flat rate of fare 7 cents.
>
> On rural lines fare limits to be 2.8 miles apart.
>
> On short city lines flat rate to apply to entire line.
>
> On all long city lines first fare limit to be approximately 3 miles from traffic center.
>
> Free transfers to be given to all passengers from and to points not more than 2½ miles from the traffic center.

ALL COSTS ADVANCE

Unusual increases in operating costs, which include a payroll whose total is $1,000,000 larger than that of last year, are given as the reasons for asking that the rate be increased. After stating that the requests of the cities of Manchester and New Haven caused the commission to insist on the company's issuing commutation tickets, the petition says:

> Though your petitioner has made every possible endeavor to make such system a success and the same has had a fair trial, said system has not produced a revenue sufficient to cover the cost of service with any return whatever upon a fair valuation of the property, and does not now produce the actual cost of operation. Wherefore your petitioner prays leave to install forthwith a flat fare system of rates upon lines, with a base or initial fare of 7 cents in accordance with the tariff hereto annexed.

The petition of the company for an increase in fare allowance is a departure from precedent, as was the action last March of the Public Utilities Commission in imposing on the railway a fare system of its own. Heretofore the company has initiated fare systems, which were defended before the Public Utilities Commission when petitioners from towns protested. The company has at the present time an appeal before the Superior Court in the matter of commutation tickets, the company's attorneys taking the stand that the imposition of fares for ordinary riders by the Public Utilities Commission shows that these rates are reasonable, and therfore any rate below those is confiscatory and unconstitutional.

A statement issued to the press by the company, on the afternoon of July 22, read:

> In order to meet increases in cost of operating the railway service the Connecticut Company must obtain a greater revenue. The payrolls for 1920 will be $1,000,000 greater than last year, due to recent advances in rates of pay. Coal, which cost $4 per ton a few years ago, is now selling for $13 per ton and at times even more.

> The authorities in the various cities where efforts are being made to restrict ruinous jitney bus competition have asked us to return to a flat rate of fare collection and we are, therefore, proposing a 7-cent flat rate of fare covering the largest portion of each city area, but not including the entire areas falling within the old 5-cent fare limits.
>
> As we are now obtaining fares of 8, 10 and 12 cents from a large number of passengers whose payments will be reduced to 7 cents, it is clear that no lower rate will produce sufficient revenue. We have no means of determining whether the 7-cent rate will be high enough, although it is possible that with a restriction of ruinous jitney bus competition and a large use of the cars we may be able to establish a lower rate.
>
> Every effort will be made to retain service upon all the lines now operated, including all those in the country areas, but of course sufficient revenue must be obtained to meet the cost of operating the cars.

The company has been in the hands of receivers since 1916. In 1917 it instituted a 6-cent fare system, which was changed on Nov. 2, 1919, to a distance tariff system. On complaint of several of the towns and cities of the state, the utilities commission discarded this system and put in a distance tariff of its own, allowing a cut rate for purchasers of fifty-zone tickets and granting commutation rates to daily suburban riders.

Fare Increase Contemplated

The Milwaukee (Wis.) Northern Railway has petitioned the Wisconsin Railroad Commission for permission to discontinue the sale of six tickets for 25 cents good on the company's line within the city of Milwaukee. The cash fare will remain at 5 cents, as at present.

The company operates an interurban service connecting Milwaukee, Cedarburg, Port Washington and Sheboygan, all points in Wisconsin. It also operates a city service over its line within the city of Milwaukee. The rate of fare for this service is fixed in its franchise at 5 cents cash or eight tickets for 25 cents. In July, 1918, the company was authorized by the Wisconsin Railroad Commission to increase the rate of fare by reducing the number of tickets sold for 25 cents from eight to six. A flat 5-cent fare now sought because of increased labor and maintenance costs.

Wants Ten Cents in Scranton

Stating that the company can no longer continue to operate on a 7-cent rate, the Scranton (Pa.) Railway has filed with the State Public Service Commission notice of its intention to raise its fare to 10 cents. The company's action follows the recent award of a substantial wage increase to its employees by a board of arbitration. The Pennsylvania Supreme Court recently ruled that the commission has full power to fix rates for electric railway service.

Jilson J. Coleman, general manager of the company, gave out a statement supplementing that of the petition and laid particular stress on the fact that the company cannot continue to operate on a 7-cent fare and could not expect to get along with an 8-cent fare, hence the request that a 10-cent rate be permitted. Mr. Coleman said the increases in wages since 1914 have totaled 124 per cent for the motormen and conductors; 135 per cent for the barnmen, and 189 per cent for the trackmen. In addition he pointed out that the cost of material has advanced more than 100 per cent on a general average during this period.

The company has lost more than $58,000 since Jan. 1, and is continuing to earn less than the operating costs. Since 1917 the only increases have been from natural growth and increases in fare rates. Wages for this year will be increased more than $150,000, the wages covered in the recent award amounting to $148,000.

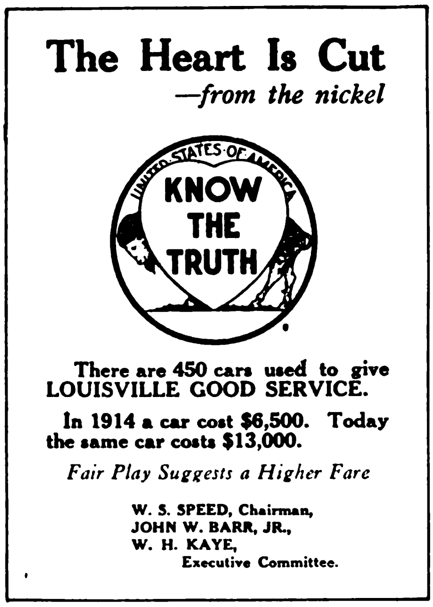
May Amend Louisville Plan

Passage in its present form of the ordinance recently submitted to the City Council of Louisville, Ky., providing for a cost-of-service franchise for the Louisville Railway, now seems improbable. Opposition to the measure as presented by the executive committee of the railway has developed in the Council. Public sentiment is also unfavorable to the granting of the franchise without a number of changes.

Hopes for a compromise are held out as the result of a statement by W. S. Speed, chairman of the directors' executive committee, that the company would not object to changes in the ordinance as drawn as long as efficient transportation is given to Louisville and the lines are saved from bankruptcy. It has become known that if the company's present effort to obtain higher fares fails, a receivership is contemplated. Under the terms of the cost-of-service agreement the initial fare would be 7 cents.

The objections to the ordinance cited by civic organizations and members of the Council are: Compensation for members of the Board of Public Works to be paid out by the railway; the turning of extra earnings into the city treasury; opportunity for the company to revise upward but none for the city to revise downward; failure to limit the period during which increased fares will be charged; the request for the city to guarantee dividends of 6 per cent on $24,500,000 physical valuation shown by the company's books while the company's sworn statement in the City Assessor's office shows an actual physical valuation of $4,700,000.

The company has been conducting an active campaign of education through advertisements in the Louisville newspapers. It calls attention to increases in the prices of commodities generally and asks the public to "know the truth" about electric railway service. One of these advertisements is reproduced in the adjoining column.



The Heart Is Cut

—from the nickel

UNITED STATES OF AMERICA
KNOW THE TRUTH

There are 450 cars used to give LOUISVILLE GOOD SERVICE.

In 1914 a car cost $6,500. Today the same car costs $13,000.

Fair Play Suggests a Higher Fare

W. S. SPEED, Chairman,
JOHN W. BARR, JR.,
W. H. KAYE,
Executive Committee.

AN APPEAL FOR FAIR PLAY

Seek Compromise in Tacoma

Company Wants Four to Eight per Cent Return on $6,000,000 Valuation—Mayor Opposes Fare Rise

The Public Service Commission of the State of Washington, which recently completed its hearing in the matter of an increase from a 7 to a 10-cent fare on the lines of the Tacoma Railway & Power Company has deferred the announcement of its decision. In the meantime, a compromise will be attempted on the following basis: Commutation tickets to be sold 15 for $1; 10-cent fare for casuals; the company to be granted some relief from gross earnings tax, street paving and free passes for city employees.

Mayor C. M. Riddell and Commissioner Fred Shoemaker, on the witness stand before the commission, declared that a straight 10-cent fare would mean granting franchises to jitney buses. It is stated that a local association in Tacoma has offered to put fifteen large jitneys in operation if the 10-cent fare is granted. City Councilmen have stated that, if necessary, they will grant franchises to the jitney men.

SEEKS ADEQUATE SERVICE

The railway, in its brief, demands a fare that will provide for cost of operation, depreciation, and from 4 to 8 per cent profit on a $6,000,000 valuation.

City Attorney U. E. Harmon has suggested that a compromise be offered the company. The new proposition would provide for the city to have joint supervision of the operation of the lines for a period of one year, the fare to remain 7 cents; the city to appoint three supervisors to waive for the period of one year the payment of gross earnings, taxes and free transportation of city employees, provided the amount thus waived, plus the addition of sums necessary to put the streets in proper condition, be expended in such street improvement.

Commissioner of Finance Silver has gone on record as opposing such a plan. He has stated that he will make an effort to put the railway out of business on several of its best-paying lines, where franchises have expired.

Injunction Against Jitney Repeal Measure

A restraining order has been issued by Presiding Judge Mitchell Gilliam, at the request of counsel for the Seattle (Wash.) Jitney Drivers' Association, to prevent the city from suspending operation of jitney buses on city streets. The order was issued just in time to prevent the cessation of jitney activities, as Superintendent of Utilities Carl H. Reeves had served notice that no jitneys would be permitted to operate after midnight on July 6, except those to which permits had been granted, and the Council has granted no permit to drivers. Before the order had been issued, ten drivers who undertook to operate without permits were arrested. They were released when the restraining order became effective.

Major Reeves' order was issued, after the City Council had finally rejected the applications of all drivers for permits, on the recommendation of the public utilities committee, leaving a loophole which would allow the issuance of permits to short lines operating as feeders to the municipal railway.

The petition filed by the jitney drivers, calling upon the City Council to present to the qualified electors of the city an ordinance permitting jitney drivers to operate along routes of their own choice, in repeal of the existing city ordinance providing for strict regulation of jitneys, is being checked by City Comptroller Harry W. Carroll, to determine if the signatures of the petition are qualified as on the registration books of the city.

If it is found that the petition bears sufficient signatures of qualified citizens, the Council will be required to submit the initiative measure to the people. Adoption of the initiative ordinance by the voters at a special election would repeal existing jitney regulations, and require drivers to go through only the formality of applying for permits to operate on routes of their own choice. The city would have no power to refuse such applications or to specify routes and schedules for the jitney lines.

Bus Company Suspends

H. S. Albrecht, receiver for the Missouri Motorbus Company, operating in St. Louis, obtained a court order on July 1 authorizing the suspension of operation of the buses. He stated that the company did not have sufficient funds to meet its payroll or purchase gasoline and that he had been unable to borrow money necessary to continue operation.

The bus company was organized late in 1919 with a capital stock of $300,000. It began operations on Feb. 9 with eleven double-deck buses having a seating capacity of sixty persons each. A regular schedule was maintained between Delmar and Hamilton Avenues and Sixth and Locust Streets. The fare was 10 cents. Contracts were let for about forty additional buses, but deliveries were held up on account of lack of funds.

Wheeling Wants Zone Fares

The Wheeling (W. Va.) Traction Company is filing new passenger fare tariffs with the Interstate Commerce Commission, the Public Utilities Commission of Ohio and the Public Service Commission of West Virginia, asking for authority to establish a zone system beginning Sept. 1. It is proposed to make up the entire system with a series of so-called major and minor zones, the major zones being approximately the same as those now in effect and the minor zones dividing these major zones in half as nearly equal as natural loading and unloading conditions will permit.

The initial fare will be 8 cents cash or 6⅔ cents on the basis of the universal ticket to be good on any division of the property and to be sold by the conductors on the cars or at any regular ticket office of the company. These universal tickets will be sold on the basis of nine minor zone tickets for 30 cents, six two-minor zone tickets for 40 cents and three four-minor zone tickets for 40 cents. Each minor zone ticket would have a value of 3⅓ cents and two-minor zone tickets will be required for the initial ride in any zone.

The cash fare for any minor zone after the initial ride will be 4 cents. The ticket charge for a minor zone after any initial charge will be 3⅓ cents.

B. R. T. Will Seek Increases Under Recent Court Ruling

Lindley M. Garrison, receiver for the Brooklyn (N. Y.) Rapid Transit Company, has announced that he will apply for fare increases for those companies of the system which the Court of Appeals in its decision held were under the jurisdiction of the Public Service Commission. These were the lines the franchises of which were granted prior to Jan. 1, 1875, and subsequent to the passage of the Public Service Commission law on July 1, 1907. Mr. Garrison's statement said in part:

> It is impossible in the short time now at my disposal to apply the decision of the court to each of the lines and separate the different franchises so that the one class that the court says is not within the jurisdiction of the Public Service Commission is picked out and put by itself. All but a very few of the franchises of these three companies are held to be within the jurisdiction of the Public Service Commission.
>
> I shall immediately comply with the privilege extended to me by the court and present to the Public Service Commission proper applications for action in respect of the franchises that the court holds the Public Service Commission has jurisdiction over.

Dallas Increase Favorably Received

The very thorough publicity methods of the Dallas (Tex.) Railway in placing the case of the company before the public are believed to have been very largely responsible for the people of that city accepting so gracefully the recent increase in fares to 6 cents. The Dallas *News*, voicing public sentiment on the fare question in a recent editorial, said in part:

> All who were opposed to having the fare increased were given an opportunity to express their opposition, and not enough have done so even to bring about a referendum.
>
> Six cents has become rather less than the average electric railway fare, so that, instead of having reason to complain, we have reason to congratulate ourselves on getting our transportation at the least cost made possible by the economic and financial conditions. But there ought to be a better satisfaction than this in the reflection that in increasing the fare to 6 cents we are doing justice to the railway and at the same time serving the best interests of Dallas. Already insufficient, our transportation facilities must have become increasingly inadequate under a continuance of the 5-cent fare.
>
> The people of Dallas are to be congratulated on the disposition made of this matter, which is equivalent to saying that the Mayor and Commissioners are to be commended for the courageous and enlightened way in which they have solved this problem.

Seven-Cent Fare in Salt Lake

Under authority of an order issued by the State Public Utilities Commission, the Utah Light & Traction Company, Salt Lake City, Utah, on July 3 raised its cash fare from 6 cents to 7 cents. The commission ordered the company to sell four commutation tickets for 25 cents, and to raise the price of school tickets from 3 cents to 4 cents. The company's request for a 1-cent transfer charge was denied. The commission recommended the adoption of the one-man safety car by the company, and also called attention to the fact that the State law with regard to street paving was unduly increasing the cost of transportation to the car-riding public.

The cost of paving, it was pointed out, amounts to ½-cent a ride. The commission contended that by the adoption of safety cars the service would be bettered and that at the same time costs would be reduced. The commission urged that every possible method be made to reduce operating cost. During the first five months of 1920 there was an increase of 1,601,781 in the number of passengers carried as compared with the same months of 1919, while the financial returns for the first quarter of 1920 show an increase in the net operating income of $17,033.

The company petitioned for a 7-cent fare early this year. It later applied for an 8-cent fare.

"Memphis Trolley Items"

The Memphis (Tenn.) Street Railway is putting out a little publication for its patrons which is distributed through pockets in each car. It is called *Memphis Trolley Items* and is for the information and entertainment of the patrons. "Avoid Accidents," "The 6-Cent Fare and Today's Prices," "Service Interruptions," "Executing a Public Trust," "The Women of History," "Week's Amusement," "Safety First Alphabet," "Transportation Necessary to City's Growth," "Help Keep Down Unnecessary Expenses" are parts of the *multum in parvo* in a recent issue. They are always bright and snappy.

Transportation News Notes

Fares Raised on Iowa Line.—The Clinton, Davenport & Muscatine Railway placed in effect on July 15 an increase in passenger rates of 6 per cent. The fare from Davenport to Clinton is now $1.25 as compared with $1.20 under the old tariff.

Eight Cents in Hornell.—An 8-cent cash fare took effect on the lines of the Hornell (N. Y.) Traction Company on July 9. The new rate was authorized by the Public Service Commission for the Second District. The fare was formerly 6 cents. The company has not met bond interest payments for the past five years.

Eight Cents in Hammond.—Fares on the lines of the Hammond, Whiting & East Chicago Railway, Chicago, Ill., in Hammond, Whiting and East Chicago, Ind., became 8 cents on July 1. The Indiana Public Service Commission, in authorizing the new rate, ordered the company to sell tickets at the rate of fourteen for $1.

Three-Cent Line Denied Rise.—The Public Service Commission for the First District has denied the application of the Van Brunt Street & Erie Basin Railroad, Brooklyn, N. Y., for an increase in fare from 3 to 4 cents. The company has increased its earnings during the past year. The net corporate income for the nine months ending March 31, 1920, amounted to $8,375. The line is three miles long.

Seeks Rise in St. Joseph.—The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has applied to the Missouri Public Service Commission for permission to increase its fare to 9 cents. Six months ago the commission allowed the company an increase from 5 to 7 cents. The company claims that during this period it has lost $9,174.

Approves Bay State Rise.—A tariff schedule providing for an increase in fare from 6 cents to 10 cents on the lines of the Connecticut Valley Street Railway, Greenfield, Mass., has been approved by the State Department of Public Utilities. The new rate went into effect on July 13. The company is selling tickets at the rate of 7½ cents each.

Prefers Higher Rate to Shutdown.—The City Council of Findlay, Ohio, has notified the Toledo, Bowling Green & Southern Traction Company, Findlay, that it is willing to grant an increase in fare on the city line, if the company will withdraw its application for abandonment of the tracks, recently filed with the Council. Street assessments, it was stated, would be kept to a minimum.

Ten-Cent Fare in Portsmouth.—The New Hampshire Public Service Commission has authorized the Portsmouth Electric Railway, Portsmouth, to charge 10-cent fares on its lines. The company has also received permission to raise the price of transfers from 2 cents to 5 cents. The fare was formerly 7 cents. The company is a subsidiary of the Boston & Maine Railroad.

Will Extend Freight Service.—The Boston & Worcester Street Railway, Boston, Mass., will shortly put in operation through freight service in conjunction with the Worcester Consolidated Street Railway and the Springfield Street Railway to points west of Worcester. The new service will give early morning delivery at destination of all goods shipped the day before.

Ten-Cent Joint Rate Allowed.—The Public Service Commission for the Second District has authorized the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., to charge a 10-cent fare between Seneca Street, Buffalo, and the plant of the Lackawanna Steel Company, Lackawanna. The company uses the tracks of the International Railway within the Buffalo city limits. It had sought to abandon this service.

Higher Fare in Savannah.—A 7-cent cash fare became effective on the lines of the Savannah (Ga.) Electric Company on July 16. The increase from the former 5-cent rate was authorized by the State Railroad Commission, which had had the company's petition under consideration for some time. The company was ordered to sell ticket books containing fifteen tickets for $1. An increase in lighting and power rates was also authorized.

Three Cents a Mile in Maryland.—Fares on the line of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., were placed on a basis of 3 cents a mile on July 11, under authority of an order of the Interstate Commerce Commission. The new fare between Baltimore and Washington is $1.05, and the round-trip rate is $2.03. The old rate was 92 cents, round trip $1.50. The single fare in the District of Columbia to the District line is 8 cents.

Higher Rates on Penn Lines.—The Chambersburg & Shippensburg Railway, Chambersburg, Pa., has filed with the State Public Service Commission notice of increase of fares in Franklin and Cumberland Counties from 7 to 8 cents. The Altoona & Logan Valley Electric Railway, Altoona, has given notice of 7-cent fares, with advances in charges for funeral cars. The Irwin-Herminie Traction Company, Irwin, has advanced its zone fares, school rates; express and freight rates.

Plans Referendum on Fare Rise.—An ordinance authorizing the Sioux City Service Company, Sioux City, Iowa, to charge a 6-cent fare for a three-year period will be submitted to the voters of Sioux City for their approval at a special election on Aug. 17. The measure provides that at the end of three years the company shall return to the present 5-cent fare. If the fare increase is authorized the company will pay its platform men a wage scale of 50 to 60 cents an hour. The present scale is 38 to 43 cents.

Operating Ratio Now 100 per Cent.—Mayor Walton of Oklahoma City, Okla., is to appoint a committee of five men to inquire into the affairs of the Oklahoma Railway. This company has operated thus far under a 5-cent fare. It is now hauling almost 80 per cent more passengers than four years ago with the same number of cars. In 1916 the revenue was 25 cents for each mile while the expenses were 16 cents a mile. At present the revenues and expenses are equal at 40 cents for each car-mile. The company has requested that the fare be increased to 7 cents on a cash basis, or 6¼ cents for tickets.

Eight-Cent Fare Not Yet Granted.—The need for immediate action authorizing an 8-cent fare was urged on July 9 by Andrew C. Gray, counsel for the Wilmington & Philadelphia Traction Company, Wilmington, Del. This company filed its petition early in June. All the requirements of the utility board had been complied with. The property had been looked over and from the appraiser's point of view a 9-cent fare would be required to net the company an adequate return. However, the company was willing to try operation on an 8-cent fare. What the company wants is action on the part of the Public Utility Commissioner, for the need now is very urgent. The company put the 7-cent fare in effect last fall under authority granted by the city utility board.

Eight Cents in Jamestown.—Authority has been granted by the Public Service Commission for the Second District of New York to the Jamestown Street Railway to charge a cash fare of 8 cents in place of the present 7-cent cash and 5-cent ticket fare, the order to remain in effect until changed by the commission, either on its determination or under a complaint. The order provides that under the 8-cent fare the company shall place strips of five tickets on sale at 35 cents, purchasers to be limited to two strips at a time. Transfers are to be given on a cash or ticket fare to points within Jamestown on the Jamestown & Warren Railway line, and the Jamestown Street Railway is to accept transfers issued by the other local line. All Jamestown Street Railway tickets outstanding are to be redeemed by the company. Present regulations of the company including those relating to the transportation of children in Jamestown are not affected by the order, which is to become effective on one day's notice. No change is authorized in the order in the 5-cent cash fare applicable to passenger transportation between points within the town of Ellicott or the villages of Celeren, Lakewood or Falconer.

Personal Mention

Commission Named to Inquire Into Ontario Hydro-Radials

The Ontario Government has announced the appointment of the special commission to investigate and report on hydro-radials. The members are as follows: Justice Sutherland, chairman; T. A. Russell of the Russell Motor Car Company, Toronto; Fred Bancroft, labor leader, Toronto; W. A. Amos, vice-president of the United Farmers of Ontario, Palmerston; A. F. MacCallum, city engineer and commissioner of works, Ottawa.

Justice Sutherland, chairman of the commission, was speaker of the House of Commons from 1905 to 1909 and was Liberal member for North Essex in the House of Commons. He practiced law in Windsor until his elevation to the bench.

Mr. Bancroft is a well-known labor man, having been vice-president of the Canadian Trades Congress. He has been on several arbitration and conciliation boards representing the men. He is a member of the Patternmakers' Union, but is at present in newspaper work. He is said to be a strong supporter of public ownership.

Mr. Amos, the vice-president of the United Farmers of Ontario, was formerly a Presbyterian minister. Illness caused him to retire from the pulpit, and he is now a farmer in Perth County. At the last provincial election he was the United Farmers of Ontario candidate in North Perth, but was defeated. He is one of the big men of the U. F. O. organization.

Mr. Russell is president of the Russell Motor Car Company and a prominent manufacturer. He served as a delegate from the manufacturers of Canada at the Imperial Commercial Conference in 1906. He has been secretary of the Toronto Manufacturers' Association.

Mr. MacCallum, at present commissioner of works in Ottawa, was formerly assistant engineer for York County, and later city engineer in the city of Hamilton. He has been on several arbitration boards.

The commission will start work immediately. All sittings will be public.

C. R. Barnes to Be Rochester Commissioner

Charles R. Barnes, electric railway adviser to the Public Service Commission for the Second District, has been appointed Street Railway Commissioner of Rochester, N. Y. In his new capacity Mr. Barnes will have supervision for the city of the local lines of the New York State Railways. The position which he will occupy is created under the terms of the cost-of-service agreement which will go into effect on Aug. 1. Mr. Barnes will have control of schedules and will generally direct the operation of the Rochester lines.

Edwin Gruhl, Vice-President

Assistant to President Advanced by Board of North American Company

Edwin Gruhl has been elected a vice-president of the North American Company. He has been assistant to the president since November, 1912.

EDWIN GRUHL

Mr. Gruhl was graduated from the University of Wisconsin, Department of Economics, class of 1908. While attending the university he delayed his course one year, during which time he was engaged in valuation work with the engineering staff of the Wisconsin Railroad and Tax Commissions. Following the resignation of W. J. Hagenah, Mr. Gruhl succeeded him as statistician of the Railroad Commission of Wisconsin. This position he occupied up to the time he joined the North American Company. He taught in his alma mater, lecturing to a class on public utility economics during the time he occupied the position of statistician of the commission.

Mr. Gruhl has been a frequent contributor to the technical magazines and the proceedings of the American Electric Railway Association. He represented the committee on cost of passenger transportation service, of which J. D. Mortimer was chairman, in the deliberations that led to the preparation of F. W. Doolittle's book "Cost of Urban Transportation Service."

Mr. Gruhl has for some years been vice-president of the Wisconsin Edison Company, Inc., and president of the Wells Power Company, a subsidiary of that company. He has also been assistant to the president of the Milwaukee Electric Railway & Light Company and the Union Electric Light & Power Company, St. Louis.

C. E. Atkinson, superintendent of equipment of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has resigned.

Michael J. Walsh, chief dispatcher at the Brooklyn Bridge station of the Brooklyn (N. Y.) Rapid Transit Company, has been made depot master at the Flatbush Avenue station.

Morton S. Cornell, division superintendent of the Flatbush Avenue lines of the Brooklyn (N. Y.) Rapid Transit Company for the past ten years, has been transferred to the Fifty-eighth Street division, where he succeeds Edwin Gilchrist. Mr. Cornell has been connected with the B. R. T. since 1895.

Edwin Gilchrist, division superintendent of the Fifty-eighth Street lines of the Brooklyn (N. Y.) Rapid Transit Company, has been granted a leave of absence. Mr. Gilchrist has been connected with the B. R. T. system for the past twenty-nine years. Early in 1900 he was appointed dispatcher and later in the same year he was made depot master. In 1906 he was made a division superintendent.

Major Gustave Storch, master mechanic of the Paulista Railway, Sao Paulo, Brazil, is spending a few weeks in this country, familiarizing himself with the details of construction of electric locomotives such as those in use on the Chicago, Milwaukee & St. Paul and Butte, Anaconda & Pacific lines. The Paulista Railway will shortly have in operation sixteen electric locomotives, twelve General Electric and four Westinghouse, which will be similar in many particulars to the machines which Major Storch is examining. He is making a special study of maintenance practice. Major Storch is accompanied by his general foreman of shops and others.

George R. Green has been appointed superintendent of equipment of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., to succeed C. E. Atkinson, resigned. Mr. Green was born in Butler, Ind., April 29, 1887. He began his work in the electric railway field when he was only fourteen years old. This was in 1901, when he went to work for the Detroit United Railway, where he continued for eighteen years, except for three years between 1909 and 1912, during which time he was master mechanic of the Saginaw & Flint Railway. During most of this period he was employed in the mechanical department, rising to the position of general foreman of interurban equipment, which position he recently resigned. During two years of his service with the Detroit United Railway he served as assistant division superintendent.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Deliveries of Rail Bonds in Good Shape

Traction Companies Ordering Only What Is Needed for Maintenance Work—Prices Appear Steady

Demand for rail bonds does not seem to be especially heavy just now as compared with past years, practically all of the ordering representing maintenance work, which is going forward at a normal pace, according to representative manufacturers of this material.

Delivery figures as quoted by several producers range from two to four weeks, although one company gave two months as its average, stating that deliveries, which they had been making in about a month, had now lengthened to twice that long as a result of slow shipments. Transportation troubles, as a matter of fact, seem to be the main factor in slowing up shipments, as there is no shortage of copper. One manufacturer, rather than depend upon the uncertainties of freight transportation, recently shipped a large order of rail bonds by express. Another big producer, however, believes the freight situation is beginning to ease up. Production for this latter company is well up to its usual standard.

If the term "stocks" can be applied to this particular item, they may be said to be in pretty good shape, inasmuch as most producers make rail bonds according to specification, but such small stocks of standard material as are usually carried are in about normal supply.

No price changes have been recorded since the downward fluctuation of about four months ago, and opinions agree that prices are likely to continue steady.

Reports on collections are about evenly divided, one view holding that they are fairly good and better than in the past, while other manufacturers say the utilities are slow in meeting their bills on account of financial difficulties, with probably half of them being classed as delinquent in payments. Money tightness, nevertheless, apparently has not caused electric railways to cancel or reduce orders, as no steps in that direction have been reported. Nevertheless, traction companies are ordering this equipment only as absolutely needed.

Priorities Help Electric Railways Get Coal for Current Use

Speculators and Market Manipulators, Through Abuse of Reconsignment Privilege, Aggravate Yard Congestion and Hold Up Car Movement

A coal shortage exists, due to inadequate transportation facilities, and there is a mad scramble for priority by coal users. Reports are prevalent on coal hoarding, overproduction, market manipulation, etc., but an analysis of the situation by the staff of *Coal Age* and the universal industrial demand for coal all tend to prove that an actual shortage exists, although aggravated by speculators.

The Interstate Commerce Commission has attacked the problem on a priority basis by fixing a "preference list" and a "geographic list" for coal distribution for sixty days from June 21 last by the method of assigned cars. The essential industries and utilities are given preference and also those districts which are so situated that they must obtain a coal supply at certain seasons or do without. In agreement with this plan the commission has assigned open cars to the coal mines, has permitted priority on coal car assignments to public utilities and has assigned geographical priority in coal distribution.

It is hoped relief will follow the remedies, but past experience with priority schemes indicates that they react to increase and not decrease transportation difficulties. When, therefore, inadequate transportation is the cause of the coal shortage prospects are not bright for immediate improvement in the general coal situation, even though the utilities themselves should more readily obtain coal by the aid of the priority order.

On July 8, 9 and 10, Division 5 of the Interstate Commerce Commission held a hearing in Washington on the coal situation. At this hearing the American Electric Railway Association was represented by Secretary E. B. Burritt for the committee on national relations, and as a result of the evidence presented the commission issued Order No. 9, which amends and suspends Order 7 and applies only to territory east of the Mississippi.

The part of the order relating to priority for utilities, including electric railways, reads as follows:

> It is further ordered that until and including Aug. 19, 1920, all common carriers by railroad within said teritory, to the extent that may be necessary in order that public utilities, including street and interurban railways, electric power and lighting plants, gas plants, ice plants, water and sewer works, also hospitals, schools and other public institutions, may be kept supplied with coal for current use but not for storage, be and they are hereby authorized to place, furnish and assign cars to coal mines for the transportation of such coal, in addition to and without regard to the existing ratings and distributive shares for mines upon said railroads; provided no cars shall be so placed, furnished or supplied by any such carrier without written application therefor from the public utility, concurred in by the delivering railroad, showing that such coal is needed for current use, and not for storage, in order that the applicant may continue in daily operation, and provided further, that such coal shall not be subject to reconsignment except to public utilities or public institutions, and that a written report of the cars placed hereunder shall be promptly made to the Interstate Commerce Commission by the railroad placing the cars.

WRITTEN APPLICATIONS NECESSARY

This order indicates that a written application and evidence of coal shortage, together with concurrence by the delivering carrier, are required by an electric railway, for example, before coal can be delivered for current use. No consideration is given to coal for storage.

There is no question that speculators and market manipulators have reaped harvests through abuse of the reconsignment privilege. The ability to juggle cars from place to place is an incentive to speculators to manipulate the markets and not only aggravates the shortage but congests the yards in the large terminals and holds up coal car movement. An absolute prohibition of manipulative reconsignment and a heavy advance in demurrage rates would, if rigidly enforced, eliminate this element from the situation.

Experienced coal men offer no prediction as to the trend of the coal market, but, based on production and transportation conditions, they look for no break in coal prices in the near future, as lack of reserve stocks forces most industries to purchase coal at once on the best possible terms.

Spot prices show wide variation and as high as $23 a ton delivered has been reported paid by Eastern utilities within the past ten days.

The Public Service Corporation of New Jersey last week paid $14 for one lot and had more offered at $17.50 which it refused to buy on the basis that the cost was exorbitant. The Public Service Commission of the Second District of New York stated that New York utilities within the past few days had paid anywhere from $16.40 to $23.10 for coal. One shipment of 2,000 tons was bought f.o.b. Staten Island for $14.50. This coal, delivered at the boilers, will probably cost between $16 and $18 per ton.

It is interesting to note in this connection that tidewater coal for New York was quoted in 1914 from $2.82 to $3.25.

Coal Age reports the following prices this week for bituminous coal from the sections named: Boston, Cambrias and Somersets, f.o.b. mines, $11.50 to $13, net tons; f.o.b. Philadelphia, gross tons, $14.75 to $16.50; f.o.b. New York, gross tons, $15.10 to $16.85; New York, f.o.b. piers, from $16 to $16.25; alongside, from $17 to $17.25. Philadelphia, $12.50 to $14, f.o.b. Pennsylvania mines. Baltimore, $11 to $13 per net ton for f.o.b. mine. Buffalo, $10 to $10.50 f.o.b. mine. Union Town, Pa., $11.25 and $11.75 for classified coals. Columbus, Hocking screenings, $5 to $8 f.o.b. mine with 50 cents additional for mine-run. Chicago, mine-run, $5.50 to $6.50, f.o.b. mines. Birmingham, $6.50 to $8.50 for spot coal, f.o.b. mines. Louisville, western Kentucky mine-run, $5 to $5.25, f.o.b. mine.

The latest element in the situation is the hearing instituted by the Senate committee on reconstruction and production, of which Senator W. M. Calder of New York is chairman. This committee met in New York at the Engineering Societies Building early this week and intends to go into the situation thoroughly, particularly as regards transportation and the alleged profiteering.

Pole Line Hardware Stocks in Poor Condition

Heavy Demand Continues, but Much of It Seems to Be for Repair and Maintenance

Unusually strong demand for pole-line hardware seems to have virtually cleaned out manufacturers' stocks of finished goods. One large company states that its volume of business for June was the largest in its history, and the general situation seems to reveal more business on hand than can be taken care of.

Naturally, with transportation in its present state of chaos and steel mills accepting orders for material on condition of no promise being made as to date of shipment, deliveries are running rather long, and according to representative producers they range from three to five months. One important jobber however, states that he is able to obtain supplies in from six to eight weeks.

In spite of impatience at long unfilled orders, very few customers are availing themselves of the privilege of canceling their orders. This may be owing, as one of the manufacturers expressed it, to careful supervision of the new orders accepted, since producers can afford to use some discrimination in the matter.

Labor troubles in the past have been affecting this market, but at present little difficulty seems to be experienced in that respect, and though production probably is not yet up to normal capacity, it is said to be improving.

Back orders of long standing are generally the rule, thus effectually preventing the accumulation of any stocks worth mentioning, although a representative company in the field has very large supplies on the way, and with their expected arrival in about four weeks the situation for this firm will be relieved. Indications are that the greater part of the material used is for repair work rather than for the construction of new lines.

No price changes have been reported since the general increase of from 15 to 25 per cent about a month ago. Reports on collections vary considerably, one manufacturer stating that instead of his bills being met in thirty days, a large part of the customers were running over as long as ninety days. Other companies, however, gave a favorable reply to the interrogation as to collections.

Deliveries of Resistance Grids Lag

Producers Unable to Date to Fill the Demand Still Holding from Last Winter's Severe Conditions

Reports on market conditions for resistance grids, gained from a survey made among several of the large manufacturers, show a wide variance. One of the big producers stated that demand was moderate on the part of industrial plants, but that orders from electric railways were small. Other manufacturers, however, are at present experiencing a call for this material that is far in excess of available supply. This, they stated, was owing to the severity of the weather last winter, which caused an unusual number of grids to burn out on street cars, and traction companies consequently fell so far behind in replacing equipment that the situation has not yet returned to normal. This heavy call is in spite of the fact that summer ordering by these companies is usually rather light, and even at present seems to be mostly for maintenance work.

The estimated length of deliveries also covers a wide range, one company reporting ability to make shipments in small quantities of the railway type grid from stock. In general from about sixty to ninety days was quoted, although in the case of one producer a figure of eight months' delivery was given, as a result of the shortage of malleable castings. In spite of long delivery dates very few orders have been canceled.

The raw material supply has been materially impeding production, as orders for steel products at the mills are unfilled and transportation continues to tie up this class of goods in favor of coal movement. Nevertheless, one producer at least is running his plant far above its normal capacity of resistance grids, but other manufacturers less favorably situated report a subnormal output. This in part is probably due to labor troubles which the latter have experienced, as this factor is not everywhere affecting the situation.

Recent price increases are reported, ranging from about 20 to 30 per cent. Collections are said to be fairly good considering all present conditions.

Rolling Stock

Athens Railway & Electric Company, Athens, Ga., has received the five cars which it recently ordered. It is expected these will be used on the Prince and Boulevard lines.

Virginia Railway & Power Company, Norfolk, Va., has secured bids for the construction and delivery of twenty double-truck closed cars and ten closed trailers to cost $420,000. It has also secured bids for fifty safety cars at a cost of $332,500.

Western Australian Government Tramways and Electricity Supply, Perth, West Australia, has asked for bids on twenty 15-ton standard street cars in this country, supplied with air brakes, electrical equipment and accessories. Bids are open until July 29.

Franchises

Central California Traction Company, Los Angeles, Cal.—D. N. Carmichael, Commissioner of Streets, is in favor of revoking the franchise of the Central California Traction Company because the company has been negligent in the matter of attending to its tracks. Eighth Street is in a very bad condition, the double track never having been completed and the single line running on one side of the street. The company maintains that it cannot obtain the money for such improvement.

Track and Roadway

Calgary (Alta.) Municipal Railway.—The Calgary Municipal Railway, through its superintendent, R. A. Brown, announces that it will spend $172,646 this year on its railway.

Connecticut Company, New Haven, Conn.—John G. Lane, director of Public Works, announces that the work of widening and paving Temple Street will begin on Aug. 1. The Connecticut Company will remove the tracks from George Street to Congress Avenue. The cost of paving Temple Street will be paid by the Connecticut Company.

San Diego Electric Railway, San Diego, Cal.—The San Diego Electric railway company has made application to the State Railroad Commission for permission to build an additional track for the purpose of serving the terminal of the San Diego and Coronado Ferry company in San Diego. Heretofore this terminal has been served by a single track from the crossing of the Santa Fe railway tracks at Atlantic and Market Streets, but increased business at the ferry makes present facilities inadequate. The improvement now being undertaken by the ferry company will involve the laying of about a quarter of a mile of new track by the electric railway company, and work is to start as soon as permission is obtained from the railroad commission.

Detroit (Mich.) United Railway.—It has been urged in a resolution to the Common Council that the Municipal Street Railway Commission enter into an agreement with the Detroit United Railway whereby construction on the St. Jean Street line will be completed.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway, through its general manager, announces that just as soon as the tracks are repaired the traffic on Thomas, Clayton & Laurel Streets will be continued. The matter of repair is awaiting the arrival of track equipment.

Eastern Massachusetts Street Railway, Boston, Mass.—The trolley tracks on the Essex Road of the Eastern Massachusetts Street Railway from Whipple's Corner to Whittier's Corner will be removed. Extensive alterations have already been started on the Brockton division of the Eastern Massachusetts Street Railway. The large brick carhouse at Campello will be turned into a repair shop for the entire district south of Boston, where it is said upward of $30,000 will be spent in installing machinery. The cars which formerly operated from Campello to the carhouse will now go to Torrey Street. To take care of this additional store of cars at Torrey street eight new tracks will be laid.

Cincinnati (Ohio) Traction Company.—On August 1 the Cincinnati Traction Company will begin the work of extending its Sixth Street car line to Fairmount.

Dayton (Ohio) City Railway.—President Grimes of the City Railroad will ask the County Commission for the right to construct a double track up Eaton pike to the west end of the Soldiers' Home.

Power Houses, Shops and Buildings

Danbury & Bethel Street Railway, Danbury, Conn.—The Danbury & Bethel Street Railway is purchasing electric power from the Danbury & Bethel Gas & Electric Light Company. Judge J. Moss Ives, receiver of the railway company, explains that this temporary agreement was decided upon because of the high price of steam coal.

Morris County Traction Company, Morristown, N. J.—The Public Utility Commission has granted permission to the Morris County Traction Company to sell its power house at Chatham, N. J., to Martin Nordegg for $18,000. The company is now receiving its power from the North Jersey Power & Light Company, the Morris & Somerset Electric Light Company and the Millburn Power Company.

Trade Notes

The Wagner Electric Manufacturing Company, St. Louis, announces the opening of a sales office and service station at No. 2007 South Ervay Street, Dallas, Tex., in charge of Charles O. Rauschkolb, branch manager.

The Coxe Stoker Sales Company, Maikle Bank Building, Hazleton, Pa., announces the appointment of Christian Schillinger, formerly engineer of steam equipment for the Delaware, Lackawanna & Western Railroad Company, as sales engineer, effective June 1.

Harold L. Hazeltine, formerly instructor of physics and electricity at the Trenton (N. J.) School of Industrial Arts, has become Eastern representative of the Sterling Varnish Company. He will make his headquarters in the New York district after Sept. 15.

The Granite City Electric Company, 21 Fifth Avenue, St. Cloud, Minn., has recently been incorporated to deal in electrical devices and supplies and also to repair and rewind motors and generators. William C. Johnson is president and business manager.

The Brown Instrument Company, Philadelphia, Pa., is building an addition to its plant costing $100,000, which will afford better opportunity to take care of its customers. The company has also added six salesmen to its force, one for each district office in New York, Philadelphia, Chicago, St. Louis, Pittsburgh and Detroit.

The H. S. B. W.-Cochrane Corporation, Philadelphia, successor to the Harrison Safety Boiler Works, has acquired a group of factory buildings, including machine shops, foundry and offices, at 3120 North Seventeenth Street. The new plant will be utilized by the company in connection with its standard power-plant equipment and specialties.

Samuel H. Taylor, general manager of the Electrical Railway & Manufacturers Supply Company of San Francisco, which is said to be the oldest jobbing firm on the Pacific Coast, was chairman of the business program committee at the recent convention of the Electric Supply Jobbers' Association, held at Del Monte.

The Arthur Power-Saving Recorder Company, New Haven, Conn., announces that it has received the order for power-saving recorders for all cars in the city of Ottawa, Canada. This installation follows extensive study of the power-saving situation by officials of the road on various properties in the United States.

The Electric Storage Battery Company, Philadelphia, announces the appointment of George D. Luther as soliciting agent in Seattle, Wash., with offices at 811 White Building. Mr. Luther joined the sales force of the Boston office of the company in 1907, and in 1910 he was made soliciting agent in Denver.

The Ohio Brass Company, Mansfield, Ohio, advises that its new foundry, which is under construction, is for malleable iron rather than for malleable brass, as was stated on page 1236 of the ELECTRIC RAILWAY JOURNAL, June 12 issue. The company name was also incorrectly given.

The Arthur Power-Saving Recorder Company, New Haven, Conn., has received an order for the equipment with its recorders of the London United Tramway. This is the second large trolley company in London which has placed orders for these recorders, the order from the London Metropolitan Electric Tramways, Ltd., having been mentioned in the issue of this paper for May 29. Both of these properties are controlled by the interests represented by Lord Ashfield, formerly Sir Albert Stanley.

R. T. Roth of Philadelphia, Pa., has recently become associated with Schweitzer & Conrad, Inc., as sales manager, with headquarters in Chicago. Mr. Roth was for a number of years connected with the Western Electric Company at the Philadelphia office. In 1910 he left the company to organize the Lewis & Roth Corporation, Philadelphia, construction engineers and manufacturers of high-tension equipment, with which he has been actively connected for the last ten years. He recently disposed of his interests in the Lewis & Roth Corporation. Mr. Roth's experience in the purchase and sale of electrical equipment has covered a period of twenty years.

New Advertising Literature

Grinders.—Charles H. Besly & Company, 118-124 North Clinton Street, Chicago, is circulating a large catalog covering the "Besley" grinders and accessories.

Electric Hammers.—Bulletin No. 4, issued by the American Electric Tool Company, Petersburg, Va., describes and illustrates the Paulero electric hammer, type A, form 1.

Electric Hoists.—The Northern Engineering Works, Detroit, Mich., have issued catalog No. 43, covering their type D electric hoists.

Lubrication.—The Vacuum Oil Company, New York City, has issued a thirty-two-page bulletin on "Bearings and Their Lubrication."

Portable Machinery.—Portable Machinery Company, Passaic, N. J., has published a twenty-four-page catalog entitled "Portable Conveyors."

Jacks.—The Duff Manufacturing Company, Pittsburgh, Pa., is distributing Folder No. 803, illustrating and briefly describing Duff and Barrett jacks of the types most widely sold.

Track Work.—The Balkwill Manganese Crossing Company, Williamson Building, Cleveland, Ohio, has published a bulletin under the title "1920 Supplement No. 1 to Standardized Specifications for Manganese Crossings which were issued in 1919."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
C. FRANCIS HARDING, Special Editorial Representative L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative
GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Asst. News Editor

Volume 56 New York, Saturday, July 31, 1920 *Number* 5

Lubrication No Longer Guess Work

A STUDY of Prof. Upton's article on lubrication in this issue leads to the conclusion that we can always improve our methods and practice.

Not many years ago lubrication simply meant "flood her" with any kind of oil or grease. It meant, for instance, big bearing boxes with a great amount of oil waste, which was thrown away as no good after being used a short time. We were not pinching the pennies so closely.

Now we can reclaim the dirty waste, filter the oil and spend thousands on bearing designs—even use ball and roller bearings—and still find such refinements profitable.

Good lubrication means decreased maintenance and less depreciation. Good lubrication is a function of the bearing and of the lubricant used, and all the recovery processes may not decrease maintenance if the wrong kind of lubricant was used originally. We can't afford to say, "Oh, well, we have been using this oil and that grease for years and it's all right" unless we are sure there isn't something better and cheaper on the market. Lubrication is only one item which proves that every detail of a business must be studied with care by the operating engineer.

What Mean These Jitney Fights?

WHAT is the place of the automobile public service vehicle? We have had many papers and reports on "automobile competition" and "motor truck competition." Have we had any on "how to use the motor vehicle" or "motor truck co-operation"? We set ourselves up as transportation experts, but most of our energies with reference to the question of the motor vehicle are devoted to arguments to show its impracticability. At best we reluctantly admit a limited subordinate field.

Is this the manner in which to approach the question? Or should we not be the first to prove, by using this agency ourselves, exactly where it fits?

Most of us remember the trials of the cables and later the electric cars to get a hearing as possible agencies in the field of local transportation. We believe it was Sir William H. Preece who said in testimony before a committee of Parliament that Edison's plan to operate electric lamps in multiple was impracticable for "demonstration shows (it) to be hopeless and experiment has proved (it) to be fallacious." But such difficulties to be overcome merely added zest to the work.

In the present issue we are presenting the last, and what we hope will prove to be a very useful, installment of Mr. Jackson's "The Place of the Bus" series. Using data therein contained, who are better qualified to place the passenger bus in its rightful sphere of usefulness than the managements of electric railways? Similarly, who are more able to place the motor truck in the interurban field or as a feeder system than these same managements?

If the public service motor vehicle has a place—and we sincerely believe it has and will continue to have a place—in the transportation field, we believe the electric railway organizations will be woefully lacking in the recognition of their duties and opportunities if they do not take the initiative in the work of placing the bus and truck in their proper spheres with relation to service by rail.

Dealing in Figures

CAR design is as old as the railway industry, and perhaps we expect too much when we predict an age of standardized cars, for past history does not encourage such a prophecy.

With the many designs available we read with interest of the offer of prizes by the London County Council for a new car design for that system. When conservative England takes such steps there is evidence of dissatisfaction with present designs, or at least hopes for a better one. Then, again, there is food for thought in the remark of a prominent motor bus engineer that street cars are defective because they are designed to be as strong as possible, not as weak as possible. The successful use of the safety car for certain traffic conditions shows that there are reasons for this statement.

As we have many times pointed out, a considerable number of the benefits which would come from complete standardization will result if certain parts or dimensions, such as roof contour, spacing between side posts, etc., are standardized. When the electric railway industry uses only about 10 per cent of the car wheels manufactured and yet has more than 360 different types of wheel, there, at least, seems to be opportunity for more standardization than now exists in railway equipment.

How's This for a Shop Slogan: "Do It Mechanically"?

THE electrical companies throughout the country have adopted as a catch phrase, and it is a good one, the words "Do it electrically." It is a challenge to every prospective or possible user of electricity to apply it for lighting, heating and power production, in preference to other means or in addition thereto. In the shops and elsewhere on the electric railway properties of the country there are still many operations being performed by hand that could be done much better and cleaner by machines. It would be well, therefore, for the master mechanic, the roadmaster and others to paraphrase the above expression to the form: "Do it mechanically." There is possibly less need for a reminder of this kind now than there was some years ago, because it is so difficult and expensive to keep good mechanics that a mechanical device is a godsend if it is reasonably effective.

This reminder is needed less by the master mechanic or roadmaster than it is by the man higher up, who holds the pursestrings and who "has to be shown" when a requisition for a new tool or other device is put through. To the latter we say that good maintenance in these days means good equipment, much of which will pay for itself in short order. The writer was impressed in one shop lately visited by the close adaptation of the tools to the work to be done. He was not surprised, therefore, to hear the master mechanic in charge say that he believed in using the best tool available in performing each shop operation. There is opportunity for much ingenuity in finding the best tool for each job or, in the event of lack of such tool on the market, in making something to fit the need.

Selling Transportation Has Become a Necessity

THE developments of the past few years and, more acutely, some recent situations with which we are all more or less familiar, show that electric railway management does not consist only of the ability to operate a road economically. The days of development and design and the days of perplexing operating problems have both presented their special difficulties, but they have been, on the whole, fairly well mastered, or at least realized. But the outstanding problem for electric railway management today is to sell the transportation service which the railway furnishes or is in a position to furnish.

As we see it, there are four parts or phases of the business which must be sold in order that the whole transportation service be put across fairly and adequately.

First of all, we must sell the necessity of railway service as compared with any and all other forms of transportation. To do this we must prove, among other things, that jitneys alone will not answer the needs of a progressive community, but that unless jitneys are put on the same basis as regards schedules, taxes and other burdens and regulations they will drive the cars from the streets.

In the second place, we must thoroughly establish in the minds of all the good faith of the management and its desire to please the public so far as its ability to do so will permit.

In the third place, we must sell the monopoly idea—the economy and sufficiency of public utility service under one management.

Finally, we must sell the necessity for increased fares and rates, under present-day conditions.

All this is no small job. And it must be done thoroughly. And the sale must be made to two classes of people: First, the employees of the company, the men who perform the many acts connected with the actual operation, and, second, the public which uses the transportation service which the railways sell.

This is the big problem of today. It does no good to bemoan past failures, to condone past mistakes, to repeat past history. The job today is to sell transportation, and all energy should be put to do that job.

Too frequently we have seen what we interpret to be a lack of appreciation of the necessary psychological link between the management and its public—a little tendency to stand aloof, perhaps, or to neglect that closeness of personal touch which makes the difference between understanding and lack of understanding. We believe such acts are entirely thoughtless or the result of its being "the same old story," to talk to the public. But it's always a new public—new men and women or boys and girls become men and women. Perhaps there is an unconscious touch of the deplored policy of bygone days, represented by the alleged statement of the late William K. Vanderbilt, when railway men too often acted on the theory that they had the only real transportation agency and the public had to take it or do without. It may have been true, but the position was wrong psychologically.

That an act is unconscious makes it none the less harmful, and the result is felt not by any particular company but by the industry as a whole. It is a common duty for all of us to "sell transportation."

How can we accomplish what we want? That "actions speak louder than words" is as true today as ever in dealing with the public. This public is reasonable. Most Americans want to give a square deal, and they will, when shown. But they must be shown, and not only by argument but by example. Electric railway managers are susceptible to getting out of touch with the public, and a big part of the job is to guard against this.

Know your customer, make him respect you and like to do business with you. Acquaint him with your business and he is three-fourths won.

There Are Teams Now at Work

WE SAID something in our issue of July 10 about "The Coaches Can't Do It All" and we have been impressed by two or three examples since then which go to prove the point we made. We have already mentioned the fact that one element of electric railway management today is to "sell" the railway industry to the men on the job as well as to the public. The results of such work come back to us in gratifying manner.

A most inspiring instance of this truth, which occurred last week, was the waiver of the Quaker City carmen of their right to insist upon the wage increase due them until the company can afford to grant it. "For nine and a half years the management has played fair with us and it was about time that we came back at them," as one P. R. T. employee said. Another similar incident, though not quite so dramatic, was the support which employees' representatives have given the New York Railways in their recent troubles and arguments with Mayor Hylan. And another instance is the concerted action of the employees of the Connecticut Company in the various cities in which the jitney fight now rages. One of their representatives said in a recent town meeting, gathered to discuss the railway-bus competition, that for twenty or thirty years he and his fellows had been treated well, had had fair play by the management, and so were with the management now in this time of trouble. In both New York and Connecticut employees' petitions were presented which indicated not only a selfish interest of the men but also a conception of some of the real problems of the systems involved.

We repeat that "The Coaches Can't Do It All" and that it pays to have the men on the system intimately acquainted with the problems of the business—entirely "sold" on the needs of the industry.

Power Factor and Load Factor Important on Energy Contracts

WHAT load factor and power factor do you maintain upon your system? How much do they cost you per year? What limitations do they place upon your operation?

It is needless to emphasize again the losses in capacity of equipment, efficiency, regulation and net income resulting from operation at low power factor and load factor upon the system for which electrical energy is generated by the railway company itself. However, with the increased tendency to purchase energy for railway operation, or at least to allocate cost of energy between the railway and lighting departments of combined utilities, the problems of load factor and power factor are confronted in slightly different form.

The tendency of large central stations to penalize such low factors or to offer a bonus for the maintenance of high factors is increasing. Whatever may be the arguments against such a practice, they are principally applicable to the small consumer, who has difficulty in understanding both the meaning of the terms and the justification of the claims.

In the wholesale contract it should be relatively easy to reap a considerable saving as a result of a bonus for load factors 40 per cent and above and power factors between 85 and 100 per cent. In no case is it easier to maintain high power factor than in the average railway substation, equipped with synchronous converters or motor-generator sets. In the case of load factor the problem of obtaining sufficient diversity of load is rather more difficult. However, in large city systems, combined urban and interurban utilities and electrified steam railroads with regenerative braking relatively high load factors should be available. Recent reports from the Chicago, Milwaukee & St. Paul Railroad indicate that load factors have been increased from 40 to 60 per cent. This is an excellent showing for such a system.

A portion of the saving, particularly in the case of power factor, might well be passed along to the substation operator who is active in maintaining such a condition. It should not be necessary to install an elaborate metering system upon which to base such a plan. Regular reading of the substation power-factor meter, checked occasionally by an inspector, should be sufficient to determine the average value for the month. Even if a recording instrument seemed desirable for each substation the saving would probably be much greater and the expense involved in recording considerably less, respectively, than in the case of coasting clocks and energy measurements made at present upon individual cars as a basis for a bonus system for motormen.

It is possible that in our attempt to run down and eliminate every possible operating and maintenance cost, in these days of conservation, we have neglected this very important saving. As a result of a recent investigation made by H. C. Thuerck of Purdue University 88 per cent of the central stations questioned were found to include load factor clauses in their contracts and 50 per cent include clauses involving power factor. As these central stations represent the largest utilities of the country the practical possibility of closing contracts in the future involving such clauses is very evident.

A typical clause, involving both load factor and power factor, taken from the wholesale contract form of one of the large central stations reads as follows:

> The maximum demand shall be determined from actual measurements of the customer's demand and a consideration of the power factor at which these measurements are taken and shall be calculated by multiplying the greatest integrated fifteen-minute demand occurring at any time within the twelve months ending with the month under consideration (eliminating from consideration, however, peaks or demands due to short circuits, line disturbances, etc.) by 80 per cent divided by the actual power factor at which the measurement is taken.

The average annual load factor of the central stations reporting was 52 per cent, with a range of from 32.5 to 92.2 per cent. The monthly load factors vary from 40 to 92.8 per cent, with an average of 61 per cent. Power factors were found to cover the entire field from 70 to 100 per cent, with an average of 90 per cent.

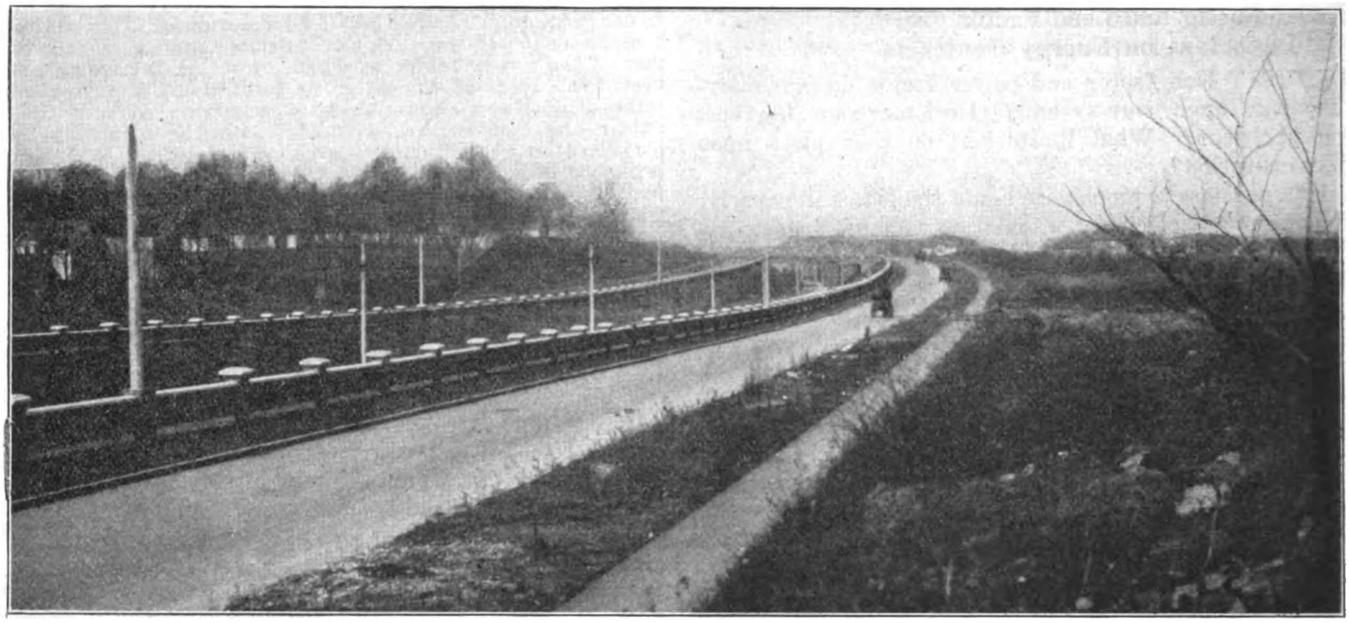
It does not follow, of course, that the addition of a relatively low load-factor load of a railway system will lower the load factor of the central station. In fact, it is very likely to raise it, due to the diversity of the two peak loads. As increased load factors and power factors mean increased economy and greater conservation of fuel such problems are worthy of extensive detailed study.

Interlocked Planning of Transportation System and Town

A VERY desirable new residential suburb of Cleveland was recently made more desirable by the placing in operation of a new rapid transit railway which makes it possible for the suburbanite to go from his home to the Public Square in less than thirty minutes despite a distance intervening of 9 miles. This new railway is described on another page of this issue. The interesting part about this is that the planning of the railway was interlocked with the planning of the suburb. Transportation was just one phase of a very comprehensive plan worked out by a firm of real estate operators for opening up a great tract of land outside of Cleveland for residential properties.

These men have demonstrated a pretty good knowledge of transportation matters as well as real estate. They realized that high speed transportation connecting their property with the heart of the city would be a tremendous advantage in disposing of the land at a profit. They made the high speed service possible by securing a private right-of-way from their property all the way to the Public Square and built a road without any grade crossings except those in the suburb itself. Then they accomplished what in effect is an excellent skip-stop system in the suburb by so laying out the streets that there are only three through street crossings with the railway per mile and hence only three stops per mile. This secures the economy of few stops and makes possible a high schedule speed—the advantages of skip-stop operation—without introducing any of the criticism of the skip-stop plan, for if the street on which a man lives does not run through to the car line he is not going to kick because the car doesn't stop at his corner.

Furthermore, by limiting the number of stops and thereby multiplying the number of riders to board and leave the cars at each stop there will develop there a business center, resulting in a great enhancement of land values. This joint real estate and railway development in Cleveland will be at least one case, apparently, where the builders of the railway will derive some benefit from the great appreciation of property values that always follows good transportation.



DOUBLE BOULEVARD AND DEPRESSED RAILWAY CONSTRUCTION THROUGH EAST END OF SHAKER HEIGHTS

New Rapid Transit Line in Cleveland

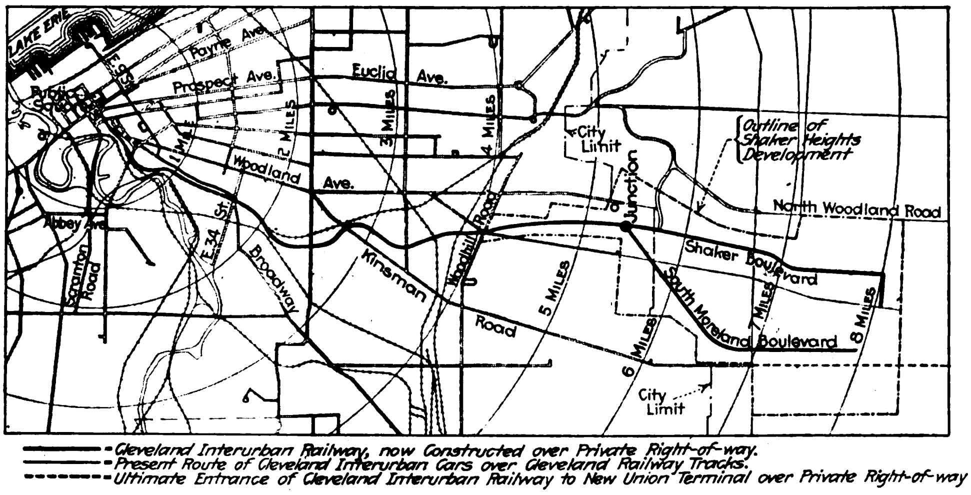
Line Built as Part of Real Estate Development, with Entrance to Public Square Over Private Right-of-Way, Has Become Main Factor in New Union Station Project—Temporary Entrance Over Surface Line Tracks Begun with 20 m.p.h. Schedule Speed Average for Run

SEVERAL years ago the Van Sweringen Company, Cleveland, Ohio, platted a 4,000-acre tract of land just outside the city limits and to the southwest of Cleveland and opened it up for home sites under the name of Shaker Heights. Since that time nearly 8,000 properties, ranging in size from 40-ft. lots to two- and three-acre pieces, have been sold and numerous families have taken up residence in this incorporated suburb.

As the new suburb was more than 8 miles from the Public Square and practically without transportation facilities, a part of the comprehensive plan of the Van Sweringen interests was to provide a high-speed electric railway service over private right-of-way from the suburb to the Public Square at the heart of Cleveland. This, it was planned, would give the residents of this section a means of getting to their work in the city in much less time than they could when living in the more desirable residential sections within the city limits, where they would depend on the street railway. This promise of a rapid transit system provided a forceful selling argument in interesting prospective buyers in Shaker Heights real estate. This was all done in good faith, and the railway right-of-way laid out and provided for in the immense program of street improvements and other development work which the real estate company carried on, involving the investment of large sums of money. But while the first contracts for work on the rapid transit line were let in 1914, the war-time restrictions, high prices and scarcity of materials have delayed the completion of the railway until recently. Operation was finally begun on Sunday, April 11, 1920.

For the purpose of building the rapid transit line the Cleveland Interurban Railway Company was organized as a subsidiary of the Van Sweringen Company. The location of the private right-of-way of this railway from the Public Square to Shaker Heights, the present route from the Public Square to Thirty-fourth Street over lines of the Cleveland Railway, and the location of Shaker Heights relative to the city of Cleveland are shown in an accompanying map. The private right-of-way of the company, which has already been secured, begins practically at the Public Square and extends out through the valley of the Cuyahoga River, adjacent to the Nickel Plate Railroad, and thence through a cut without grade crossings practically to the junction point in Shaker Heights. From here out the line divides into two branches, both built on the surface, one extending 2⅞ miles beyond the junction over the South Moreland Boulevard and the other 2⅝ miles over the Shaker Boulevard. The distance from the Public Square to the junction is 6⅛ miles, making the total distance to the end of the South Moreland branch 9 miles and to the end of the Shaker Boulevard branch 8¾ miles, a total length of double-track line of 11⅝ miles and an equivalent single-track mileage of 23¼ miles.

Because the right-of-way in the central section of the city made possible connection with practically every railroad entering Cleveland easy, the Cleveland Interurban Railway rather naturally became involved in the Union Station project as affording the best entrance into a new station for all steam and electric lines, having a location close to the Public Square. The complications of this larger undertaking have delayed the completion of the plant of the interurban company for its own entrance to the Public Square, and temporarily


Lake Erie
Payne Ave.
Prospect Ave.
Euclid Ave.
Public Square
Woodland Ave.
1 Mile
2 Miles
3 Miles
4 Miles
5 Miles
6 Miles
7 Miles
8 Miles
Abbey Ave.
Scranton Road
E. 34 St.
Broadway
Kinsman Road
Woodhill Road
City Limit
Junction
Outline of Shaker Heights Development
North Woodland Road
Shaker Boulevard
South Moreland Boulevard
City Limit
Cleveland Interurban Railway, now Constructed over Private Right-of-way.
Present Route of Cleveland Interurban Cars over Cleveland Railway Tracks.
Ultimate Entrance of Cleveland Interurban Railway to New Union Terminal over Private Right-of-way

OUTLINE MAP OF SECTION OF CLEVELAND, SHOWING LOCATION OF SHAKER HEIGHTS DEVELOPMENT AND THE ROUTE OF THE NEW CLEVELAND INTERURBAN RAILWAY

the rapid transit cars are therefore being routed from Thirty-fourth Street in over existing lines of the Cleveland Railway, a distance of 1⅞ miles. The routing of the rapid transit cars at present is therefore around the post office loop adjacent to the Public Square, thence north on Superior to East Ninth Street, west on Ninth Street to Broadway and along Broadway to Thirty-fourth Street, there joining the private right-of-way.

The right-of-way is laid out the entire length and all bridges designed for an ultimate of four tracks, looking toward an express and local service at some future time. At present the system has been double-tracked throughout. As soon as the right-of-way enters the Van Sweringen property it widens out to provide a 90-ft. railway area through the center, with a 50-ft. boulevard on either side. There are no grade crossings between the downtown terminal and the junction point in Shaker Heights. From Woodhill Road to the junction the tracks are depressed and a brick and concrete fence, unique in design, ornamental and comparatively inexpensive, has been built for protection along either side of the depression. The details of this fence design are taken up in a later paragraph. The boulevard lighting poles are built into this fence, and it is the plan to carry the feed wires for the lighting system on the trolley poles with a lead-in from each lamp, thus avoiding any wires paralleling the boulevard other than those on the trolley poles. The frontage along the boulevards is to be developed with high-grade apartment buildings.

One of the unique features developed in connection with the operation of the cars on the surface from the junction point to the ends of the two lines is that the layout of streets was so arranged that there would be a grade crossing only every one-third mile. This serves the dual purpose of minimizing the danger of accidents at grade crossings and reducing the number of stops to a maximum of three per mile. This feature was carried out completely in connection with the South Moreland Boulevard branch, but it was not thought of until the street construction work along Shaker Boulevard, which was done first, was too far along to change. This control over the number of stops through the street arrangement is better appreciated by a glance at the accompanying map of Shaker Heights.

A further result of the limitation of the number of stops to three per mile through the layout of street intersections will be to make each of these points a business or community center. As a part of the development of this idea the promoters plan to build a railway station at each of these points and so to design it as to provide for important concessions from which an income will be derived. This return, it is expected, will considerably more than offset the interest on the investment and the maintenance of the property. Each of these stations is to be of different architectural design, providing a distinctly ornamental addition to the business center that will harmonize with the surroundings and meet business needs. None of these stations has as yet been built, but the plans for them are pretty well along and several of them will be built this summer, according to present plans.

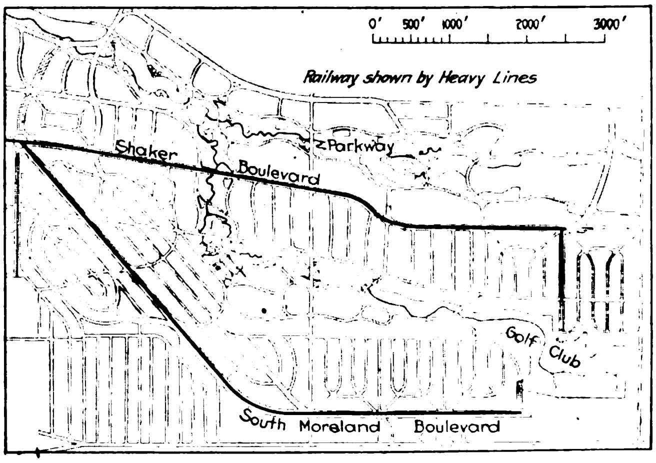
TRACK AND OVERHEAD CONSTRUCTION

The track and overhead are of high-grade construction, following along standard practices. The track is all of open type construction, with 90-lb. A. S. C. E. rail laid on 8½-ft. x 7-in. x 9-in. oak and yellow pine ties, some creosoted and some not, depending on what could be secured. The roadbed is completely rock ballasted. Bonzana continuous joints and Abbott joint plates and welded bonds of the type developed by L. P. Crecelius, electrical engineer Cleveland Railway, were used.

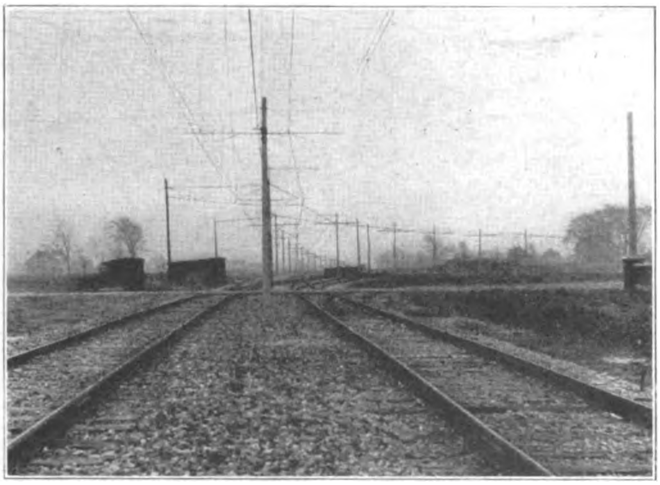
The overhead is of the catenary type, supported on concrete center poles. The trolley used was of No. 0000 size and about 4 miles of 500,000 circ.mil feeder is carried on short side-arm brackets on the trolley poles.

ROLLING STOCK FOR THE RAPID TRANSIT LINE

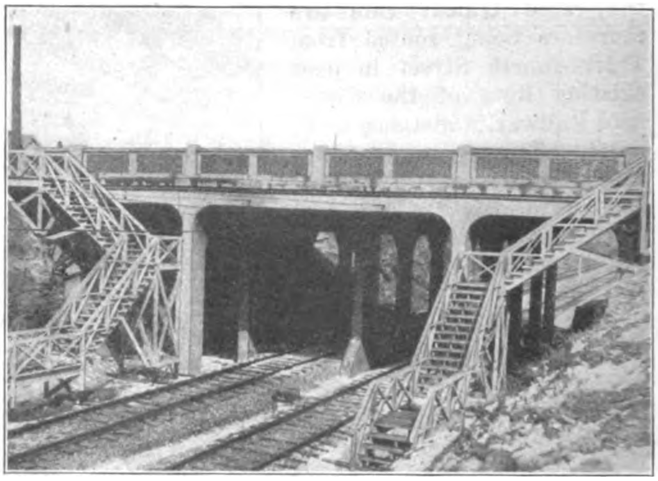
For the time being, four of the Cleveland Railway center-entrance and exit cars, refitted for the rapid transit service, comprise the complete rolling stock equipment of the interurban railway company. These


0'
500'
1000'
2000'
3000'
Railway shown by Heavy Lines
Parkway
Shaker Boulevard
Golf Club
South Moreland Boulevard

MAP OF SHAKER HEIGHTS SHOWING LAYOUT OF STREETS TO LIMIT THE NUMBER OF STOPS TO THREE PER MILE



VIEW OF NEW LINE AT JUNCTION POINT WHERE SURFACE CONSTRUCTION BEGINS, SHOWING CENTER POLE AND CATENARY OVERHEAD CONSTRUCTION

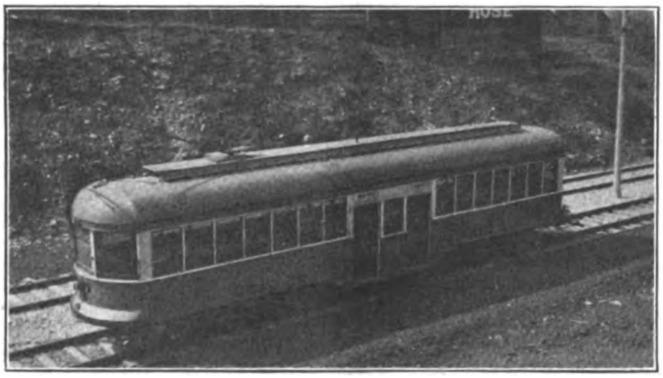


TYPICAL BRIDGE CONSTRUCTION, SHOWING PROVISION FOR AN ULTIMATE OF FOUR TRACKS, AND TEMPORARY STAIRS DOWN TO THE LOADING POINT

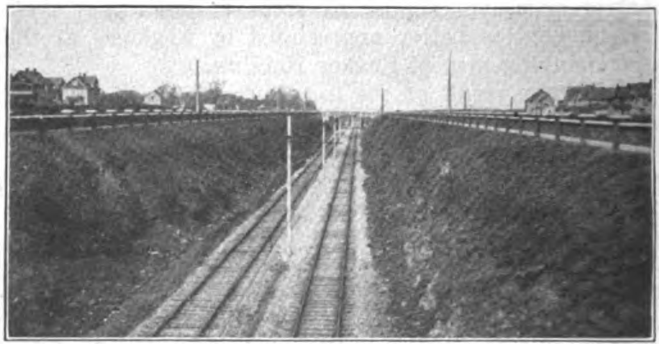
will be added to as the territory served develops. These car bodies are owned and supplied by the Cleveland Railway under an operating agreement, which will be given in a later paragraph, but the cost of re-equipping them was paid by the interurban company. The equipment comprises Brill 68-E-1 trucks mounted on 26-in. wheels and having a 6-ft. wheelbase, four Westinghouse 340-A-1 motors geared for 45 m.p.h., Westinghouse HL multiple-unit control and automatic air brakes. The car bodies are 51 ft. long and have longitudinal seats on one side and cross-seats on the other, with a well in the center, and provide a seating capacity of sixty passengers. The cab partition at the front end of the cars was moved back slightly to make room for the installation of the multiple-unit control equipment in the cab. The installation of this equipment in the cab was made partly because of lack of clearance and space underneath the car and partly to make frequent inspection, cleaning and any repair work easy. The manner in which the control mechanism was mounted in an asbestos lined cabinet in the motorman's cab is pictured in an accompanying illustration.

A thirty-minute service is being given on both the South Moreland and Shaker Boulevard branches, the cars on both lines being operated into the city, thus providing a fifteen-minute service between the Public Square and the junction point. As the riding increases with the growth of the territory additional cars will be added to each train rather than to shorten the headway. This manner of increasing the service will be carried out in order to preserve certain definite times of arrival and departure of cars, since it is believed there will be less objection to comparatively infrequent service if the riders know what the schedule is.

The running time from the end of either branch to the Public Square is at present twenty-seven minutes, permitting of a three-minute layover at either end of the run, each car making one round trip an hour. The schedule speed obtained in this service is at 20 m.p.h., including stops. When the union terminal project is completed, so that the cars can be operated the entire distance over private right-of-way, it will be possible to cut seven minutes off the running time each way. This will give a schedule speed, including stops, of 27 m.p.h., and make it possible for residents at the end of the lines in Shaker Heights to ride to the Public



WOVENRIGHT HOSE



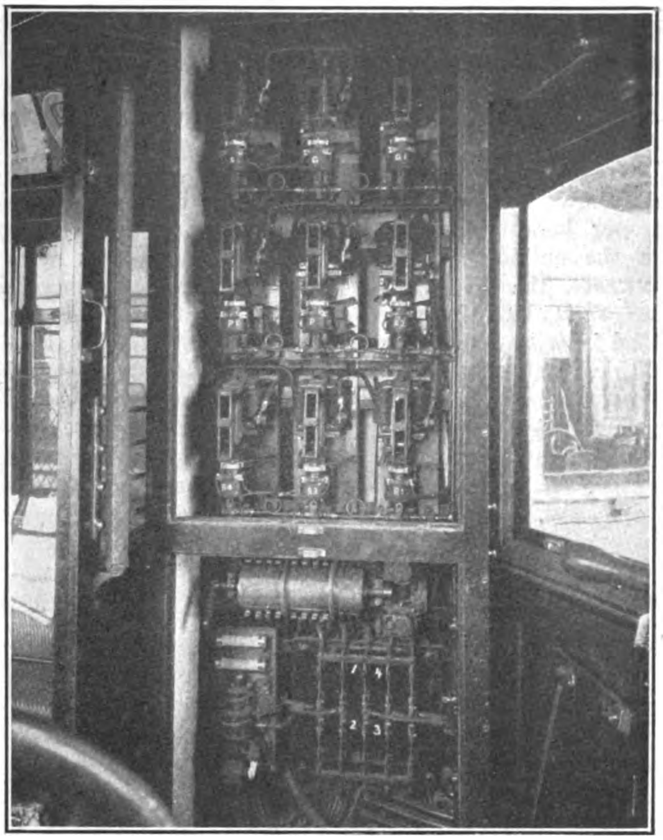
AT TOP, TYPE OF CAR BEING USED IN THE RAPID TRANSIT SERVICE. AT LEFT, CONSTRUCTION ON PRIVATE RIGHT-OF-WAY OF CLEVELAND INTERURBAN RAILWAY IN CLEVELAND. AT RIGHT, DEPRESSED RIGHT-OF-WAY BETWEEN WOODHILL ROAD AND THE JUNCTION, SHOWING ORNAMENTAL FENCE ALONG EITHER SIDE

Square in twenty minutes. A flat fare of 10 cents for a ride over the full length of the line, or any part of it, will be collected when operated completely over the company's own right-of-way begins. At present the 5-cent fare is collected when the passenger boards the car and another when the car passes from the city line to the interurban line or vice versa. An effort was made to work out a zone plan in this connection, but the difficulties of locating zoning points and features of competition with the Cleveland Railway city lines brought the conclusion that this was not expedient. The 10-cent flat fare, however, even from points within the city limits to the Public Square, has not seemed to deter people from riding on the rapid transit line, though they could ride over the lines of the Cleveland Railway from the same point for 5 cents. For example, officials of the interurban railway have been surprised at the amount of business originating at the Woodhill Road stop. This is in a community settled largely by workingmen and served by a city line. However, the running time to the Public Square on the latter is twenty-five minutes, whereas it is only fourteen minutes on the rapid transit line. This difference of running time has apparently attracted the patronage of numbers of working people despite the 10-cent fare.

It has been found, since the operation of the rapid transit line began, that the travel of domestic employees and mechanics between the city and Shaker Heights gives about equally heavy traffic both ways during the rush hours. This characteristic will undoubtedly change as the territory becomes more thickly settled and the number of building operations decreases, although there will very likely continue to be a noticeable traffic of domestic help outbound in the morning and inbound in the evening.

OPERATING AGREEMENT WITH CLEVELAND RAILWAY

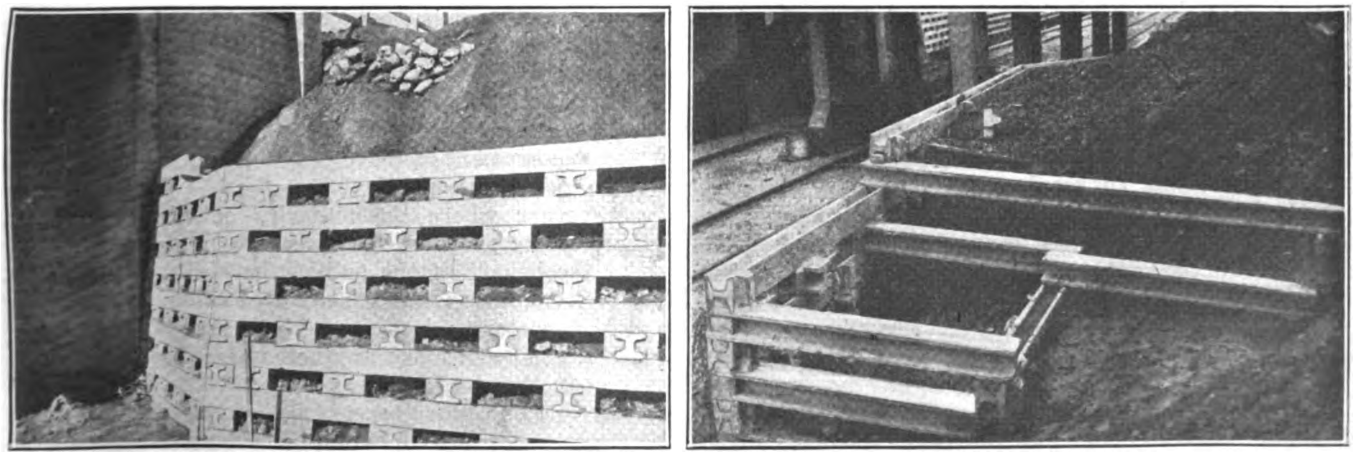
The Cleveland Railway entered into an operating agreement with the Cleveland Interurban Railway last September. By the terms of this contract the former furnishes the rolling stock (temporarily) and the trainmen and power necessary for the service and maintains the overhead equipment and all fixtures, collects and retains all fares and pays the cost of operation, including maintenance, transportation expenses, general expenses, taxes and interest. The units to be used in figuring these costs are the average costs per car-mile of operating the city lines. If there is any surplus over these costs the city company pays the interurban company 90 per cent thereof, but the latter indemnifies the former against any deficit. The city company is entitled to collect and retain the regular rate of fare from passengers on the rapid transit cars while they are on the city track between the Public Square and East Thirty-fourth Street, in addition to the fares collected from passengers while on the interurban company's track. In return for the revenue thus obtained from passengers while on the city track the city company pays the interurban company 2 cents per car-mile for the use of its cars.



MULTIPLE-UNIT CONTROL EQUIPMENT MOUNTED IN THE CAB OF THE RAPID TRANSIT CARS

The agreement was made for a period of two years from Oct. 1, 1919, and for another year beyond that expiration if neither party desires to terminate it upon its expiration.

The fence, previously referred to, along the depressed right-of-way was constructed by first pouring a 24-in. square footing 3 ft. deep and coming up to the level of the ground every 15 ft. Four ½-in. steel rods, 24 in.



CONCRETE CRIBBING USED IN SHORING UP THE SIDES OF CUTS long, were then set in this concrete, with 12 in. projecting above the top. Pre-cast heavily reinforced 7-in. x 6-in. concrete bottom rails were then laid to span these footings, being placed between the vertical rods set in the footings.

With the bottom rails in place, a single tier of brick was laid on the footing and carried up to the proper height, forming a hollow post 17 in. square on the outside. The posts were then filled in with concrete, the 13-in. wide heavily reinforced concrete top rails laid in place and the posts topped off, filled in with concrete and capped, giving a solid monolithic construction. The space between the bottom and top concrete rails was then filled in with a 4-in. curtain wall of brick. This brick curtain serves only to complete the appearance of the fence, the posts and top and bottom rails providing all the strength necessary. This has been attested by the manner in which the fence has withstood the shock of a severe bump from an automobile on two or three occasions. The curtain wall has been knocked out, but the concrete rails have not been damaged, though the automobiles have.

The property of the Cleveland Interurban Railway was planned very largely by W. E. Pease, chief engineer the Van Sweringen Company.

New Discipline Plan in Los Angeles

Merit and Demerit System with Novel Features Adopted by Los Angeles Railway Corporation for Its System

A MERIT and discipline system that makes employees disciples of merit is the program of cooperation between executives and platform men that has been introduced by the Los Angeles Railway Corporation. On the theory that a man's past record should not prevent him turning over a new leaf for efficient service, the company has discarded all previous conduct sheets. A new card index has been opened for veteran and new employees alike.

Commencing with a mark of 100 per cent each month, a motorman or conductor has the opportunity to maintain his clear record for thirty days and earn the cash bonus which is attached to the pay envelope or he may automatically discharge himself by accumulation of demerits which would bring his efficiency below a mark of 75 per cent. While a man may earn the bonus by keeping his commencement record of 100 per cent clear, he can place himself in line for special consideration and promotion by gaining credits that would give him more than 100 per cent.

G. J. Kuhrts, general manager of the company, placed this new system into effect, and under the "Kuhrts Plan," as this system has become known, supervisors have the first authority to impose credits or demerits. Since they are the closest to the platform men during working hours they are in position to observe when an employee is exerting his best efforts to render accurate daily reports, display exçeptional acts in prevention of accidents or injury and like matters. At the same time the supervisor is the first to observe when an employee shows a laxity in observance of running schedules, careless operations of car, failure, neglect in collection of all fares and rendering of prompt and proper reports.

The supervisor's observations are reported to the division superintendent and the latter assumes jurisdiction when the supervisor finds himself unable to handle the situation and virtually confesses failure. If a case of alleged negligence in duty is so complex that the division superintendent is unable to handle it, then it goes to the manager of service, George Baker Anderson. The latter represents the "Court of Last Resort," and he reviews all credits and demerits. An employee is welcome to appeal his case to the manager of service after a supervisor or superintendent has meted out discipline and he is assured of a hearing. At the end of the month each platform man receives a card showing his efficiency percentage for the month, then the slate is wiped clean for the next month.

The "Kuhrts Plan" is designed to increase the initiative of platform men as contrasted with the discarded system of expecting men to follow orders and ask no questions. Practical suggestions for the betterment of service are recognized under the merit system and encouraged by an award of from five to fifteen points credits.

Placing opportunity in the hands of the men instead of merely expecting them to fulfill routine instructions is the keynote of this plan. A quick response has come from them. Since the plan has been in effect increased efficiency as well as the increased care of materials has been noticeable.

When a man's percentage of efficiency falls to less than 75 and he stands at the threshold of dismissal his general attitude to the company is carefully weighed before final action is taken. The "Kuhrts Plan" is to help the man who will try. If in the face of his opportunities he shows general disregard for his own welfare as well as that of the company and his offences are serious he automatically discharges himself in short order. But the final word dismissing a man cannot be given until approval has been given by the manager of service.

The grading of credits or demerits is on the basis of from five to fifty points each, with five points representing 1 per cent. The credit accounts are balanced monthly and the bonus will come in the form of a Christmas gift. Payment will be made Dec. 15, but a man must have been in the company's service six months to be eligible. This feature encourages men to stay with the job and take a lively interest in their work, knowing that financial reward and appreciation are forthcoming.

A Unique Service

IN a recent issue of *System* the following suggestion for increasing the volume of business of drug stores and other busy corner stores is offered. This appears to be a suggestion upon which the electric railway may many times capitalize.

The note says: Street car callers, similar to the train callers in railroad stations, are used successfully by the management of a drug store in Springfield, Ohio, as a service to the public. The store is situated on a street corner where the majority of car passengers transfer from one line to another.

For the benefit of the public, the arrival of cars on the different lines is announced by a caller in the drug store. A customer does not have to worry about missing a car, but can make any necessary purchases while waiting in the store.

That this and other service plans inaugurated by the store are successful in winning customers is attested by the heavy increase in the volume of business.

The Place of the Bus—VI

In This Final Article It Is Shown that Practically Every Kind of Motor Bus Operation Costs More Than Modern Car Service on a Well-Traveled Route, Proving that at Present Costs the Bus May Supplement but Cannot, from an Economical Point of View, Supplant the Electric Railway Upon the Basis of Equal Fare and Responsibilities

BY WALTER JACKSON
Consulting Engineer

FIFTH AVENUE, NEW YORK, LOOKING NORTH FROM FORTIETH STREET. THERE IS AMPLE ROOM FOR THREE LINES OF VEHICLES IN EACH DIRECTION

"THE world is so full of a number of things," sang Stevenson—fancy flights about motor bus profits included, we would add. Between the well-meant enthusiasm of the motor bus salesman, the exuberance of the traction-fighting city official and the entrancing "within-the-law" prospectuses of the stock broker the inquirer finds it difficult to hit the straight trail to the altar of Truth unless he is prepared to seek the facts at the source. In the cases of individual bus operation, hereinafter presented, the data were obtained through personal interviews with scores of busmen and bus dealers and their statements were then checked and counterchecked to allow for the usual percentage of prevarication. In the cases of companies recourse was also taken to inquiry of the management, to the study of private records and court proceedings and to analysis of public, but not always easily accessible, reports. As much material was obtained in confidence the writer will be sparing in the use of names but liberal in the description of conditions that affect business and costs.

The figures have been prepared to cover the entire range of motor bus operation from the Ford one-man bus to the *de luxe* double-deckers, inasmuch as the success or failure of motor bus service depends so largely upon choosing the right capacity. A short-haul seventeen-seater will have a better schedule and make more money than a thirty-seater if the latter has to run during many thin hours, and there are cases where a 5-cent vehicle makes money where a 10-cent bus would lose it. Most of the data given were obtained in studies for various clients during the latter part of 1919 and the first three months of 1920. The cost of gasoline is one important item that has gone up, 6 cents or more to the gallon since most of these data were secured, and as the general trend is upward it will be proper enough to assume that the figures are low rather than high.

SIXTEEN HOURS A DAY MAKE A JITNEY PAY

Table I shows some of the high spots in the operation of a seven-seater in a thriving New England city. The route is exceptionally fine because there are factories at each end, the business and amusement center is half way between and a mingling of residences with factories assures well-balanced two-way travel almost every hour of the day. The operator was a South American who lived sparingly, ran his car up to sixteen hours a day, was polite to his customers in broken English and saved $10 a day on the average for the threefold purpose of maintaining his car, paying for his bread and garlic and purchasing a $2,100 Reo speed wagon, out of which he hoped to make a daily profit of $15 to $20 with fewer working hours for himself. By dint of hard work he had accumulated enough to pay the customary $800 down and $100 a month thereafter with interest at 6 per cent. His reason for turning to the sixteen-passenger bus was that the $250 a year liability premium was too heavy a burden for a seven-seater, aside from the long hours of labor.

TABLE I—SEVEN-SEAT HIGH-GRADE TOURING CAR IN A NEW ENGLAND CITY

Length of run	3.7 miles
Schedule speed	16 m.p.h.
Daily fair weather earnings	$15-$17
Daily bad weather earnings	$12
Saturday maximum earnings	$20
Operates from 6:30 a.m. until late at night	
Daily gasoline cost	$2
Daily upkeep, lubrication, repairs	$2
Tire life	3 months
Annual license fees and markers	$20
Liability bond per annum cost	$250
Estimated daily profit, out of which depreciation, tires, wages and bonding would have to come	$10

TABLE II—FORD CHASSIS UNDER NINE-SEAT BUS IN A NEW ENGLAND CITY

Length of run	3.7 or 3.13 miles
Schedule speed	12 m.p.h.
Daily fair weather earnings	$15
Daily bad weather earnings	$10
Saturday maximum earnings	$18
Operates from 6:30 a.m. to 10 a.m. 11:30 a.m. to 2 or 3 p.m. 4 p.m. to 7:30 p.m.	
Daily gasoline, oil and tires	$5
Repairs	Self-made
Annual license fees and markers	$20
Liability bond per annum cost	$250
Miles per gallon gasoline	8

TABLE III—ONE-TON USED STEWART TWELVE-SEAT BUS IN NEW ENGLAND SUBURBAN SERVICE

Length of run (suburban)	6 miles and mor
Express running time	35 minutes
Normal or local running time	45 minutes
Average fair weather intake daily	$25
Fares—10 cents and 15 cents; some children at 5 cents	
Operates weekdays from 5:40 a.m. to 7:30 and 8 p.m.	
Operates Sundays from 1:30 p.m. to 7:00 p.m.	
Daily gasoline 12 gal. at 26 cents per gallon	
Miles per gallon gasoline	8⅓
Daily lubricant for 100 miles run	2 qt., 1 pt.
Daily gasoline, oil and tire charge	$7
Daily cost of 35x5 in. tires (bad roads)	$3
Annual bond, license, tax, etc	$470
Annual fire and collision insurance *	$100

* This is a very rare charge among jitney bus men.

TABLE IV—ONE-TON STUDEBAKER INSTALLATION (THREE BUSES) IN NEW ENGLAND SUBURBAN SERVICE

Length of run, city and suburban, all smooth paving	14 miles
Running time of 45 minutes equivalent to schedule of	19 m.p.h.
Average daily earnings	$30
Fare practically 2 cents per mile, or for 14 miles	25 cents
Minimum intertown fare	10 cents
Hours of service in combination with others	4:45 a.m.-12:50 a.m.
Daily gasoline, oil, tires and upkeep	$11
Weekly wages of drivers, nine-hour day	$25 to $30
Owner's estimate of total operating expenses per mile	25 cents
Annual bond, tax, license charges per bus (exclusive of liability bond)	$39

Table II tells the story of another satisfied operator. Until the passage of a "one-route-within-twenty-four-hour" ordinance, he had the pleasant habit of dividing his time on two routes according to the flow of traffic. On the 3.7-mile route already named he would operate from 6 a.m. to 10 a.m., lay off until 11:30, then work up to 2 or 3 p.m. on a 3.13-mile route which enjoys exceptionally good midday shopping and theater travel. After a rest to 4 p.m. he returned to the first route to carry factory workers up to 7.30 p.m. This man was an intelligent American mechanic who had studied traffic possibilities to a nicety. He was satisfied that he could bring his gross earnings up from $20 to $22 a day, but did not relish the extra hours this would involve. As he operated only through the best hours of the day and drove his car so carefully he did not believe it would pay him to employ a driver with so small a bus for the sake of an eighteen-hour day. While he was not sure whether he could call his vehicle a nine-seater or an eleven-seater, he pointed with pride to the fact that he had carried as many as thirty-three (highly compressible) girls. His Ford bus had cost him $1,150, on the basis of $415 down and $100 a month thereafter with interest at 6 per cent. At the time these figures were obtained (January, 1920) the price would have been $1,215. The bus was not large enough for the business, so he was going to pass it on to his brother in favor of a sixteen-passenger Reo, for which he would pay $2,300 instead of $2,150 (for the sake of having oversized tires), making a first payment of $500 cash and $300 value of second-hand equipment. He had but one complaint: That the trolley cars on one-third of the run were so thick they interfered with his schedule!

NON-STOP SERVICE GIVES BUS THE JUMP IN SUBURBAN SERVICE

Table III tells some of the story of another bus operator in the same territory. In this instance operation is to a suburb and not all of the road is smooth going. By dint of hard work and many little courtesies to patrons this driver has worked up quite a personal clientèle—a condition not uncommon on suburban long-headway routes. Knowing almost to a person where his customers are to be expected, this operator does not bother to stop for riders within the city 5-cent jitney zone, but does pick up the children of his suburban customers at 5 cents on their way to or from school when he is likely to have room for them. His running time does not represent the best that could be done with a bus. A new machine would make the same run in about ten minutes less, he said. There is not much to choose between the speed and the service of car and bus in this example, but the busmen on this route have worked out to a high degree of refinement the art of starting a minute or two before the car and thus picking up most of the waiting customers. During the rush hours, namely, 6 a.m. to 9 a.m. and 4 p.m. to 6 p.m., they have a more legitimate advantage over the trolley service in giving non-stop operation between suburb and city. If there were no trolley line, of course, there would have to be a local bus service too. In any event, the rush-hour bus, unlike the car, runs more miles instead of less during the heaviest hours. In co-ordination with the trolley service, such through bus operation would be entitled to and would get a fare higher than that charged for the local car service. In competition with the trolley, however, this is economic waste which the public must pay for in the end.

HARD SLEDDING FOR THE HIGHWAY TROLLEY

Table IV tells the tale of another bus route in competition with the trolley, as studied in the same territory. It is one of the rare instances where the buses are driven by employees. The owner has three machines of similar type, one of which is usually in the repair shop or in reserve. He is an expert mechanic and proud of the fact that he has obtained, in four years or more, some 250,000 miles from a 1-ton delivery type. This man had kept close tabs on his accounts. He held the opinion that his operating expenses alone amounted to 25 cents per bus-mile, or betwen 1.5 and 1.75 cents per seat-mile. When his other charges, such as replacement, license, bonds and taxes, are taken into consideration his margin is a very narrow one indeed. One may doubt whether his personal earnings per hour of work are any higher than if he were engaged as an expert mechanic for an employer.

However, looking at this from the selfish viewpoint of the rider, let us make a contrast with the trolley service as follows:

The headways offered by this operator and his fellow-jitney operators are the same as those of the trolley company, namely, fifteen to forty minutes. The running time of the bus, however, averages forty-five minutes, which is some twenty minutes faster than the trolley. The latter is handicapped by the usual delays in city and village streets, in addition to which it lacks enough sidings to permit better headways of the overlapping routes than, say, ten minutes. An increase in the number of sidings and the use of light, one-man cars would probably wipe out the present kind of bus operation almost instantaneously, for even now the busman's margin is perilously small. With a 25 to 50 per cent increase in trolley mileage it would not be possible for the busmen to pursue their present trick of starting out just a minute or two ahead of the car to snap up roadway patrons. In this case such policy is particularly harmful to the trolley, because during its layover within a block from the town center on a public street the bus attracts people who have completed their business ten, fifteen or twenty minutes before the departure of the next bus or car. It is more natural that they should enter and make themselves at home in the layover bus than stand on a street corner until a car for the same destination goes by.

TABLE V—AVERAGE COST OF OPERATING SIXTEEN-SEAT JITNEY BUS IN A NEW ENGLAND CITY WHERE EARNINGS ARE HIGH

Earnings at $25 to $30 a day (850 miles a week)	$0.20 per mile
Or, say	$170 per week
Costs per week:	
Driver for nine-hour day	$35
Gasoline and oil for eighteen-hour day	25
Tires	10
Incidentals	5
Add:	
Owner's wages for nine-hour day	40
For 33⅓% depreciation on $2,200 bus	14
Interest on $2,200 at 6%	2.50
$400 per annum for taxes, license, bond, or	7.75
Repairs at 1 cent a mile	8.50
Pay for garage, starters, etc	6.00
Total weekly expenses	$151.75

In round numbers, say $152 for 850 miles, or 18 cents per mile.

The bus also offers a lower fare than the trolley, the contrasting rates being 25 cents against 32 cents. Up to mid-October, 1919, the bus charged 20 cents. In all probability the busmen could charge more than the trolley rather than less and be better off. Their service is worth it. Indeed, the absence of the "selling transportation" spirit when the present trolley cars were bought is proved by the condition that the uncomfortable longitudinal seat should be standard for a 14-mile ride. A cross-seat bus of more liberal dimensions would simply run away with the business.

As the public is getting more service and better speed than ever before, it is hardly in the mood to listen to any additional taxation of the buses, such as a road-maintenance charge. On the other hand, here is the trolley line monopolizing one-fourth to one-third the width of a state highway with ever-increasing automotive traffic. The automobilist is already looking with longing eyes toward the unpaved strip used by the relatively occasional trolley car. A few years more and he will be clamoring loudly that the principle of the greatest good for the greatest number demands the paving of the right-of-way strip and the practical abolition of the trolley.

Looking at this matter then in a cold-blooded, practical way, it is up to the electric railway management to balance the cost of track improvement and modern one-man cars against the cost of substituting a modern one-man gas or trackless trolley bus service for an obsolescing trolley system. When the public understands just what the company can do in the way of fares and service under each method and what the relative charges or benefits will be to the community it will be possible to come to a satisfactory decision.

It is possible to conceive a solution whereby the trolley service in the closer populated districts will be retained for short hauls at low rates and a non-stop bus service at higher rates be operated between the terminal cities; but one cannot conceive a solution that would permit the continuation of two competing services each of which is below par.

NARROW JITNEY MARGINS THAT CAN BE WIPED OUT BY MORE TROLLEY SERVICE

Table V presents the average actual cost of a sixteen-passenger jitney bus as determined from a study of a large number of buses in the same city. The earnings are exceptionally high, for this operation is in a city where about one-third the traffic is within 1.25 miles and more than three-fourths of the traffic within 2 miles, and on the principal routes of which the loads are beautifully balanced. Operation is for eighteen hours a day and includes some special hacking service.

It will be seen that the actual operating expenses plus overhead bring the cost of a sixteen-passenger vehicle to 18 cents a mile, leaving a margin of 2 cents a mile over and above the actual wages of the operator. In practice, however, the $900 which this table shows as the total for a fifty-week year would be curtailed by bad weather, laying up of the bus for overhauling, etc. But the obvious fact is that the margin between wages and operating profit is a mere 2 cents per mile, which would be wiped out at once by the introduction of 25 to 50 per cent more trolley service. It follows that, despite the exceptionally favorable jitney conditions in this particular city, the only true field for an automotive vehicle is to offer short-cut rides at somewhat higher rates than the trolley instead of competing over the same streets and at a lower rate of fare.

[No account is taken of the fact that increases in gasoline and other costs since the foregoing data were secured would add 1 to 2 cents per mile.]

It is interesting to compare this example from practice with a set-up of costs issued by a manufacturer of the same general line of buses. His total of gasoline, oil, tires, repairs, insurance, depreciation (four-year basis) interest and garage worked out roughly at 9 cents a mile, with gasoline at 26 cents a gallon (now more than 30 cents). Unfortunately, no allowance was made for license, tax, bonding, jitney association membership dues, etc., which we have seen equivalent to $400 per annum, nor is any allowance made for the $35 a week wages or $1,815 per year of approximately forty-nine weeks. This unavoidable addition of $2,215 per annum is equivalent to another 7.3 cents per bus-mile on the maker's fair assumption of 30,000 miles per annum with one driver only. Adding 9 cents and 7.3 cents gives us 16.3 cents, which is not so far away from the 18 cents found in practice. Having overlooked the wage, bond, tax and similar costs, the bus maker showed the delightful result of 22 cents per bus-mile gross and only 9 cents per bus-mile for expense. In reality, only the most intensive cultivation of traffic under still more favorable conditions than the instance cited would give a gross earning as good as 20 cents per bus-mile, while the cost of operation and overhead necessarily advances with the age of the vehicle, aside from recent increases in gasoline and other supplies.

For all that, there will always be plenty of men to take a chance in an individual business even if nothing more than bare wages result. Knowing this, some bus manufacturers sell their machines on the basis of 20 per cent down and installments of $100 or so a month with interest at 6 per cent. They have nothing to lose, for if the first buyer does not make good they can resell the machine as a used car and still show a profit. Railway companies, therefore, should not lull themselves to blissful sleep because of repeated demonstrations that jitney bus operation is of doubtful profit to the jitneur. They must make it a point to give a character of service, both car and motor bus, that will kill the snake in the shell.

THE STORY OF A WELL-RUN JITNEY BUS COMPANY

Generally it is quite out of the question for a jitney bus company to operate as carefully and efficiently as the individual jitney operator. The writer, however, has studied the workings of one such concern whose methods in some respects are worth the earnest attention of electric railways which are contemplating motor bus operation. The high spots of its operation are shown in Table VI.

The company is now operating on half a dozen routes twenty to thirty motor buses, all with Day-Elder chassis with bodies fitted chiefly with railway type rattan cross-seats, to give a capacity of twenty-three. The interior is roomy and much better lighted than the usual jitney bus. Attention has also been given in the arrangement of door, step and seating to make ingress and egress comfortable, safe and rapid. The vehicles are attractive and are kept in excellent condition. The downtown starter acts also as an inspector to correct minor troubles and forestall major ones.

TABLE VI—OPERATING COSTS OF A JITNEY BUS COMPANY USING DAY-ELDER CHASSIS WITH 23-PASSENGER BODY

Length of run up to 5 miles over smooth, granite and cobblestone paving	
Schedule speed of local service	10 m.p.h.
Non-stop rush-hour service approximately	13 m.p.h.
Fares 5 and 10 cents, against 6 and 12 cents on trolley	
Annual charges for bonding, license fees, taxes	$500
	Per Bus-Mile
Estimated cost of pneumatic tire upkeep	5.5 cents
Estimated cost of gasoline, 6 miles per gallon and gasoline at 25.5 cents per gal	4.25 cents
Wages one-man bus 50 cents an hour at 10 m.p.h	5.00 cents
Wages of supervisory staff, say 20% of platform	1.00 cent
Inspection, repairs, etc	Too early to figure

MANUFACTURER'S ESTIMATE

(Courtesy of Lang-Warden Motors, Inc., New York)

Day-Elder 1.5 to 2-ton chassis with twenty-three-seat bus, extra pair of tires, war tax, freight, etc., approximately	$4,729.00
Fixed Expenses:	Per Annum
Interest on investment ($4,729) at 6%	$283.74
Overhead, and repairs twice a year	500.00
Garage rent	360.00
Drivers, two at $30 each for fifty-two weeks	3,120.00
Total fixed expenses	$4,263.74
Operating expenses:	Per Bus-Mile
Tires, based upon 8,000 miles guarantee	$0.05952
Gasoline, 12 miles per gallon at 27 cents	.02250
Oil, 150 miles per gallon at 60 cents	.00400
Grease	.00100
Depreciation, based upon 100,000 miles	.04729
Total	$0.13431

Recapitulation:	Per Bus-Mile	Per Annum
Fixed expenses for 150 miles a day for 300 days or for 45,000 miles per annum, costing $4,263.74	$0.09475	$4,263.74
Operating expenses for 150 miles a day for 300 days	.13431	6,043.95
	$0.24906	$10,307.69
Approximate over-all cost, exclusive of bonding, license fees, taxes	25 cents per bus-mile	

NOTES

Manufacturer's service or maintenance plan for one year covers semi-monthly inspection, which includes tightening of all nuts, greasing of working parts, readjustments, detail report of condition to owner, etc., without cost, except for lubricants.

Foregoing estimate assumes wholesale operation with, say, 15 per cent reserve. Hence the individual bus is treated as if in daily use throughout year on two-shift basis.

Garage rental is based upon large city operation and would be less in medium-size cities.

Estimated gasoline consumption is considerably higher than actual operation over highways including much rough paving.

Employees are not uniformed, but appear to be courteous and skillful. Their wage is below that of the local street railway, but actually a good driver earns more, as he receives 5 per cent of all gross earnings shown by his farebox as a bonus. This appears to be a real stimulus to the men to go after business. The company is also planning to pay $100 to each man who completes a year's service without accident. There is considerable democracy of management, the men themselves deciding upon the rotation of their runs, which they seem to prefer upon the basis of alternating "earlies" and "lates." As there are two shifts to a bus, every vehicle is kept out for eighteen hours a day. This arrangement permits the bus company to rent out its garage facilities, located near the business center, for storage and inspection of private machines. Hence it may be said that garage expense is practically nil.

Competition with the electric railway is direct, inasmuch as the buses run over the same routes and at fares of 5 and 10 cents against 6 and 12 cents. On one of the best-traveled routes the over-all bus ride is only 2.5 miles. The bus has no noticeable advantage in local frequent-stop operation, but during rush hours it makes through runs between terminals at a great saving in time over the electric cars, which cannot do any leap-frogging. Pneumatic tires are used as being more pleasing to the rider. On this point it may be worth remarking that habitual jitney riders invariably prefer the pneumatic-tired vehicle, although a solid-tired vehicle may be ahead in the line-up. For that reason, operators who begin with solid tires go to pneumatics eventually.

This bus company has the advantage of operating in a highly industrialized section with an unusually good load factor, although not the equal of the city previously described. Up to the present time its gross earnings have been high enough to show an apparent profit over the operating and fixed expenses, which must be on the order of at least 25 cents per mile, judging from the company's own estimates and the estimates of the chassis builder. It must not be forgotten that a large proportion of the riders pay 10 cents for rides between 2.5 and 4 miles, that taxes are negligible and that the management is efficient and popular. In this case the one-man bus is still holding its own against the two-man car, but whether it will hold its own against shorter-headway, lightweight, one-man car operation is much to be doubted. The proper place for this type of service would be in co-ordination instead of competition with the electric railway, for the rush-hour through-service feature is but one of many advantages that could be developed to a greater degree than at present.

ELECTRIC RAILWAYS SHOULD NOT COMPETE WITH THEMSELVES

From the review of the operations of jitney men and jitney companies, we may now pass to the motor bus operations of electric railways, which have gone through a peculiar development and which are still in a state of flux.

It will be recalled that when the jitney plague de-

TABLE VII—OPERATION OF FLEET OF 1.5—2-TON WHITE CHASSIS WITH SIXTEEN-SEAT SUBSTANTIALLY BUILT BODY AS OPERATED BY AN EASTERN ELECTRIC RAILWAY

Length of run, approximately	2.5 miles	
Service given from	7 a.m. to 12 midnight	
Schedule speed averages	7.75 m.p.h.	
Transportation earnings per bus-mile, with 6-cent fare, approximately	35 cents	
Cost of bus, exclusive of heaters, fare box, etc	$6,100	
Weight of bus, 6,970 lb., or	436 lb. per seat	
Annual performance per bus, approximately	18,000 miles	
Operating Expenses:*	Cents per Bus-Mile	
Maintenance of Equipment:		
Superintendence	0.58	
Chassis repairs	3.10	
Body repairs	0.81	
Tire upkeep and renewals (28,000-mile solid)	1.60	
Shop expenses and accessories	0.26	
Depreciation (25 per cent per annum)	6.60	
		12.95
Conducting Transportation:		
Superintendence	0.58	
Platform wages (one man, 46 cents an hour)	7.50	
Dispatchers and street supervision	1.14	
Garage employees and expenses	0.92	
Service-car expenses	0.13	
Cleaning and oiling	1.20	
Gasoline (4.6 miles per gallon)	5.70	
Lubricating oil	0.11	
		17.28
General and Miscellaneous:		
Salaries general officers and clerks	0.96	
Miscellaneous office expenses, printing, etc	0.31	
Injuries and damages	2.11	
Insurance	0.53	
Stores and miscellany	0.39	
		4.30
Total operating expenses, including depreciation		34.53
Fixed Charges:		
Interest and discount	4.10	
Taxes	1.60	5.70
Total operating and fixed charges		40.23

* The following costs are not absolutely exact, owing to certain changes arising during the fiscal year, but they are accurate within a cent or two per mile over all.

scended upon the United States in 1914 and after, several electric railways undertook a little jitney operation *sub rosa* to see what was in the gassed thing. Thus arose the odd spectacle of a railway competing with itself as well as with the interloper. It was expensive business, and usually a few weeks were enough to convince the electric railway that it couldn't run a jitney as cheaply with hired men as the man who owns or rents and repairs his own car. Here and there, however, the jitney developed into a more legitimate bus service openly conducted by the railway. One of these, which is deservedly popular, is in operation in a large Eastern city. Unfortunately, it is still being run at street railway fares and it has not yet been rerouted sufficiently to serve the twofold purpose of less poaching on the railway service and a faster, more direct run between terminals. At 5 and 6-cent fares these buses lost money. At 7 cents they threaten better results on a route a little more than 2.9 miles long. Table VII shows that these sixteen-seat motorbuses cost 34.53 cents per bus-mile. The depreciation item is rather liberal for this make of chassis. On the other hand, no charge was made for garage rental or for management. The table also indicates that the buses are not routed to secure free running, as their schedule average of 7.75 m.p.h. (aside from idle miles constituting a further loss) is certainly low for a vehicle of such small capacity and results in higher platform cost and lower bus-hour intake. The earnings of 35 cents per bus-mile were not enough to carry operating expenses and overhead.

The legitimate field for a service of the foregoing character would be as an alternative higher-fare route to relieve a nearby congested car street, thereby assuring higher schedule speed for the bus and some measure of relief to the cars.

In the heyday of electric railway construction in America there were built a great many extensions into open country under pressure from real estate or amusement park interests. Many of these extensions continue a loss down to the present day, while the most promising of them required years and years to reach the stage where revenue exceeded expenses.

BUSES POSTPONED COSTLY TRACK EXTENSIONS

In the following discussion of the San Francisco bus operations, as well as other bus services, it will be seen that such costly track extensions can now be avoided through the inauguration of a motor bus service. It would be unfair to expect the motor bus to show a profit for such pioneering in thin territory, especially when it is treated as part of a universal-fare street railway system. All that can be justly expected is that it should handle this thankless class of business at a lower over-all cost than would be possible with an electric railway. It would be difficult to make most of these extension routes self-supporting in any case, but it may be respectfully suggested that the users of such facilities be assessed an additional increment of fare, whether it be 2, 3 or more cents per mile. Such a plan is fairer than that of favoring still further the passenger who rides to the very end of the trackway!

Tables VIII, IX and X tell the operating tale of the service given with White motor buses, first on four, then on three and now on two extensions of the San Francisco Municipal Railway. These routes are described in Article II of this series, so that it is only necessary to recall that Route 1 is a twelve-minute headway extension across Golden Gate Park, the trolley route being 4.8 miles and the bus extension 2.08 miles long, and that Route 2 is a fifteen-minute headway extension along Great Highway (ocean shore), the trolley route being 7.06 miles and the bus route 1.12 miles long. Route 3, discontinued April 12, 1919, had a ten-minute headway, and it was possible on it to get a 6.04-mile trolley ride and a 1.70-mile bus ride for 5 cents, as on the other routes. Route 3 in itself was a consolidation of Routes 3 and 4 made to reduce losses.

Under the circumstances, it would be hopeless to expect a profit from a motor bus service. Thus, in 1918, the total receipts from motor bus operation after due allowances were but $27,479.40, whereas the cost, despite no tax or license charges, was $53,817.61, leaving

TABLE VIII—OPERATION OF WHITE 2-TON MODEL TDB CHASSIS WITH NINETEEN-SEAT BODY (7,830 LB., OR 412 LB. PER SEAT LIGHT) USED BY SAN FRANCISCO MUNICIPAL RAILWAY, CALENDAR YEAR 1918

(Figures courtesy of the White Company, San Francisco Office)

Investment:		
Five-Model TDB White truck chassis f.o.b. San Francisco at $4,255		$21,275.00
Five motor bus bodies at $2,000		10,000.00
Total investment		$31,275.00
Estimated Cost of Operation, including Fixed Charges:		
Interest on investment at 6%		$1,876.50
Insurance on fleet of five cars as follows:		
Fire and theft	$350.28	
Public liability	250.00	
Property damage	100.00	
Collision	652.50	
Employers' liability	675.00	
		$2,027.78
Licenses (exempt)		
Taxes (exempt)		
Storage		300.00
Actual fuel consumption, 47,352 gal. distillate at 10 cents*		4,735.20
Actual oil consumption, 4,128 gal. at 29 cents		1,197.12
Actual tire cost, 294,889 miles at 6.5 cents per mile		19,167.78
Repairs—Labor and parts		3,125.82
Actual wages of drivers (50 cents an hour)		15,132.41
Depreciation at 20 per cent per annum		6,255.00
Total cost		$53,817.61
NOTE: Repairmen's wages	68.75 cents an hour	
Cleaners' wages	56.25 cents an hour	
Machinists' wages	$1.00 an hour	
Total number of passengers carried		1,023,298.00
Receipts from motor bus operation		$27,479.40
Loss on motor bus operation (estimated)		$26,338.21
Total cost per bus-mile		18.25 cents

Distillate consumption, 6.2 miles per gallon.

* Unsatisfactory; to be replaced by straight gasoline.

a deficit of, say, $26,338. The cost of operation per bus-mile, including the overhead as detailed in the table, was 18.25 cents. Inasmuch as there were no license, tax or management charges, it will be seen that the cost of these nineteen-seaters must have been at least 1 cent per seat-mile. California wages, it will be observed, are high, whereas fuel is much less. The use of the more comfortable pneumatic tire enhances the tire charge.

Table IX shows that advancing costs in 1919 raised the expenses per bus-mile to 23.6 cents, whereas the earnings per bus-mile were but 12 cents. In this case the net loss on this accommodation service was $30,124.05. In January, 1920, receipts were 12.6 cents and outgo 27.3 cents per mile. Part or all of this loss may have been recouped by the city of San Francisco through the enhancement of suburban realty values, but this kind of set-off is not open to a privately owned electric railway.

OFFICIAL COMMENT ON SAN FRANCISCO BUS OPERATION

Through the kindness of F. Boeken, superintendent San Francisco Municipal Railway, further data (January, 1920) and the following general facts have been made available:

TABLE IX—OPERATION OF SAN FRANCISCO MUNICIPAL RAILWAY BUSES FOR CALENDAR YEAR 1919

(Courtesy the White Company)

Receipts Route 1	$13,341.85	
Receipts Route 2	7,229.50	
*Receipts Route 3	2,276.05	
Receipts total		$22,847.40
Operating Expenses:		
Repairs to buses owned	$12,357.57	
Platform expenses	16,360.90	
Garage expense	11,446.84	
**Rental of buses	592.50	
Tire expense, varying from 5.5 to 7.5 cents per bus-mile	16,143.10	
Total operating expense		$56,900.91
Operating loss		$34,053.51
Reserves:		
Depreciation (18% of receipts)	$4,112.53	
Compensation insurance	529.16	
Total reserves		4,641.69
Total operating and overhead expenses		$61,542.60
Gross excess of expense over revenue		$38,695.20
Revenue Credits:		
Comprising 5-cent tickets, 2½-cent school tickets and transfers credited at 2½ cents each		8,571.15
Net loss		$30,124.05
Total bus-miles		260,324
Receipts per bus-mile, exclusive of credits		$0.188
Receipts per bus-mile, inclusive of credits		.120
Expenses per bus-mile, including overhead		.236
Net loss per bus-mile		.116

* Route No. 3 discontinued April 12, 1919.
** Rented bus discontinued March 21, 1919.

TABLE X—OPERATION OF SAN FRANCISCO MUNICIPAL RAILWAY BUSES JANUARY, 1920

(Courtesy F. Boeken, Superintendent)

Receipts Route 1	$1,272.05	
Receipts Route 2	529.30	
Total receipts		$1,801.35
Operating Expenses:		
Repairs to buses owned	$1,532.16	
Platform expenses	1,329.15	
Garage expense	1,004.06	
Total operating expenses		3,865.37
Operating loss		2,064.02*
Reserves:		
Depreciation (18 per cent of receipts)	$324.24	
Compensation insurance ($1.99 on $1,700.50 and $2.49 on $955.95, or $33.84 and $23.80, respectively)	57.64	
Total reserves		$381.88
Gross excess of expense over revenue		$2,445.90*
Revenue Credits:		
Comprising a few 5-cent tickets, with school tickets and transfers credited at 2.5 cents each	$666.45	$666.45
Net excess of expenses over revenue		$1,779.45**
Tire Expense:		
19,510 miles at 5.5 cents		$1,073.05
Net loss, tire expense included		$2,852.50
Daily net loss, tire expense included		92.02

* Tire expense not included.
** After crediting bus lines with proportionate transfers and tickets.

Total bus-miles	19,510
Receipts per bus-mile, exclusive of credits	$0.092
Receipts per bus-mile, inclusive of credits	.126
Expenses per bus-mile, including overhead	.273
Net loss per bus-mile	.147

Mr. Boeken says that January may be considered an average month (this being the Pacific Coast) so far as bus performance goes. Table X shows each bus in service averaged 158 miles daily, but 180 miles a day is nearer the usual performance. Two other buses were in the shop for repairs during this month, so that the actual mileage per bus owned would have to take this 33⅓ per cent reserve into account.

The total cost of these six buses, delivered and ready to operate, is placed at $34,345.05. Experience has shown that owing to the very small revenue per mile earned by these suburban buses the setting aside of 18 per cent of the cash receipts (14 per cent for depreciation and 4 per cent for injuries and damages, as in the case of the electric cars) is not sufficient to cover depreciation. The compensation insurance item in these tables is a fund set aside for the care of injured employees, in compliance with State law. The $1.99 rate applies to the bus drivers and the $2.49 rate to the shop mechanics.

Hitherto the buses have been using a mixture of gasoline and distillate in the ratio of two to one, but owing to the difficulty experienced in starting and because of the tendency to carbonize straight gasoline will prevail hereafter.

Up to April 1, 1920, five of the buses had been in operation for twenty-seven months (from January, 1918) and the sixth bus just twelve months. Up to Dec. 31, 1919, the first five buses had averaged 110,000 miles each. By the second year's operation maintenance had increased to the point where one of the five machines was always in the shop. In order to maintain the schedules, the city has ordered two more buses, which, like the others, will have White chassis.

Finally, Mr. Boeken's statement on the transportation value of the motor bus may be quoted verbatim:

"These bus lines are operated in an outlying, sparsely settled district and serve as temporary extensions of the Municipal Railway's main lines. While the experience with these buses has, to a certain extent, been costly to the Municipal Railway, they have served as a means of transportation for some people who heretofore have been without any transportation. They have also saved the Municipal Railway the expense of building unprofitable extensions. Still, I do not feel that our experience could be considered as a criterion in judging the merits of motor bus transportation as compared with street cars. However, I do not believe that motor bus transportation will ever entirely supersede the electric street railway unless some style of bus is developed along lines different from any so far tried out in this country."

TROLLEY CAR LOSSES WOULD HAVE BEEN GREATER ON SAN FRANCISCO EXTENSIONS

That Mr. Boeken is right in assuming that trolley car operation would have led to greater losses will be obvious from a brief calculation. The total length of route operated early in 1919 with motor buses approximated 5 miles. At a construction cost of $70,000 per mile, or $250,000 total, the fixed charges on the permanent way would have cost 6 per cent of $350,000, or $21,000 per

TABLE XI—OPERATION OF FOUR STUDEBAKER SIXTEEN-PASSENGER MOTOR BUSES FORT WAYNE, IND., MARCH 15 TO DECEMBER 31, 1917, INCLUSIVE

(Courtesy Sam W. Greenland, General Manager)

Connection made between two trolley routes one mile apart in residential district:

		Cents per Bus-Mile
Cost of four buses	$5,861.00	
Mileage	93,012	.....
Gross revenue	$5,345.23	5 75
Total cost, operation and overhead	11 240.00	12.084
Detail of Expenses:		
Repairs (Labor and material)	1 344.45	1.445
Front tires	279.43	0.300
Rear tires	682.40	0 734
Tire repairs	84.53	0.091
Lamps	8.34	0.009
Battery repairs	53.91	0.058
Cleaning	47.57	0.040
Gasoline and oil	2,543.02	2.734
License fee	74.00	0.080
Liability bond	80.00	0 086
Depreciation	2,950 00	3.172
Driver's wage	3,102.35	3.335

TABLE XII—OPERATING STATEMENT FOR SIX MONTHS OF 1919 FOR ONE-TON MORELAND MOTOR BUS, FRESNO TRACTION COMPANY

(Courtesy F. W. Webster General Manager)

Service		Feeder to electric line
Fare		6 cents, transfers free
Operating revenue, including $51.48 of 2.5 cent tickets		$1,369.38
Operating Expenses and Overhead:		
Maintenance supplies	$79.23	
Maintenance labor	132.78	
Salaries	1,254.26	
Gasoline and oil	....	
Depreciation	457.86	
Rent of equipment	505.20	
Miscellaneous	21.25	
		$2,450.58
Net loss from operation		1,081.20
Interest on investment—6 months at 6%		144.96
Total loss for six months		1,226.16
General Data:		
Cash passengers		21,965
Transfer passengers		27,705
Ticket passengers		2,055
Passengers carried		51,275
Miles operated		10,044
Average earnings per mile		$0.1363
Average expenses per mile		$0.2439

annum. The most economical operation, of course, would be with safety cars. In 1919 six such cars would have cost delivered about $36,000, which at 6 per cent interest would have added $2,160 a year to the fixed charges. It may be assumed that the cost of safety car operation, covering the usual operating accounts (way and structure, equipment, power, conducting transportation, traffic, general and miscellaneous), would have been 18 cents per car-mile. As the total revenue per vehicle-mile was but 12 cents, safety car operation costs would fall short 6 cents per car-mile, or $18,000 per annum, on the basis of 300,000 car-miles on three routes. Adding this deficit of $18,000 to the overhead charges of $21,000 on permanent way and $2,160 on rolling stock gives a total deficit of $41,160. To this total we must add $6,480 a year, or 18 per cent of the receipts (which may be placed at 12 cents on 300,000 miles, or $36,000), plus another $530 for compensation insurance. The grand total then will be $48,170 per annum, or a deficit of 16 cents per car-mile. This compares with 11.6 cents deficit per bus-mile on the basis of the 260,324 bus-miles actually run. In all probability the losses with electric railway operation would have been greater rather than below the estimate made. The fact that the car service would offer almost twice as many seats is of no significance, as the need for such capacity has not arrived. If the buses, then, failed to make money in this thankless work, they certainly lost less than a trackway.

FORT WAYNE HAS HAD TO CUT OFF ALL UNPROFITABLE SERVICE

Table XI shows the intake and outgo of four Studebaker sixteen-passenger buses which were operated from March 15 to Dec. 31, 1917, by the Fort Wayne & Northern Traction Company, Fort Wayne, Ind., to give crosstown service between two trolley routes 1 mile apart. The route was through a residential district, with little opportunity for other than transfer riding. This is indicated by the fact that the revenue was but 5.75 cents per bus-mile, whereas the operating and overhead charges then totaled 12.084 cents per bus-mile. Of this amount per bus-mile 3.172 cents was charged to depreciation. In view of the fact that this company is in receivership, it is not remarkable that it has discontinued this costly accommodation for the same reason that it is taking up unprofitable amusement park trackage.

EXTENSION SERVICES AT FRESNO, PALO ALTO AND SAN JOSÉ, CALIFORNIA

Table XII is an operating statement for six months of 1919 of a one-ton Moreland motor bus run by the Fresno Traction Company as a feeder. To use the succinct phrase of F. W. Webster, general manager of this company: "For financial result, see attached statement." The high spots are an over-all expense of 24.39 cents per mile (exclusive of fuel and oil), against a revenue of 13.63 cents per mile. The average revenue per passenger was only 2.67 cents, for 27,705 passengers rode on transfers.

Table XIII details the story of four months' operation in 1918 of a bus feeder line by the Peninsular Railway between Palo Alto, Cal., and the army camp at Fremont. The fare of 10 cents included transfer privileges to or from Palo Alto city cars. F. E. Chapin, general manager, advises that in operating this line it was found that the overloading during certain times of the day had a far more disastrous effect on the equipment than it would have had on ordinary electric motors.

TABLE XIII—OPERATION IN 1918 BY PENINSULAR RAILWAY OF BUS FEEDER LINE BETWEEN U. S. ARMY CAMP AT FREMONT AND PALO ALTO TO CONNECT WITH PALO ALTO CITY CARS AND INTERURBAN CARS FOR SAN JOSE

(Courtesy F. E. Chapin, General Manager)

Fare each way with transfer privilege to or from Palo Alto city cars. .. 10 cents

Equipment—One 2-ton Moreland truck converted to thirty-eight-seat bus and one 40-hp. Fadgl auto bus seating eighteen.

Operation over paved highways.

Operating Statement First Four Months of 1918

Month	Expenses	Revenues	Loss	Miles Run	Earnings, Bus-Mile	Average Expense Bus-Mile
January	$400.85	$152 00	$248.85	1,280	11.88	31.32
February	500.81	444.35	56.46	2,709	16.40	18.48
March	637.40	508.20	129.20	2,995	16 96	21.28
April	521.87	87.70	434.17	1,129	7.77	46.22

NOTE—Expenses include only items of cost connected with the buses, such as material, supplies and labor for repairs, wages of drivers, gasoline and oil, depreciation and miscellaneous items connected with operation. Expenses do not include any overhead charges, such as superintendence, advertising, cost of tickets, injuries and damages, nor interest on investment.

TABLE XIV—OPERATION BY SAN JOSE RAILROAD OF BUS FEEDER LINE DAILY ON HOBSON STREET AND ON MONTEREY ROAD ON SUNDAYS AND HOLIDAYS

(Courtesy F. E. Chapin, General Manager)

Fare on Hobson Street with city car transfer privilege	6 cents
Fare on Monterey Road with city car transfer privilege	10 cents

Equipment—One 1-ton Ford truck converted to twelve-seater
One 40-hp. Fadgl auto bus seating eighteen.

Operation over paved highway on Monterey Road and on gravel and waterbound macadam on Hobson Street.

Operating Statement Last Five Months of 1919 and January, 1920

Month	Expenses	Revenues	Loss	Miles Run	Earnings, Bus-Mile	Expenses, Bus-Mile
August	$474.84	$117.90	$356.94	2,035	$5.79	23.32
September	525.41	86.63	438.78	2,003	4.33	26.23
October	556.25	111.01	445.24	2,036	5.45	27.32
November	577.36	110.91	467.17	2,030	5.43	28.44
December	497.66	98.07	399.59	2,036	4.82	24.44
January	730.15	88.46	641.69	2,036	4.34	35.86

NOTE.—Expenses cover same items as in Table XII.

The buses were also more stuffy and disagreeable when it was necessary to inclose them during wet weather than is the case with the more substantial and more spacious electric car. The extremely low density of traffic is indicated by the fact that a 10-cent fare brought only a maximum of 16.96 cents per bus-mile.

Table XIV shows the operation by the same management of a bus feeder service at San José, also in connection with the city car transfer privilege, except that a 6-cent fare prevails on the route operated weekdays and a 10-cent fare on the route operated on Sundays and holidays. A maximum earning of 5.79 cents per bus-mile indicates the starvation character of this service. As a matter of fact, Mr. Chapin advises that his company secured permission to abandon two wornout, remote and unprofitable narrow-gage lines only on condition that it run this bus service until the expiration of the original franchise period. Here is a hint to others who are operating a long stretch of desert track!

TABLE XV—REPORT OF FIFTH AVENUE COACH COMPANY, NEW YORK, FOR FISCAL YEAR ENDED JUNE 30, 1919

(Preliminary Report to Public Service Commission)

Number of passenger buses owned at close of year	279
Average number of passenger buses operated	233
Bus-hours	1,002,006
Bus-miles (including 125,551 idle miles)	8,002,026
Schedule speed	8.2 m.p.h.
Net mileage per hour	7.98 m.p.h.
Passengers carried at 10 cents each	36,488,447

Income Statement:		Total	Per Bus-Mile, Cents
Total fares (46.21 cents per active miles)		$3,648,845	45.12
Livery service (65,101 miles)		53,659	0.66
Advertising and miscellany		40,194	0.50
Total revenue from operation		$3,742,697	46.28
Maintenance:			
(Superintendence $44,290; shop expenses $18,131)		$62,421	0.77
Repairs (bus bodies and chassis, $283,556)		299,626	3.71
Tires (solid)		76,595	0.95
Depreciation		82,503	1.02
Conducting transportation		1,591,640	19.68
Accidents and damages		103,682	1.28
Traffic—advertising		8,766	0.11
General and miscellaneous		122,360	1.51
Total operating expenses		$2,347,594	29.03
Taxes		486,790	6.02
Total revenue deductions		$2,834,384	35.05
Income from operation		$907,553	11.22
Non-operating income		42,168	
Gross income		$949,721	
Income Deductions:			
Rent	$78,540		
Interest	27,225		
Total		$105,763	
Net income for year		$843,958	
Surplus adjustments		228,061	
Net surplus		$615,897	

TABLE XVI—VARIATIONS IN REVENUE AND EXPENSES IN CENTS PER BUS-MILE, FIFTH AVENUE COACH COMPANY, 1913–1919, FISCAL YEARS ENDED JUNE 30

Year	1913	1914	1915	1916	1917	1918	1919
Total revenue from operation	42.51	38.93	35.12	33.48	38.21	33.91	46.28
Operating expenses, including taxes	35.05	32.20	24.49	23.37	27.68	29.01	35.05
Gross income from operation	7.46	6.73	10.63	10.11	10.53	4.90	11.23

TABLE XVII—VARIATIONS IN PRINCIPAL OPERATING ITEMS, IN CENTS PER BUS-MILE, FIFTH AVENUE COACH COMPANY, 1912–1919, FISCAL YEARS ENDED JUNE 30

Year	1912	1913	1914	1915	1916	1917	1918	1919
Conducting transportation	17.56	18.25	18.88	11.47	12.22	15.32	16.32	19.68

NOTE.—"Conducting transportation" includes superintendence, fuel, lubricants, platform men, miscellaneous stage service employes, lighting buses, miscellaneous stage service expenses, washers and cleaners; other garage employees, cleaning material, other garage expenses and other transportation expenses.

	1912	1913	1914	1915	1916	1917	1918	1919
Maintenance of plant and equipment	10.37	12.83	9.40	6.75	6.47	6.45	6.43	6.44
Of which tires cost	3.13	....	....	....	....	0.79	0.82	0.95
Maintenance of bus equipment	7.21	10.02	7.48	5.47	4.59	3.50	3.19	3.70
Depreciation	*5.31	2.81	1.92	1.28	1.88	1.25	1.72	1.02
Taxes	2.70	2.50	2.50	2.23	2.02	2.79	3.48	6.02

* In 1912 depreciation was given as 33⅓ per cent. per annum. Estimate for 1920 fiscal year is 1.9 cents per bus-mile.

NOTE.—"Maintenance of plant and equipment" includes superintendence, repairs of buildings and structures, repairs of shop tools and machinery, shop expenses, repairs of omnibus bodies, material and labor; repairs of omnibus chassis, material and labor; depreciation of tires, repairs of service cars, depreciation of equipment, depreciation of shop tools and machinery.

In view of the extraordinary jitney bus development in California, it is also interesting to add that more than two years ago Mr. Chapin operated an auto bus connecting with the cars at Bascome and running to Los Gatos via Campbell, a distance of about 8 miles over a route different from that taken by the electric cars. This route proved no more successful than the service detailed in Tables XIII and XIV and was given up.

While the bus services conducted by Mr. Chapin were (or are) obviously too thin for any kind of commercial transportation, it may be interesting to quote his statement: "Our experience has been proved that the electric service is more dependable and comfortable to the passengers and can be performed more economically than service by auto bus."

WHAT FIFTH AVENUE BUSES ARE DOING

The pioneer motor bus company in the United States is the Fifth Avenue Coach Company, which is controlled by the New York Transportation Company. The latter company in turn is controlled through stock ownership by the Interborough-Consolidated Corporation, which holds either directly or indirectly, through certain directors, about 57 per cent of the 235,000 $10 shares outstanding. For the greater part of its motor bus life, in fact, the Fifth Avenue Coach Company has been controlled by the predominant traction interests of old New York. It is important to bear this fact in mind for two reasons: First, it accounts for the development of the bus business on a frankly supplementary rather than on a competitive basis; second, the backing of the company was powerful enough to prevent the entrance of competitors who, it may be said, had a rather rosy idea of the profits of the company.

In the early days of the company routes and rides were very short and earnings per bus-mile were correspondingly high, but the fly in the ointment was the lack of a dependable gasoline vehicle. In later years a high standard of excellence has been attained in reliability of service and traffic has grown enormously with the extensions of the routes, but the rate of fare, fixed by statute, remains at 10 cents in the face of higher wages, higher fuel and other increases in expense. Thus John A. Ritchie, president of the company, testified on May 16, 1919, before the Illinois Public Utilities Commission that the uncontrollable increases in expenditure for the twelve months ended March 31, 1919, because of higher labor, advances in material and war taxes, amounted to $483,000, reducing the possible net earnings from $1,100,000 to an actual net earning of $686,000.

A more comprehensive idea of this company's operations is obtainable from its annual reports to the New York Public Service Commission of the First District. Table XV shows the report for the fiscal year ended June 30, 1919, the best in the history of the company. The *de luxe* character of the service is indicated by the fact that these forty-eight seat double-deck buses averaged 4.5 passengers per bus-mile. The total earnings per bus-mile from all sources were 46.27 cents, operating expenses exclusive of taxes were 29.03 cents and operating expenses inclusive of taxes were 35.05 cents. Income from operation was 11.22 cents, or $907,553.08. The net surplus was $615,897.06.

If this had been a regular kind of year, one could justly conclude that double-deck, two-men motor bus operation at a flat fare of 10 cents was a glorious bonanza. This is not so. The surplus quoted looks very good, but it is also a fact that on June 30, 1912, the company had a deficit of $416,977.82. From that year onward the deficit was reduced and turned into a surplus. However, a glance over the intervening years, as presented in Tables XVI and XVII, will disclose how much the prosperity of a *de luxe* bus company depends upon weather conditions or upon occasions that influence the amount of transient traffic.

The year ended June 30, 1919, produced the top earnings of 46.27 cents a mile for two outstanding reasons: A mild, practically snowless winter, which permitted riding on the open top deck almost every day; an extraordinary amount of visitors' patronage, due to the return of hundreds of thousands of soldiers via the port of New York, and the peace-time festivities and the arrival of friends and relatives to greet the incoming soldiers. In contrast, we have the preceding year, when the gross earnings were but 33.91 cents a bus-mile because of a bitter winter. These fever-chart fluctuations are very different from the customary steady annual rise in electric railway gross earnings. They prove that the profit-bringing part of the bus clientèle is made up of casual rather than regular riders. There are, of course, a considerable number of natives who like to ride the open top deck in fair weather, but "when the breezes blow, they generally go below" into the nearby subways or make use of the closed surface cars. The winter of 1919-20 must have been the worst in the history of the company, and its effect will certainly be reflected in the report for the current fiscal year. The fact that the company operates over the show street of New York was a bit of good luck, because the city made strenuous efforts to clear it as quickly as possible, although the bus company also did its best.

The bus-mile figures given in Tables XVI and XVII are not absolutely exact because the preliminary annual reports submitted to the commission are made up differently from the long-delayed annual reports as corrected for final publication by the commission. They are close enough, however, for all practical purposes. As previously noted, the total operating revenue per bus-mile has been extremely variable, ranging from 33.48 cents in 1916 to 46.27 cents in 1919. If we make a non-equated average of the figures from 1913 to 1919 inclusive we get 38.35 cents, which would leave only a margin of 3.30 cents over the operating expenses and taxes. The continued prosperity of the company therefore is predicated on no further advance in cost or else a higher earning per bus-mile through higher rate of fare, preferably by zoning.

POSSIBILITIES OF COST INCREASES

As to the probability of no further advance in cost, the actual case is that there must have been a big advance in cost over the high figures for the last fiscal year. Wages were advanced 20 per cent or more early during the current fiscal year, and gasoline, aside from other items, has seen several increases in price. A 20 per cent increase in the payroll is serious enough, yet a further 10 per cent increase is also pending.

Also, according to the paper of Geo. T. Green, general manager Fifth Avenue Coach Company, New York, on "Motor Bus Transportation in New York" (see ELECTRIC RAILWAY JOURNAL, July 24, 1920), the yearly gasoline bill is now $500,000, so a 20 per cent advance in that item would be equivalent to $100,000. In the fiscal year ended June 30, 1919, fuel cost $302,193, or 3.74 cents per bus-mile.

Examining the unit expenses of past years, it will be noted that the earlier crest in "conducting transportation" was in 1914, when the company had but an average of 111 buses in daily service, compared with 233 in 1919. Since the fiscal year 1915 this item has been rising steadily. The item of "maintenance of plant and equipment" reached its zenith in 1913 with the figure of 12.83 cents a mile, and by 1919 had been cut almost in half through improvements in the buses, smaller overhead charges per bus-mile operated, etc., as indicated by corresponding decreases under the sub-item "maintenance of equipment." It will be noted that the latter rose 0.51 per mile from 1918 to 1919, and there is no reason to anticipate a reduction in 1920. "Tires" show a great reduction since 1913, but they have also advanced in recent times. "Depreciation," was placed at 1.02 cents per bus-mile in 1919, but under date of Dec. 17, 1919, the Fifth Avenue Coach Company advised the New York Public Service Commission of the First District that the depreciation allowance from 1915 to 1919 fiscal years plus July 1-Oct. 31, 1919, should have been 1.98 cents per bus-mile instead of actual credit of 1.19 cents—a difference of $271,830. The company estimated that 1.90 cents would be a proper figure as per experience of the period Jan. 1-Oct. 31, 1919. Maintenance during the same period was 7.25 cents. This compares with 6.4 cents in 1919 fiscal year.

TABLE XVIII—CHICAGO MOTOR BUS COMPANY—STATEMENT OF OPERATION FOR YEAR ENDED JUNE 30, 1919

Gross Earnings	Twelve Months to Date	Cents per Bus-Mile
Transportation revenue	$499,469	36.53
Special bus revenue	463	0.03
Advance revenue	4,175	0.31
Total operating revenue	$504,107	36.87
Non-operating revenue	1,365	.10
Total revenue	$505,472	36.97
Operating Expenses		
Maintenance of way and structures	$409	0.03
Maintenance of equipment	141,580	10.35
Depreciation reserve	44,270	3.24
Gasoline expense	56,290	4.12
Conducting transportation	168,470	12.32
Traffic expenses	2,558	0.19
General and miscellaneous expenses	61,604	4.50
Taxes	19,239	1.41
Total operating expenses	$494,423	36.16
Net earnings	11,049	0.81
Fixed Charges:		
Interest on funded debt	11,791	0.86
Interest on unfunded debt	1,182	.09
Discount on funded debt	7,961	0.58
Total fixed charges	$20,935	1.53
Net income deficit	9,886	0.72
Revenue bus-miles	1,367,413	.....

Finally, it will be observed that the item of "taxes" (indicating taxation of other income) has advanced to 6.02 cents per bus-mile, or 13 per cent of the gross earnings per bus-mile. Truly, nothing is as certain as death and rising taxes.

TABLE XIX—MONTHLY STATEMENT OF REVENUE MILES, CHICAGO MOTOR BUS COMPANY,

For the Year Ended June 30, 1919

1918	Revenue Miles	Total Revenue
July	159,111	$61,629
August	129,877	56,771
September	107,867	37,931
October	95,244	32,578
November	93,738	28,227
December	97,373	27,742
1919		
January	96,609	29,667
February	95,580	26,859
March	109,431	35,670
April	111,771	41,227
May	129,603	52,519
June	141,209	69,107
Total	1,367,413	$499,932

TABLE XXI—COMPARATIVE CUMULATIVE STATEMENT, CHICAGO MOTOR BUS COMPANY,

For Three Months Ended March

	1920		1919	
Gross Earnings	First Three Months	Cents per Bus-Mile	First Three Months	Cents per Bus-Mile
Total operating revenue	$106,702	35.04	$92,197	30.57
Non-operating revenue	324	.11	426	.14
Total revenue	$107,027	35.15	$92,624	30.71
Operating Expenses				
Maintenance of way and structures	121	0.04	60	0.02
Maintenance of equipment	31,832	10.46	30,795	10.21
Depreciation reserve	9,909	3.25	9,885	3.28
Gas expense	13,666	4.49	12,464	4.13
Conducting transportation	44,682	14.68	35,361	11.72
Traffic expense	2	.....	366	.....
General and miscellaneous	15,752	5.17	14,981	4.97
Taxes	5,760	1.89	3,885	1.29
Total operating expenses	$121,727	39.98	$107,799	35.62

TABLE XX—STATEMENT OF OPERATIONS, CHICAGO MOTOR BUS COMPANY, FOR THREE MONTHS ENDED MARCH, 1920

Gross Earnings	Jan., 1920	Cents per Bus-Mile	Feb., 1920	Cents per Bus-Mile	Mar., 1920	Cents per Bus-Mile	Total	Cents per Bus-Mile
Transportation revenue	$30,268	30.65	$31,695	32.92	$43,209	39.48	$105,173	34.50
Special bus revenue	60	.06	30	0.03	......	.....	90	0.03
Advertising revenue	330	0.34	661	0.69	447	0.41	1,439	0.47
Total operating revenue	$30,658	31.05	$32,386	33.64	$43,656	39.89	$106,702	35.04
Non-operating revenue	97	0.10	93	0.10	133	0.12	324	0.11
Total revenue	$30,756	31.15	$32,480	33.74	$43,790	40.01	$107,027	35.15
Operating Expense								
Maintenance of way and structures	83	0.08	7	0.01	30	0.03	121	0.04
Maintenance of equipment	11,957	12.11	9,834	10.22	10,040	9.17	31,832	10.46
Depreciation reserve	3,226	3.27	3,135	3.26	3,547	3.24	9,909	3.25
Gasoline expenses	4,303	4.36	4,222	4.39	5,140	4.70	13,666	4.49
Conducting transportation	15,213	15.40	13,861	14.40	15,608	14.26	44,682	14.68
Traffic expenditure	......	......	......	......	2	......	2	2
General and miscellaneous expense	4,761	4.82	4,574	4.75	6,416	5.86	15,752	5.17
Taxes	1,734	1.76	1,833	1.90	2,192	2.01	5,760	1.89
Total operating expense	$41,281	41.80	$37,468	38.93	$42,977	39.27	$121,727	39.98
Net earnings	10,524	10.65	4,988	5.18	812	0.74	14,700	4.83
Fixed Charges								
Interest on funded debt	265	0.27	265	0.27	265	.24	795	0.26
Interest on unfunded debt	665	0.67	998	1.04	386	0.35	2,050	0.67
Discount on funded debt	......	.....	......	.....	4,889	4.47	4,889	1.61
Total fixed charges	930	0.94	1,263	1.31	5,541	5.06	7,734	2.54
Net income	11,454	.....	......	.....	4,728	4.32	22,435	7.37
Revenue bus mileage	98,750	.....	96,273	.....	109,439	.....	304,462	.....

FAILURES AT CHICAGO AND ST. LOUIS

While the Fifth Avenue Coach Company had a margin of 11.23 cents between total operating revenue and expenses (taxes included) per bus-mile, the Chicago Motor Bus Company for the same fiscal year ended June 30, 1919, had only a margin of 0.81 cents to meet 1.53 cents per bus-mile in fixed charges. Hence, the recent bankruptcy.

The operating statement of the Chicago Motor Bus Company shown in Table XVIII indicates that the trouble was due to lower density of traffic than New York. The fifty-one-seaters of Chicago earned but 36.53 cents per mile from transportation alone, while the forty-four to forty-seven-seaters of New York in the same period earned 45.12 cents. There was less difference in operating expense, Chicago showing 36.12 cents against New York's 35.05 cents. However, there is reason to believe that the New York vehicles are easier to maintain and are kept in better condition. Table XIX is a mileage and revenue statement by months, showing the enormous difference in mileage given in summer and winter months, such as 159,111 miles in July and 96,609 miles in January, both thirty-one days, with the contrast in revenue—$61,629.50 against $29,667.90—still more striking. The New York bus traffic is far steadier.

To conclude the sad story of Chicago, Tables XX and XXI are presented showing revenues and expenses for the first three months of 1919 and 1920. The comparison in Table XXI shows that operating expenses were 39.98 cents per bus-mile in 1920 against 35.62 cents in 1919, while revenue rose from 30.71 cents to 35.15 cents. There was an operating deficit both years.

The latest victim to the 10-cent *de luxe* idea is the Missouri Motorbus Company, whose receiver obtained on July 1, 1920, a court order authorizing suspension of a service begun no longer ago than Feb. 9, 1920, with eleven sixty-seat double-deck buses.

CO-ORDINATED SERVICE DESIRABLE

In concluding this survey of the place of the motor bus the writer would summarize the position of affairs as follows:

No service duplicating railways should be operated except for traffic relief purposes.

Such service should be given by the local railway system.

Higher fares should be charged, preferably on a distance basis, wherever the bus offers superiority in speed and accommodations and also wherever it serves districts that are too sparsely settled to justify a permanent way.

Safe Car Windows

A RECENTLY invented laminated safety glass for use in car windows is being placed on the market. This consists of two sheets of ordinary glass between which is interposed a thin sheet of pyroxylin plastic. Hydraulic pressure and the application of the proper degree of heat weld the glass and the pyroxylin sheet together in a solid unit. The pyroxylin binder prevents any scattering of the fragments of glass in the event of violent breakage. It is claimed that the transparency of the glass is not appreciably reduced by the insertion of the plastic sheet.

Lubrication and Lubricants

Late Theories of Lubrication Are Discussed and the Effects of Different Conditions on the Lubricant to Be Used Are Pointed Out*

By G. B. UPTON, M. M. E.
Professor of Experimental Engineering Cornell University

THE value of lubrication is first in the fact that it brings friction losses in machinery to tolerably small amounts, losses which without lubrication would be intolerably large. Secondly, by reducing abrasion of metal moving past metal almost to the vanishing point, lubrication not only makes machinery possible which otherwise would be impossible but even makes the machinery long lived and free from repair expense.

The cost of lubrication should not be considered simply as the cost of the lubricant and its application. The lubricant should be credited with the power saved by reduction of frictions, the saving of wear of machinery and avoidance of wage and production losses, while machinery unlubricated, or less well lubricated, would be standing idle for repairs.

The coefficient of friction of a bearing is by definition the ratio of friction force at the surface of the shaft (tangential to the shaft) to the load force holding the shaft against the bearing. This load force frequently has no direct or proportional relation to the power being transmitted in the shaft. An ordinary shop line shaft furnishes a good example. The forces on its bearings are due to weight of shaft and pulleys, and to belt pulls, and these forces are substantially independent of power transmitted along the shaft.

When a lubricant is used the laws of friction of solids go utterly into the discard. The coefficient of friction goes from a value of around 0.2 for solids to anywhere from 0.001 to infinity with complete fluid friction. We commonly get, in bearings, coefficients of friction from 0.005 to 0.02, under actual running conditions; values less than one-tenth those for unlubricated conditions.

The coefficient can and does exceed unity for very light loads with fluid lubrication, and when lubrication fails and bearings "seize," tearing and welding metal into metal, the coefficient of solid friction exceeds unity and approaches infinity.

In the limiting case for fluid friction in a bearing, a case never reached, but only approached, by an actual bearing, the laws of fluid friction would appear to be that total friction is independent of load, directly proportional to speed, directly proportional to "viscosity" of the lubricant, and inversely proportional to the radial clearance of the bearing from the shaft (the thickness of the oil film). With total friction finite and independent of load the coefficient of friction is inversely proportional to the load.

In an actual bearing these laws of the limiting case for fluid friction are not realized. The first reason for this is that the thickness of the oil film between bearing and shaft is not constant, independent of the load. The load tends to squeeze the oil out. When, and as an increasing load thins the oil film, the fluid friction increases, and a sufficient load will break the oil film and bring about a change to solid friction. The laws of friction of an actual bearing, then, may be anywhere between the laws of "perfect fluid friction" on one side and plain solid friction on the other side, depending upon load, speed and properties of the lubricant.

VISCOSITY IS ALL IMPORTANT

The most important single property of the lubricant is its "viscosity." This may be considered as a measure of the internal friction of the oil as layers or portions of the oil move with regard to each other. Water has low viscosity. Tar has a high viscosity. Viscosity is a property of a lubricant that works both for us and against us, but on the whole is necessary to the success of lubrication.

When a shaft is standing still in a bearing another property of an oil becomes important—the "surface tension" or "capillary." The molecules of a substance have an attraction for one another, and also may feel attractions for molecules or other substances, if those others are near enough as molecules know distances. At the surface where a liquid touches a solid the attractions of molecules of the liquid for the rest of the liquid, in one direction away from the contact surface, are in competition with the attractions in the other direction of the liquid molecules near the contact surface toward the mass of the solid. Usually the latter force is the stronger, and the liquid tends to climb and spread itself out on the surface of the solid, or "wets" the solid. The opposite case is possible, as witness the action of mercury; small portions of liquid mercury roll themselves up into little balls when lying on a surface of a solid, because mercury has a higher "surface tension" than almost any solid. The "wetness" of a liquid is the reciprocal function of the surface tension. Hot water is wetter than cold water, because the surface tension is less, and oils are much wetter than water, usually, for an oil film will displace a water film on a metal if it gets a chance to do so.

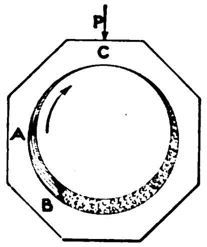


FIG. 1. OIL LAYERS TRY TO MOVE UP WITH SHAFT ROTATION

The wetness, or lowness of surface tension, of an oil gives it in a bearing a readiness to serve as a lubricant. If we feed oil to the crack between bearing and shaft, when the shaft is stationary, the oil will promptly crawl into the crack and fill it. The thinner the crack the harder does the oil try to get in, and the farther will it crawl. The force of this action is not big enough, unfortunately, to lift the shaft off the bearing on the loaded side. The best that the wetness of the oil can do for us is to get the clearance space of the bearing loaded with oil, so that when motion starts oil will be in place ready to begin lubrication after a fraction of the first revolution of the shaft; not more than a quarter turn is needed when circumstances are favorable.

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*Abstracted from the *Sibley Journal of Engineering* for May, 1920, where the theory and mathematical calculations are given in extended form.

Few oils are unit, single substances chemically. They are solutions in each other of considerable numbers of substances. At the surface where the oil touches a solid the composition will be a bit different from that of the bulk of the oil, or we may say that the properties of an oil surface, such as viscosity, will be different from the properties that we find for the oil as tested in bulk. The thinner the oil film in our bearings the more important will such differences be. The layer of oil affected by this type of action is only a few molecules thick. This phenomenon we will call "adsorption."

We are quite familiar with the fact that the viscosities of oils change rapidly as temperature changes. Viscosity decreases, for an approximation, about as the inverse cube of the Fahrenheit temperature in the case of the ordinary mineral lubricating oils. For pressures of thousands of pound per square inch the effect of pressure on viscosity becomes important, and the increase of viscosity is with something like the square of the pressure. This action combines with the adsorption phenomena and together the two actions probably constitute "body," or "oiliness" of the lubricant, as far as that property may be distinguished from the viscosity which is measured at ordinary pressures. The distinction between "viscosity" and "body" is at times large.

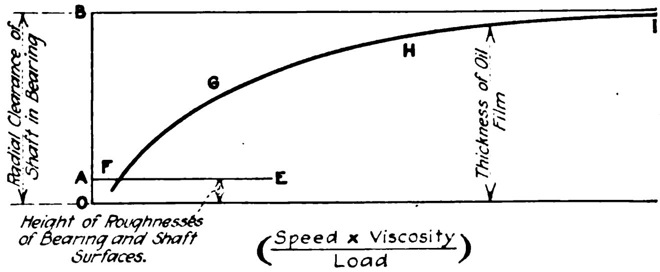

FIG. 2—RELATION BETWEEN THICKNESS OF OIL FILM AND FORCE RATIO

The viscosity of a lubricant is the property principally concerned in the formation and maintenance of the lubricating film under ordinary running conditions of machinery. When a shaft is stationary in a bearing the oil usually coats the surface of the shaft more or less completely save on the side toward the load on the bearing. In that direction the load has squeezed the oil out, and metallic contact exists. This metallic contact may be on only a few points, with oil pools between, if the bearing and shaft are rough surfaced. If the surfaces are good the metallic contact is a portion of cylindrical surface with length parallel to the axis of the shaft, and over a cylindrical arc of 10 to perhaps 40 or 50 deg., depending on the load, the size of the shaft and the clearance between shaft and bearing (difference of radii of outside of shaft and inside of bearing).

HOW IS A BEARING LUBRICATED?

When the shaft begins to turn it tries to carry oil with it. As the rotation continues and speeds up a contest begins. The shaft tries to carry oil up onto the region where the load has been holding shaft and bearing in metallic contact. The bearing tries to wipe this oil off the shaft and keep the lubricating film from forming. The force which the bearing brings to bear to keep the oil out is the load. The force by which the shaft tries to bring oil in depends on the speed of the shaft, the form, dimensions and clearance of the bearing surface and on the viscosity of the oil. To move one layer of oil over another requires a force proportional to the product of the speed of the motion and the viscosity of the oil. Fig. 1 may show that in preventing the formation of the oil film the bearing would have to overcome this viscous force, proportional to the product of speed of shaft and viscosity of oil. It depicts the oil layers trying to move up with the motion of the shaft and being successfully held back by the bearing. Two approximate velocity traverse curves through the oil film are shown, at *A* and *B*.

At some critical value of the speed, as speed increases, the viscous force tending to form the oil film overcomes the load on the bearing, and the oil goes through, lifting the bearing on an oil film, and ending metallic contact and metallic friction. With further increase of speed above this critical speed, where solid friction ends and fluid friction begins, the oil film grows thicker. This thickening of the oil film does not, and cannot, go on indefinitely as the speed increases. The limit of film thickness is set by the radial clearance of bearing and shaft, or by concentric running of the shaft in the bearing. The higher the speed of the shaft and the viscosity of the oil the nearer will the thickness of the oil film approach the radial clearance as a limit. The thickness of the oil film, at which a bearing runs, depends on the ratio of the forces trying to form and to break the film, or it depends on the ratio of load to the product of speed and viscosity. Fig. 2 shows the form of the relation between thickness of oil film and the force ratio, using the force ratio in the reciprocal form from the preceding statement.

There is another action which in starting a shaft supplements the viscous force in getting the oil film through and ending solid friction. Incidentally, this second action may be present during starting, and absent during stopping, so that a bearing perhaps forms an oil film, in starting, at a lower value of speed times viscosity divided by load than that marking seizure in stopping. This second action is illustrated in Fig. 3, *A* and *B*. Before motion starts bearings and shaft will be in the relations to each other shown in *A*. When the shaft starts to rotate it will shift its contact point with the bearing, as in *B*, back against the direction of rotation. But this shift or attempt at it promptly pinches between shaft and bearing, at the new contact point, the oil film which was already present there. Only about 15 deg. of shaft rotation is needed to bring this action into play. (Tangent 15° = 0.27, which is greater than the usual coefficients of solid friction.) If, before the end of this first 15 deg. of motion, the acceleration has been high enough to get the speed above the minimum necessary to maintain the oil film, it is actually possible to get the shaft under way without experiencing any solid friction of the slipping, or abrasive, type. And in that case the starting friction will be fairly low. If the acceleration in starting is small, so that after 15 deg. of rotation the shaft velocity is still below the minimum necessary to maintain the film, then the shaft rolls for the first 15 deg. and then slips with solid friction until the speed goes high enough to carry the oil through. This latter is the usual case for plain bearings, certainly so when they start under heavy loads, and this high starting friction under load constitutes one of the disadvantages of a plain bearing when it is compared with ball or roller bearings.

When a cold machine comes up to speed the function (speed times viscosity divided by load) runs up to high values, for the viscosity is still very high. The oil film then builds up to full thickness, as illustrated in the region *HI*, or beyond, in Fig. 2. This assumes, of course, an adequate supply of oil. Then the friction warms up the machine, as time goes on, and this lowers the viscosity of the oil. This lowering of viscosity results in a thinning of the oil film; the machine after warming up probably operates its bearings in the region *GH* of Fig. 2. If it gets into the region *FG* there is danger, with a slight further warming up, of breaking the oil film or having a bearing "seize."

A REMEDY FOR SEIZING

The remedy for seizing, since load and speed are fixed in the design and operation of the machine, is obviously the change of oil to one of higher viscosity. The low limit of tolerable viscosity for oil in a given machine is that viscosity which will give a fair factor of safety against seizing of the bearings when they are working at their worst combination of low speed and high load, and this viscosity must be had at the upper limit of bearing temperatures in the operation of the machine.

The action of a plain bearing when a machine is being shut down, and shaft speed comes down to zero, is in type very nearly the reverse of what happens in starting. The detail is different, mainly because the machine, and the oil in the bearings, are warmer than at starting. Viscosities are less, often considerably less, on account of the higher temperatures. The speeds at which the oil film breaks in shutting down are much higher than those at which the oil film forms in starting—very nearly, if not exactly, inversely as the viscosities. For in stopping as in starting there is a critical value of (speed times viscosity divided by load) below which the oil film cannot be maintained, and friction changes to mixed fluid and solid and slipping or rolling of solids. It is quite possible to determine experimentally this critical value of (speed times viscosity divided by load) which must be exceeded if lubrication is to occur in a given bearing.

There are two considerations to be kept in mind in placing oil holes and oil grooves in bearings. The first is that they do not belong in the loaded half. The second is that the oil supply should come in at the leading edge of the bearing, to be picked up by the shaft and carried up under the load with a minimum of travel from the point of supply. This means practically that the best place for oil supply is about 90 deg. off the line of loading, and ahead of it. Trouble comes when the direction of loading is variable. In such a case we have to search for the point of minimum loading. One fact of importance in this connection is that a load due to centrifugal force, and hence rotating at shaft velocity with regard to the bearing, is indifferent as to location of oil supply from the bearing, and all such forces may be properly neglected in locating the oil holes and grooves, if these are in the bearing. The centrifugal forces cannot be neglected if the oil supply comes through the shaft. Grooves in the bearing should be of the simplest—a little channel from the oil hole, running out parallel to the axis of the shaft so that the length of the groove is about three-fourths of the length of the bearing. The groove should be quite a bit wider at the center of the bearing than toward the ends. The edges of the groove should be carefully and widely rounded off; they should never be sharp. A groove is made to spread oil, but it should not be forgotten that the natural end leakage of a bearing is an effective spreader of oil—perhaps even too effective, so that the groove need not do much in that line. A groove is also a reservoir of oil, to take care of starting conditions, and of intermittent character of oil supply in some systems of lubrication. Above all, grooves should never be put in the most loaded half of a bearing.

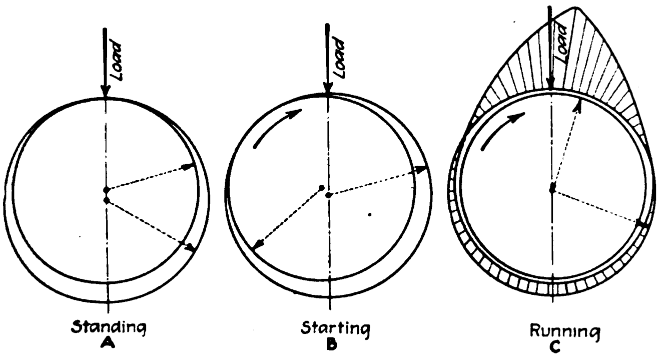

FIG. 3—EFFECTS FOR STANDING, STARTING AND RUNNING SHAFTS

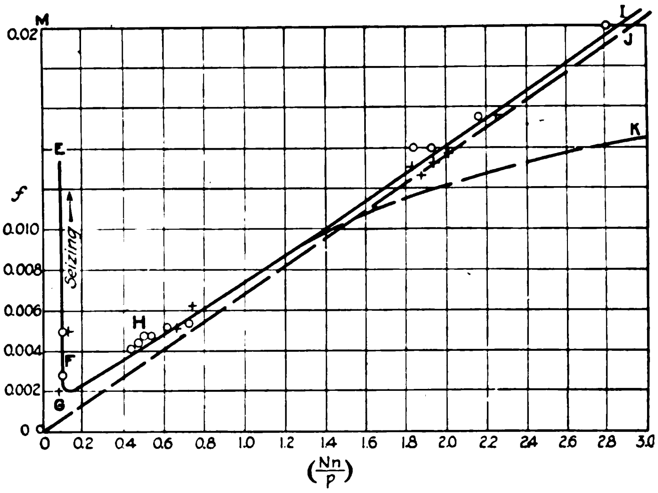

FIG. 4—CHARACTERISTIC CURVES OF RAILWAY TYPE BEARING IN THURSTON TESTING MACHINE

A characteristic curve of a railway type bearing in a Thurston testing machine is shown in Fig. 4. Shaft, steel, 3.97 in. diameter. Bearing, brass, 7.81 in. long, 3.31 in. chord of contact, 113 deg. arc of contact, bearing surface smooth, ungrooved cylinder; radial clearance about 0.003 in. Ordinate *f* is coefficient of friction; abscissa Nn/p is speed in r.p.m. x viscosity in C.G.S. units, over bearing pressure on projected surface in lb. per square inch. Two different oils were used, a machine oil and an automobile oil; the different point symbols indicate these oils. Three loads were used, 39, 135, and 155 lb./in.^2 Three speed regions were used, 390, 230, and at seizing from 15 to 50 r.p.m. Viscosities ranged from 0.50 to 0.15 C.G.S. units. These load speeds and viscosities were combined in various ways to give a wide range of Nn/p. No matter what the combination used, a point on the curve *EFGHI* results. This shows that the experimental problem of measuring the action of oil in a bearing is fairly solved.

The advantage of ball or roller bearings over plain bearings are three. The starting friction of ball or roller bearings is the same as their running friction; starting friction of plain bearings is much higher than running friction, if the bearing starts under load. A plain bearing starting without load works about as easily in starting as a roller bearing. Second, the running coefficient of friction averages lower for ball and roller bearings than for plain bearings. The minimum coefficient for a plain bearing may be as low as the best of the ball bearing, but the minimum coefficient for the plain bearing comes just at the edge of seizing. Third, ball and roller bearings hold a shaft to rigid and exact concentricity. Plain bearings will do this only when operated at high speeds and light loads, and on small clearances. There is usually no necessity for concentric running of shaft and bearing; occasionally, as in a lathe headstock, it must be assured. The disadvantage of the ball and roller bearings, as compared with plain bearings, is in initial cost and cost of installation.

Ball and roller bearings do not need lubrication to reduce their coefficient of friction, except as friction comes from rubbing of balls on each other, or on the retaining cages, or of the cages on the races. Indeed, lubrication frequently raises the coefficient instead of lowering it. The main reason for "lubrication," in ball and roller bearings, is to protect from rusting. Rust protection by the "lubricant coating the metals is quite another property from those concerned in real lubrication, though we must admit that no lubricant could be used as a lubricant anywhere if it did not have protective powers against rust.

A second case of lubrication is that of a wristpin in a steam or gas engine, or spring shackle bolt of an automobile. The line of loading is only slightly variable in direction; the loading may or may not reverse. The angular motion is small and is not continuous, but oscillating. In this case the angular motion will not carry oil in to form a lubricating film, as when the angular motion is continuous, and lubrication by oil is possible only when the loading reverses regularly. At each reversal oil runs in by combination of pressure squeezing and capillary action to the unloaded side of the pin, while being pushed out on the loaded side. The capillary action helps always to form or maintain the film. Another action of importance here is the increase of viscosity under pressure. This makes the oil squeeze out more slowly on the loaded side of the pin than it squeezes in on the unloaded side. If the pressure on a wristpin does not reverse, however, the oil will squeeze out on the loaded side and stay out. The pin may of course roll in its bushing for nearly 15 deg. of motion on either side of its central position before metallic slipping and wear need occur. Between this rolling action and the peculiar properties of grease lubrication a fair lubrication of wristpins or shackle bolts may often be had when the loads do not reverse.

CHIEF FUNCTION OF CUTTING LUBRICANTS IS TO CARRY OFF HEAT

What may be considered another type of lubricating action occurs in the case of our "cutting oils" or solutions applied to cutting tools in the machine shop. Kingsbury has given the explanation of this case. The action of the "lubricant" is in part merely the carrying away of heat, keeping the cutting point of the tool from becoming overheated and losing its temper. With this cooling goes real lubrication, preventing still higher frictions. A little crack forms in the work being cut, just ahead of the cutting "point" of the cutting tool. This crack fills with lubricant by the capillary action, or surface tension effect. Temperatures being high, the surface tension of the lubricant is very low, and it will fill the little crack very rapidly indeed, unless the (bulk) viscosity of the lubricant is too high. To this rapid filling of the crack high viscosity is a detriment. The chip being cut off bends outward and slides across the top of the cutting tool, tending to a metallic contact with high pressure at a point a little bit back from the cutting end of the tool. It is at this point of contact of chip and tool that lubrication is needed. The lubrication depends upon the "body" or "oiliness" of the lubricant; in other words, the viscosity should be high when the lubricating film becomes very thin and subjected to high pressure. The previous requirement must not be forgotten that the bulk viscosity must be low, to permit the lubricant to run into place.

So far it has been tacitly assumed that the lubricant used was a liquid, possessed of a true viscosity, which viscosity was a function of temperature, pressure and film thickness. There is a large class of lubricants which are not liquids. These lubricants are called greases. Some greases are really or practically oils which have a freezing point above ordinary room temperature; put into a bearing they melt and act as oils after melting. Such melting down can be used to regulate the feeding of a grease into a bearing, though perhaps at the cost of a continuously high friction in the bearing. Greases, like the mineral oils, do not freeze completely from liquid to solid at one single temperature; they change from all liquid to a mix of liquid and solid, getting stiffer as it cools, through a wide range of temperature. In this condition of mixed solid and liquid, or colloid and liquid in soap greases, the grease is not properly called a viscous substance. It is strictly a plastic body, instead of a viscous one. The difference is this, that with a viscous body the application of any shearing force, however small, will cause a shearing motion proportional in velocity to the force, while with a plastic body the shearing force must exceed a certain finite value before any shearing motion occurs. This limiting stress to start shearing motion we may call the yield stress. When the shear stressing exceeds the yield stress, the velocity of shearing motion is proportional in a plastic body to the excess of the stress over the yield stress. Grease lubrication works at low speeds and high loads, where no oil will lubricate, and in trying to prove or disprove the theory we will make our first real measurement of those physical properties of grease which are active in lubrication.

Another consequence of the difference of viscous and plastic action occurs after motion has ceased. If load stays on after motion stops, or if metal surfaces are brought together in a direction normal to the surfaces, an oil will squeeze out from between the metals. It goes out rapidly at first, more slowly toward the end; but will in time squeeze out entirely. The squeezing out is slowed up, near its end, by the increase of viscosity under high pressures and in thin films, or "body" of the oil as distinguished from bulk viscosity. If now a grease be used instead of an oil we get the added effect of dependence of effective viscosity on rate of shear. This makes it much harder to squeeze the lubricant out from between the metals; it goes more slowly than an oil. And in the end it is probable that the greasy lubricant cannot be squeezed entirely out by a normal pressure. This may be the explanation of the superiority of greases over oils as lubricants in such places as steering spindles and spring shackle bolts of automobiles, or in plain collar thrust bearings. That property we call "greasiness," vaguely and without definition, may be the "yield stress" and "plasticity" of the grease, and the consequent dependence of effective viscosity on rate of shear.

CONCLUSION

We may now summarize the physical properties of lubricants in which we are interested. First is viscosity, necessary to the formation and maintenance of the lubricating film. We need the viscosity to get down to, but not go below, a certain minimum value at the highest temperature at which the lubricant must function. A lower viscosity than this minimum will allow seizing of bearings while running; a higher viscosity is safe and tolerable, but brings higher friction in the bearings. If the lubricant must operate over a wide range of speeds, loads and temperature a high value of "body" will be desirable and helpful; that is, viscosity will increase distinctly under high pressures and in thin films. Viscosity and body need to be known as functions of temperature, so that we can foretell the action of the lubricant through the range of its temperature in service. With a grease the effective viscosity, or yield stress and plasticity, needs similarly to be known over the range of temperature, pressure and film thickness.

The measurement of surface tension of the lubricant, relative to the metals of shaft and bearings, is not usually important and probably would be difficult.

Where gravity flow, or flow through pipes under a small driving head, is used to supply lubricant to a bearing, we must be careful that at low temperatures the true or effective bulk viscosity of the lubricant does not get so high as to diminish or stop the supply. Hence an interest in the "chill point," or "cold test" of an oil (or "freezing point" of a grease?). The "chill point" test should not be done as it is now done; it should be a part of the test of viscosity as a function of temperature. The "chill point" should be taken as that temperature at which the bulk viscosity passes through a certain arbitrarily set standard viscosity; values of 10 or 20 c.g.s. absolute units are suggested.

We cannot tolerate in a lubricant any tendency to start rusting or corrosion of metals. The lubricant must be chemically neutral; not an electrolyte of becoming one to any appreciable degree. We ought to be able to use a film of a lubricant as a protection against rust.

The ideal lubricant should be permanent in its properties under the conditions of use. It should not change by oxidation, whether cold or hot, within the temperature range of service. It should not react with water either. A slight amount of evaporation of lubricant in service might be quite tolerable, if the remaining lubricant were still unchanged in properties, or not changed for the worse. Evaporation losses, as a source of oil consumption, are usually less than mechanical leakages from bearings or oiling systems. It is toward this question of permanence of properties in service that our tests of flash and burning point, carbon residues, oxidation products, etc., are directed. It may be suggested here that while the flash points and burn points of gasolines and kerosenes represent the formation of combustible mixes of the vapor of the oil with air, the case is different with lubricating oils. Uusually with lubricating oils the vapor of the oil does not make a combustible mix with air at atmospheric pressure; the combustible mix found at the flash point and above is due to decomposition products of oxidation and heating of the oil. And the temperature at which this first occurs (the flash point) is usually less important in itself than the nature and rate of the decomposition indicated and the effect of it on the residual oil. We need a new set of tests for our oils, for the effects on properties of the oil of oxidation, heat, and contact with water in reality, the tests for permanence of properties under conditions of service. These tests should cover emulsification also.

The picking up in suspension in the lubricant of dirt and metal dust cannot be blamed on the lubricant, and such stuff can be settled or filtered out in a properly designed lubricating system.

Progress Toward a National Public Works Department

THE movement to have Congress establish a national department of public works, to assume jurisdiction over all government engineering and construction undertakings, is progressing slowly but surely, according to a recent bulletin of the National Public Works Department Association, issued by M. O. Leighton, chairman. The first phase of the campaign, which is the establishment of the underlying principle, has been decisively won. The second phase, which consists of securing the right kind of a department, is to be more laborious than the first and involves much consideration of detail, sifting of evidence and presentation of results in convincing form.

The most distinct setback was the failure of the referendum of the Chamber of Commerce of the United States. The association attributes this failure to a lack of adequate publicity and to the inaction of local engineering bodies which were depended upon to take care of the issue in their own local commercial organizations. Lack of finance prevented the necessary publicity and evidence is being accumulated that important commercial bodies which voted adversely on the referendum did so in ignorance of its character, intent and purpose.

The association argues that the principles underlying the public works movement—economy and efficiency in business and conduct of the government affairs—are not confined to the public works function. It has been remarked that if a public works department is created, this will be the first step in applying businesslike principles to the entire government structure.

Delay is sometimes urged pending the announcement of a general bill for the reorganization of the government, but this seems rather useless, the logical step being to establish the public works department first.

The association points out that engineers, architects and technical men throughout the country have a rare opportunity to further the movement now because Congress is in recess and representatives are at home. It is up to the men "back home" who will ultimately benefit by the establishment of such a department to instruct their representatives in Congress and enlist their cooperation in the furtherance of this legislation.

Appeal for Equitable Laws

THE Hon. Joseph M. Brown, who has served two terms as Governor of Georgia, has written an interesting pamphlet entitled "An Appeal for Just Laws and for Their Impartial Enforcement." Ex-Governor Brown has sent this pamphlet to all the national legislators and hopes to get action on his recommendations.

The pamphlet is of interest to the railway industry as it purports to be a history of the street railway strikes and the action of the Amalgamated Association of Street and Electric Railway Employees of America in connection therewith. The pamphlet gives data in regard to seventy-nine strikes in sixty-five cities due to the Amalgamated Association, with information on the damages and injuries incidental to these strikes. In order to eliminate such damages and injuries Ex-Governor Brown urges a law that will force unions to incorporate and thus render them liable to civil action, just as the railways are liable to civil action in damage suits.

Record of Large Turbo-Generator Armature Breakdowns*

Temperatures Up to 150 Deg. Not Injurious—Local Heating Only Cause of Breakdown—High Voltage Generators a Success

By F. D. NEWBURY
Manager Power Engineering Department
Westinghouse Electric & Manufacturing Company

THE first Westinghouse generators larger than 10,000 kva. were placed in operation in 1913. These were generators roughly 20,000 kva. in size, two pole in the case of 25 cycles and four pole in the case of 60 cycles. The design of such large two and four-pole units in 1911 and 1912 was highly experimental, and while these units met the standard temperature rise guarantee of 50 deg. C. by thermometer it has since been found that the true copper temperatures of the strands nearest the air gap near the center of the core have had at least 200 deg. C. rise in some cases. Experience has shown designers how to avoid these high local temperatures to a considerable degree (mainly by reduction of eddy current losses), and this is mentioned here only to bring out the significance of the record of trouble due to heating.

During these seven years' experience there have been twenty-two cases of major armature trouble, involving twelve different installations or designs and sixteen individual units. By major armature trouble is meant trouble serious enough to result in the failure of one or more armature coils.

The classification of armature failures as to cause is in some cases a difficult matter. The events leading up to the trouble may be unknown and the evidence is very often burnt up. It has been thought best, therefore, to separate these cases into three classes, as follows:

1. Where the manufacturer has accepted responsibility.
2. Where the operating company has accepted responsibility.
3. Where the cause is unknown or in dispute.

1. Eight cases were chargeable to design, workmanship or other causes for which the manufacturer accepted responsibility. Five cases (of these eight) were caused by defects in manufacture that developed very shortly after installation. Three cases (of these eight) concerned details of design that led to failure after four or five years' operation. Two of these cases (in one design) involved high local temperatures caused by eddy currents in the top strands of the coil.

2. Eleven cases were chargeable to operating hazards for which the operating company accepted the responsibility. Four cases (of these eleven) were caused by trouble first originating outside of the armature winding. In three of these cases the fire started in the cable just outside of the generator; in the fourth case the fire started in a series transformer accidentally open circuited. Four cases (of these eleven) occurred in one installation and were caused by abnormal voltage surges that caused the outside surfaces of the insulation to catch fire. In addition to these four cases that resulted in coil failures as many more fires started that were put out before such damage was done. This trouble disappeared after the generator neutral was grounded. One case (of these eleven) was caused by ice or water (it occurred on Feb. 28) carried into the generator from the air washer. Two cases (of these eleven) were caused by forced operation under conditions that were known to be unsafe. One case involved unsafe overloads and the other case involved continued operation after it was known that the armature needed minor repairs.

3. Three cases involved unknown causes or the cause was in dispute. In two of these cases the operating company believed armature coil heating to be responsible.

This classification of armature breakdowns shows that out of nineteen cases where causes were agreed to eleven cases were caused by operating hazards for which the generator can in no way be held accountable. The majority of these cases were caused by fires of external origin.

If all the cases in which armature heating was involved, even by suspicion, are grouped there are only five cases out of twenty-two breakdowns. Two cases, involving one of the first designs, were caused by design proportions; in two others temperature was not the primary cause of breakdown, but the operating companies believed it to be a contributory cause, and in the fifth case enforced overloading was the primary cause.

The writer's opinion, based on a careful study of operating experience and based on a detailed knowledge of internal temperatures and coil and insulation design, is that breakdowns caused by armature heating are in reality due to abnormal local temperatures that have values of the order of several hundred degrees, and that temperatures of 100 deg. or 150 deg., ordinarily discussed in connection with guarantees, have very little to do with the problem. This statement, of course, applies only to windings completely insulated with mica within the slots.

HIGH-VOLTAGE GENERATORS SUCCESSFUL

This record of breakdowns brings to the surface another fact that is interesting and important and that is reassuring to the companies operating high-voltage units. If these generators be classified according to voltage it is found there are twice as many generators wound for 11,000 volts, or higher voltage, as there are generators wound for lower voltages. But these twenty-two cases of armature breakdown are equally divided between these two voltage classes. This means that the percentage of armature breakdowns in the high-voltage generators under discussion is only one-half that of the lower voltage generators. This record would be very different with treated cloth insulation (in large high-voltage generators) that is subject to cumulative heating on account of dielectric losses increasing with temperature, or with partially closed armature slots, still used by some European designers.

This record does not prove that high-voltage generators are necessarily safer or less subject to breakdown, except in so far as breakdowns may be caused by voltage surges that are independent of generator voltage. Obviously a 10,000-volt surge would be dangerous in a 2,400-volt generator, but would be harmless in a 13,000-volt winding. The record does prove that 11,000 and 13,000-volt windings are just as reliable as low-voltage windings, and, further, that breakdowns are generally caused by trouble unrelated to line voltage.

The facts brought out by this record may be summarized as follows:

1. The majority of armature breakdowns is caused by operating hazard originating outside the generator.
2. Armature heating in armatures completely insulated with mica is a minor cause of breakdown.
3. High-voltage generators, with mica insulation and open armature slots, are as reliable as, and probably are more reliable than, large low-voltage generators.

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*NOTE BY AUTHOR.—This article is based on a discussion of a paper, "Classification of Large Steam Turbo-Generator Failures," by Philip Torchio, presented at the A.I.E.E. convention, White Sulphur Springs, June 30, 1920.

Going After Business at the Depot*

Several Definite Suggestions Are Made as to How Street Railway Companies Can Get a Larger Part of the Traffic Originating at the Railroad Station—Experience of a Traveling Man Points Way to Greater Use of Signs, a Barker and a Waiting Car

BY W. MCK. WHITE
Western Manager Columbia Machine Works & Malleable Iron Company

EVERY day taxicabs and buses haul loads of people to and from the railroad stations at high rates of fare, when the majority of travelers would much prefer to use the street cars if the service were available and, which is just as important, if it were persistently brought to their notice. How can this business be drawn to the street railway company? The simple expedient of increasing the number of cars on the station routes or of rerouting to have a station-to-hotel circuit or an all-depot belt line is valuable and essential, but there are other steps necessary to assure a paying traffic for these cars. Or perhaps it would be well to say that other means should be used to give you the cream of this business, namely, fully loaded cars and a pleased patronage rather than a casual traffic picked up at random.

In dealing with the incoming passenger business at the depot there are three phases of the situation to consider.

First, there are those people who are familiar with the town they are entering. They know whether they can reach their destinations conveniently by trolley and what car to take. They know what the prevailing rate of fare was when they left town and they know how long they will be enroute. This traffic is fostered by the customary methods and frequency of service, and if these passengers prefer to pay a high taxi fare it is at their own volition, unless the car service for them is actually inconvenient. But the majority will use street cars if an adequate schedule is offered.

Second, there are those people who are strangers and prefer to take a cab or bus, rather than to be recognized as strangers by having to ask a policeman or station porter or some one else for directions. It may seem peculiar to have this distinction made, but I am sure you will agree that the average traveling man does not like to stand around asking how to reach his hotel. So he jumps into a cab and pays seven to ten times more than street car fare to reach his destination, and the few minutes that he saves thereby are ordinarily not worth it.

Third, there are many travelers who take cabs from force of habit, a habit acquired perhaps when they were strangers and never learned that a convenient street car service was being maintained. Of course many persons take individual means of transportation because they can well afford it and it is their desire. And many, it is to be regretted, do so because of previous experience with long waits forced by non-appearance of trolley cars. I am thinking, however, of thousands of travelers of moderate means and reasonable minds who would prefer to pay 5, 6 or 7 cents for a trolley trip to their hotels or homes, instead of a flat 50 cents or a taxi rate of 50 cents at least and usually more.

Nearly every street car system operates lines reaching the railroad stations and hotels, and in fact every possible source of revenue passengers. Quite often it costs more to gather up a few fares than the amount taken in. But if, in so doing, the habit of street car usage is fostered and the dependence on cabs is reduced the effort is worth while. The problem then is not to originate revenue traffic but to corral that which is available and which to the railways at present is lost. I am offering some suggestions which would cost little to put into effect and are entirely feasible.

A railroad station crowd usually needs only to be politely directed. But when the people emerge from a station they are greeted by cries of "Taxi, taxi!" "Cab, cab!" "Buses to hotels," and similar invitations. Now why not surprise them by letting them hear "Street car to all hotels," "Street car down town," "Street car to all points. This way, please."

Or at least why not post a prominent sign which might read "Street car leaves this station every four minutes for hotels and all parts of the city. Fare, 6 cents." Or, perhaps this: "Street cars leave this point every six minutes. Frequent, safe service to business and residence parts of the city. Fare, 7 cents."

I think that electric railways do not make sufficient use of signs to direct passengers. We know of signs which have been of great value, such as those which the Chicago Elevated Railways have painted on their structures. Tens of thousands of persons every day follow the painted arrows in the New York subway stations. The skip-stop and the later plan of loading berths have led to the use of "Car-stop" signs, but we need more signs of an informative nature and the wider use of them should be considered by all railway managers. A splendid start could be made at the steam railway stations and then on trolley poles opposite the hotel entrances. Don't you think it would please a great many travelers to see a sign across from their hotels reading "Street car to Union Depot, every five minutes. Fare 7 cents."

A sign tells its story all day long and may easily be illuminated for night display.

STUDY THE LOAD AT THE STATION

In almost every city there are certain hours when a large number of people arrive at the stations on important trains. I believe the street car companies would do well to have a man "on the spot." Every company employs a number of uniformed street men, inspectors, supervisors and others who could be used. There should be no logical objection to the active solicitation of business which daily escapes because of passive methods. A special gathering in some locality at infrequent periods will receive the particular attention of the transportation department and yet daily hundreds of possible fares pass through the railroad station gates unnoticed. The street car companies can invite this patronage as surely as and more properly than the taxicab drivers.

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*Abstract of paper presented at the Illinois Electric Railway Association, midsummer meeting, Springfield, Ill., July 30.

It may not be necessary to assign a representative to this work exclusively at any one station unless the business warrants it. But that inspector in his daily wanderings might just as well as not be at the Union Station when the morning trains come in, or at the Central Station when the afternoon Limited arrives. And he would become a business-getter for the company.

Coincident with this it would be wise for the traffic departments to make a closer study of the time of train arrivals and of average loads. Most street railway companies endeavor to provide a good station service, but suppose you are running a ten or twelve minute headway in the middle of the day and your car leaves the station at 11.10 a.m. when a train is due at 11.13. Or perhaps the 3.36 p.m. car meets a train on which records show a heavy passenger traffic arriving. Here is a chance for a beneficial change in the street car schedule, because trains often arrive on time, and the non-appearance of a car for even five minutes will greatly increase taxicab patronage. I feel sure that the cases mentioned are entirely possible and are occurring in many places.

The safety car has given us the slogan "A car always in sight," and this thought is justly popular in street car offices today. Now why not apply this effectively to the depot car line? A sign is good, a uniformed announcer is better, but best of all would be a waiting car. All the cries of taxicab drivers would avail little against the presence of a street car and it would draw the crowd as positively as a magnet acts on iron filings.

I think the constant presence of a street car is entirely feasible. If the line passing the station is a busy one, with a headway of a minute or two, or even less, there would always be a car in sight, down the street perhaps. Why not hold each car until the next one arrives, using this as a point for checking car movements and schedules and at the same time secure the advantage of always having a car at the station. And if the station is on a single line with a longer headway, why not have your lay-over there instead of at some unimportant place at the far end of town. A station lay-over point would offer conveniences for your crews, and I would again suggest that each car await the arrival of the next following one before departing.

Recently I was discussing this subject in New Orleans with Nelson H. Brown, general superintendent of railways, and he told me of an experience he had in Worcester, Mass., several years ago. He put on a depot car, the only duty of which was to meet incoming trains and its crew had no specific route. The conductor would ask passengers where they wished to go and he would route the car to suit the convenience of the greatest number. This car proved to be the best paying one in Worcester. Many other schemes can be evolved to attract the station trade and to facilitate handling it. If the traffic is heavy enough a hotel-station line may be installed as in Cleveland and Kansas City.

It is not often that you find a situation like that in Peoria, where the street car company has a terminus within the steam railroad station, but this might be arranged elsewhere. The collection of fares by a street man as well as by the conductor, the increase of car service and other suggestions are in order. And I hope that your carpenter shops will be instructed to turn out some good signs, your painter to letter them (black on a cream background is a good combination) and your line department to mount them on poles at stations and hotels.

POLITE CREWS HELP

In conclusion, I am going to offer a suggestion concerning the platform men on the depot cars. These cars should be manned by crews who can politely and intelligently handle strangers, who know the city, are willing to answer questions and to call the names of streets and hotels. They should be coached on the value of this business and urged to co-operate. They should be instructed not to pull away just when a train arrives, for nothing is more aggravating to those coming through a station than to see a car just departing when so many more passengers could be carried. The trouble is that the average crew considers the schedule more important than public service and the filling of the fare box. Where a delay of two or even three minutes would fill a car with pleased passengers it is worth while to wait.

We have all heard exclamations like these: "Gee, we were lucky to catch a car right away," "Thanks for waiting," "This is fine." Isn't that far better in the pyschology of public relations than "Oh, pshaw! Why didn't they wait," or "Just my luck to miss that car." Or, what is far worse, "Well, I guess we'd better take a taxi,"

"Facts About Figures"

AN EXPERT on publicity whose name is known from coast to coast writes as follows on the editorial on "Facts About Figures—Figures About Facts," in the issue of this paper for June 26:

> You have hit the keynote about "facts and figures" exactly. Figures are the most tiresome and uninteresting, as well as unconvincing, things in the world except to the "bug" who dotes on that sort of stuff, but for the average normal mind we have got to prepare the figures according to a different formula, and your formula is the right one.
>
> Many a time I have thanked the Lord for the broad vision of the executive officers of the company with which I am connected for accepting this view of the situation and that is why I never attempt in my work to run a mass of unvarnished statistics. The lay mind will not react on figures or technical statistical matter. You have got to speak in the language of the street or the street car when you try to present statistical matter.
>
> Think of the world of time, energy and gray matter utterly wasted by our high-priced efficiency experts, traffic sharks, accountants, engineers and others in preparing a maze of figures that prove nothing to the untutored, nontechnical mind.
>
> Now, I want to congratulate you for the concise and clear way you have stated the proposition. It is "facts about figures" and not "figures about facts" that drive your argument home, and the fewer figures the better.
>
> I hope every publicity man and every executive and every figure expert in our industry read that editorial and took it to himself as a personal message.

New Side Bearing Trolley Wheel

THE Thornton Trolley Wheel Company, Ashland, Ky., is placing on the market a new type of construction for trolley wheels. No bushing or central axle is used, but instead two spherical side bearings with removable bearing bosses. The bearing bracket is provided with two grease reservoirs, so that the wearing parts are lubricated with grease. It is claimed that the two reservoirs will provide sufficient lubrication when filled to operate approximately 1,000 miles under normal service conditions.

St. Paul Electrification Results*

Complete Results of Electrical Operation for the Year 1919—Effect of the New Power Indicator and Limiting System—Itemization of Costs

By R. BEEUWKES
Engineer Chicago, Milwaukee & St. Paul Railway

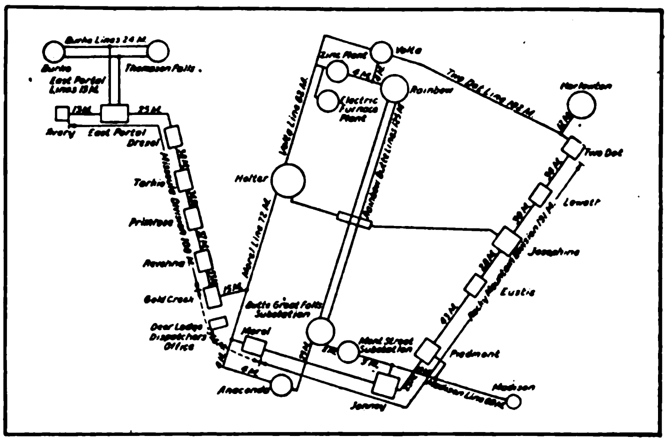
POWER for the electrical operation of the Chicago, Milwaukee & St. Paul Railway between Harlowton, Mont., and Avery, Idaho, is delivered to the transmission system in the form of 100,000-volt, three-phase, 60-cycle current. The power is supplied under two separate contracts, one for the Rocky Mountain division, extending from Harlowton to Deer Lodge, and the other for the Missoula division, extending from Deer Lodge to Avery.

The power company's 100,000-volt transmission lines are shown in the single line layout of the system, as are also the points of power delivery to the railway company and the latter's 100,000-volt transmission system.

TABLE I—ST. PAUL ELECTRIFICATION—LIST OF SUBSTATIONS AND THEIR EQUIPMENT

Substations	Transformers	Motor Generators
Rocky Mountain Division		
Two Dot	Two 2,500 kva.	Two 2,000 kw.
Loweth	Two 2,500 kva.	Two 2,000 kw.
Josephine	Two 2,500 kva.	Two 2,000 kw.
Eustis	Two 2,500 kva.	Two 2,000 kw.
Piedmont	Three 1,900 kva.	Three 1,500 kw.
Janney	Three 1,900 kva.	Three 1,500 kw.
Morel	Two 2,500 kva.	Two 2,000 kw.
Missoula Division		
Gold Creek	Two 2,500 kva.	Two 2,000 kw.
Ravenna	Two 2,500 kva.	Two 2,000 kw.
Primrose	Two 2,500 kva.	Two 2,000 kw.
Tarkio	Two 2,500 kva.	Two 2,000 kw.
Drexel	Two 2,500 kva.	Two 2,000 kw.
East Portal	Three 2,500 kva.	Three 2,000 kw.
Avery	Three 1,900 kva.	Three 1,500 kw.

The railway transmission line of the Rocky Mountain division extends from Two Dot substation to the Morel substation, a distance of 184 miles, the former point being 12 miles from Harlowton, eastern terminus of the division, and the latter point 17 miles from Deer Lodge, the western terminus. Power is delivered by the power company at the Two Dot, Josephine, Piedmont and Morel substations. The railway transmission line of the Missoula division extends from Gold Creek substation, 18½ miles from Deer Lodge, a distance of 180 miles, to the substation at Avery, the western terminus of the division.



TRANSMISSION LINE AND SUBSTATION LAYOUT FOR THE CHICAGO, MILWAUKEE & ST. PAUL ELECTRIFICATION

Seven substations on each division are used to convert the 100,000-volt alternating current of the transmission line to the 3,000-volt direct current used for traction purposes. Each motor generator consists of two 1,500-volt direct current generators connected in series and driven by a 2,300-volt synchronous motor supplied from the substation high tension buses through a three-phase, 100,000/23,000-volt transformer and is guaranteed for a maximum five-minute overload of 200 per cent. The rated capacities of these stations are given in Table I.

The accompanying diagram shows diagrammatically the railway company's high-tension line, arrangement of apparatus in the substations and the general layout of the 3,000-volt distribution or trolley system.

The contact wires of the trolley system consist for the main line of two No. 0000 B. & S. grooved trolley wire flexibly supported side by side from a ½-in. steel catenary and tapped at intervals of about every 1,000 ft.

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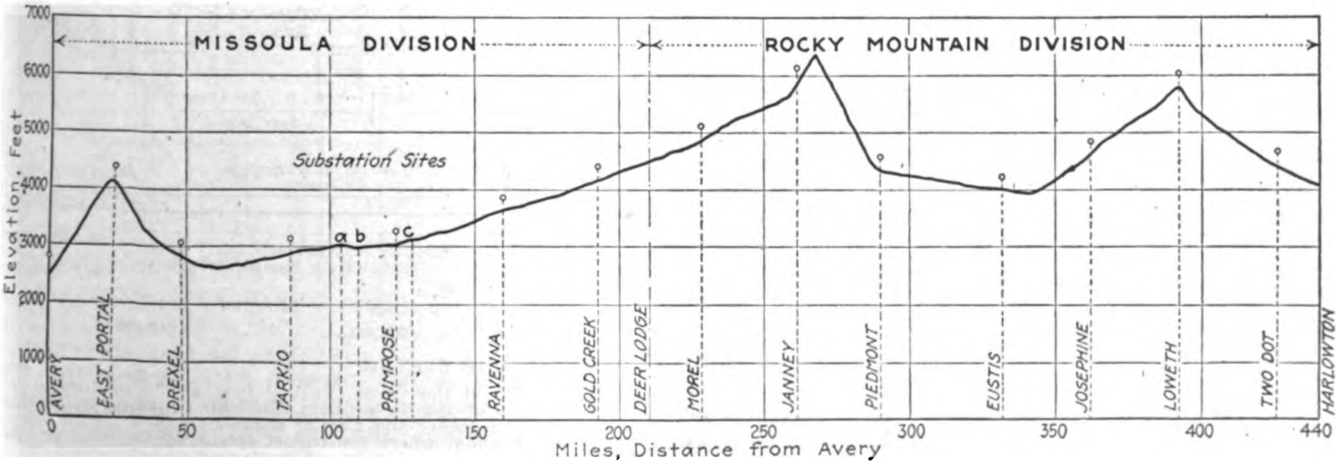
*Abstract of paper presented before the Pacific Coast Section of the American Institute of Electrical Engineers, Portland, Ore., July 15, 1920.



PROFILE OF THE ELECTRIFIED DIVISIONS, SHOWING SUBSTATIONS to a feeder which connects to the adjacent substation buses through switches and automatic circuit breakers. Over passing, industrial and similar tracks only a single No. 0000 copper trolley wire is used. There is an insulated air gap in the trolley in front of each substation separating the trolley system west of the substation from that east of the substation; that is, portions east and west of the substations are fed, respectively, through separate feeder breakers. There is also an insulated air gap at the beginning and end of every passing track, so that by means of a section switch installed in the feeder at the gap the district between any two gaps may be isolated in case of trouble so as to permit operation up to the location of the open switches.

The return circuit consists of the 90-lb. running rails and, in general, of a No. 0000 B. & S. copper supplementary negative wire which is run along the trolley poles and connected to the track at intervals averaging about 8,000 ft. through each alternate signal system reactance bond. This supplementary negative, however, is intended more as a safety measure to bridge open rail bonds than to increase the return circuit conductivity. However, on various feeder cutoffs on the mountain grades, where the conductivity of the positive circuit closely approaches that of the return circuit, one of the two feeders on the cutoff is in parallel with the running rails and is provided for the purpose of increasing the return circuit conductivity.

POWER DEMAND CONTROLLED BY TRAIN DISPATCHER

The terms of the power contracts are similar and each provides for a minimum payment on basis of a 60 per cent load factor. Where the load factor exceeds 60 per cent payment is made on basis of the actual kilowatt-hours consumed, the rate being 5.36 mills per kilowatt-hour. The demand is controlled for each division by means of a so-called power indicating and limiting system,* which on the Rocky Mountain division was put into operation early in the year 1918 and on the Missoula division a few months ago. Briefly, this system is so arranged as to indicate and record at the dispatcher's office at Deer Lodge the total kilowatts or demand being supplied in any instant by the power company to the railway company and to prevent the maximum demand from exceeding a certain amount as determined by the "demand setting made by the dispatcher," this limiting action being secured by lowering of the substation direct-current voltage and therefore of the train speeds.

The effect of this limiting action is clearly indicated on the graphic time-table of train movements on the Rocky Mountain division for February 19, 1920, and corresponding load curve traced by tapalog meter of the power indicating and limiting system with the load limit set at 16,000 kw.

The percentage of time when the limiting action will take place, for a given amount of business, will depend on the demand setting and on the possibilities of spacing the trains so that as few as possible will at one time be operating on the heavier grades, the latter matter, except as regards passenger trains and certain time freights, being to a considerable extent in the hands of the train dispatchers. The slowing up of the train speeds of course results in increased train and enginemen's expense and increased time in getting freight over the road, and a proper balance must be struck between this increased expense and the saving in power cost and the limit setting determined upon accordingly. Table II gives an idea of the percentage of time the limiting action takes place with average kilowatt load and settings as indicated, this percentage being based

TABLE II—ST. PAUL ELECTRIFICATION, LIMIT SETTING AND AVERAGE KILOWATT-HOUR TAKEN MONTHLY

Month	Limit Setting	Average Monthly Load in Kilowatts	Per Cent Time Limiting Action Takes Place
July, 1918	12,000	8,020	13.0
Aug., 1918	12,000	7,820	15.5
Sept., 1918	12,000	6,675	8.2
May, 1919	14,000	7,840	4.62
Aug., 1919	14,000	7,650	4.12
Sept., 1919	14,000	8,230	9.50
Oct., 1919	14,000	8,420	10.65
Nov., 1919	14,000	7,115	8.24
Feb., 1920	16,000	8,625	2.40
Mar., 1920	16,000	8,680	2.20
April, 1920	16,000	8,620	.90

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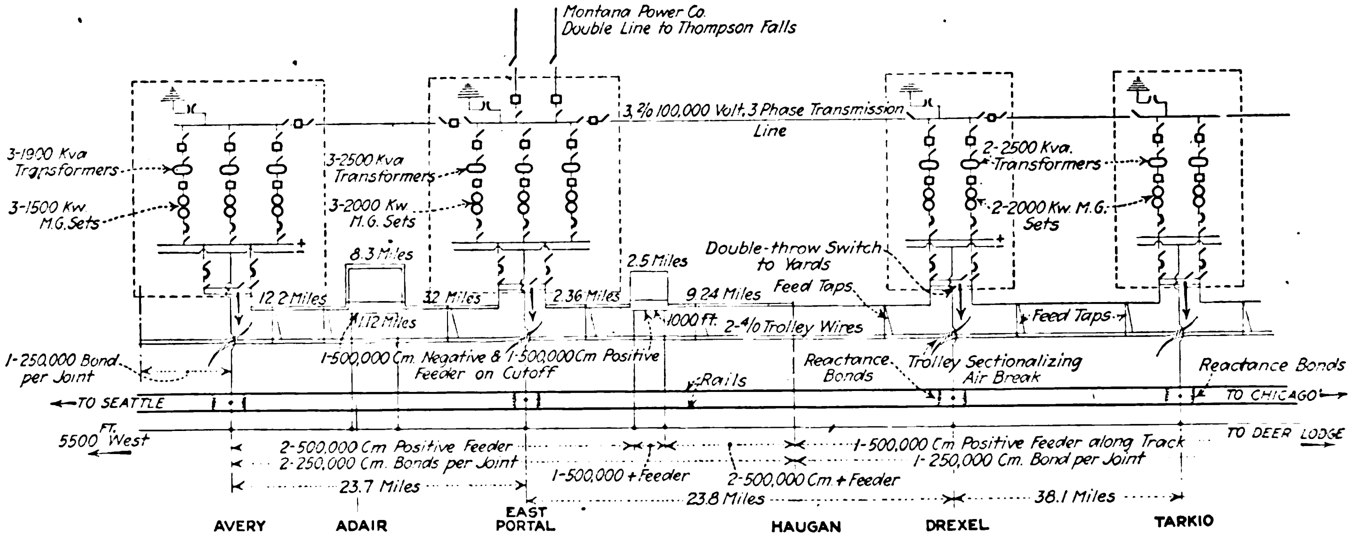
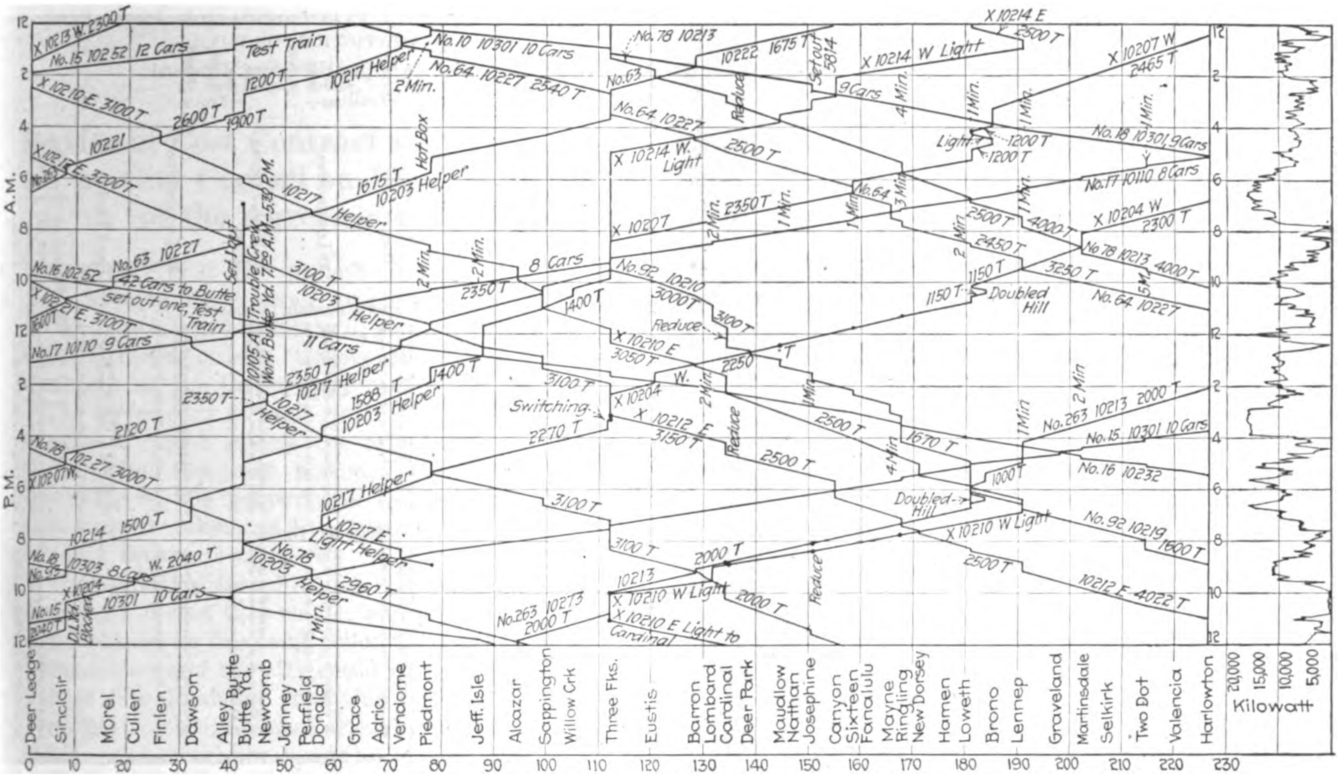
*This system was described in the ELECTRIC RAILWAY JOURNAL for April 10, 1920, page 759, in the article "Holding Down Line Peaks," by J. J. Linebaugh.


Montana Power Co.
Double Line to Thompson Falls
3-⅔/100,000 Volt, 3 Phase Transmission Line
3-1900 Kva Transformers
3-1500 Kw. M.G. Sets
3-2500 Kva Transformers
3-2000 Kw. M.G. Sets
2-2500 Kva. Transformers
2-2000 Kw. M.G. Sets
8.3 Miles
2.5 Miles
Double-throw Switch to Yards
12.2 Miles
32 Miles
2.36 Miles
9.24 Miles
Feed Taps
1.12 Miles
1000 ft.
2-4/0 Trolley Wires
Feed Taps
1-250,000 Bond per Joint
1-500,000 Cm. Negative & 1-500,000 Cm Positive Feeder on Cutoff
Rails
Reactance Bonds
Trolley Sectionalizing Air Break
Reactance Bonds
TO SEATTLE
TO CHICAGO
5500 FT. West
TO DEER LODGE
2-500,000 Cm Positive Feeder
2-250,000 Cm. Bonds per Joint
23.7 Miles
1-500,000 + Feeder
2-500,000 Cm + Feeder
23.8 Miles
1-500,000 Cm Positive Feeder along Track
1-250,000 Cm. Bond per Joint
38.1 Miles
AVERY
ADAIR
EAST PORTAL
HAUGAN
DREXEL
TARKIO

ELECTRICAL LAYOUT FOR A PART OF THE SYSTEM

NOTE.—Feeder and trolley are sectionalized at all substations and railway stations. No. 0000 feeder is tapped to each trolley every 1,000 feet. Reactance bonds are 5,000 to 6,000 ft. apart. Negative taps are made to the middle point of every second reactance bond. Side track rails are bonded in series with the supplementary negative. One rail bonded with one 250,000 circ.mil bond per joint in the yard. Trolley feed taps are disconnected for a distance of 1 mile on each side of each substation where there is a single feeder and 2 miles where there is a double feeder, except at Ravenna, where the tunnel entrance east, and at East Portal, where the tunnel entrance west, limit the distance. Other portions are similar to that above.



GRAPHIC TRAIN SHEET AND LOAD CURVE FOR THE ROCKY MOUNTAIN DIVISION, FEB. 19, 1920

on the number of hours the limiting system was actually in service.

In arriving at the amounts chargeable for power against the different classes of train service, the total kilowatt-hours to be paid for—that is, the actual kilowatt-hours, or the actual kilowatt-hours increased, if necessary, to correspond to a minimum 60 per cent load factor—are taken and from them are deducted the kilowatt-hours metered against substation lighting, auxiliary power, signal system supply, etc., amounting to about 1 per cent. The remaining kilowatt-hours are then divided between the different classes of train service, freight, passenger and non-revenue, in proportion to the total net kilowatt-hour readings obtained for these respective services from wattmeters installed in the locomotives. These readings are taken on the form provided for the purpose, and a record of the power consumption of each train is thus obtained. The readings are referred to as "net" readings, as they represent motored energy less regenerated energy.

TABLE IIIA—ST. PAUL ELECTRIFICATION—AVERAGE INPUT

	Rocky Mountain Division			— Missoula Division —		
Month	Actual Kw.-Hrs. System Input for Locomotives	Net Kw.-Hrs. Input at Locomotive	Ratio	Actual Kw.-Hrs. System Input for Locomotives	Net Kw.-Hrs. Input at Locomotives	Ratio
January	6,381,233	4,838,480	75.9	5,540,581	3,753,430	67.6
February	4,610,607	2,921,840	63.3	4,107,960	2,702,710	65.8
March	5,795,859	4,351,126	75.2	5,412,048	3,469,120	64.2
April	5,949,840	3,962,650	66.6	5,429,932	3,574,080	65.8
May	5,803,455	4,146,517	71.4	5,745,397	3,795,770	66.2
June	5,662,650	4,100,810	72.3	5,697,785	3,853,590	67.6
July	5,744,738	3,794,940	66.2	5,318,692	3,505,630	65.8
August	5,648,815	3,755,280	66.5	5,133,008	3,255,820	63.4
Sept	5,892,430	3,799,830	64.5	5,102,562	3,434,010	67.3
October	6,222,486	3,971,149	63.8	5,389,883	3,654,955	67.8
November	5,095,937	3,425,458	67.2	4,879,130	3,181,456	65.2
December	5,809,976	3,830,870	65.8	4,971,601	3,382,700	67.9
Total	68,618,026	46,898,850	68.3	62,728,579	41,563,271	66.3

The ratio of the total net locomotive wattmeter readings, all services, to the total actual kilowatt-hours input to the system chargeable to locomotives for the various months of 1919 is given in Table IIIA.

As there are no wattmeters installed in the direct-current side of the substations, a ratio for net substation output to system input or to locomotive is not obtainable. There are, however, wattmeters in the circuits of the individual motor generator sets and Table III, considered in connection with the profile of the line, and Table IV, on page 230, will be of interest in showing the manner in which the energy is distributed among the respective substations, average kilowatt being used for convenience instead of total kilowatt-hours, and the whole of the year 1919 being taken.

TABLE III—ST. PAUL ELECTRIFICATION—AVERAGE INPUT OF SUBSTATIONS

Rocky Mountain Division	Avg. Annual Kw. Input Net to Motor Generators		Missoula Division	Avg. Annual Kw. Input Net to Motor Generators	
Substation	*Total	**Per Motor Generator	Substation	*Total	**Per Motor Generator
Two Dot	895	813	Gold Creek	1,150	1,128
Loweth	962	783	Ravenna	915	1,115
Josephine	1,014	1,013	Primrose	908	925
Eustis	1,022	1,016	Tarkio	843	803
Piedmont	1,218	617	Drexel	790	778
Janney	1,390	559	East Portal	1,390	778
Morel	1,047	1,072	Avery	812	523
System total	7,548	....	System total	6,808	....

* Total kw.-hrs. Computed on the basis of 8,856 hours in the year; four days in December are included.

** Total kw.-hrs.: Total running hours of motor generators.

OPERATING FIGURES FOR 1919

The figures in Table V, on the next page, show for the year 1919 the net kilowatt-hours per thousand gross ton-miles for freight revenue service and passenger service, respectively, and corresponding cost of these kilowatt-hours at the high tension bus or point of delivery of the power to the railway system. The lesser

TABLE IV—ST. PAUL ELECTRIFICATION, LINE DATA

From	Elevation*	Curve in Degrees			Grade		Distance Miles†
		Maximum	Average	Total	Maximum	Average	
Avery to Kyle	2,495	10	4.62	1,706.3	1.70	1.35	7
Kyle to Falcon	2,996	10	4.01	1,051.8	1.70	1.48	5
Falcon to Adair	3,394	10	3.73	990.4	1.70	1.50	5
Adair to Roland	3,782	10	4.24	1,074.3	1.70	1.45	6
Roland to Tunnel No. 20	4,150	10	4.06	112.0	1.12	1.03	1
Tunnel No. 20 to East Portal	4,160	10	4.06	112.0	1.07	1.03	1
East Portal to Saltese	4,147	10	3.45	1,563.6	1.70	1.53	8
Saltese to Haugan	3,452	10	2.35	671.5	1.70	1.09	4
Haugan to Drexel	3,142	10	2.62	1,342.8	0.80	0.56	10
Drexel to Foraker	2,856	10	3.27	775.8	0.80	0.52	5
Foraker to St. Regis	2,733	10	2.25	583.0	0.60	0.21	5
St. Regis to Ashmore	2,678	5	0.85	280.9	0.40	0.12	6
Ashmore to Superior	2,674	3	0.73	230.6	0.40	0.14	7
Superior to Cobden	2,717	3.02	0.37	166.4	0.40	0.23	8
Cobden to Tarkio	2,823	5	0.94	388.7	0.40	0.25	8
Tarkio to Cyr	2,925	5	0.87	397.0	0.40	0.14	9
Cyr to Alberton	2,988	3	0.84	287.0	0.35	0.16	5
Alberton to A	3,042	3	1.20	165.0	0.35	0.28	3
A to B	3,078	3	1.29	401.8	0.40	0.21	2
B to Frenchtown	3,003	2.84	0.29	105.1	0.20	0.07	10
Frenchtown to Primrose	3,028	2	0.26	84.4	0.30	0.13	8
Primrose to C	3,071	0	0.00	0.0	0.40	0.36	5
C to Missoula	3,160	4	0.39	103.8	0.32	0.09	8
Missoula to Bonner Jct	3,182	10	1.42	474.7	0.40	0.28	6
Bonner Jct. to Clinton	3,279	3	0.29	152.0	0.40	0.33	10
Clinton to Ravenna	3,452	2	0.20	121.1	0.40	0.35	11
Ravenna to Bearmouth	3,665	3	0.84	454.6	0.40	0.26	10
Bearmouth to Drummond	3,805	4	0.64	350.7	0.40	0.27	10
Drummond to Gold Creek	3,955	2.5	0.15	96.0	0.40	0.37	13
Gold Creek to Garrison	4,188	3	0.8	325.1	0.40	0.34	7
Garrison to Deer Lodge	4,329	3	0.3	174.0	0.40	0.42	10
Deer Lodge to Sinclair	4,520	3	0.06	20.6	0.60	0.46	10
Sinclair to Morel	4,684	3	0.17	84.8	0.60	0.40	9
Morel to Finlen	4,882	3	0.95	441.3	0.60	0.57	8
Finlen to Dawson	5,145	10	1.58	5.33	0.60	0.44	6
Dawson to Colorado Jct	5,292	6	0.77	3.13	1.08	0.46	6
Colorado Jct. to Butte Yard	5,480	8	20.0	215.0	0.75	0.04	2
Butte Yard to Newcomb	5,484	5	0.44	109.1	0.90	0.54	5
Newcomb to Janney	5,618	8	2.9	853.8	1.66	1.03	4
Janney to Continental Divide	5,871	8	2.65	865.1	1.66	1.47	5
Continental Divide to Grace	6,352	8	2.81	1,052.2	2.00	1.84	8
Grace to Cedric	5,664	8	2.49	631.8	2.00	1.92	5
Cedric to Vendome	5,178	8	3.46	693.1	2.00	1.80	3
Vendome to Piedmont	4,818	1	0.06	19.0	2.00	1.58	7
Piedmont to Jefferson Island	4,359	1	0.11	56.9	0.30	0.19	10
Jefferson Island to Alcazar	4,263	8	2.18	773.2	0.26	0.09	6
Alcazar to Sappington	4,232	4	1.10	290.5	0.33	0.20	4
Sappington to Willow Creek	4,180	2	0.14	48.0	0.30	0.10	8
Willow Creek to Three Forks	4,145	1	0.02	8.4	0.40	0.25	6
Three Forks to Eustis	4,066	5	0.25	171.2	0.30	0.18	8
Eustis to Barron	4,017	6	1.25	508.9	0.30	0.11	8
Barron to Lombard	3,971	8	1.92	314.0	0.30	0.10	3
Lombard to Deer Park	3,987	8	1.65	637.3	1.00	0.57	7
Deer Park to Nathan	4,206	8	1.97	812.3	1.00	0.60	8
Nathan to Josephine	4,454	9.5	2.05	444.0	1.00	0.83	4
Josephine to Canyon	4,645	10	2.41	585.5	1.00	0.92	5
Canyon to Fanalulu	4,869	10	1.58	518.1	1.00	0.59	6
Fanalulu to Moyne	5,062	8	2.15	455.1	1.00	0.70	4
Moyne to New Dorsey	5,209	3	0.40	125.5	0.82	0.44	5
New Dorsey to Hamen	5,346	6	0.99	271.2	1.00	0.83	6
Hamen to Loweth	5,573	6	1.12	253.0	1.00	0.95	4
Loweth to Bruno	5,789	10	2.60	603.4	2.00	1.28	5
Bruno to Lennep	5,491	10	1.75	508.4	1.10	0.92	5
Lennep to Groveland	5,225	4	0.11	195.0	1.00	0.60	7
Groveland to Martinsdale	5,001	1	0.03	7.2	0.99	0.80	4
Martinsdale to Selkirk	4,812	2	0.15	44.3	1.00	0.64	6
Selkirk to Two Dot	4,624	2	0.12	42.2	1.04	0.58	7
Two Dot to Valencia	4,427	4	0.37	16.9	0.81	0.44	5
Valencia to Harlowton	4,290	1	0.06	18.1	0.60	0.39	5

* Elevation at first place.
† Scaled from profile.

consumption of energy during the summer months as compared with the winter months will be noted. The figures for the passenger service are approximate, as the ton-mile data is based on the assumption of an average weight per car, no record of the particular cars handled in all the separate trains being available.

TABLE VI—ST. PAUL ELECTRIFICATION—DISTRIBUTION OF OPERATING COSTS FOR 1919

	Account	Total All Services	Per Unit
255.	Power substation buildings	$8,487	$606.00 per bldg.
257.	Power transmission system	1,773	4.87 per mile
259.	Power distribution system	78,461	179.00 per route-mile
261.	Power line poles and fixtures	24,299	55.50 per route-mile
306.	Power substation apparatus	40,224	2,870.00 per station
383.	Train and yard power produced	102,152	7,300.00 per station
395.	Total	$255,396	

1.	Cost per thousand gross ton-miles trailing freight as actually distributed in accounts	28.8 cents
2.	Cost per thousand gross ton-miles train freight as actually distributed in accounts	24.9 cents
3.	Cost per thousand gross ton-miles trailing freight on basis distribution in proportion to freight kilowatt-hours	30.2 cents
4.	Cost per thousand gross ton-miles train freight on basis distribution in proportion to freight kilowatt-hours	26.2 cents
5.	Cost per actual kilowatt-hours, delivered to locomotives	1.1 cents

TABLE V—ST. PAUL ELECTRIFICATION—OPERATING STATISTICS FOR 1919

Month	Thousand Gross Ton-Miles, Trailing	Net Kw.-Hrs. per Thousand Gross Ton-Miles: Trailing		Train		Load Factor	Cost of Kw.-Hrs. per M. Trailing, Gross Ton-Miles, Cents
		At High Tension Bus	At Locomotive	At High Tension Bus	At Locomotive		
Freight Service:							
		Rocky Mountain Division					
Jan	98,478	47.8	36.3	41.2	31.3	63.7	25.7
Feb	79,859	43.1	27.3	37.3	23.6	57.7	24.0
March	118,297	39.0	29.3	33.9	25.5	65.3	20.9
April	121,646	38.5	25.6	33.1	22.0	61.1	20.7
May	124,395	36.5	26.1	31.7	22.6	56.0	20.9
June	122,264	36.7	26.2	31.7	22.9	56.4	20.9
July	120,723	36.7	24.3	31.6	20.9	55.4	21.3
Aug	111,092	40.9	27.2	34.9	23.2	54.6	22.4
Sept	115,787	39.7	25.6	34.1	22.0	58.8	21.7
Oct	108,920	45.8	29.2	39.4	25.1	60.0	23.6
Nov	86,267	44.0	29.6	37.7	25.3	50.9	27.8
Jan.-Nov	Avgs.	40.5	27.7	34.8	23.8	57.3	22.5
		Missoula Division					
Jan	87,598	44.3	29.9	38.6	26.1	....	23.8
Feb	73,481	39.8	26.2	35.2	23.2	....	21.7
March	103,613	40.3	25.8	35.6	22.8	....	21.6
April	109,133	38.5	25.4	34.1	22.4	....	20.2
May	118,331	37.9	25.1	33.5	22.2	....	20.3
June	116,660	37.8	25.6	33.3	22.5	....	20.3
July	106,045	38.1	25.0	33.5	22.0	....	20.4
Aug	101,017	38.8	24.6	34.3	21.8	....	20.8
Sept	99,578	38.5	25.9	34.1	22.9	....	20.6
Oct	100,504	40.0	27.1	35.3	23.9	....	21.4
Nov	78,459	45.3	29.5	39.2	25.5	....	24.3
Jan.-Nov	Avgs.	39.7	26.3	35.0	23.1	....	21.3
		Rocky Mountain and Missoula Divisions Combined					
Jan.-Nov	302,507	40.1	27.1	34.9	23.5	....	21.9
Jan.-Dec	476,085	....	....	....	....	....	22.3
Passenger Service:							
Jan.-Nov	340,480	56.8	38.7	39.7	27.1	....	38.4
Jan.-Dec	378,080	....	....	....	....	....	38.1

The cost of maintaining and operating the transmission lines, substations and trolley system for the year 1919 is given in Table VI and a final figure thus arrived at showing the approximate total operating costs involved in the delivery of the electric energy to the locomotives.

CONCLUSION

The installation being comparatively new, it might naturally be assumed without consideration of other facts that the figures for the maintenance are considerably lower than those which will eventually obtain, but it should also be borne in mind that the maintenance and operating costs given will, except for power, remain more or less constant so far as any consideration of their being affected by the business handled is concerned, so that the cost per thousand ton-miles would be correspondingly reduced as business is increased. It is also expected that considerable improvement will be effected in maintenance methods, which would again tend to reduce costs. The figures are therefore given merely to show the results which are at present being obtained.

Schuylkill Railway Installing Telephone Dispatch System

THE Schuylkill Railway, Girardville, Pa., is installing a telephone dispatch system over its entire property. The wires are being placed on the 6,600-volt high tension poles and are properly protected with fuses ahead and behind. Telephone instruments are being located at each turnout in an iron box with the proper switch lock, to which each conductor carries a key. When completed jack boxes will be located at convenient points between the regular telephones and each car will carry a phone with an extension cord. Kellog 2,500-ohm 5-bar ringer instruments are being used.

Rochester Accepts New Agreement

Service-at-Cost Contract Between City of Rochester and New York State Railways Passed by City Council on July 14—Balancing Fund and Sliding Scale of Rates Features of the Agreement—Commissioner of Railways Has Heavy Responsibilities

ROCHESTER has at last agreed upon a plan for solving its railway problems. The new service-at-cost agreement will go into effect on Aug. 1 with 7 cents or ten tickets for 65 cents and free transfers as the initial fare conditions.

The agreement extends until Aug. 1, 1930, and incorporates a clause giving the city the right of renewal for another ten-year period. Pending an appraisal the value of the property is fixed at $17,500,000, and this sum is taken as the temporary base value upon which a return is allowed.

The existing franchise of the New York Railways contains a 5-cent fare clause, and therefore the company could obtain no financial relief from the Public Service Commission and the city could not obtain better service due to the financial condition of the company. The service-at-cost agreement was the solution to the situation.

It is the purpose of the city and the company in entering this agreement so to arrange their affairs that the company shall provide the very best service which it is possible to give under any system of careful, scientific and economical management and to secure to the company a proper return upon the value of the property used in service.

DUTIES OF CITY COMMISSIONER

Articles I and II of the agreement define terms and outline the general objects and considerations of the agreement. Article III deals with an officer called Commissioner of Railways and defines his powers and duties.

The duty of the Commissioner of Railways is fundamentally to administer the terms of the contract on behalf of the city. He is appointed by the Mayor subject to the approval of the Council and receives a salary of $12,000 per year from the railway company.

The commissioner "shall have power and it shall be his duty to direct the making of extensions, betterments and permanent improvements; to direct the making of repairs, renewals and replacements; to direct the purchase of cars and parts thereof, and all other items of equipment, the purchase of real estate, the abandonment and replacement of equipment of every kind whatsoever. He shall have power to select and designate materials used in track construction and items of equipment, as to quality, type, kind and class. He shall direct the routing and rerouting of cars, fix and determine all places for cars to stop; fix and determine all schedules, headways, the rate of speed of cars, methods of operation, and do, order and direct generally in respect to operation. . . ."

The commissioner is limited, however, by restrictive clauses covering orders for unprofitable extensions or service, and in case of dispute his decisions are subject to review by a board of arbitration. The commissioner must work through the company organization in actually carrying out his duties, while the company, on the other hand, must furnish him office space and clerical help, pay the salaries of his department, keep such accounts as he may designate and furnish him with duplicates of all its accounts, orders and other operating and engineering records.

The commissioner passes on all purchases and accident claims, salaries and wages and any other items affecting the cost and kind of service. The franchise prohibits any labor contract which does not contain an arbitration clause.

The commissioner has all the legal and accounting force of the city at his disposal and must make quarterly reports to the City Council and Mayor.

An interesting provision is that the commissioner shall have power, with the consent of the company, to install and carry out such supplemental transportation and methods of transportation in connection with surface cars operated hereunder as he and the company shall determine to be proper and necessary in the interests of good service.

VALUE AND RATES OF FARE

The commissioner is protected in tenure of office against any summary dismissal. He must contract to resign in case of a permanent disability, misbehavior, or if he shall in any way become incompetent to fulfill the obligations of his office, but if he fails to do so he can be removed only through the enforcement of his contract by a suit in equity in the Supreme Court.

Article IV of the agreement deals with the value of the property and, after establishing the sum of $17,500,000 as the "temporary base value," provides that a board of three men shall appraise the property immediately. The board is to consist of a representative of the railway company, a representative of the city and a third member agreed upon by the first two members or appointed in case these two disagree. "They shall immediately proceed to appraise and determine the fair value of the property of the company actually used and useful in the operation of the lines, including all property from which any revenue is derived under the terms of the contract." The finding of the board is final and only subject to review by a court.

The cost of the appraisal is to be paid by the railway company and the value determined is fixed as the sum upon which returns are to be based. This value is only subject to change due to abandonments or betterments involving capital accounts. Any dispute as to additions or abandonments is to be arbitrated.

The rate of fare is dealt with in Article V. A single uniform fare is to be charged and universal free transfers are to be given. The commissioner may, however, direct a transfer charge to be put in force, and he may likewise cause to be put in force a larger fare on "owl cars." The fare charged varies from time to time as described later and eight rates of fare are provided for, rate E to go into effect at the beginning of operation under the agreement. The several rates are as shown in table on page 232.

Rate	Cash	Tickets
A	3 cents	six for 15 cents
B	4 cents	seven for 25 cents
C	5 cents	ten for 45 cents
D	6 cents	nine for 50 cents
E	7 cents	ten for 65 cents
F	8 cents	ten for 75 cents
H	9 cents	twelve for $1
G	10 cents	eleven for $1

In Article VII it is provided that at the beginning of the contract the sum of $300,000 from the company's working cash shall be deposited to a separate account to be known as a "balancing fund." The fund is augmented or decreased, of course, depending on the total cost of operation.

Article V goes on to say, with reference to the variation of rate of fare, that "when the 'balancing fund' shall exceed the sum of $300,000 by the sum of $200,000 on the first of any month on the first day of the following month the fare shall change to the next lower rate, and shall continue to change each month until the 'balancing fund' is found to equal or exceed $500,000." When the balancing fund on the first of any month is less than $200,000 the fare shall advance to the next higher rate on the first of the following month and continue to advance on the first of each month until the balancing fund shall exceed the sum of $300,000." These provisions do not apply until the rate then in force has been in operation three months. Provision is also made for adequate advance notice to the public of a change in fare. A minimum of one week is required.

Article VI makes provision for the return to the company based on value and rate of fare.

The company is to receive as its sole income a return on the base value which is fixed by the rate of fare in force. For fares of 7, 8, 9 or 10 cents the return is to be 6 per cent per annum. For a 6-cent fare the return is 6.5 per cent; for 5 cents, 7 per cent; for 4 cents, 7.5 per cent, and for 3 cents 8 per cent. If a transfer charge is ever introduced it is not to affect the rate of return paid the company.

The important questions of disposition of revenues and the provision and definition of funds are the subject of Article VII. There is first provided a "general fund," in which all revenues of the company shall be first deposited and accounted. From this fund shall be paid:

1. Operating expenses, which shall include:
   (a) Maintenance of ways and structures.
   (b) Maintenance of equipment expense.
   (c) Traffic expense.
   (d) Conducting transportation expense.
   (e) General and miscellaneous expense. (Each lettered subhead is further divided into many detailed items.)
2. All taxes, including federal, state, corporate and income taxes properly allocated to operations hereunder.
3. The return to the company on the base value and the temporary base value.
4. The compensation and expenses of appraisers.
5. The salaries of the commissioner and his assistants, and all expenses in connection with the commissioner's office.
6. All other expenses which the company and commissioner agree should be paid from the general fund.

RENEWAL AND DEPRECIATION FUND

There is then provided a renewal and depreciation fund, to which shall be credited a sum equal to 2 per cent per annum of the base value, which sum, however, may be increased or decreased by mutual agreement of the company and commissioner. These charges shall be computed and made monthly. This fund is to be expended only for renewals and replacements, it being the intent that the cost of maintenance shall be met and paid as an operating expense.

The "balancing fund," already referred to, receives all moneys remaining in the "general fund" after payments provided for have been made. Computations and transfers are to be made monthly. On the other hand, if accounts due and payable out of the "general fund" exceed the amount therein the deficit shall be made up by transfer from the "balancing fund."

This fund's "normal" value is a part of the base value and includes all allowance for working capital. The commissioner may require the company, however, to provide other cash for temporary or emergency purposes, to take advantage of favorable markets, etc., but the company is allowed interest at 6 per cent on all such cash advanced, and if it costs the company more than 6 per cent it shall be reimbursed, the additional cost to be paid as "operating expense."

Bond discount, required in case of financing extensions or betterments, shall be an "operating expense" and paid from the "general fund."

EXTENSIONS AND ABANDONMENTS

Article VIII provides that extensions, betterments and permanent improvements may be proposed by the company or the commissioner and shall be carried out only when the commissioner shall direct. The work is to be done largely by the company organization, although contracts may be made if approved by the commissioner. Disputes as to the method of handling specific cases are to be settled by arbitration.

The commissioner is limited in his orders for direct expenditures for extensions and improvements to the sum of $400,000 after the expiration of the fifth year of the term of the agreement and other financial limitations are placed on such expenditures unless both the company and the commissioner approve the expenditures, in which event no limitation is placed on the sum to be expended.

The city has the right to finance and build any lines or extensions it desires and turn them over to the company for operation. The company when operating such lines is to reimburse the city for their cost and this sum is to be added to the base value. The city may also retain ownership while permitting the company to operate lines or extensions so constructed and financed.

The commissioner may direct the abandonment of any property, including real estate, which he deems no longer useful or which he believes should be replaced. The value of this abandoned property is to be subtracted from the base value.

The suburban lines, covered in Article IX, are under the jurisdiction of the Public Service Commission, but come under the cost-of-service agreement in the event the city enlarges its corporate limits to include them.

Article X disposes of a local controversy and Articles XI and XII provide for the usual protection and nonsale or transfer of property and for the company's liability to the public.

Article XIII is devoted to arbitration. Arbitration is provided for only those cases specified in the agreement and specific exceptions are taken to any arbitration as regards rate of fare, base value, rate of return or interpretation of the agreement.

The company must notify the commissioner within five days after receipt of his order in order to take advantage of any arbitration clauses.

The arbitrators are to consist of a company representative, a city representative and a third man selected by the first two arbitrators. In the event they cannot agree on a man he is to be appointed by the senior justice of the Supreme Court for the Seventh Judicial District.

The arbitrators are instructed to investigate and try the matter before them in a formal manner in accordance with established rules of evidence and procedure. The arbitrators are paid on a fifty-fifty basis by the city and company.

Breach of contract is provided for in Article XIV. A penalty of $500 a day in liquidated damages may be recovered in a civil suit, which shall be paid out of income and not revenue.

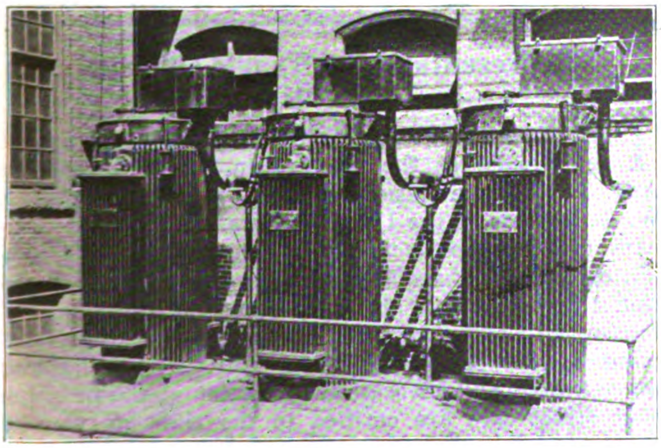
Articles XV, XVI, XVII and XVIII contain miscellaneous provisions for the modification of existing contracts, for various minor matters, for the legality and legal effect of the contract and for the termination and renewal of the agreement. Article XIX provides for the official execution of the contract by the Mayor of the city and the president of the company.

CONCLUSION

The terms of the contract are in general similar to other cost-of-service contracts, although the power of the commissioner is itemized in more detail. The commissioner has more duties to perform than any one man in a railway organization has been able to perform in the past, so no doubt he will require an experienced and numerous staff to carry out his duties. This agreement offers one more opportunity for actual trial with the cost-of-service type of franchise.

Outdoor Installation of Transformers

THE General Electric Company has developed a new type of bushing for outdoor type transformers of moderate voltage. This bushing, which has received the approval of the inspection department of the Associated Factory of Mutual Fire Insurance Companies, should make it possible to dispense with transformer houses. These transformer houses are specified, in some localities, by insurance companies, their construction being determined by insurance requirements and safety first considerations.



TRANSFORMER INSTALLATION AT PACIFIC MILLS, LAWRENCE, MASS.

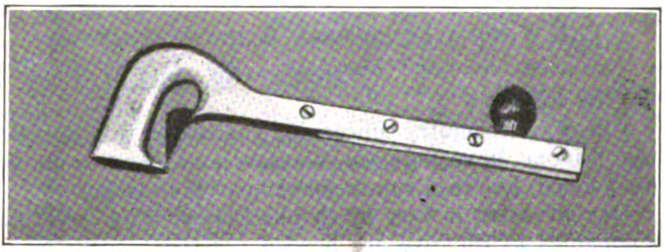
The scheme provides that all circuits, generally above 600 volts, be brought to the housing in underground cable. This cable above ground is in a metal duct which is securely fastened to the transformer cover, all exposed parts being at ground potential and waterproof. The waterproof feature is essential, from the underwriter's standpoint, in making it safe for firemen to play streams on burning buildings near the transformers without danger.

Since the circuits to the transformer will generally consist of waterproof lead-covered cable, provision is made in the outboard portion of the housing for enclosing a standard end bell, corresponding to the circuit voltage.

Ample clearance is provided in the housing. The transformers receive standard high potential test with housings in position and without any taping or other insulation on the bushings. The use of these transformers is only limited, as regards voltage, by the voltage limits of the underground cable.

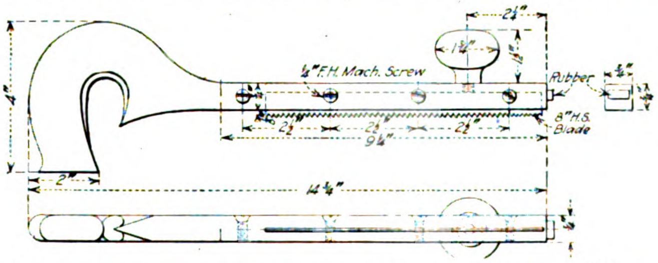
Hand Saw for Mica Undercutting

IN THE shops of the Wilkes-Barre & Hazleton Railway and the Lehigh Traction Company, Hazleton, Pa., the majority of the mica undercutting on the armatures is done by hand. For this work a special saw has been made under the direction of James W. Brown, superintendent of shops.



THIS ALUMINUM FRAME WITH ORDINARY HACKSAW BLADE MAKES A LIGHT AND EFFICIENT SAW FOR MICA UNDERCUTTING

The main body of the saw frame consists of an aluminum handle, made in a local foundry, according to specifications furnished by the railway company. As is clearly shown by the accompanying drawing, only one-half of the blade arm is aluminum. The other half is made of brass, primarily with the idea that the thread for the screws would hold better in brass than in aluminum. An ordinary 8-in. hacksaw blade is used and is clamped in position by means of four screws which pass through the aluminum side of the frame and are threaded into the brass side. These screws do not pass through the saw blade, so the latter is readily adjustable for depth of undercutting by loosening the screws. A piece of hard rubber is set into the end of the saw, so that the striking of the saw at the end of the slot will neither be annoying nor harmful. The knob handle on the top of the saw is from a controller handle.



CONSTRUCTION DETAILS OF HAND SAW FOR UNDERCUTTING MICA

Letters to the Editors

Engineering Organizations to Be Listed

DEPARTMENT OF COMMERCE, BUREAU OF STANDARDS,
WASHINGTON, D. C., July 16, 1920.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for July 10 you call attention to the need for a handbook of technical and allied organizations. The Bureau of Standards has long recognized this need and has in an advanced state of preparation a bureau report that will list about 150 technical and commercial organizations either actually engaged in or interested in engineering standardization. It is believed that this report will fill the need, felt by many engineers, for an authoritative and up-to-date list of organizations, giving their purpose, their membership, extracts from their constitutions and addresses of their secretary. It is hoped to publish the report in the near future and to make revisions as needed.

F. C. BROWN.

Interurbans Also Have Problems

THE WINONA INTERURBAN RAILWAY COMPANY
WARSAW, IND., July 21, 1920.

To the Editors:

I have your inquiry concerning the rumor that part of the Winona lines between Warsaw and Peru is to be abandoned, but this rumor is without foundation.

Our situation is very much like that of other traction companies in that we are headed for the readjustment rocks as fast as we can go. If a favorable solution of the problem is not reached in a short while there is no question but that a large number of interurban lines will receive through tickets for the junk heap.

As I view the matter, the interurban industry has been swallowed up and lost in the general discussion of the traction problem. In these days the public thinks of the traction problem as a situation having to do with the street railway industry of our larger cities and but little attention is paid to the problems confronting miles and miles of interurban roads connecting thousands upon thousands of cities, villages and hamlets.

It would seem to me that city street car service and interurban service are entirely different operations and should therefore be treated as separate industries. Street railway problems are purely local and each city line is confronted with operating conditions which are substantially different from those of a city line in another city. An interurban property performs an entirely different service. Its traffic, instead of moving between city blocks, moves between cities, and is therefore not governed by the policies of street railway operation. Interurbans perform practically the same service as steam railroads.

I notice that the JOURNAL of July 10 contains very little if any reference to interurban lines. The discussion is almost entirely directed toward city operation. Please refer to the articles, written by Messrs. Pardee, Dana, Rawson, Higgins and others to see my point.

Why not have some discussion on the interurban situation, entirely independent of the street car mess? Why should we allow the local problems confronting Toledo, Cleveland and other cities to permeate the entire industry, and in particular to be made a factor in the discussion of the interurban situation.

I like the sentiment expressed in your editorial "What We Are Going to Do." If we handle our end of the problem the public will do the right thing.

J. C. SCHADE,
General Manager.

[Some of the articles in the issue of July 10 referred to interurban problems. That of Mr. Lewis, for example, was almost entirely on this subject. But we invite further contributions on ways by which their peculiar problems may be solved.—EDITORS.]

Locomotives for Gothard Line

OERLIKON, PRÈS ZURICH, July 8, 1920.

To the Editors:

The United States consular report by Trade Commissioner Groves on Swiss railway electrification, mentioned on page 1159 of your issue for June 5, contains an error where it says that "the locomotives for the Erstfeld-Bellinzona line are being built by Brown, Boveri & Company of Baden." This is not true, as all of the locomotives for the freight trains on order for the Gothard line, which practically consists of the Erstfeld-Bellinzona line, are being built and have in part already been delivered by our own firm and the Swiss Locomotive Works of Winterthur, the two firms dividing the work among themselves somewhat the same way as the Westinghouse company and the Baldwin Locomotive Works in your country divide the work on the construction of Westinghouse-Baldwin locomotives.

Furthermore, the Brown, Boveri locomotives are not being built by that firm alone, but jointly with the Swiss Locomotive Works. Will you kindly correct your note in one of your early issues.

ATELIERS DE CONSTRUCTION OERLIKON.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Representative at Traffic Officers' Convention

THE American Electric Railway Association will be represented at the meeting in San Francisco on Aug. 23-27 of the National Traffic Officers' Association. W. H. Maltbie of the United Railways & Electric Company of Baltimore, a member of the association's committee on code of traffic principles, will be the association's representative at the meeting, at which he will present an address on traffic regulation from the standpoint of the electric railways. Mr. Maltbie, among other things, will advocate the adoption of the principle that street cars are entitled to the right of way on their tracks.

The Traffic Officers' Association is an organization of the traffic officers of the police departments in the different cities, and one of the principal objects of the convention is to frame a model motor vehicle act to be placed before the various state legislatures and the provinces of Canada. Electric railway companies which are especially interested in this subject could well send representatives to this convention.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION

PERSONAL MENTION

Service at Cost Urged

New York Commissioner Recommends Flexible Rate Plan for City Lines —Sees Fare Reduction

Adoption of a cost-of-service plan on the traction lines of New York City was urged in a statement issued on July 25 by Public Service Commissioner Lewis Nixon of the First District. Commissioner Nixon declared that, in his opinion, the making of service-at-cost agreements with the various operating companies would result in an ultimate reduction in fare.

Commissioner Nixon issued his statement in the expectation that several railways would shortly apply to the Public Service Commission for fare increase under the decision of the Court of Appeals confirming the commission's power to raise fares under certain conditions. Mr. Nixon outlined a tentative program for the New York City lines as follows:

> Each of the present railroad systems to be simplified by the consolidation or merger of its constituent companies into one railroad corporation, and, if possible, a unified control of all systems brought about.
>
> All holding companies (not railroad companies) should be abolished.
>
> Perpetual franchises to be surrendered and to be replaced by terminable or indeterminate franchises.
>
> All leases and underlying contracts to be terminated.
>
> The city to have the option of acquiring the properties at an agreed valuation. If the city so elect, the purchase price may be amortized out of earnings.
>
> A flexible fare to be provided, automatically adjusted to meet the cost of service. The cost of service should be so fixed as to cover reasonable return on values, the rates paid on such investment to be those warranted by fixed rather than speculative return.
>
> FAIR RETURN URGED
>
> A standard of service of car-mile per revenue passenger to be fixed arbitrarily for six months between certain limits. During such time careful investigation should fix such limits definitely.
>
> Recommendations covering the purchase of new equipment and the putting into effect of service to secure greater efficiency shall be submitted.
>
> The investment which is entitled to return shall be determined by a committee of three to be named by the Court of Appeals, if it can so act, of which one member, however, shall be nominated to the court by the city.
>
> The cost of service fare shoud yield a fair and adequate return upon the cost of capital actually invested in the plants, and this does not mean the cost of reproduction nor the carrying of obsolete, worn-out or dead equipment or facilities.
>
> Outstanding bond and other capital issues must be weighed with full history of their issuance, the prices received for the same and the disposition of the proceeds.
>
> All superseded property cannot be considered in an estimate, but due consideration as to posibilities to amortize such property out of returns shall be given, and if the committee should conclude that any such property is a proper charge to be included in the cost of property entitled to a return, it shall be added or carried in a suspense account and charged to operating expense over a term of years. . . .
>
> A system of accounting based upon that of the Interstate Commerce Commission, modified to suit the requirements of the local situation, is to be established. The standard of service, of course, must be maintained.
>
> The investment account, once determined and approved, is to be increased or decreased only with the approval of the Public Service Commission.
>
> REPLACEMENT FUND PROPOSED
>
> There shall be established a renewal and replacement reserve, maintained by the payment thereto of a certain percentage of the investment in depreciable property, and an injuries and damage reserve, maintained through credits and charged to operating expense.
>
> State and city taxes to be considered as a part of the cost of service; the federal income tax, however, to be a matter for separate adjustment.
>
> The flexible fare control fund shall be formed by crediting to it returns in excess of the cost of service. This fund to have an upper and lower limit controlling the decrease respectively in fares.

Railway Helps in Housing Inquiry

The Kansas City (Mo.) Railways is co-operating with the Chamber of Commerce in an investigation of the housing problem. The industrial department of the chamber has conducted a preliminary investigation, responsive to statements that demand for houses was far beyond the supply. Less than 10 per cent of industrial establishments to which questionnaires were sent returned answers indicating the need of houses, for rent or purchase, by their employees. On the face of these partial returns, the housing situation does not appear to be serious. Still it is known that several large employers have kept men constantly busy looking for living quarters for employees. The difficulty of securing co-operation in the inquiry, from the many industrial plants, has caused the industrial committee to look to the Kansas City Railways for more definite data.

The general situation is somewhat confused by the inclination of workers who have lived in Kansas City several years to declare their need for residences, such need being a desire for better homes than they have been occupying. The railway, however, is constantly employing men who have not previously lived in Kansas City; and many of these are unable to find homes to which to bring their families from other towns, or from the farms. The railway is therefore inquiring into the need for homes for its employees, the kind of homes desired, and the availability of such homes. This report, when completed, will be the basis of further action by the Chamber of Commerce. Tentative plans are now being made definite, for organizing and financing a housing corporation on such scale and with such program of building as may be necessary in the light of the further data soon to be at command.

Will Accept Award

Bay State Officials and Carmen to Abide by Findings of Arbitration Board

Acceptance of findings of the arbitration board which is considering the demands of the employees of the Eastern Massachusetts Street Railway, Boston, Mass., has been promised by Homer Loring, chairman of the public trustees of the company, and James H. Vahey, counsel for the company. Mr. Loring and Mr. Vahey have advised Chairman Ogden of the arbitration board of their intention of abiding by the board's decision.

The company has defaulted with regard to the payment of interest on bonds to the extent of $725,604 for the year ended June 1, 1920, and $2,014,225 on the payment of dividends, Mr. Loring told Chairman Ogden. Under a moratorium clause of the mortgage, unpaid bond interest to the extent of $461,625 and a penalty of $92,325 must be paid before Dec. 30 of this year or the bonds defaulted.

SUPERVISORY FORCE REDUCED

The witness testified that $500,000 was expended by the road last winter in fighting snow and ice, $326,000 of which was spent in February. He said that a saving of $196,310 was effected by the road during the year ended May 1, 1920, by reducing the supervisory force from 925 employees to 700 and a saving of $34,900 was made by cutting down the salaries of the executives. He said that every time the fare has been increased, no matter how slight, there has been a reduction in traffic.

Mr. Loring said that the State of Massachusetts "has made a mistake almost approaching a calamity" in allowing street railway lines to close down, and he pointed out that while millions of State money have been spent to make good roads, the railroads, the carriers of the working people, have been allowed to deteriorate and to be abandoned.

151 MILES DISCONTINUED

Mr. Loring said that since the receivership went into effect, in 1918, 151 miles of lines have been discontinued out of a system of approximately 900 miles. Many lines were continued for months with the company taking substantial losses in the effort to maintain service for the public, but when the equipment became useless through wear, the lines were finally dropped instead of built up, because the company's treasury could not stand the burden.

P. R. T. Men Patient

Employees Postpone Wage Advance Until Company Secures More Revenue Through Fare Readjustment

Confidence in President Thomas E. Mitten of the Philadelphia Rapid Transit Company was expressed by representatives of all employees of the company by the casting of a unanimous vote to wait until the company's revenue increases in volume to the amount necessary to pay increased wages which became effective May 16 and June 1, 1920. The unanimous vote of confidence cast by the 250 employees' representatives was indorsed by their fellow-employees when they made known their decision upon their return to the company's shops, carhouses and offices.

T. E. MITTEN expressed his appreciation of the result accomplished by the co-operative committeemen and those whom they represented. The action of the convention followed an address by Mr. Mitten in which he reviewed the agreement between the company and the men, by which the wages paid in Philadelphia are determined by the average maximum wage of four cities: Chicago, Cleveland, Detroit, Buffalo. Mr. Mitten said, in part:

> The wage established by the average paid in these four cities up to May 1, 1920, produced a maximum rate of 65 cents an hour for trainmen in Philadelphia; wages in other departments adjusted in a similar ratio.
>
> On May 16, 1920, Detroit increased its maximum wage for trainmen from 60 cents to 75 cents an hour.
>
> Chicago, on June 1, 1920, increased the maximum rates for the trainmen from 65 cents to 80 cents an hour.
>
> Chicago actually began giving the men the increased wage on July 15 and expects to pay the amount due for high wages for the period between June 1 and July 15 by installments.
>
> In the early experience, under the co-operative plan, in 1913, the company's earnings fell off in such large volume that the 22 per cent fund, which then controlled the wages paid to the men, was insufficient to support the maximum rate per hour then established.
>
> ### Company Goes More Than Half Way
>
> The company, however, did not reduce the wages because of the deficit in the 22 per cent fund, but for more than two years paid out more money in wages than the 22 per cent fund produced.
>
> The time is now here when the men have an opportunity to reciprocate. The company, in paying the 65 per cent rate, anticipated increased receipts from the tariff filed with the Public Service Commission.
>
> The wage scale established on the 65-cent basis represents an increase above the 58-cent rate of $2,100,000 annually.
>
> The new rate established by the latest increase at Detroit and Chicago will produce a maximum rate of 72½ cents an hour for trainmen with wages of other departments adjusted proportionately. This represents another increase in wages of approximately $2,250,000 annually, making a total of $4,350,000 increased wages accomplished in 1920 by applying the average of the four cities on the basis of wage adjustment in Philadelphia.
>
> ### Higher Fares Must Precede Wage Rise
>
> The company cannot pay this further increase to the men until the Public Service Commission permits the collection of such additional revenue from the passengers as will make the payment of this larger wage possible. I, therefore, submit for your consideration the following plan:
>
> (a) That the wages based on the 65-cent rate at the present time being paid should not now be disturbed.
>
> (b) That as soon as the increased revenues received by the company permit the new rate based on the 72½ cent rate should be made effective and paid to the men from the date forward.
>
> (c) That the wages shall at that time be made retroactive to the dates upon which Detroit and Chicago advances were effected: May 16 and June 1, 1920. That the amount due to each man from the advanced wage from May 16 to June 1 paid to the date upon which the payment at the new rate is begun in Philadelphia shall be credited to his account and the sum total paid over to each employee as quickly as the increased earnings will permit.

Indorsement of the action of the representatives has been filed by the employees in every branch of the service and letters received by the management explicitly state:

> We will stand back of President Mitten to a man in anything he does in connection with the management of the Philadelphia Rapid Transit Company, knowing full well from past experience that our cause is in good hands, and we approve this action of our representatives with three hearty cheers and best wishes for his success in all his undertakings.

The action of the P. R. T. men is hailed by the Philadelphia *Public Ledger* as indicating a new spirit of co-operation between management and labor. In a long editorial dealing with the P. R. T. case the *Ledger* said:

> It is an astounding situation. We have all known vaguely that Mr. Mitten has had extraordinary success in dealing with his men. And there is no more important factor in the success of any enterprise involving a large labor problem today. But it will come as a cheering surprise to the people of Philadelphia that Mr. Mitten cannot only get the hearty and efficient co-operation of his men when he is raising their wages and meeting their demands, but that he can carry them with him to a man even in this grinding era of high prices when he asks of them that they keep on working at lower wages and permit him to put off an already pledged increase of pay. That is surely the record. If any other great executive has been able to do this, we have not heard of it.
>
> The men voted confidence in Mitten and paid for the privilege of doing it. Only a record of just dealing, sympathetic treatment and faithful adherence to promises can have won so complete a trust. We stress this point, for it is of vital importance in this period of labor unrest and the unmeasured mischief which flows from it, that Philadelphians should appreciate how valuable an asset they possess in a manager of their most important public utility who can establish and maintain such relations with his men. A similar *entente cordiale* between other executives and their employees would save this nation a pile of money, a vast amount of worry and an industrial and transportation disorganization which does much to keep up the high cost of living.

Commenting in similar vein upon the stand taken by the men, the Philadelphia *Evening Star* said on July 26:

> It shows that "Tom" Mitten has won and enjoys the genuine confidence of his men and that they trust him. It shows that Mr. Mitten is a phenomenal manager of labor, since he has won such confidence, and it shows that under the co-operative scheme which Mr. Mitten devised and set up the personnel of the P. R. T. employees has reached a very high standard, for unless the men of the company were of a high standard they would not be equal to this very expressive and potent "gesture," as our friends in diplomacy would call it.
>
> This emphasizes once more what we have often commented upon, that the Mitten management has shown the way to gain real co-operation between employer and employed. While strikes and conflicts are the order of the day and employers and employed almost everywhere are bickering, the employees of the P. R. T. to a man and by the motion of one of them, which received more seconders than could be recorded, decided upon this self-sacrifice in order to support the man at the head of the company.
>
> There is a good augury in this. It shows what may be accomplished by fair and decent treatment of employees and what support employees will give their chiefs when they know their chiefs mean well by them. Unrest and revolution may rear their ugly heads where they will, we have still the instance of this noble act and we see from it that the American workingman is still a man and an American in all respects and that he quickly responds to fair and decent treatment.

Des Moines Outlook Clears

Council Plans Valuation of Railway System, with View to Higher Fare—Sliding Scale Proposed

The first definite step looking to a solution of the traction muddle in Des Moines, Iowa, was taken last week when the City Council of Des Moines took steps to employ an expert to determine the true valuation of the plant of the Des Moines City Railway and to report back to the Council. In introducing the resolution in the Council for the employment of an engineer, Commissioner Budd stated this was the first step in a movement which he would foster toward a sliding scale of fares. The resolution was unanimously adopted and steps will be taken at once looking to the retention of an expert.

Differ on Valuation

Later in the week the Council called into consultation Max Toltz of the firm of Toltz, King & Day of St. Paul, and discussed with him the plan of trying to arrive at a fair valuation of the plant. At the present time there is a difference of $2,500,000 in the valuation claimed by the Des Moines City Railway and that placed on it by H. W. Byers, special counsel for the city of Des Moines in its statement with the public service corporations. Mr. Toltz, in his conference with the Council, advised that such an investigation as the Council desired would cost the city at least $10,000 and would extend over a period of two months at least.

Neither the Des Moines City Railway nor the citizens' public service committee, which recently made an investigation of the local railway question, were represented at the meeting of the Council. Scott Goodrell, city traction supervisor, told the Council that at the present time the city is getting as good railway car service as the revenues of the company will permit. He stated that the only way to improve service in Des Moines is to grant an increased fare.

Extra Service Opposed

Mr. Goodrell opposed the idea that additional cars put in service would mean additional revenues for the company and called attention to the fact that a definite test of this plan had been made a few months ago on one of the lines of the city and resulted in a loss of $10 a day upon the extra cars put into service. Mr. Goodrell estimated the cost of operating a car eighteen hours a day as $53.64. The

company is now operating under the direction of Judge Martin J. Wade of the Federal Court. Approximately two years ago a receivership was declared. F. C. Chambers, now general manager, and Homer K. Miller are the receivers in charge of the company.

Four years ago the company was granted a twenty-five-year franchise calling for six tickets for a quarter. During the war period the City Council allowed the company to charge a straight 5-cent fare. A year ago a special election was called on a proposition to increase the fare to 6 cents, but the measure was defeated, largely through disagreements between the union of electric railway employees and other unions of the city. Last fall Judge Wade allowed the company to make material cuts in the off-hour service, although rush-hour service is maintained at former standards.

San Diego Employees Insured

Employees of the San Diego (Cal.) Electric Railway share in a life, health and accident insurance plan started recently by the Spreckels companies in San Diego and San Francisco. Both life insurance and the pensions are given without cost to the employees. The health and accident insurance is furnished through the newly organized Spreckels Employees' Mutual Benefit Association. Each member allows the company to retain 50 cents a month out of his pay, and a like amount is contributed by the company to a fund which is to provide free medical attention to the employees and members of their families, and an income of half their regular wage for a period of not more than twenty-four weeks in cases of sickness or accident not covered by the state industrial insurance. Hospital service is allowed in exceptional cases or where it is necessary to operate immediately, or where a member is living alone.

The insurance plan is based on length of service and provides the following payments to beneficiaries:

Over sixty days but less than six months, $150.
Over six months but less than nine months, $175.
Nine months but less than one year, $200.
One year but less than two years, $250.
Two years but less than three years, $300
Three years but less than four years, $400.
Four years but less than five years, $500
Five years but less than six years, $600.
Six years but less than seven years, $700
Seven years but less than eight years, $800.
Eight years but less than nine years, $900.
Nine years and over, $1,000.

J. A. Moon, assistant to Traffic Manager M. J. Perrin, is the electric railway employees' representative on the board of directors of the Employees' Mutual Benefit Association. He holds the position of assistant treasurer. Other members are: H. P. Wellman, chairman, San Francisco; W. G. Blackie, treasurer, San Francisco; Walter Ramage, secretary, San Francisco; F. E. Miles, auditor, San Francisco; W. A. Turquand, vice-chairman, Hotel del Coronado; C. A. McGrew, assistant secretary, San Diego Union; H. D. Huff, assistant auditor, San Diego.

Mayor Urges Sympathetic Attitude

Norfolk Executive Pleads for Co-operation Between Municipalities and Utilities—Sees City Ownership a Failure

Pleading for closer co-operation between public utilities and the communities which they serve, Mayor Albert L. Roper of Norfolk, Va., in addressing the convention of the Southern Gas Association in that city recently, appealed for a more sympathetic attitude toward public service corporations. Mayor Roper laid especial emphasis upon the fact that adequate transportation is essential to every city and town. He deprecated the "short-sighted, penny-wise and pound-foolish policy" adopted by many city councils whereby railway systems are starved to death at the expense of the community. Mayor Roper stated that if he had his way he "would prop up every public utility on its last legs and keep it going through times of stress and tribulation." The expression of Mayor Roper's views is of especial significance because of the action recently taken by the city authorities with regard to the local lines of the Virginia Railway, Light & Power Company. Under his direction the city of Norfolk has entered upon a valuation of the company's property for the purpose of fixing a fair return on the capital invested. The matter of a just return for gas has already been agreed upon.

MUNICIPAL ownership is a failure, according to the Mayor. He also regards the idea of a fixed fare as "just as idiotic as to say that potatoes shall always sell for 40 cents a peck, regardless of what it costs to produce them." He believes that every utility is entitled to a rate sufficient to take care of fixed charges and operating expenses and, in addition, to a fair return on the investment. Mayor Roper said, in part:

In welcoming to Norfolk an organization such as this, I do not feel that I am welcoming to the city a set of men who are engaged in a private industry. As a matter of fact, you are a part of the greatest fabric of civilization in this country. Manufacturers of gas are to be placed, of course, in the same rule as the men who furnish us transportation. We have had a great deal of misunderstanding about the public utility people. I speak with a great deal of sympathy for the gas men, as I do with a great deal of sympathy for the seller of transportation, because I believe that he has been misunderstood. For years it was the outdoor sport of some of the politicians of this city to do every conceivable thing they could to block the game of the public utilities of the city. It made no difference what was the virtue of the proposition which was being put forward by the public utilities. Because it was desired by the public utilities, it was wrong. As a matter of fact, these bickerings went on to such an extent that there was no possibility of getting through the Council anything resembling a fair settlement of the difficulties and differences between the city and the public utilities.

You can readily understand what a short-sighted, penny-wise and pound-foolish policy that is. It was due to a very large extent to the public utilities; it was due to an equally large extent to the municipal authorities; both were wrong. They were wrong simply because the public utility man went at his game from the standpoint of the return on the dollar invested. The only apparent idea for the operation and perfection of their plant was that they must get the largest possible return from their invested capital. I say they were wrong in that. The municipalities were wrong, on the other hand, in that they felt that the public utilities should conduct a philanthropic enterprise, losing sight of their invested capital, and give service regardless of the cost. These opposing views are the cause of the clash all over the United States and all over the world, and are responsible for the difficulty through which certain classes of public utilities are passing today.

DEPRECATE MUNICIPAL OWNERSHIP

One of the remedies suggested for the evil was public ownership of the public utilities. Personally, I do believe, except in a very modified degree, in public ownership of public utilities. I may go so far as to say that so far as our national Government is concerned, I think the sooner they let go of some of the things they are trying to do at the present, the better business is going to be and the more promptly we are going to get back to that normal to which all of us fondly look.

This whole proposition seems to me a very simple matter. I can see no difference between the man who sells potatoes and the man who sells service, whether it be gas, electricity or transportation. The man who sells potatoes takes into consideration the amount of money he has invested in his establishment, the cost of producing those potatoes, his loss on the potatoes that spoil, and his overhead operating expenses, adding to that a certain amount agreed upon as profit. . . .

FIXED FARE CONDEMNED

The idea of a fixed price or unit for the sale of transportation, to me, is just as idiotic as to say that potatoes shall always sell for 40 cents a peck, regardless of what it costs to produce them. Therefore, I am in favor of that attitude toward the public utility by a municipality, which shall provide a revenue to the public utility sufficient to take care of the invested capital, depreciation, the overhead costs, and, on top of that, a fair return on the investment. The fare may be 5 cents a unit of travel today, may be 6 cents tomorrow, it may be 10 cents six months from now, and a year from now it may be 4½ cents. But whatever it is, the man who invests his money in service, whatever type the service may be, is entitled to a fair return upon his investment over and above what it costs him to produce that service, just as truly as the man who buys trees, cuts them and makes them into hewed lumber and sells them is entitled to a fair return. . . .

The whole thing comes back to this: That the municipality has a right to expect all the service that the public utilites can furnish consistent with their operating costs and a fair return. The public utility, on the other hand, has no right to expect a larger return for its investment than is consistent with the service it renders. Do not look at the one and not look at the other; there is a mutual relation. It is this co-ordination of interest which brings about and is going to bring about that condition of affairs in our economic world, so far as you gentlemen are concerned, which you desire and which, I believe, any self-respecting community is going to desire. . . .

CITY HURT BY BANKRUPT UTILITY

People have said to me, "Let the old traction company go hang, it would be a good thing if it did go into bankruptcy." My reply was, "I don't know what the effect on it will be by being bankrupt, but God knows I don't want it to go into bankruptcy from the standpoint of the city of Norfolk."

I trembled to think what would happen, what would be the confusion, what would be the interruption to business, if our public utilities were put into bankruptcy. The first step taken when a receivership occurs would be that the non-profitable, non-paying lines would be stopped, and our suburbs would be without transportation. The only things that operate under receivership conditions are the short hauls, where lines can make money easily, and no receiver is going to do anything solely for the municipality, as his business is to develop, to demonstrate what he can do with the lines. Do not talk to me about this business of bankruptcy for public utilities. If I had my way, I would prop up every one I saw on its last legs and keep it going through times of stress and tribulation, in order that the time might come in the development of such enterprises when it could live on the substance furnished it.

Toledo Vote Enjoined

Judge Killits Enjoins Submission of City Bond Plan to Voters—Measures Held Illegal—Doherty Accepts Service-at-Cost

There will be no referendum on the twin bond ordinances designed to acquire and construct a municipally owned transportation system for Toledo, Ohio, as scheduled for the primary election on Aug. 10. Judge Killits, of the Federal Court, upon hearing of the arguments on dismissal of the injunction suit brought by the Toledo Traction, Light & Power Company against the county election board, granted the injunction on July 24. As an evidence of good faith and at what was claimed to be a real sacrifice, Henry L. Doherty, as chairman of the board of the Toledo Railways & Light Company, pledged the company's acceptance of the Milner cost-of-service franchise ordinance with the valuation of $8,000,000 as finally fixed by the commission and sent to Council by Judge Killits.

MR. DOHERTY took care not to admit that this was the true valuation of the traction property but said that in the interest of a quick settlement and to stop "inflammatory talk," he would agree to accept the $8,000,000 figure as a compromise. This turn of affairs makes it impossible for the two plans to come up at the November elections.

BOND PLAN HELD ILLEGAL

The contention of the company in the injunction suit was hinged upon the legality of the twin ordinances for bond issues aggregating $7,000,000. The city officials and counsel for the election board admitted that one section of the city charter had not been complied with in their passage through Council. The Judge, who helped to write the charter a few years ago, ruled that this particular section of the city charter was mandatory and that the ordinances were therefore illegal.

The most interesting of all of the developments in the hearing of the case came when the court attempted to find out what the mysterious "plan" of the muncipal ownership enthusiasts was. Chairman Henry Ashley, of the commission which drafted the plans; Councilman Harry Curtis, campaign manager for the bond ordinances; City Service Director David Goodwille, who headed the valuation commission, and other members of the municipal ownership commission were subpœnaed by the court to help get at the facts. Most of the city officials disclaimed any knowledge of a particular plan for the using of the money. The traction interests claimed that there was an ulterior motive in the efforts to put through the bond issues.

WOULD ABANDON MANY LINES

There are in the present system of the Toledo Railways & Light Company 116 miles of track. Chairman Ashley said his plan was to eliminate seven of the present lines and to have a system containing only sixty-five miles of track. This he admitted would deprive thousands of people of service now furnished by the Rail-Light. He said the plan for limited trackage was based upon maps showing density of population, but he would not indicate where lines would be built.

He declared that the present railway system would be dismembered through condemnation proceedings. He indicated that there were no more than sixteen miles of the present system that the commission would consider worth keeping in the municipal system.

The so-called "system" was to have a series of radial lines in the congested districts of the city carrying passengers out to the one-mile or two-mile circles, and from these points to use buses for the completion of trips. The present city is plotted in some directions out as far as the eight-mile and ten-mile circles. Mr. Ashley proposed to have a five-minute service on the railway and a ten-minute service with buses.

PLAN CALLED "FUTURISTIC"

The real purpose of the ordinances became apparent when Mr. Ashley told the court that the people had been brought up on the slogan of "millions for defense but not a cent for tribute." In 1914 the people ratified a plan to issue bonds for $8,000,000 to be pledged against the street car property. This plan was never carried out, but the ordinances still remain. It developed that the municipal ownership plan might have in it the use of $7,000,000 derived from general credit bonds, the $8,000,000 authorized to be levied upon the traction property itself, and a scheme to "extend the credit of the city without bonds" as Mr. Ashley put it.

Passage of the Milner ordinance has been urged by Judge Killits, who maintains that in enacting the measure the city would be in the position of offering a fair plan of settlement.

Five-Cent Rise in St. Louis

The Missouri Public Service Commission, sitting as a board of arbitration on the wage demands of the employees of the United Railways of St. Louis, has awarded an increase of 5 cents per hour, retroactive to June 1. There is to be no changes in hours and working conditions. This increase will make the schedule of platform wages as follows: First year men, 55 cents; second year men, 60 cents; third year men, 65 cents. Extra men are guaranteed a minimum of $100 a month provided they shall be available for service at heavy loading points for collection of tickets and issuing of transfers, when required.

The wages of other employees for whom a specific rate per hour was demanded is to be increased 5 cents per hour. The payment of back wages is to begin on Aug. 1, and the company will have to Jan. 1, 1921, to pay the back wages. Counting the present increase as 10 per cent, the increase in street car men's wages since June 1, 1918, has been slightly more than 115 per cent.

Twin City Board Reports

Arbitrators Recommend Higher Fare and Pay Increase in Minneapolis—Council Takes Action Soon

After a series of meetings lasting three weeks the arbitration board sitting at Minneapolis, Minn., has made two sets of recommendations looking to settlement of the demand for increased wages by the trainmen of the Minneapolis Street Railway. The report to the City Council recommends sanction of increases of fare from 5 cents to 7 cents, with four tickets for a quarter. The report to the company recommends increase of trainmen's wages 10 cents an hour, or to a maximum of 70 cents, the increase to be retroactive thirty days from date of sanction of an increased fare by the Council.

It was announced that an ordinance would be introduced July 30 for action by the City Council along lines indicated in the board's report. Owing to the probability of objection by the seven socialist aldermen to an immediate second reading of the ordinance draft, postponement of action until Aug. 6 is the outlook.

The increases outlined in the board's wage recommendation to the company are as follows:

First year men, 55 cents per hour; second year men, 58 cents; after two years, 60 cents. Trainmen working more than nine hours a day to be paid for each hour or part thereof over nine hours: First year, 65 cents; second year, 68 cents; after two years, 70 cents. All bonus men and extra men to be paid not less than $4.30 a day. Except in emergencies, such as cases of fire, failure of power, storms, etc., trainmen shall not be required to make additional trips unless willing to do so.

Schedules will be based as follows: 40 per cent of runs to be completed in eleven hours; 20 per cent to be completed in twelve hours; 40 per cent to be completed in thirteen and one-half hours. The company shall furnish eight-hour runs to those who wish them.

Every trainman shall be allowed vacation leave with pay at the rate of one day a month for each month of service from July 1, 1920, month by month or at one time, as desired, providing the employee has worked for the company at least one year.

Other employees working at hourly rate shall receive a 20 per cent increase.

Employees receiving yearly compensation are increased as follows: Not more than $1,800 a year, 20 per cent; not more than $2,400, 20 per cent on $1,800 and 10 per cent on all above that sum; not more than $3,600, 20 per cent on $1,800, 10 per cent on $600 and 5 per cent on remainder.

W. S. Bemis, who has been chosen to make a physical survey of the St. Paul City Railway as a basis to discover whether the company is entitled to an increase in fare from 5 cents upon improving the service as ordered by the Council ordinance, has taken the preliminary figures to Chicago for consultation with E. W. Bemis, who is the expert employed for this valuation.

Meanwhile trainmen of the Twin City Rapid Transit Company are holding in abeyance their strike order dependent on prompt action by the Council of the two cities.

Buffalo Strike Averted

Intervention by Governor Postpones Threatened Walk-out—State Board to Pass on Demands

Danger of an immediate strike of platform men on the local and interurban lines of the International Railway, Buffalo, N. Y., has been averted by Gov. Alfred E. Smith, who has ordered an investigation into the financial affairs of the company by the State Labor Board. The first session of the board was held in Buffalo on July 29.

Although the stage had been set for a strike because of the failure of the arbitrators elected by the men and the company to agree upon an umpire to settle the wage question and other grievances after almost two months, officers of the Amalgamated Association refused to call the walkout. "By striking we would be playing into the hands of the company, which favors a strike to break the union and establish an open shop," said William B. Fitzgerald, international organizer of the Amalgamated.

SETTLEMENT IN SIGHT

The intervention of the State Labor Board in the dispute has had a soothing effect upon the situation with the result that it now is believed the two arbitrators can get together and agree upon an umpire. President Herbert G. Tulley of the International has withdrawn his demand that only a member of the Public Service Commission should serve as umpire.

The State Public Service Commission in a decision handed down by Chairman Charles B. Hill holds that it is without authority to intervene in the situation and no member or official of the commission could sit as umpire in the arbitration proceedings. President Tulley contended that any increase in wages granted the employees by the arbitrators should be passed along to the car riders in the form of increased fares because the additional revenue received from the 7-cent fare already is being paid to the employees in higher wages. By voting to increase the wages of the company's employees, President Tulley believes that an official of the Public Service Commission sitting as umpire in the arbitration proceedings would be in a position to know the company's financial condition and to give relief by having the commission grant another fare increase.

RAILWAY'S FINANCIAL NEEDS

A review of the financial condition of the International by the State Labor Board is expected to bring about the report that the company is not in a position to grant additional wage increases at this time. The report of the board would be used by the company in making its application to the Public Service Commission for another fare increase, to which the municipal authorities say they will enter vigorous objections because of the company's failure to enter into negotiations with the City Council for a service-at-cost agreement proposed by Mayor George S. Buck some time ago.

CLOSED SHOP AN ISSUE

The great question in dispute between the union platform employees and the railway is the "open shop." The company insists that it will never again sign a contract with the Amalgamated. The present contract expired May 1. President Tulley has told the men he will insist upon the open shop principle hereafter. The union originally demanded a wage increase for platform men from 48 to 88 cents an hour. The company immediately raised the men to 60 cents an hour, an increase of 12 cents an hour. The union asked for an eight-hour day, but the company said no concession in hours could be granted. President Tulley has agreed, however, that if the men in the shops, carhouses and power houses express a desire for an eight-hour day after the wage question is settled, that provision can be written into the contract.

Mr. Tulley on July 29 addressed to Lieutenant-Governor Walker, chairman of the State Labor Board, a letter outlining the company's position. Mr. Tulley stated that "the company is desirous of establishing more direct contact with its men, and will enter into no further contract which does not recognize and assure uninterrupted continuance of the open-shop principle."

Labor Poll Concluded

United States Chamber of Commerce Members Vote Against Public Utility Strikes

The members of the Chamber of Commerce of the United States have voted almost unanimously against strikes being permitted on public utilities. It will be remembered that last month the chamber decided to take a referendum on two questions relating to anti-strike legislation for public utilities. These questions, which were published on page 1268 of the issue of this paper for June 19, follow:

(1) Should strikes by employees of all public service corporations performing public service essential to the lives, health, security, comfort and well being of the people by law be explicitly enjoined?

(2) Should suitable tribunals be created by law to adjudicate differences between the employees of public service corporations and their employers, and the decisions of such tribunals be final and binding upon both parties?

On the first question the vote was: for, 1564; against, 97.

On the second question the vote was: for, 1571; against, 100.

In addition to this referendum, one was conducted at the same time on industrial relations in general, including the right of open shop operation and the right of employers and employees to deal directly with each other without participation by outside interests. There were in all twelve questions in this referendum, and the vote gave overwhelming approval among other things, to the open shop, to the right for direct dealing, and to condemnation of a restriction of productive effort or output.

Wage Increase Refused

Ohio Electric Unable Further to Raise Carmen's Pay — Men Asked Closed Shop Policy

The Ohio Electric Railway, Springfield, Ohio, on July 24 returned to its motormen and conductors, unsigned, a new contract which the latter had presented a few days previously. J. H. McClure, vice-president of the company, in a letter to the men, said the company is not now in financial condition to grant an increase in wages and called attention to the fact that increases had been denied on several of the company's city lines. The only place where an increase has been given was on the Zanesville line, and this was only a slight advance.

The company is now confronted with the question of a source of sufficient revenue to pay operating expenses and taxes and to maintain the property in proper physical condition for safe operation, he said, and he suggested that the present agreement be continued until at least some of these difficulties are out of the way.

MEN ASKED CLOSED SHOP

Demands made by the men include an agreement on the part of the company to meet and treat with accredited officers and committees of the union on all grievances; to refuse, after a thirty days' trial, to retain any one in its employ who proves unsatisfactory to the union; to employ only members of the union and to see that those applying for positions shall first secure permission of at least two members of the executive committee. This would mean a closed shop contract.

The proposed contract provided that the workday be figured on a ten-hour basis, all runs to pay for ten hours and all time over ten hours to be paid for at the rate of time and one-half. The wage scale demanded was as follows: For the first three months, 75 cents an hour; for the next nine months, 77 cents an hour; for one year and thereafter, 80 cents; freight helpers, 55 cents and an additional 10 cents an hour for freight train crews. The men now receive from 41 to 50 cents per hour on the interurban lines and 38 to 47 cents on city lines.

In addition the men asked for free annual transportation books for employees on city and interurban lines, trip passes for members of their families on request and a vacation on pay for fifteen days at least once a year.

Increases in Wages in Oakland

The San Francisco-Oakland Terminal Railways, Oakland, Cal., has increased the pay of its city trainmen as follows:

	Old Rate, Cents	New Rate, Cents
First three months..........	48	52
Next nine months............	52	55
Second year and thereafter....	54	59

On the interurbans the increases were:

	Old Rate, Cents	New Rate, Cents
First three months..........	50	54
Next nine months............	53	57
Second year and thereafter...	55	61

Gas Situation Critical

Leading Official of New York Company Summarizes Situation in Statement —Coal Question Grave

The situation of the gas companies, as many readers of this paper know, is somewhat like that of the electric railways. They are faced with largely increased expenses for coal and other materials essential in the manufacture of gas, with consequent need for corresponding rates. George B. Cortelyou, president of the Consolidated Gas Company of New York, recently summed up the situation in the following words:

> The emergency is immediate and far reaching. It embraces the entire industry. The economic conditions—many of them of world-wide extent and influence—affecting the supply of coal, oil and other essential materials required in the manufacture of gas, of labor and of the funds needed to maintain and develop our properties are not bogies invented by the industry to secure preferential treatment, excessive rates or unwarranted returns upon investment. They are plain facts.
>
> All over this land today gas companies, great and small, are rendering, often under most adverse conditions, this service so vital to the welfare and comfort of our people. What they need and should have, in the interest of the public, is the reasonable certainty of adequate rates, a sufficient supply of coal, oil and other necessary supplies and such manufacturing and operating conditions as will utilize and conserve these materials as well as contribute to all other possible economies of production and distribution.

Joliet Increase Accepted

The Chicago & Joliet Electric Railway, Joliet, Ill., effected a settlement with its car and shop men on July 1 on the basis of the original offer of the company, the wage scale per hour being as follows:

Main line, interurban division	65 cents
Lyons, Lockport & Dellwood Park divisions of interurban line	62 cents
Joliet city lines:	
First three months	56 cents
Next nine months	58 cents
Second year and thereafter	60 cents

Nine hours will constitute a day's work, with time and one-half for overtime.

All other employees will receive corresponding increase of 10 per cent over the old scale.

At a special meeting of the men, on June 30, eighty-five voted to accept the company's proposition against fifty-six voting to reject the offer.

B. R. T. Men Ask 30 per Cent More

Demands for wage increases and improved working conditions were presented on July 28 to William S. Menden, general manager of the Brooklyn, (N. Y.) Rapid Transit Company, by a committee representing the three Brooklyn locals of the Amalgamated Association of Street and Electric Railway Employees of America. The committee, which was accompanied by P. J. Shea, International vice-president of the union, planned to submit similar demands to H. Hobart Porter, vice-president of the Brooklyn City Railroad.

The committee demanded an eight-hour day, with a limit of twelve hours for those on swing runs, and time and one-half pay for all overtime. Other demands are: For surface motormen and conductors, from 84 cents to 92 cents an hour, the present schedule being from 52 to 62 cents an hour; switchmen and car cleaners, 55 cents an hour. For Sunday and holiday work, 10 cents extra an hour. A six-day week and a twelve-hour rest period after each day's work.

For elevated conductors, 87 cents to 90 cents an hour is asked. The present rates are from 54 cents to 57 cents. For guards on the elevated and subway lines from 82 to 85 cents an hour is demanded, the present pay being from 49 to 52 cents an hour. The contract under which the men are now working will expire on Aug. 28.

News Notes

Japan Planning Electrification.—A bill has been introduced by the government in the Japanese Parliament creating the Imperial Electric Railway. The aim of the bill is to establish electric power supply for railroads and gradually to convert roads to electricity.

Arbitrators Meet at Alton.—A board of arbitration composed of L. C. Walcott, David M. Walsh and C. E. Smith met on July 21 to consider the question of the wages to be paid the trainmen of the Alton, Granite City & St. Louis Traction Company, Alton, Ill. The men, who have demanded an increase in wages, are now receiving from 46 to 51 cents an hour. The present fare in Alton is 8 cents.

Offers Fifteen per Cent Rise.—Clinton Q. Richmond, general manager of the Berkshire Street Railway, Pittsfield, Mass., has offered the employees of the road a wage increase amounting to 15 per cent. The men previously rejected an offer by the company for an advance of 10 per cent. Carmen now receive $4.50 for a nine-hour day. They ask $6.50 for an eight-hour day.

Wages Raised on Interurban.—A wage advance of 15 cents an hour has been granted the trainmen of the Rochester & Syracuse Railroad, Syracuse, N. Y. The pay of shopmen and freight handlers has also been raised. The trainmen have been receiving 47 cents an hour. They demanded 90 cents, but compromised on 62 cents. A request for an eight-hour day in place of the present ten-hour one was denied. The pay increase is retroactive to May 1.

Will Arbitrate Newport Wages.—Articles of arbitration have been signed by officials of the Eastern Massachusetts Street Railway, Boston, Mass., and representatives of the carmen of the company's Newport, R. I., division. Two members of the board of arbitration which will pass on the carmen's demands for higher wages and changes in working conditions have been named. H. Lloyd Rooney will represent the union, while Robert S. Goss of Fall River will represent the company.

Ask 75 Cents in Memphis.—A demand for an increase in wages to a scale of 75 cents an hour has been presented to T. H. Tutwiler, receiver for the Memphis (Tenn.) Street Railway by the company's employees. Under the present contract, which expires July 31, the men receive from 42 to 48 cents an hour, depending on the length of service. An important provision of this contract is that if no agreement as to the rate of pay for the ensuing year can be agreed upon by July 31 the men will remain at work, and the scale of pay, whenever it is agreed upon, will be retroactive to Aug. 10.

Improvements Wait on Wages.—Until the wage scale reaches a minimum of 52 cents an hour there will be no money spent on improvements to the system of the London (Ont.) Street Railway. The system is being operated by the Ontario Railway & Municipal Board, and the men are working for 48 cents an hour, with the understanding that when the receipts warrant it they will receive an increase in pay. Citizens are dissatisfied with the service and the cars. In regard to the latter, many are declared to be antiquated, and only a few of them are equipped with air brakes. But the men demand that they shall come first, and that all improvements must wait on the wage increase.

Tramway Carmen to Compete.—*Partners*, the magazine of the Dallas (Tex.) Railway, has been awarding $1 a month for the best true-to-life story submitted by employees. The Denver (Col.) Tramway *Bulletin* in a recent issue says that it too is interested in what the carmen do with their spare time. It will go even further than *Partners*. Two prizes of $1 each will be offered to the tramway employees. The first award will go to the contributor of the best true-to-life story and the second prize will go to the contributor of the funniest story. When possible the stories will be printed in the *Bulletin*, whether or not they are among the prize winners.

Bus Hearings Continue.—The Board of Estimate in New York City devoted last Wednesday morning to hearing arguments against a proposed general bus system. The principal spokesman was Arthur G. Peacock, counsel for the Interborough Rapid Transit Company. Others who appeared in opposition to the bus were representatives of the employees of the New York Railways and of real estate interests and tax-payers' associations. An important protest was registered by the Brooklyn Chamber of Commerce, which declared that a city-wide bus system would further complicate the existing transit difficulties and increase the discomfort of the public. During the session Mayor Hylan denied he was committed to any plan of city transportation.

Financial and Corporate

West Penn Does Well

Net Income Available for Dividends on Line in Pan Handle Increased 22 Per Cent

A remarkable increase in earnings for the year ended Dec. 31, 1919, is shown by the West Penn Railways, Pittsburgh, Pa., with a balance to surplus of $678,693 after all dividends on both preferred and common had been paid. This is an increase over 1918 of 77 per cent. Passenger revenue increased 13.7 per cent, and although the operating expenses increased 18.8 per cent, the net operating revenue is on the increase with a percentage change of 5.6 over 1918.

INCOME STATEMENT—WEST PENN RAILWAYS

Year ended Dec. 31	1919	1918	% Inc. over 1918
Total railway revenue	$10,634,611	$9,352,905	13 7
Total railway operating expenses	6,801,227	5,722,236	18.8
Net operating revenue	$3,833,384	$3,630,669	5.6
Taxes (excluding Federal income and profits tax)	357,295	269,491	32.6
Operating income	$3,476,089	$3,361,178	3.2
Non-operating income	452,256	365,296	23 8
Interest charged to improvement accounts	201,387	34,278	487.0
Gross income	$4,129,732	$3,760,752	9.8
Deductions from gross income:			
Interest on funded debt	$1,916,348	$1,708,442	12.7
Interest on floating debt	69,830	85,390	—18.2
Amortization of discounts	113,750	160,079	—28.4
Dividends paid on stocks of subsidiary companies	192,952	195,314	— 1.2
Total deductions from gross income	$2,292,880	$2,149,225	6.7
Net income	$1,836,852	$1,611,527	14.0
Federal income and excess profits taxes	192,686	263,705	—27.0
Net income available for dividends	$1,644,166	$1,347,822	22.0
Dividends paid	965,473	965,473	0.0
Balance to surplus	$678,693	$382,349	77.5

The net income available for dividends increased 22 per cent. This increase is mainly due to the interest charged to improvement accounts being increased 487 per cent and the total deductions increasing only 6.7 per cent, while the gross income increased 9.8 per cent.

NET INCOME INCREASES

The passenger revenue increased to a greater extent than the car miles or car hours. The net income increased 1.42 cents per car mile or 7.9 per cent over 1918, while it increased 16 cents per car hour, or 8.4 per cent. The operating ratio appears to be increasing instead of decreasing, the increase being slightly over 4 per cent.

The West Penn Railways and its subsidiary railways own and operate 339.25 miles of electric railways, largely interurban, in Western Pennsylvania, the Pan Handle of West Virginia and eastern Ohio. The company was created in May, 1917, by a consolidation of a company of the same name, West Penn Traction Company and a number of other affiliated street and interurban railways in Pennsylvania whose lines formed a connected system. Since the consolidation the preferred stockholders have increased from about 1,400 to 2,450.

STATISTICAL INFORMATION—WEST PENN RAILWAYS

Year ended Dec. 31	1919	1918	% Inc. over 1918
Miles of single track	339 25	339.25	0.0
Total car miles (passenger and express)	9,436,320	8,935,660	5.6
Total car hours (passenger and express)	888,919	844,226	5.3
Ratio CM to CH (speed m.p.h.)	10.6	10.58	0.2
Passenger revenue	$10,634,611	$9,352,905	13.7
Passenger revenue per mile of single track	$31,390	$27,600	13.7
Statistics, per car mile:			
Operating revenue	$1.127	$1.046	7.7
Operating expenses (cents)	72.10	64.20	12.3
Net income (cents)	19.47	18.05	7.9
Statistics, per car hour:			
Operating revenue	$11.97	$11.07	8.1
Operating expenses	$7.65	$6.78	12.8
Net income	$2.07	$1.91	8.4
Operating rates—per cent	63.8	61.2	4.2

Bay State Lines Losing

All but one of the "home rule" districts of the Eastern Massachusetts Street Railway, Boston, Mass., are falling behind, according to testimony presented by Homer Loring, chairman of the public trustees, before the board of arbitration which is hearing the demands of the system's employees for higher pay. All but Fall River have showed deficits since September, 1919, when the "home rule" plan was put in operation.

The Fall River district showed a profit between Sept. 1, 1919, and April 30, 1920, of $44,105. The deficits of the other districts for the period of "home rule" operation were enumerated as follows:

District	Deficit
Chelsea	$373,813
Lynn	138,606
Salem	199,869
Gloucester	130,589
Lowell	70,574
Lawrence	112,351
Haverhill	68,180
Hyde Park	98,838
Quincy	278,411
Brockton	135,249
Taunton	86,637
Hull-Hingham	3,507

P. R. T. Application Fails

Financial Relief Refused by Public Service Commission Pending Fixing of Valuation

The financial outlook for the Philadelphia (Pa.) Rapid Transit Company took on a graver form on July 26, when the State Public Service Commission issued a ruling suspending for the present the proposed increase in fare in the shape of a 3-cent charge for transfers on the P. R. T. lines. The commission's order is made pending an appraisal of the P. R. T.'s property. The commission's action came as a surprise, and for the present at least deprives the company of additional revenue estimated at $3,000,000 annually.

REVENUE NEEDED FOR WAGES

The company had counted upon the additional revenue to meet the higher wages which were to have been paid the employees, but which the latter recently waived following a statement by Thomas E. Mitten, president of the P. R. T., on the company's financial condition. The company had hoped to place the 3-cent exchange rate in effect on Aug. 1. As the commission will not sit again until September, there is little hope of an increase before Jan. 1.

The commission also rendered a decision in which it refused to dismiss the demurrers filed by the Northwestern Business Men's Association attacking the payment by the P. R. T. of rentals to its underlying companies. These rentals amount to $10,000,000 annually and have been the subject of much discussion between the city and the company. The decision opens the whole subject to review, although there is some doubt as to the jurisdiction of the commission. The underlying companies were given ten days in which to file an answer to the suit and a hearing was set for September. The board of directors of the P. R. T. on July 26 elected Frank Buck, a large stockholder, and W. C. Dunbar, financial vice-president of the company, directors to succeed Horatio G. Lloyd and C. W. S. Packard, resigned. The seat vacated by E. T. Stotesbury, chairman of the board, was not filled. On Wednesday and Thursday of this week Union Traction stock on the Philadelphia Exchange sold at around 23 and Philadelphia Rapid Transit stock around 13. Four weeks ago Union Traction sold around 28 and P. R. T. around 18½.

Public Service Shows Loss

Net Income for June Drops to $4,114, Reflecting Wage Increase of $150,000 a Month

In the statement filed with the State Board of Public Utility Commissioners by the Public Service Railway of New Jersey covering operation for the month of June, the effect of the voluntary wage increase recently granted the company's employees is clearly seen. Net income dropped to $4,114 as compared to $223,166 for the corresponding month of 1919. The increase in wages amounted to $150,000 for the month.

The financial statistics as compared to the corresponding month in 1919 show an encouraging increase in gross revenue, but this is more than offset by the rise in operating expenses caused by the wage increase.

The financial statement for the month follows:

June	1920	1919
Total operating revenue	$2,242,992	$2,083,349
Operating expenses and taxes	1,881,392	1,437,679
Operating income...	$361,599	$645,669
Non-operating income	67,832	5,758
Gross income	$429,431	$651,427
Fixed charges	425,317	428,281
Net income	$4,114	$223,166

The chief item of increase in the cost of operation was the wages of motormen, conductors and trainmen, which increased from $458,335 to $628,015 during the year.

Of the passenger revenue last month $2,120,736 was derived from cash fares and $68,198 from revenue transfers. During the month the company carried 30,534,512 revenue passengers and 7,075,972 transfer passengers, or a total of 37,610,484.

San Francisco Reorganization Hearing Aug. 30

The California Railroad Commission has set Aug. 30 for a hearing on the application of United Railroads, San Francisco, for approval of the reorganization plan.

Of the $23,500,000 of 4 per cent bonds of 1927, holders of $22,657,000 par value have assented to the modified plan and deposited their securities. The holders of practically all the $5,200,000 underlying bonds have also agreed to the reorganization.

The commission has had its engineers at work checking up valuations and the hearing is for the purpose of allowing objections to be made publicly if they develop.

The reorganization committee has expressed its intention of issuing the new securities in exchange for present holdings as rapidly as circumstances will permit, but this cannot be done until formal approval of the plan is granted by the commission.

It is also the intention of the committee to pay on the new 6 per cent cumulative prior preference stock dating from April 1 last. The new prior preference stock will be given to present 4 per cent bondholders to the extent of 50 per cent of par value of their holdings. On this basis, bondholders are assured of interest at 6 per cent annually on $500 par value of this stock, for every $1,000 bond now in their possession.

American Railways Reports Increase in Gross

For the fiscal year ended Dec. 31, 1919, the combined income statement of the subsidiary and affiliated companies of the American Railways, Philadelphia, Pa., showed an operating revenue of $16,312,231. Operating expenses, including a depreciation reserve, amounted to $11,240,406. The operating ratio was then 69 per cent. The net revenue was $5,071,824, and with the taxes, equal to $744,808, the operating income equaled $4,327,016. Gross income for the year was $4,365,270. After deducting interest, rentals, sinking fund and other charges the income for 1919 was $1,714,831. The American Railways is a holding company. It owns and controls forty-five railway, light, power or gas companies distributed through twelve states. Of this total number nineteen are railway or traction companies.

Sees Brighter Outlook for Utilities

Brighter prospects for the holders of electric railway and other public service securities are seen by the National City Bank, New York, N. Y., which reviews the utility situation in its July bulletin. The bank regards the present as a most opportune time to take advantage of low prices for the purchase of these securities.

In discussing the utility outlook in general and the traction outlook in particular, the bank says, in part, as follows:

> June witnessed a revival of interest in public utility issues, and new issues were promptly absorbed by discriminating investors. It has been unfortunate that the investing public has neglected public utility issues during the past year, largely as a result of the tragic position in which we find some of our major traction properties. In the traction field, however, there are many situations which merit confidence. The present census is showing an enormous increase in urban population, but during the past decade there has been little increase in traction mileage. This has resulted in a great increase in the number of passengers carried, and earnings in many cases have been adjusted to a profitable basis. Corporations furnishing power and light are enjoying unequaled prosperity. The installation of electric power in factory operations has resulted in an enormous demand on the power companies to supply current. The large central stations have demonstrated their ability to produce and distribute power at such an economical unit cost that their position is permanently assured. The increased density of population is reflected in the growing demand for light, and it has been estimated that there are now 14,000,000 homes in the United States still to be supplied with electric light. Before the war public utilities securities issued by corporations of undoubted strength, based on strong values and earning powers, could be purchased at prices to yield from 5 per cent to 5½ per cent. Today, with largely increased values and increased demand for the output, the same class of securities can be purchased at prices to yield 7 per cent to 8 per cent.

T. H., I. & E. Improves

Gross Earnings of Indiana Road 20 per Cent More Than in 1918—Traffic Increasing

For the year ended Dec. 31, 1919, the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., shows a gross earning from railway operations of $4,480,984. This was an increase of $749,677, or 20 per cent, over 1918. Operating expenses for 1919 were $3,084,392, an increase of $612,173, or 25 per cent. Net earings were $1,396,592, as compared with $1,259,067 in 1918, an increase of $137,525, or about 11 per cent. In 1918 the taxes paid were $232,536, these payments increasing to $262,476 in 1919. This was an increase of nearly 13 per cent.

The total maintenance charges for the year 1919 were $1,059,898, an increase of $349,038. Of this amount $946,122 was expended on the railway property as against $622,307 in 1918. The interurban lines carried 8,782,328 passengers, or an increase of 179,132 or 2.0 per cent over 1918. The city lines carried 16,140,623 passengers as compared with 12,984,413 passengers in 1918. This was an increase of 3,156,210 passengers, or 24.3 per cent over 1918. The company handled a total of 138,019 tons of freight and express.

The Terre Haute, Indianapolis & Eastern Traction Company has made a specialty of transporting live stock. During 1919, 1285 carloads of live stock were hauled to Indianapolis from the surrounding towns. This is an increase of 580 carloads, or 82 per cent over 1918. During 1919 a slight revision of freight rates was authorized by the Public Service Commission, which gave the company a small net increase.

The passenger rate of fare for the year was 2¾ cents a mile, but the company now has a petition pending before the Indiana Public Service Commission asking that the rate be made 3 cents a mile. In the city of Richmond, the reduced rate tickets were eliminated, and the fare is now 5 cents with transfer. Wages of conductors, motormen, section men, etc., increased approximately 22 per cent during the year.

Grand Rapids Deficit Continues

The report of the Grand Rapids (Mich.) Railway for the month of June shows a deficit of $12,774 for the month. The gross income was $140,718. Operating expenses were $135,513, showing an increase of $9,886 over the same month a year ago. The total loss for the first six months of 1920 is $83,544. This is nearly one-third more than the loss for the whole of 1919. The report further shows that more passengers are being carried since the 7-cent fare and the rerouting went into effect. A total of 2,140,576 passengers were carried during the month, showing an increase of 123,287. The 7-cent fare went into effect June 24. Company officials estimate at least a 15 per cent increase in passengers because of the better service given.

Richmond Value Fixed

Engineers Place Value of $14,382,410 on Local Lines of Virginia Railway & Power Company

A value of $14,382,410 has been placed on the Richmond, Va., lines of the Virginia Railway & Power Company by Stone & Webster, who are making a valuation of the company's properties. Announcement of the engineers' findings was made by Thomas S. Wheelwright, president of the company, on July 21. The figure placed on the Richmond property by Stone & Webster represents the "reproduction new" cost.

Historic value of the Richmond properties of the company, or the actual cash invested in the railway business under its control from the time the business was founded, is given by Mr. Wheelwright as $20,249,400. The latter figures represent the actual investment made in the property, including interest and deducting the return.

The State Corporation Commission appointed representatives who have been following the work of the appraisers as made in Richmond and the city of Norfolk has done the same, but no action was taken by the city of Richmond, notwithstanding the company's open and continued invitations. The work at Norfolk has been completed and report has been made to the city. The work in Richmond has not been completed in all of its details.

In commenting on the company's need for a higher return, Mr. Wheelwright said:

> In the statement of earnings and expenses . . . the interest charges are estimated at 5 per cent on less than $6,000,000, and these statements show the railway is not earning 5 per cent on this sum alone, so that more than $8,000,000 of invested capital on any basis on which the matter can be figured is not getting any return at the rate of fares now in effect.

Housing Corporation Disposes of Road

The Richmond & Seven Pines Railway, the only road owned by the United States Housing Corporation, has been tentatively sold by the United States Housing Corporation to Oliver J. Sands, a banker of Richmond, Va.

The price agreed upon when Mr. Sands came to Washington for a conference with housing corporation officials and war department officers was $90,000 for the electric line and $90,000 for the houses. The agreement is that both are to be sold together or the deal is off. Mr. Sands originally offered $55,000 for the railroad and $45,000 for the houses. When this offer was turned down he increased his bid from time to time until $90,000 for each was agreed upon.

The conference was held at offices of the United States Housing Corporation. Captain Moran represented the War Department, which has an interest in the houses. The Housing Corporation, which owns the railroad outright, agreed to the prices for both the railroad and houses. Captain Moran accepted the price on behalf of the War Department, but it was understood he would have to obtain approval of his superiors before the deal could be definitely closed.

The plan of the Government to dispose of the property was noted in the ELECTRIC RAILWAY JOURNAL for May 29, page 1115.

Financial News Notes

Time for Deposits Extended.—A very large amount of the first mortgage 5 per cent sinking fund thirty-year gold bonds of the Albany (N. Y.) Southern Railroad has been deposited pursuant to the terms of the deposit agreement dated March 1, 1920. In order to give the non-depositing bondholders an opportunity to participate in the benefits of the exchange plan, the time within which bonds may be deposited has been extended to and including Aug. 2.

Will Run Huntington Lines.—The stockholders of the Huntington (N. Y.) Traction Company, Inc., voted at their organization meeting on July 20 to incorporate under the laws of the State of New York with the par value of the stock at $80,000 and to purchase the property of the defunct Huntington Railroad. The following directors were elected: Henry A. Murphy, Jack Hirschfeld, Edward McNally, W. A. Dempsey, E. B. Hawkins, E. T. Dempsey, R. H. Hunt, Frank Willette and Phillip S. McNally. Edward T. Dempsey was elected president, W. A. Dempsey vice-president and Henry A. Murphy secretary and treasurer.

Will Abandon White Plains Line.—Supreme Court Justice Joseph Morschauser has granted to Leverett S. Miller, receiver of the Westchester Street Railway, White Plains, N. Y., permission to join in a declaration of abandonment of a portion of the Mamaroneck line from the band stand in that village to the town line, and he has also ordered that the Shore Line Electric Railway show cause before him at Poughkeepsie on Sept. 11 why the corporation should not be dissolved. These decisions are in connection with the suit of the Farmers' Loan & Trust Company against the Westchester Street Railway to foreclose a mortgage.

Cities Service Shows Gain.—The report of earnings for the month of June for the Cities Service Company shows gross to have been $2,137,241, an increase of $536,224 over June a year ago. Net income, after interest and other charges, amounted to $1,922,442, a gain of $542,937, leaving a balance of $1,533,962 available for reserves, common stock dividends and surplus. Preferred stock dividend requirements were earned 4.33 times for the year ending June 30, 1920, and for the same period $40.13 a share was earned on the common stock outstanding. For the first half of the current year earnings applicable to the common stock amounted to $45.66 per share.

Equipment Trust Certificates Offered.—The Chicago (Ill.) Trust Company, as trustee, is offering for subscription an issue of 7 per cent equipment trust certificates covering the purchase by the Trenton & Mercer County Traction Corporation, Trenton, N. J., of forty one-man safety cars from the J. G. Brill Company. The issue, which has already been authorized, will close at $155,000. The certificates of this issue represent 65 per cent of the purchase price of the cars, the balance having been paid in cash and junior securities. Coupon certificates are offered in denominations of $1,000 and $500, registrable as to principal and at prices ranging from 98.76 and interest to 96.07 and interest.

Charleston Lines Losing.—A statement of the earnings and expenses of the Charleston (W. Va.) Interurban Railway has been filed with the state Public Service Commission at the request of City Solicitor Donald O. Blagg, who is representing the city in protesting against a rate increase applied for by the company. For the last four months the income on the city lines has been $108,521 and, deducting operating expenses, interest on money borrowed, depreciation and costs of new equipment, the company contends that it is $4,703 behind. Last year during the same period it lost $22,246 on the 5-cent fare then in effect. Its total revenue on all lines, city and suburban, during the first six months of 1920 was $431,312.

Sale Attacked; Receiver Asked.—R. A. Forsyth of Birmingham, Ala., a stockholder in the railway and lighting properties at Gadsden, Ala., taken over several months ago by the Alabama Power Company, has filed a bill in chancery in which he asks for a receiver for the local railway lines, the lighting plant and the ice plant. Mr. Forsyth charges that the sale of the property of the Alabama City, Gadsden & Attalla Railway and the Gadsden Railway, to the Alabama Power Company, was not a genuine one and that the price named in the deed was less than one-fifth of the actual value of the property. His petition is also in the form of a bill of discovery which seeks to declare all terms of the contract for the sale of properties illegal and to make them null and void. The petition names as defendants to the action the Gadsden Railway, the Alabama City, Gadsden and Attalla Railway, the Gadsden Ice & Coal Company, the Gadsden Railway, Light & Power Company, and the Alabama Power Company. It asks that the Alabama Power Company and the Gadsden Railway, Light & Power Company be restrained from claiming any share or interest in the property, rights, etc., of the concerns transferred to the Alabama Power Company.

Traffic and Transportation

Higher Fare Promised

Commission, After Hearing Connecticut Company's Plea, Announces It Will Grant Immediate Relief

At the close of an all-day hearing at Hartford, Conn., on July 29, the State Public Service Commission announced that it would issue an order on the following day granting relief to the Connecticut Company, New Haven, in the shape of a higher fare. The rate to be fixed by the commission would, it was reported, be 7 cents straight. The commission stated that its order would be temporary in character. Chairman Richard T. Higgins said that this temporary means of relief would be made permanent only if it proved to be a fair policy on a full trial. The whole matter would be adjourned to a not distant date he said, when it would come up for final action.

DRASTIC ACTION NEEDED

Judge Walter C. Noyes, chairman of the Federal trustees of the railway, made the statement to the commission that in view of the fact that the company had lost $87,000 during the period from June 1 to July 15, the measure of relief would have to be large and it would have to come quickly. The $87,000, he said, was only a small part of the actual loss of the company, as it did not include rentals, interest, taxes or other items. He predicted that without relief the road would have to shut down within six or eight weeks.

Judge Noyes sketched the recent history of the company and said that he did not believe that a "wholesale" rate was in accord with sound railway economics. Such a rate was applied by the commission in the recent zone fare matter when commutation tickets were ordered for certain suburban communities. Both Judge Noyes and President Lucius S. Storrs of the company stated to the commission that the sale of these tickets had been negligible. "Commutation passengers on a street railway mean a loss to the road," Judge Noyes said. "They come at the peak hour when the road doesn't want them. There can be no justification for the wholesale distribution of commutation privileges."

ZONE PLAN A FAILURE

Thomas J. McGreevy, an auditor of the company, presented a mass of figures to show that the distance tariff scheme which the commission ordered in effect on May 9 had not been successful. A previous distance tariff system inaugurated by the company on Nov. 2 of last year raised the operating revenues greatly, but both schemes had failed to provide sufficient money to pay taxes and rentals, let alone dividends, he said. The Bridgeport division had an excess of operating expenses over operating revenue of $50,000 during the month of June, Mr. McGreevy stated, the rest of the system falling behind $65,000 during that period.

Under the proposed plan of the company, Mr. Storrs stated, a person could travel to any point within three miles of a city's traffic center for 7 cents. On the second 7 cents a person could travel from 2.2 to 2.8 miles, the company not yet having decided as to the length of the second zone. All suburban zones, he said, would be laid out on the basis of 3 cents a mile. Expressing doubt of the company's ability to operate a 7-cent fare he said:

> If the 7-cent fare does not bring in more money, we shall have to get 8 cents, or curtail service, which we shall have to do immediately under the present fare system. We know that if we cut out certain unprofitable country and city lines that we can make the property pay, but we don't care to do that and we don't think the commission or the people want us to give up any of the lines.

E. A. Clark, of Hamden, one of the lawyers appearing in opposition to the company's petition, asked Receiver Harrison B. Freeman of the Hartford & Springfield Street Railway, who was attending the hearing, if it was not a fact that his company had lost patronage by raising fares. Mr. Freeman replied that under a 10-cent fare system now in operation on the lines of his road, the revenues had increased considerably over what they were when 6 cents was the basic fare.

JITNEY SERVICE COMPLEMENTARY

There are 8,250 jitney "seats" in the state, Mr. Storrs stated, dismissing the jitney idea with the statement that jitneys should act as a service complementary to that given by the electric railway. He stated that whether the proposed increase in fare would cause the jitneys to increase in number, the company did not know. But he was certain that the situation of the company had become so bad that it would make little difference what the jitneys charged.

The hearing has firmly established the precedent set by the commission at the close of the last zone fare hearing of having rates of fare fixed at the outset by the commission. The Connecticut Company installed rates of fare on previous occasions without asking permission of the commission, and the commission acted only when it received a protest from the individuals or communities. Since the commission imposed a fare method of its own devising on the company last May, however, the Connecticut Company officials felt that they should present their petition to the commission before changing the rate basis. Thus the commission is now more powerful than at any previous time in its history.

Public's Co-operation Asked

Bethel Selectmen Appeal to Citizens to Aid Local Railway, Threatened with Shutdown

Candidness in laying its financial condition before its patrons has secured for the Danbury & Bethel Street Railway, Danbury, Conn., the official indorsement of the town of Bethel. The Bethel Board of Selectmen has issued an appeal to the public to co-operate with J. Moss Ives, receiver of the company, in his effort to keep the road in operation. The board points out that the welfare of the community would be jeopardized by the discontinuance of electric railway service.

"OPEN DOOR" POLICY

Mr. Ives some time ago adopted the policy of keeping the public advised of the company's condition through advertisements in the Danbury newspapers. He stated frankly that, unless the road were able to increase its revenue, service would be suspended. Recently he announced an increase in cash fare to 10 cents, stating that even with the higher rate the road might be unable to continue operation much longer if jitney competition remained unchecked.

The appeal of the Board of Selectmen follows:

To the People of Bethel:

Possibly every one in Bethel read the statement made in the *Evening News*, Saturday night, by the receivers of the Danbury & Bethel Street Railway. If so, they understand what Bethel is threatened with—the loss of its trolley service unless there is better patronage of the road within the coming month. Perhaps all do not realize what this would mean to Bethel as a town. During the past few months Bethel has had a real estate boom greater than ever before in the history of the town. While some of the sales have been to local people, many new families have come here to locate permanently. Will outsiders continue to come here if they learn that the town is such a back number that it has lost its trolley service?

TROLLEYS CALLED ESSENTIAL

New industries have come into the town, and these factories are giving employment to large numbers of persons who are earning higher wages than ever before in their lives. Everyone is busy, there are no unoccupied houses, stores or factories; in fact, Bethel is booming as never before. Do we want this to continue or do we want to step over on the downward path again, for the loss of the trolley will mean a depreciation in the value of property

The jitneys are run independent of any restrcitions; on their own time and when and how they please. It has been said that were the trolley service abandoned in Bethel, the people of this town would pay more than 10 cents to go to Danbury and undoubtedly this is true. Another advantage of the trolley over the jitney is in spacious cars with plenty of ventilation and vehicles free from tobacco smoke, for while some of the jitneys have signs inside the buses calling on smokers to respect the ladies, it frequently happens that the drivers themselves are puffing on cigarettes or cigars, while if a smoker boards their bus nothing is said to him if he does not see fit to discard the weed.

SERVICE IMPROVEMENT SEEN

There is no attempt on the part of the trolley company to deny that there has been ground for complaint of the service on the part of the people, but the trolley service has been entirely reorganized and better service is promised; the delays at the railroad crossing here are to be done away with, as the men operating the cars are not to leave their cars; the tedious waits on switches will also be overcome by the use of the four one-man cars which will be operated on a ten-minute headway all day between Wooster Square, Danbury, and the Greenwood Avenue crossing in Bethel. . . .

Bridgeport Rides in Motor Buses

Connecticut Company Stops All Local Service—Buses Flock from Nearby Cities—Good Weather Assists Jitney Men

Bridgeport, Conn., has been without trolley service since 12:01 a.m. on July 26 because of the failure of a city ordinance restricting jitneys to stand the test of the State courts. The Connecticut Company had agreed to continue service pending the hearing on the jitney men's injunction, but after the injunction was sustained gave notice it would cease service Sunday night, which it did. Jitney and bus drivers from every city in the State flocked to Bridgeport during Sunday evening and night and for the first three days helped their Bridgeport brethren handle the crowds, rush and lean hour, and on fairly well regulated schedules. However, the human weakness element of such service is getting in its work. There were approximately 500 buses in service on Monday and Tuesday. On Wednesday some of the visiting jitneys had started home, and by Thursday it was stated that the number of buses was dwindling toward 300.

THERE is no doubt that the first two days of the week found Bridgeporters getting a good transportation service. The jitney men had voluntarily obligated themselves in their own association to maintain schedules and charge no more than 5 cents, and they lived up to their agreement. The rush-hour traffic was handled, but the state law that requires that a jitney shall carry only two more passengers than its designated seating capacity was smashed to smithereens in the supreme desire of the jitneys to make good. Notice from the state motor vehicle authorities that this provision must be enforced rigidly caused some dismay.

JITNEY RULES ENFORCED

It was this dual problem of having to start on schedule whether the bus was filled or not, and to limit rush-hour loads to the legal requirement, that caused the jitney men of New Haven, Waterbury and Hartford to start back home Wednesday night. News of the situation from the jitney men's standpoint, coupled with the expense and difficulty of registration in Connecticut, was apparently the reason why the Massachusetts and New Jersey buses did not appear in the numbers anticipated.

The second day of the fair field for the motor bus saw many of the jitney men late. Buses being individually owned, each operator is his own ultimate boss, and those who had worked from twelve to sixteen hours on Monday were too tired to show up early on Tuesday morning. Attempts were made to work out a plan of having the jitney operators work in two shifts, but no definite arrangement had been announced on Thursday.

By Wednesday evening jitney men found that handling the rush-hour load was a strain under which they were breaking down and an appeal came to the business men of Bridgeport for the co-operation in the form of staggering the closing hours. John G. Schwartz, president of the Bridgeport Bus Association, said, "We do not propose to tell the business men or the manufacturers how to run their business, but it is a fact that we have received not one iota of co-operation from either of them in attempting to handle the transportation of the city thrust suddenly upon us." He then suggested certain staggered hours.

BUSES GIVE GOOD SERVICE

Street traffic under the jitney-bus-no-street-car transportation system has been satisfactory. The buses have been requested to hug the curb, allowing more rapidly moving private motor vehicles to use the middle of the street. Congestion and crowding have been less in many cases than with the electric cars. One traffic officer who commented on this said that every time a street car stopped forty or fifty motor vehicles would pile up behind it while it was unloading and loading, and then he would have a heavy traffic group to pass over his corner. With the buses he claimed greater flexibility and freedom, and that his traffic units came in smaller groups.

Very few complaints have been received from the public with reference to the buses, except that there have not been enough of them for rush-hour transportation. There has been overcrowding, and a few jitney operators have disobeyed the fare limit and charged 10 cents.

There is no intimation as to when or whether the Connecticut Company will resume service in Bridgeport. It was at first anticipated that the city would pass an ordinance in line with the suggestion contained in the decision of Judge Banks upholding the jitney men's injunction, but indications Thursday were that the company might not receive any further legislative help from the city. Unexplained orders in the carhouse of the Connecticut Company called the trainmen to duty on Saturday, July 31, to be assigned runs effective Aug. 2. The company has made no statement on this, but some of the trolley men say it merely means an extension of some shore service out of New Haven which runs into the Bridgeport division.

ALL EYES ON BRIDGEPORT

The situation in Bridgeport is being watched closely by all of the other cities in the State, numbers of whom have held "town meetings," from which the various councils are trying to get opinions and data from which to base any possible jitney restricting legislation. On the whole the attitude of these meetings, as well as newspaper editorial comment over the State, has been that the electric rail service can not be dispensed with, and that it is only fair that the motor buses be placed under restrictions similar to those placed on the electric rail systems, or that they be restricted to service which is supplementary, or at least which is not actually competitive. In the comment of the same papers and of people who support the above arguments there was a well defined attitude that the Connecticut Company has taken an unwarrantedly drastic step in Bridgeport, and a step not in consonance with the attitude of Bridgeport expressed by its attempt to pass a restricting law. The criticism is that the Connecticut Company discontinued service before Bridgeport could possibly have enacted a legal ordinance without the Mayor's having called a second emergency meeting of the Council.

In Ansonia, Waterbury, Hartford and New Haven there was during the week a noticeable decrease in the number of jitneys operating, and this was attributed in one of the "town meetings" by one of the jitney men's representatives to the fact that the jitneys had gone to Bridgeport. This proved somewhat of a backfire in his argument as to the dependence the public should place upon the jitney service.

The experience of Bridgeport so far this week and the discussion in the other cities in Connecticut have failed to produce anything very conclusive as to the final outcome of the trolley-motor bus controversy in Connecticut, with the exception of a more or less well formed public sentiment as outlined above.

Seattle Increase Effective

Failure to file a referendum petition before noon on July 17 calling upon the City Council of Seattle, Wash., to submit to popular vote the proposition of increasing the fare on the lines of the Municipal Street Railway has caused the 10-cent cash fare to go into effect. Owing to the delays in manufacture of the 6¼-cent tokens, the advanced fares did not become effective until July 24. During the thirty days that had elapsed since the bill was approved by Mayor Caldwell, petitions had been circulated asking for a referendum vote on the subject. Filing of such a petition would automatically have prevented the ordinance becoming a law until it was voted upon by the people.

The new fare tokens, providing for four rides for a quarter, have been placed on sale on all cars of the municipal lines, at the railway office, and on busy corners in various parts of the city. Nearly 500,000 tokens were sold the first day of their use. The tokens are to be sold on the cars permanently, according to the present plan. The new fare schedule provides for a cash fare for one of 10 cents; cash fare for two, 15 cents; four tokens for 25 cents; eight tokens for 50 cents; 16 tokens for $1. Transfers are issued on fares paid with cash or with tokens.

Birneys in Baltimore

One-Man Cars Making Good on 3.4-Mile Belt Line Around Business District—Many Transfer Points

Standard Birney cars were placed in operation on the Fremont Avenue route of the United Railways & Electric Company, Baltimore, Md., on July 1. The line is completely equipped with the new cars and they have proved very successful. The Fremont Avenue route skirts the congested center of the city, acting as a belt line around two sides of the business district. The route intersects and transfers to and from twenty-four of the important lines of the system on a run of 3.4 miles and has twenty-four compulsory stops, including twenty-two track intersections.

HEAVY TRANSFER INTERCHANGE

The non-rush hour running time is twenty-four minutes each way, with twenty-six minutes for the rush hours, morning and night. There is rather heavy transfer interchange at many of the intersections, and hence it was felt that this route would give an "acid test" to the use of this type of rolling stock in Baltimore. The cars were purchased from the J. G. Brill Company and deliveries began during May.

Preparatory to operating cars, in order to provide as far as possible against delays and operating trouble, the track and overhead were gone over and put in good condition and two additional electric switches were installed to facilitate operations. There is a loop at one end of the line, but at the other end, where heavy loading is encountered during evening rush hours, it has been necessary to station a terminal man to help handle the cars and assist the operator. At certain points the stops were changed from "near side" to "far side" to minimize interference with other lines.

The newspapers were kept informed of the plans of the company and were afforded an opportunity to inspect the new cars and operating methods before the cars were actually put on for public use. When the time came, however, to put the cars on the street no special publicity was employed, outside of a news item in the paper. The entire service was changed over at one time.

THOROUGH PREPARATIONS MADE

The company in 1919 began to study the possibilities of operating safety cars of the Birney one-man type. Careful investigation was made of installations already in operation. The officials of the company went over the matter on the ground in a number of different cities. They also had the benefit of the advice of the representatives of manufacturers who have been making a service and transportation study of this new car. An investigation was made of the different lines in the system, and it was finally decided to purchase thirty-three cars for the Fremont Avenue route.

Careful consideration was given to the standard safety car then being built for general use around the country. There were a number of things which the engineers of the company at Baltimore considered desirable to incorporate in the new cars, but it was found, due to quantity production methods of manufacture, that if the standard design was changed it would increase materially the expense of the cars and would slow down their delivery. Hence the standard Birney car was purchased without alterations in equipment or design.

INSTRUCTION FOR OPERATORS

As soon as cars began to arrive from the builder they were operated on an unused stretch of track on off hours by the crews of the Fremont Avenue line. This line had previously had hand-brake single-truck cars on it, and the men had to be instructed in the use of the air brake, in addition to the other new devices on the new cars. Great care was taken to give these men sufficient time to qualify. Due to the frequent interchange of passengers it was particularly necessary to drill the motorman in handling transfers and fares. The pains and time given to this feature of the work were amply rewarded, because every man but one out of approximately fifty-one was able to qualify.

With the old equipment nine cars on the base schedule and twenty-one in rush hours provided the service, the car seating thirty, with a maximum allowed capacity of fifty-seven. In place of these a new schedule providing fourteen safety cars on the base and twenty-nine in the rush hours was started. The new service was augmented approximately 45 per cent over the old, as measured in car-miles per day. This service is better than any previously furnished on this route and has been of help to the company in gaining the co-operation and approval of the riders. Due to the short time the new equipment has been in service, it is not yet feasible to draw any conclusions as to operating or financial results.

Ten Cents in Tacoma

The State Public Service Commission in a decision handed down on July 27 ordered a 10-cent cash fare placed in effect on July 28 on the Tacoma, Wash., lines of the Tacoma Railway & Power Company and the Pacific Traction Company. The companies were ordered to sell tickets at the rate of twenty-five for $2. The new rates will remain in effect for a period of six months.

Provision was made in the commission's order that, should the city relieve the companies of the 2 per cent gross earnings tax, free transportation of policemen and other city employees, and from the terms of the franchises requiring the street paving, tickets are to be sold at the rate of fifteen for $1. The order, from all indications, presages a war between local jitney bus associations and the railways. Several members of the City Council are admittedly in favor of jitney operation under conditions of regulation.

City's Case Closed

Chicago Makes Final Appeal to Commission for 5-Cent Fare—Mayor Wants Safety Cars

Chester E. Cleveland, Mayor Thompson's special traction counselor, completed argument before the Illinois Public Utilities Commission last week in the effort of the city of Chicago to force a return to a 5-cent fare on the Chicago Surface Lines. The substance of the argument was that if that part of the contract between the city and the Surface Lines which specifies good service at a 5-cent fare is invalid, then the entire contract should be invalid. Or, if those portions of the contract which permit the company to operate on the streets and the city to share in the net proceeds to the extent of 55 per cent are valid, then that portion which specifies the 5-cent fare should be valid.

MAYOR "WATCHES STEP"

In view of this position, Mayor Thompson has vetoed ordinances permitting the extension of lines as provided under the 1907 contracts and has refused to accept the 55 per cent of the net proceeds which has been tendered to him by the Surface Lines, on advice of counsel that to do these things would put the city in the position of acquiescing in the validity of the contract, while it has taken the position that the contract was forfeited when the rate of fare was increased above 5 cents.

The city administration has sent out several representatives to various points in the country to make a hurried study of safety cars, presumably for the purpose of determining whether the Chicago companies should take advantage of the economies offered by this type of equipment and thereby make possible operation at a lower fare. The investigation by the city is being conducted through Mayor Thompson's traction commission, of which Corporation Counsel S. A. Ettelson is chairman.

R. F. Kelker, Jr., transportation supervisor for the city, was sent to Kansas City, Mo., to make a similar survey, and T. E. Flanigan, his assistant, was sent to Gary, Terre Haute and Fort Wayne, Ind.

SAFETY CARS FAVORED

While in Terre Haute Mr. Flanigan asked the opinion of Mayor Hunter on this type of equipment, and his Honor responded with the following statement.

> As Mayor of Terre Haute, and resident of Terre Haute for forty-eight years, I take great pleasure in recommending to any city in need of street car service the one-man cars. They have proven to be very satisfactory in Terre Haute, and the public would not care to change back to the old style. They are quick to stop and quick to start and no danger of anyone getting hurt by getting on and off the car, as the door does not open until the car stops, and the car does not start until the doors close. They don't seem to have any trouble in making change quick or issuing transfers. We have about fifty of them in operation in Terre Haute, and they are giving good satisfaction and good service and we have no complaints from the public.

Transportation News Notes

Town Council Authorizes Regulation of Buses.—The Town Council of Westerly, R. I., has authorized Chief of Police Thomas E. Brown to regulate the operation of buses in competition with the Shore Line Electric Railway from Westerly to Watch Hill and Pleasant View.

Fare Raise Unopposed.—An application of the Wallkill Transit Company, Middletown, N. Y., for permission to increase its fare from 5 cents to 7 cents was unopposed at a recent hearing before the Public Service Commission for the Second District. The company operates in Middletown and its suburbs.

Ten Cents Straight on Narrow Gage.—The Boston, Revere Beach & Lynn Railroad, Lynn, Mass., has received permission from the State Department of Public Utilities to charge a straight 10-cent fare on its narrow gage line in Winthrop. The sale of commutation tickets has been ordered discontinued.

Jitneurs Ordered from Streets.—Thirty-one jitney drivers of Bayonne, N. J., were ordered by the municipal authorities to cease operation on July 16. The jitney men had failed to comply with the provisions of a new State law requiring the filing of $5,000 bonds by all operators. Sixty-four jitney licenses are held in Bayonne.

Seven Cents in Halifax.—Halifax, N. S., is now paying a 7-cent fare. The Nova Scotia Legislature recently authorized the Nova Scotia Tramways & Power Company, Ltd., to raise its cash rate from 5 cents to 7 cents, and to sell tickets in books at the rate of seventeen for $1. Twenty workmen's tickets are sold for $1.

Six Cents in Danville.—The Board of Aldermen of Danville, Va., has passed an ordinance empowering the Danville Traction & Power Company to raise its fares from 5 cents to 6 cents. The City Council some time ago undertook an investigation of the local lines, with the view to the possibility of taking over the railway system.

I. C. C. Order Stands.—The Interstate Commerce Commission has refused to rescind its former action permitting the Washington, Baltimore & Annapolis Electric Railway to increase its one-way and round-trip fares between Washington and points in Maryland on that line. The new tariff became effective on July 11.

Would Charge More in Santa Barbara.—Application has been made to the California Railway Commission by the Santa Barbara & Suburban Railway, Santa Barbara, for permission to charge an 8-cent cash fare on its Santa Barbara lines. The company proposes to sell tickets at the rate of five for 35 cents and school tickets at the rate of 2½ cents each, in books of forty for $1. The company also seeks to raise the rate on its bus lines.

Higher Fare in Gulfport.—The Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., has been authorized by the municipal authorities of Biloxi, Gulfport and Pass Christian, Miss., to raise its fares on its lines in these cities from 6 cents to 7 cents in each zone. This company has granted its employees a wage increase to a scale of 40 to 50 cents an hour.

Wants Rise on Suburban Line.—Application has been made to the State Public Service Commission by the Wheeling (W. Va.) Traction Company for an increase in rates on its line between Weirton and Moundsville and intermediate points. Reasons for the proposed increase are the cost of fuel, labor, and all necessary materials for the maintenance of proper service.

Upholds Interstate Advance.—The Interstate Commerce Commission has issued an order permitting the Wheeling (W. Va.) Traction Company to raise the fares on its line to Steubenville, Brilliant, Bellaire and Martins Ferry, Ohio. The fare from Wheeling to Bellaire becomes 10 cents. The city of Martins Ferry has brought court action to oust the company from the city streets.

Fare Zones Rearranged.—The collection of fares based on a 2½-cent zone was discontinued on the lines of the Connecticut Company, New Haven, Conn., formerly operated by the Shore Line Electric Railway, Norwich, Conn., on July 15. The collection of fares is now based on 5-cent zones. At the same time the use of the Rooke cash register was discontinued. Overhead clock registers are now being used.

"Jay Walking" Banned in Knoxville.—"Jay walking" is now punishable as a misdemeanor in Knoxville, Tenn. An ordinance barring the practice throughout the city took effect on July 12. Under the terms of the new law pedestrians in crossing streets are required to move in the direction of vehicular traffic, and are forbidden to cross streets or highways except at the regularly designated crossings and then at right angles only.

Six Cents in Richmond.—An ordinance has been passed by the Common Council of Richmond, Va., authorizing the Virginia Railway & Power Company to charge a 6-cent fare on its lines in that city. The company is now charging a flat 5-cent fare. Its application to the city authorities for financial relief encountered little opposition.

Will Fight Scranton Increase.—City Solicitor Houck of Scranton, Pa., has been directed by the City Council to take steps to protest against the proposed increase in fare by the Scranton Railway from 7 cents to 10 cents. The city authorities have been urged to carry the case to the United States courts.

New Bus Law Proposed.—A new ordinance has been introduced in the City Council of Philadelphia, Pa., granting permission to the Philadelphia Transportation Company to operate motor buses on Broad Street from Olney Avenue to the Philadelphia Navy Yard. The ordinance specifies no fare rate. Mayor Moore recently vetoed a measure previously passed by the Council which would have empowered the bus company to operate at a 5-cent fare.

Interurban Raises Rates.—A new schedule of fares became effective on the line of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, between Youngstown and New Castle, Pa., on July 20. The rate between Youngstown and New Castle becomes 50 cents and between Youngstown and Lowellville 20 cents. An advance of 10 cents has been made from all points between Lowellville and New Castle to Youngstown.

Denies Jersey Increase.—The State Board of Public Utility Commissioners has dismissed the petition of the Atlantic Coast Electric Railway, Asbury Park, N. J., for permission to increase the present rate of fares from 6 to 8 cents in each of its zones. The board has signified its willingness to approve a 7-cent fare in each zone. The company operates in Asbury Park, Bradley Beach, Neptune City and adjacent municipalities along the New Jersey coast.

Wants Ticket for Workmen. — S. Wiley Wakeman, general manager of the Fore River Plant of the Bethlehem Shipbuilding Company, in a communication sent to Forrest I. Neal, chairman of the home rule committee of the Quincy Chamber of Commerce, urges a special workingman's ticket entitling the worker to a reduced fare on the Eastern Massachusetts Street Railway in Quincy. The railway has recently increased its fare about 33⅓ per cent on strip tickets and 100 per cent on straight fares.

Seeking Eight-Cent Fare in Bellaire.—Bellaire, Ohio, car riders after Sept. 1 next may be paying an 8-cent cash fare or 6⅔ cents for a ride on a ticket. In a communication to City Council C. P. Billings, general manager of the Wheeling Traction Company, says that a new rate schedule for fares has been filed with the Public Utilities Commission providing for those cash fares and ticket rates. The company is willing to accept the franchise passed by City Council recently, provided the rental clause is dropped and some minor changes made.

Hearing on Portland, Me., Fares.—The petition for a 9-cent ticket fare and 10-cent cash fare was the basis for a hearing on behalf of the Cumberland County Power & Light Company operating the Portland (Me.) Railroad, before the Public Utilities Commission. It was brought out that the deficit for the past year, so far, was $147,000. An additional burden, at least $100,000, would be occasioned on account of wage increases granted by the board of arbitration. Judge Cleaves, chairman of the Commission, said that the company owed it to the public, as well as to the commission, to clear up the situation with respect to all rumors and intimations in connection with the financing of the company.

Hearings on California Rise.—Hearings on the application of the Pacific Electric Railway, Los Angeles, Cal., for a general increase in its rates began before the State Railroad Commission on July 15. An application of the city of Pasadena and other municipalities to have the petition dismissed was refused. The company introduced testimony to show that it had been operating at a heavy loss, the total loss up to May 31 last having been $12,189,780. It was testified that the loss during 1919 was $2,767,726, and that in 1918 the loss was $1,778,191. It was further shown that wages for 1919 had been increased $2,621,162.

Ten Cents in Galesburg.—The Galesburg Railway, Lighting & Power Company, Galesburg, Ill., has been authorized by the Illinois Public Utilities Commission to increase its fares from 7 cents to 10 cents, and to sell ten tickets for 75 cents. The Danville (Ill.) Street Railway & Light Company has been authorized by the commission to increase its fares from 5 cents to 7 cents. The Tri-City Railway has been granted a 10-cent fare in Rock Island and Moline, Ill., and in adjacent towns to Moline. The commission has issued an order continuing in effect the 6-cent fare now being charged by the Kankakee Electric Railway on its lines.

Eight Cents in Rock Island.—Eight-cent fares went into effect on July 20 on the Rock Island, Moline, East Moline and Silvio, Ill., lines of the Tri-City Railway. The increase from the former 7-cent rate was authorized as an emergency measure by the State Public Utilities Commission, pending action on the company's petition for permission to install a permanent fare of 10 cents on its Illinois lines. By the terms of the commission's order the fare for children less than twelve years of age becomes 4 cents. The company recently raised the wages of its employees from 60 cents to 70 cents an hour.

Wants Higher Rates Continued.—Argument was started on July 22 before the Interstate Commerce Commission on the application of the Hudson & Manhattan Railroad, New York, N. Y., to make permanent the temporary fare schedule of 10 cents uptown and 6 cents downtown, which has been in force for several months in the tubes between the city of New York and New Jersey communities. James C. Carmalt, counsel for the railroad, declared the increase in fares was necessary if the company was to continue to pay the interest on its bonds, which amount to about $79,000,000. As an alternative, he said, the company was willing to fix a flat rate of 8 cents.

Eight Cents in East St. Louis.—The Illinois Public Utilities Commission on July 23 authorized the East St. Louis & Suburban Railway, East St. Louis, Ill., to increase its fare from 6 cents to 8 cents effective July 26, to provide additional revenue necessary to meet the recent wage award. The company had petitioned for a 10-cent fare. The commission in entering the order stated that a 6-cent fare would be confiscatory and a 7-cent fare would not meet operating expenses and pay a fair return on the lowest estimated value of the company's property. The 8-cent fare is the only solution to the present high cost of operation.

Commission's Rate Authority Upheld.—Justice Curran has dismissed with costs the case of the city of Winnipeg vs. the Winnipeg (Man.) Electric Railway, challenging the right of the company to increase fares fixed by contract. This decision was reached on the grounds that the court of King's bench is without jurisdiction to question the validity of an order made by the Public Utilities Commissioner. Judge Curran rules that the Public Utilities act is constitutional and wholly within the legislative authority of the province to enact, but while it constitutes the Public Utilities Commission a court of record, it does not make it a superior court.

Commends Bluefield Service.—Following receipt of the report of W. B. Hall, assistant engineer of the State Public Service Commission, on an investigation of the complaint of the city of Bluefield, W. Va., of inadequate service furnished by the electric railway lines of the Appalachian Power Company, City Attorney John R. Dillard has asked for a public hearing. Mr. Hall reported that the car supply is adequate for the transportation of passengers within the corporate limits of Bluefield; that conductors and motormen on all cars were giving very good service considering their experience, and that while some of the cars were old and needed painting badly and a few minor repairs, as a whole the city is better equipped and is receiving better service than many cities of the same size.

Asks More on Bus Lines.—Following the application of the Pacific Electric Railway to the California Railroad Commission for an increase in its passenger and freight rates, auto stage lines operating out of Los Angeles to all points in Southern California, as well as operating between Los Angeles and San Francisco and way points, have applied to the State Railroad Commission to increase their fares. The Railroad Commission controls the regulation of these auto stage lines as to rates of fare, operating schedules and routes. Exhibits filed by the Motor Transit Company, operating the bus lines, show that its total operating expenses for January, February and March, 1920, were $281,245, while its revenue from all sources was $253,350. The number of passengers carried for this three-month period totaled 561,721 and the car-miles operated amounted to 1,401,764.

Motor Bus Regulation in St. Louis.—The Board of Aldermen on June 29 passed a motor bus bill providing that companies operating motor buses in St. Louis, Mo., must pay an annual license of $25 per bus, and must pay into the city treasury 3 per cent of their gross receipts. The measure fixes the maximum fare as 10 cents, requires that each company give a bond of $10,000 to the city and puts bus schedules under the regulation of the Board of Public Service. A fine of from $25 to $500 is fixed for the violation of any of the terms of the bill. Outside of the municipal buses operated in Forest Park, the only buses being operated in St. Louis are the eleven of the Missouri Bus Company, which run on fixed schedules between Sixth and Locust Streets and Delmar and Hamilton Avenues.

May Raise Rates Again.—Unless the books of the Cincinnati (Ohio) Traction Company show a gain in receipts for the month of July there will be an increase in fare of ½ cent, making the rate 8 cents flat on Sept. 1. Despite the fact that the fare was raised to 7½ cents by ticket or 8 cents cash on June 1, there was a deficit for June of $13,601. Under the terms of the franchise, when the receipts are less than the operating cost for any two calendar months, the fare may be raised ½ cent, provided fifteen days' notice of the fact is given previous to the day on which the proposed increase becomes effective. This notice will likely be given to the patrons of the company Aug. 15. The operating revenues of the company for June, according to its report, were $763,871. Operating expenses for the same period were $507,401. Rentals, taxes and sinking fund and interest charges, the report shows, made the total expenditure in excess of the receipts. For the six months ended June 30 there was a deficit of $141,108.

Commission's Power Upheld.—Restrictions on the powers of the cities of Utah, imposed by the public utilities law, to control by franchise utilities operating within their boundaries, were defined by the Supreme Court of Utah in deciding the case of Murray City against the Utah Light & Traction Company and the Utah Power & Light Company. The suit was brought by Murray to test the legality of the Public Utilities Commission's ruling with regard to zone systems, the order of the commission being in violation of the Murray franchise. It was alleged by the city that, in the matter of fares and zones, and also in various other particulars, with regard to the repair and grading of tracks and crossings, the franchise had been violated by the traction company. The court points out that in a similar case it held that the State, by reason of its right as a sovereign, retained the power to modify or annul a rate or fixed charge for services rendered by a public utilities, and that any order made by such a commission is a regular and binding order.

Personal Mention

Rochester's New Director

C. R. Barnes, Who Will Manage Local Lines, Will Have Wide Powers—Takes Office Aug. 1

The appointment of Charles R. Barnes, electrical expert for the Public Service Commission of the Second District to be the first Commissioner of Railways of Rochester, N. Y., was announced by Mayor Edgerton on July 20. The selection of Mr. Barnes to supervise the operation of the lines, in the interest of the city, under the new "service-at-cost" plan approved by the Mayor and the Common Council for the local division of the New York State Railways was noted in the ELECTRIC RAILWAY JOURNAL for July 24.

As Commissioner of Railways Mr. Barnes will have the duty of enforcing the ten-year temporary contract, which supplants the old agreement with the company. As the arbiter of disputed questions as to the character of the service he will fix the rate of fare and will determine the character and scope of the alterations and improvements to be made. No claims for damages against the company involving an expenditure of more than $100 will be settled without his consent. In short, he will be responsible to the city for the character of the service.

C. R. BARNES

Mr. Barnes is familiar with the operation of the Rochester railway system. As expert for the Public Service Commission, he has made many studies of the problems there and most of the betterments made in recent years have been in accordance with his suggestions. Operation of the lines under Mr. Barnes's direction will begin on Aug. 1. The fare will be 7 cents until Mr. Barnes is able to show earnings enough to decrease it, or, on the other hand, he may be constrained to raise the fare.

Mr. Barnes was born near Spencerport, N. Y., in 1853. He entered the employ of the New York Central Railroad when a boy. He was telegraph operator at the Spencerport village station for four years and then was appointed ticket agent and freight agent for the Rochester & State Line Railroad, now the Buffalo, Rochester & Pittsburgh Railroad. In 1880 he became superintendent of the fire-alarm telegraph office for the city and held that post until 1898, when he resigned to become electrical expert for the State Railroad Commission. Later this body was merged into the Public Service Commission, but Mr. Barnes retained his post.

W. A. Dempsey has been elected vice-president of the Huntington (N. Y.) Traction Company.

Henry A. Murphy has been elected secretary of the Huntington (N. Y.) Traction Company.

C. P. Westlake has been appointed supervisor of equipment of the Eighth Avenue Railroad and the Ninth Avenue Railroad, New York, N. Y.

C. V. Peeling, who resigned some time ago as manager of the Cornwall Street Railway, Light & Power Company, Cornwall, Ont., has become connected with the Palmetto Power & Light Company, Florence, S. C.

Edward T. Dempsey has been elected president of the Huntington (N. Y.) Traction Company, organized to take over and operate the lines of the defunct Huntington Railroad.

Russell G. Carter, Belfast, has been appointed superintendent of the Belfast district of the Penobscot Bay Electric Company, a subsidiary of Maine Power Company, to succeed H. P. Blodgett, who has been transferred to the Rockland District.

Bryant White has succeeded Graham Claytor as general superintendent of the light and power departments of the Roanoke Railway & Electric Company, Roanoke, Va. Mr. White was formerly a power engineer in the employ of the Public Service Electric Company, Newark, N. J.

John F. Stevens, a trustee of the Boston (Mass.) Elevated Railway, has been made president of the newly organized Hyde Park Transportation Department, formed to take over and operate on behalf of the city of Boston the Hyde Park lines of the Eastern Massachusetts Street Railway.

Charles D. O'Donnell, who was recently appointed superintendent of the Southbridge division of the Worchester (Mass.) Consolidated Street Railway, was presented by his friends with a gold watch and fob on July 16.

Will Run City's Lines

Joseph S. Goodwin Named General Manager of Detroit's New Municipal Railway

Joseph S. Goodwin, formerly manager of the Bridgeport (Conn.) lines of the Connecticut Company, has been selected for the position of general manager of the Detroit (Mich.) Municipal Railway, the personnel of which is now being organized for the construction and operation of city-owned lines under the terms of the municipal bond issue approved by the voters of Detroit at an election on April 5. The plans sanctioned by the voters call for the construction of 101 miles of new track and for the equipping of this trackage with 400 motor cars and 150 trailers, as well as for the taking over of 55.5 miles of line now being operated by the Detroit United Railway. The total trackage provided for the city system is 156.5 miles of north and south and crosstown lines, with two routes open to the heart of the city.

Since resigning his position with the Connecticut Company early last June, Mr. Goodwin has been associated with the firm of Charles E. Morse, Inc., of Boston, with headquarters in Hartford, Conn. Mr. Goodwin was born in Beverly, Mass., in 1877. He entered railway work in 1895 as a motorman on the Gloucester, Essex & Beverly Street Railway, now a part of the Eastern Massachusetts Street Railway system. He was subsequently employed as a motorman for a short time by the Rhode Island Company, Providence, R. I.

J. S. GOODWIN

In 1901 Mr. Goodwin entered the employ of the Hartford & Springfield Street Railway, Warehouse Point, Conn., as a motorman. He was later appointed a dispatcher of the company. In 1906 he was advanced to the position of chief dispatcher and served in that capacity until February, 1914, when he was made secretary and superintendent of the system. He was subsequently made general manager of the company. Three years ago he resigned to become manager of the Bridgeport lines of the Connecticut Company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Strong Market for Asbestos Insulating Material

Electric Railways Ordering in Larger Quantities—Deliveries Fair in Spite of Raw Material Shortage

Asbestos products as used in electric insulation are in such shape as to induce an optimistic view of the situation, according to inquiries instituted in this field. Demand for this material at present is not only strong but is increasing. Most of the call is for repair work purposes, with central stations the strongest buyers, although electric railways are now buying better than has been the case during the past three or four years.

Deliveries are in pretty fair shape, and although transportation difficulties for asbestos producers have as yet given no evidence of easing up, on the item of asbestos board, for instance, deliveries can be made on large orders in about thirty days.

Production at present is said to be above normal, in spite of the fact that some shortage of raw material is experienced, which again is induced by the freight situation rather than because of an actual scarcity of raw material. Even here the situation is not characterized as "bad." The cost of asbestos fiber is very high, however, and bids fair to go still higher.

Prices on the finished material are ruling strong, with a tendency apparently to increase if any change comes about.

Increasing Foreign Demand for Trolley Line Material

Domestic Buying for Maintenance Work Only—Shortage of Castings Lengthening Deliveries as Prices Stiffen

Domestic activity in the field of overhead trolley line material is not especially marked, although orders for maintenance work are in fair volume. This demand, however, is more or less spasmodic. In some quarters it is said that inquiries are increasing, but electric railways are closely watching their actual needs for ears, hangers, crossings, splicers, etc., and little or no new construction work of this sort enters the market. Foreign demand seems to be picking up, however, rather active markets being reported in South Americe, Mexico and Switzerland, Australia and New Zealand.

Delivery quotations show a wide variance, several producers quoting from four to eight weeks. One company is in a position to ship in about ten days, with delivery up to the railroads; still another producer touches the opposite extreme in being unable to promise delivery under three to four months. Reasons given for these delays cover a wide range; in the case of some manufacturers it is raw material with a dearth of castings that is impeding production, and with others, who report a normal output with no labor troubles, embargoes are given as the cause of delay.

In the majority of cases stocks of finished goods are rather flat, but here and there a condition characterized as "good" or "fair" can be found. General price increases ranging from 6 to 15 per cent came into effect on July 1, but the higher price level apparently caused no orders to be canceled. Present demands are for the most part really to satisfy the most urgent needs. Collections on sales of this material are reported at this time in a favorable condition.

Current Fuel Needs of Utilities Secured

Regional Priorities Act Virtually as an Embargo on Coal Exports —Home Competition and Foreign Buying Tend to Force Prices Up

Relief may be expected in the coal situation now that the Department of Justice, the Interstate Commerce Commission and the Senate special committee on reconstruction are all devoting their attention to it. The three parties are attacking the problem from independent angles in accordance with their respective power to act, *i e.*, prices, transportation and legislation.

Evidence introduced at recent hearings indicates that the present situation is critical. A shortage of coal stocks and of coal cars had to be faced by the coal producers and users. The mine owners contract for only a percentage of their output and sell the rest on the open market; the large consumers contract for an excess tonnage to secure a storage supply and to make sure of sufficient deliveries. When a shortage of cars and of production occurs, the mine owners reduce both the coal supplied on contracts and also the spot coal.

Elements Tending to Increase Price

When the contract coal users do not receive their full quota of coal they go into the open market and try to get the spot or free coal under competitive price conditions. This competition forces prices up and a further element in increasing the prices is introduced by the fact that foreign countries are in the market for coal at any price, and also that some dealers and speculators have manipulated markets by reconsigning coal cars until conditions were tight.

John W. Lieb, vice-president of the New York Edison Company, in his testimony before the Senate committee on reconstruction gave a good picture of the situation for his specific case. The Edison and affiliated companies have a coal contract for the year which includes all the coal to be used and a storage of about 250,000 tons. The prices on this contract coal run from $4.25 to $4.75 at the mine. Since Aug. 1, 1919, the "contract" coal received was only about 52 per cent of the contracted amount, with the result that the companies went into the market and purchased "free" coal at an average price of $10 per ton. The companies were thus compelled to purchase about 30 per cent of their coal in the open market or quit business. As these companies use about 4,000,000 tons per year this means, on a 30 per cent basis, that they are paying about $7,000,000 a year more for coal than they would need to pay if conditions were such as to permit contract deliveries.

Labor Making New Claims

Another element in the situation is now appearing and that is labor. The previous wage adjustments were made on a normal coal price basis, and now that the men see the high prices obtained for "free" coal they are claiming a share in the extraordinary profits. The operators, however, say the wage scale was fixed by the government for a year and they cannot change it. The result has been a strike of laborers in Illinois, Indiana and Ohio, which only further decreases production and boosts the price of free coal.

The Interstate Commerce Commission has ordered all open cars to the mines and has given priority on assignments to public utilities and to certain geographical sections, particularly New England and the Northwest. This will relieve the situation for the utilities as regards their day-to-day consumption but will not permit any reserve storage for emergency conditions. It does, at the same time, amount to what is virtually an embargo on coal exports, besides an emergency use of rail equipment and a very decided increase in coal production.

A decrease in coal prices need only to be expected when there is either a greater supply on the market or a smaller demand from consumers. The fact that there are no reserve stocks of domestic coal, combined with a nation wide propaganda, encouraged by government bureaus and coal operators, to the effect that there is a coal shortage, has created an almost hysterical demand for coal. The situation should be very much improved in the next thirty days due to the recent orders of the Interstate Commerce Commission.

Transformer Market Continues in Active State

Raw Material Stocks Fair — Power Transformers Quoted on Five to Eight Months Shipments

Transformer manufacturing plants are busy filling back orders and taking on new business, although some diminution is noted in the volume of inquiries and extent of so-called proposition work, compared with earlier in the year. Not much difference can be seen in the character of buying, both power and distribution transformers being sought in about the same proportions. The passage of the national water-power act has opened the door to larger sales, sure to be realized more and more as these resources are developed. As yet it is too early for this legislation to exert a substantial effect on orders, but considerable business is looked for from Western sources as projects long imprisoned on paper are released for construction.

MATERIALS SITUATION SHOWS IMPROVEMENT

An improved material situation as regards the heavier items used in transformer manufacture features present conditions. Manufacturers are less worried today over the supply of copper, magnetic steel and sheet iron than during the past winter. Railroad congestion has given cause for anxiety all through the year, but by strenuous efforts necessary stocks of the foregoing raw material have been accumulated in sufficient amount to permit steady production to be assured for some time. The chief difficulty has come in connection with the supply of such items as long-fiber cotton, shellac, enameled wire for primary coils, porcelain and grain alcohol.

Difficulties still exist in connection with the cotton supply, these being heightened by the large purchases of this material by the automobile industry. It has become necessary, in some cases at least, to buy shellac abroad before shipment to the United States in order to forestall complete absorption of imports on arrival. Facilities for local manufacture of enameled wire and porcelain will soon be established in at least one representative transformer-making plant, so that these materials will cause less trouble in future from the shortage standpoint.

Deliveries of distribution transformers now average about eighteen weeks, although occasionally much shorter shipments can be made. On power transformers classed as 200 kva. and over shipment can be made in from five to eight months. There are practically no factory stocks in hand of either type. Labor conditions are fairly steady and prices have been quiet but firm since the last advances, which took place in the late winter and in the spring.

Every effort is being made through quantity production and by pushing the standardization program to hold prices close to present levels, which are still far below the advances attained in many other lines of commodities. If pig iron advances further this summer, it seems likely that transformer prices may have to undergo another upward readjustment, but there is little certainty at present about this. A bright spot in this branch of the industry is found in the results of rating standardization, which have cut the sale of specials to one-third that of four years ago and reduced the number of standards to about 40 per cent of the old figures.

Long Island Car Purchase in Abeyance

Decision of Public Service Commission on Application for Increased Rates Will Affect Purchase of 100 Cars

On Aug. 2 the Public Service Commission, First District, will hold a hearing to pass upon the application of the Long Island Railroad for an increase in passenger rates. Involved in the outcome of the proceedings is the fate of 100 new passenger cars which the commission recently urged the Long Island Railroad to buy in order to care for growing passenger traffic. Replying to the request of the commission for the immediate purchase of these cars, in order to insure delivery by the summer of 1921, President Ralph Peters of the Long Island Railroad said that the financial ability of the company to pay for the cars depended upon its ability to earn the interest on the money which must be borrowed to purchase this rolling stock. As the likelihood of earning sufficient capital to meet the interest in turn depends upon the railroad's application for increased rates being granted, the hearing on Aug. 2 will have a special significance.

President Peters estimated that 100 new cars at present prices would cost about $3,000,000. This is the second installment of cars which the Public Service Commission has requested the Long Island Railroad to buy. Nearly a year ago the first notification was followed by contracts being placed for 100 passenger cars, apportioned between two builders in amounts of seventy and thirty cars. These were ordered in December, 1919, and delivery was supposed to be made in time to meet the summer traffic of 1920. Up to a recent date but two of these cars had been delivered, with eight more reported on the way.

Rolling Stock

The city commissioners of Calgary, Alberta, Canada, decided to call for bids on sixteen new motors for cars of the Calgary Municipal Railway.

The Springfield (Mo.) Traction Company is expecting shipment shortly of eight safety cars from the Cincinnati Car Company.

The Laconia (N. H.) Street Railway Company has purchased two safety cars from the Wason Car Company of Springfield, Mass., and delivery of the cars has been made.

Eastern Massachusetts Street Railway, Boston, Mass., lost twenty electric cars recently in a fire which swept the car barns at North Abington and destroyed four buildings. The total damage is estimated at about $75,000. Included among the cars which burned were nine of the double-truck type, three small cars, a sand car, flat car, a line wrecker and five snow plows.

The Burlington (Vt.) Traction Company is putting into operation two new 18-ton pay-as-you-enter cars, purchased from the government, which had intended them for use in transporting shipyard workers. The cost will be $10,500 each, but certain necessary modifications of the cars will raise this amount to $12,000 each. Seats are provided for sixty passengers.

Franchises

Portland Railway, Light & Power Company, Portland, Ore.—Franchises have been granted by the city and county for the construction and operation of the line on Jersey and Emerson Streets and proceedings have been started to widen the county road to 70 ft. Application will be made to the Public Service Commission to require the Portland Railway, Light & Power Company to operate the line as a part of the city's traction system. The length of the extension is approximately 1 mile and the cost will approximate $35,000.

Track and Roadway

Alabama Power Company, Birmingham, Ala.—A survey is to be made of the car line of the Alabama Power Company in Gadsden to determine what improvements will be found necessary.

Pacific Electric Railway, Los Angeles, Cal.—Plans are under way for the construction by the Pacific Electric Railway of a line to Sylvan Park and the University of Redlands. The line will run up Brockton Avenue to University Street and then down to Colton Avenue. The work, it is estimated, will cost about $7,000.

Los Angeles (Cal.) Railway.—Work on extending the electric line to Hollywood has been started by the Los Angeles Railway. One-half mile of double track will be laid to connect with the present Western Avenue line. This new improvement will cost about $50,000 and is part of the extensive program of $150,000 which the Los Angeles Railway has under way.

Palmer, Mass.—The street railway company of Palmer, which is part of the Springfield Street Railway Company, is relaying its track on North Main Street in preparation for the cement roadway which is expected to be built this summer.

Detroit (Mich.) United Railway.—The Detroit United Railway plans an extensive construction program in Flint and Pontiac, Mich., for this year. The work in Flint comprises 10½ miles of track and in Pontiac it comprises about 6 miles of single track.

Interborough Rapid Transit Company, New York, N. Y.—The Powers-Kennedy Company was the lowest bidder for the construction of column foundations and embankment for storage yards for the Brooklyn service of the Interborough Rapid Transit Company. Bids were opened July 19 by Transit Construction Commissioner John H. Delaney. Seven contractors submitted bids, the lowest bid being $407,000. In the steel construction for the same storage yard there were five bids submitted, the lowest being that of Bigelow & Nicholas for $387,400. This yard will be one of the largest in the transit system. The steel construction must be completed within eight months and the column foundations within eighteen months.

Power Houses, Shops and Buildings

Los Angeles (Cal.) Railway.—Two new rotary converters will be installed at one of the main downtown substations. This will approximate an expenditure of $65,000.

Toledo Railways & Light Company, Toledo, Ohio.—The Toledo Railways & Light Company has closed contracts for the construction of a high-tension transmission line belting the city of Toledo and adjoining that of the Toledo Terminal Railroad. The cost of this work will be approximately $1,000,000. The matter of preparing plans and securing right-of-way has been in progress for almost a year.

Interborough Rapid Transit Company, New York, N. Y.—A new subway station in Forty-second Street, between Fifth and Sixth Avenues, is planned as part of the Queensboro extension. The Forty-second Street Property Owners' & Merchants' Association is pushing forward this project, which will mean a line running west from Park Avenue. It will afford a connection with the west side subway and with the B. R. T. The station will have entrances at the east and west end, that is, one near Fifth Avenue and the other near Sixth Avenue.

Professional Note

The California Engineering Company, consulting civil, mechanical, electrical, hydraulic and marine engineer, announces the opening of its offices at 131 Leidesdorff Street, San Francisco, Cal. Paul B. McKee is president of the company: Paul R. Parker, vice-president and chief engineer, and Byron H. Hurd secretary.

Trade Notes

The Bussman Manufacturing Company, St. Louis, Mo., has purchased the fuse department of the Appleton Electric Company, Chicago.

The Economy Electric Devices Company, Old Colony Building, Chicago, announces that the Grayson Railway Supply Company, St. Louis, Mo., has been made its representative in the southwest territory.

Herman L. Wittstein, recently works manager of the Chapman Valve Manufacturing Company, Springfield, Mass., has been appointed production manager of the Morris Metal Products Company, Bridgeport, Conn.

The Locke Insulator Manufacturing Company, Victor, N. Y., announces the resignation of B. A. Plimpton as sales manager, effective Aug. 15. D. H. Osborne is serving as acting sales manager.

The National Carbon Company of Cleveland and San Francisco has recently increased the scope and efficiency of the Columbia data sheet service for users of motors and generators in regard to correct brushes for thes machines.

The Stoker Manufacturers' Association announces the appointment of the following officers and executive committee at a meeting held recently at Lakewood, N. J.: Sanford Riley, president; M. Alpern, vice-president; A. C. Pratt, treasurer; S. A. Armstrong, H. A. Hatton, and J. G. Worker, secretary.

The Indiana Service Corporation, Fort Wayne, Ind., formerly called the Fort Wayne & Northern Indiana Traction Company, has placed an order with the Economy Electric Devices Company, Chicago, for Economy meters for a complete installation on the remainder of its interurban cars. The Fort Wayne-Decatur division has been equipped for about a year.

The Gate Coil Company, Boston, Mass., has acquired property and a factory on Willard Avenue, Providence, which is to be remodeled for the manufacture of electric coil-winding machinery. The company is a subsidiary of the Universal Winding Company, Providence, R. I., and is capitalized at $100,000. Robert A. Leeson, 95 South Street, Boston, is president, and Frank N. French is treasurer.

The Blaw-Knox Company announces a change in the name of Hoboken, Pa., the home of the Blaw-Knox Company, to Blawnox. The Blaw-Knox Company was first established in Hoboken, Pa., about five years ago, at the same time operating another plant at Wheatland, Pa. About two years ago the latter plant was removed and added to the Hoboken works, which has since been enlarged.

The American Jobbers' Supply Company, Woolworth Building, New York City, as the Eastern associated company of the Joslyn Manufacturing & Supply Company, Chicago, has taken over the exclusive sale in the East of the Lindsley Brothers Company, producer and distributor of Western red and Northern white cedar poles. R. D. Patterson, formerly Eastern representative of the Lindsley Brothers Company, is now associated with the American Jobbers' Supply Company.

The Roller-Smith Company, 233 Broadway, New York City, announces certain recent changes in its sales organization as follows: G. L. Crosby, previously sales manager, is now general sales manager at New York City; M. Frankel, previously assistant sales manager, is now Western sales manager at Chicago; W. J. Shire, previously a sales engineer, is now Eastern sales manager at New York City; C. G. Kahant, previously a sales engineer, is now export manager and district sales manager at New York City. F. R. Ryan, J. E. Wood and H. D. Baker remain district sales managers respectively of the Chicago, Cleveland and Detroit territories. In addition to the above C. M. Hunt is a sales engineer in the New York office, and M. B. Mathley is a sales engineer in the Chicago office.

New Advertising Literature

Switching Apparatus.—The Union Switch & Signal Company, Swissdale, Pa., has issued bulletin 93, describing its style "M" electric switch movement.

Arc Welding.—The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is distributing reprint No. 85, entitled "Analysis of Arc Welding Principles and Processes."

Wood Preserver.—The C-A-Wood Preserver Company, St. Louis, Mo., is getting out a series of letters, which will be continued, on the preservation of timber, poles, etc.

Ball Bearings.—The Fafnir Bearing Company, New Britain, Conn., has published booklet No. 20 covering its ball bearings for electrically driven and other machines.

Controllers.—The National Electric Controller Company, Chicago, is distributing price list No. 10, descriptive of National controllers, etc.

Condulets.—Crouse-Hinds Company, Syracuse, N. Y., is circulating bulletin No. 1000N, on "Condulets, Mogul Obround Series."

Machine-Tool Control.—The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has issued a forty-eight page book, entitled "Machine Tool Control—C-H Controller."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
C. FRANCIS HARDING, Special Editorial Representative L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative
GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. B. ANDERSON, Asst. News Editor

Volume 56 New York, Saturday, August 7, 1920 *Number* 6

Another Zone System Gone by the Board

THAT the plan of the Connecticut Company and the Public Utilities Commission of Connecticut to return to a flat 7-cent fare is a blow to the zone system in this country will be denied by no one. Frankly we are sorry to see events take the turn that they have had to take in the affairs of the Connecticut Company. Particularly, after the abandonment of the zone system in New Jersey, its discontinuance in Connecticut is doubly serious, from the standpoint of those who would like to see a fair tryout in this country.

There must be a reason for this move and we believe every one in the industry, for or against a distance-tariff system in theory, is interested in what explanation may be found and what lessons may be learned.

There are, of course, many difficulties in the analysis of a problem as complex as the fare, the gross and the net of a complete and varied system such as the Connecticut Company, especially when it is at the same time experiencing severe and unregulated jitney bus competition. But there are a few points in this case which are worth the attention both of the industry and of the commissions charged with the regulation of the various companies.

In the first place, it will be recalled that the Connecticut Company, to avoid a higher flat rate fare than its 6-cent fare then in effect, installed last November a zone system of its own devising with zones of different length, depending on traffic and other features, and, on the whole, quite logical. The company prepared the public and its employees and the system was put in operation with surprising smoothness. There was but little dissatisfaction except that ever present human feeling of all of us against paying any more for any thing.

The second step was taken six months later, when the Connecticut commission, in response to complaints from suburban riders, imposed a zone system of its own on the company, making all zones equal in length. While the cash fare per zone was raised, this was tempered by the introduction of a reduced rate ticket and still further made unproductive and complicated by certain special commutation rates.

The change was an unfortunate one, as we pointed out at the time (May 1), first, because it upset a system which, if not perfect, was at least working fairly well and, second, because it substituted therefor a distance-tariff plan which was unsound in that it both complicated fare collection and was based on the theory of equal fares for equal lengths of ride, irrespective of other variables. We referred to the order at the time, also, (May 1 and 15), as one which appeared to exceed the bounds of supervisory regulation and assume more the phases and responsibilities of management.

The results during the latter half of May and all of June and July showed, according to Connecticut Company officials, a reduction of income below the corresponding period of last year, whereas under its own zone system the company had been enjoying an increase of from 17 to 23 per cent over corresponding months of the previous year and had hopes, at least, of eventually realizing a satisfactory net revenue. To add to the fare troubles, the jitneys and buses have increased manyfold, with corresponding inroads on the legitimate revenue of the railway.

Of course no one can say definitely that the earlier zone system would have proved an entire financial success, or been wholly satisfactory from an operating standpoint. It had undeniably certain elements of weakness. But for the period in which it was in use it had yielded good returns, and it was fairly easy to operate.

Finally, with so many changes in fare systems in so short a time, and with a large part of the public, with the existing zone system before it, complaining against a zone system, it is not perhaps surprising that the company, when it had to change again, decided last week to ask a return of what is practically its original system, using 7 cents in place of 5. The details of this system are given in the news columns this week.

There are two lessons in this story. One is that a zone system, to work in this country, must be right and must be administered correctly. We think the Connecticut Company's own system at least approached this condition. The other is that regulating commissions should regulate, *i.e.*, supervise, check and advise, but they should be very slow to require the adoption of unusual and experimental methods of operation, in view of the fact that they cannot assume financial responsibility in case of the failure of such plans. Much as we admire personally and professionally the Connecticut commission, we believe in this case it committed an error. It has tried to right it by granting the present 7-cent fare application of the company, but meanwhile the zone system dies without fair trial.

We are not unmindful of the other elements of the zone fare argument pro and con. This is not England. American cities have grown on the flat fare basis, though Australia has successfully made the change. People here live far from their places of employment and amusement, and one traffic route doesn't pass through several distinct communities as is common in Europe. The psychology of the public is an important element.

But income measured in dollars must go up. An increase in flat fares causes increasing private automobile traffic; it meets the opposition of those whose income has not increased in proportion to the average; it meets jitney bus competition, etc., so it seems quite logical to try to adapt to our conditions a system of charge which retains the low short-haul fare and yet fairly charges the entire riding public in such a way that the total revenue will permit satisfactory continuance and growth of service. A zone system can do this.

The Swiss Are Unique in Both Engineering and Finance

WALL Street was awakened recently by the call from across the water for a twenty-year, 8 per cent $25,000,000 bond issue for the further electrification of the Swiss Federal Railways. The high interest rate is significant. Would that American railroads might obtain loans as readily and that their net income might prove sufficient to pay 8 per cent on such an issue. Government control might assure the proper gross revenue as a result of arbitrary and immediate increase of rates, but experience during the war with soaring operating costs under government control indicated that such a solution would not produce the necessary net return. The Swiss government evidently did not profit greatly by its national credit, but paid the market price for the accommodation. The interesting feature of the deal to railroad officials is the fact that the loan was made under what would normally be considered adverse circumstances in order to reap the rewards of electrified operation and further development of water powers.

But the activities of Swiss engineers are of interest as well. In this issue some rather unique features of heavy traction are described. The determined stand taken by Swiss and Italian engineers years ago in favor of single-phase high-voltage trolley operation is further confirmed by the rather extensive addition which is now being made to their locomotive equipment. The successful solution of the problem of regenerative braking in connection with single-phase energy supply, as indicated by the engineers responsible for the designs, represents no small portion of their pioneer work.

Swiss engineers have apparently standardized the intermediate geared shaft which in turn operates the drivers through the agency of connecting rods. This is in marked contrast to the return to direct drive which has been adopted for similar service upon the new locomotives for the Chicago, Milwaukee & St. Paul Railroad. Although it is true that gear reduction and even combinations of gears and side-rod drive are in use in this country, particularly for heavy freight service, the complicated arrangement described herein which is used upon the foreign locomotives would seem to have the disadvantages of more parts to disturb the schedule as well as higher repair and maintenance costs.

The apparent solution of the gear problem by the Swiss was especially interesting. *Engineering* of London for May 28, 1920, publishes a very complete analysis of the gear troubles encountered upon the early locomotives and the method of eliminating them. In a nutshell, it seems that the two motors geared to a single countershaft were found to be swinging in a pendulum-like fashion about the countershaft as a center, thereby producing tremendous strains upon gear teeth, frame and connecting rods. After extensive tests, confirmed by calculations, a new split herringbone gear was substituted with a separate forged steel rim provided with eight radial springs. This rim is free to move about the periphery of the spider upon which it is mounted. The problem was solved, but more expensive parts were added as the result.

Thus it appears that in both financial and engineering matters the solutions of railway problems adopted by our European friends seem complicated and expensive to American engineers. However, results are being accomplished, and accomplished rapidly. An occasional reference to their methods may therefore be refreshing.

The Increase in Railroad Rates, the Interurbans and Electrification

THE Interstate Commerce Commission has spoken. And it has spoken in a manner which should bring satisfaction to every one in the transportation business. We believe the public on the whole is glad to see the railroads get a living revenue and is now chiefly concerned in seeing that the increase is not passed on five or ten fold in increased prices.

For electric railways we see two distinct benefits, even though most electric traction lines are not directly affected by the order.

One of the benefits is in the question of traction rates. There is bound to result a different psychology in transportation rates as a whole. After long study the most important rate commission in the country not only declares steam rates are too low but gives to the electric roads within its jurisdiction the right to increase their freight rates and tacitly approves also an increase in their passenger rates by saying that its order "is not to be construed as an expression of disapproval of increases, made or proposed in the regular manner, in the passenger fares of electric lines." In other words, the commission realizes that relief for the electric passenger rates will have to come largely from the individual state commissions, but promises that it will not oppose reasonable advances in interstate fares.

Undoubtedly, also, the form in which the advance for the steam roads was recommended is better for the electric lines than if all of the increase in income had been placed on freight. The latter policy was strongly advocated by a number of trunk line officials. This suggestion, however, was not accepted by the commission, and the authority to increase (in the Eastern group) passenger fares by 20 per cent and freight rates by 40 per cent with somewhat lower freight charges in the Southern, Western and Mountain Pacific Groups followed. This means, if the passenger fares are increased according to the ruling, that interurban railways will have a considerable margin in cents per mile to increase their fares until the two are equal.

Again, the principle of valuation as a basis for utility rates is helped by the decision. In fact, the rates are granted primarily upon tentative valuations made by the commission, which, incidentally, are found by groups of roads to be not greatly different from the book costs as shown by the carriers.

Another phase of the increase which is of electric railway interest is that it should advance the cause of trunk line electrification. It has been said for some time that most steam railroad officials with electrification projects did not need to be convinced of the advantages of such a step. What they needed was money, and money should now come. That the credit condition of the roads will be immediately improved seems certain. As a result it should be possible to realize some long-cherished desires to gain the many benefits of electrification.

And there is more than a mere opportunity to carry through some electrification plans. There is also a duty to do this. While the present recognition of the transportation problem may be tardy it has, at least in part, come, and the transportation world now owes it to the public to put into operation all the economies and better service features which the public has been told could not be accomplished without more money and which the public will expect now that more money is available. One of these benefits is proper electrification.

Lord Ashfield's Survey and Solution

ALTHOUGH, as its title, "London's Traffic Problem," denotes, Lord Ashfield's contribution to the May, 1920, issue of the *Nineteenth Century and After* is devoted chiefly to London, the questions discussed are, in a measure, of wider character. Furthermore, these questions are treated by a man who has had the widest practical contacts as a transportation administrator, first in the United States and then as director of the great London traffic combine itself. Whether just "Al" Stanley, Sir Albert or Lord Ashfield, we have, in him, always listened to a man whose deserved success comes largely from the faculty of looking into the future and of acting courageously upon his deductions. Indeed, in these times when the need for revenue is driving some managers to dangerous lengths in cutting service and other practices that discourage travel, it is well to recall that Lord Ashfield's success as a manager in London was built upon the theory of attracting the greatest possible amount of patronage. One may say with truth that long before town planning was a live subject, his fare and service schemes for encouraging suburban development did more in a direct, practical way than thousands of resolutions and hundreds of exhibitions by professed town planners.

Turning to Lord Ashfield's article, we find a most illuminating discussion of the need for anticipating the growth of a city rather than limping decades behind. It is many a year since the Royal Commission on London Traffic produced ponderous tomes but generated no action on the subject of traffic co-ordination and development. Instead, the work was left very largely to the operating and financial genius of this one man, who succeeded in putting under one management every private transportation undertaking in Greater London, whether tramway, underground railway or motor bus. Unfortunately, he could not go further and co-operate with the municipal undertakings of the London area. The result has been mutual strangulation. The buses, in particular, proved such obnoxious competitors by their incursions into tramway territory and their tax-free operation over tramway routes that the municipal authorities could only bide the time when changed conditions—such as the higher costs of today—would enable them to marshal public sentiment against increases in fare. So, too, the necessity for conserving its own enormous investments naturally led the Traffic Combine (as it is locally dubbed) to oppose any municipal work that would cut into or duplicate its own services. And, to make matters worse, there are jealousies aplenty among the political sub-divisions themselves. All of which accounts for the haphazard conditions of today and the likelihood of a stalemate so long as these conflicting interests continue.

Lord Ashfield believes that the best way out is coordination under one management of all private and public transportation facilities with a wide degree of public regulation of such management. He would have such a co-ordinated system operate on a commercial, even on a competitive basis, so that the public would get the most efficient use of all the facilities available without precluding a worthy reward to the organization that handled an undertaking of such consequence to the public welfare.

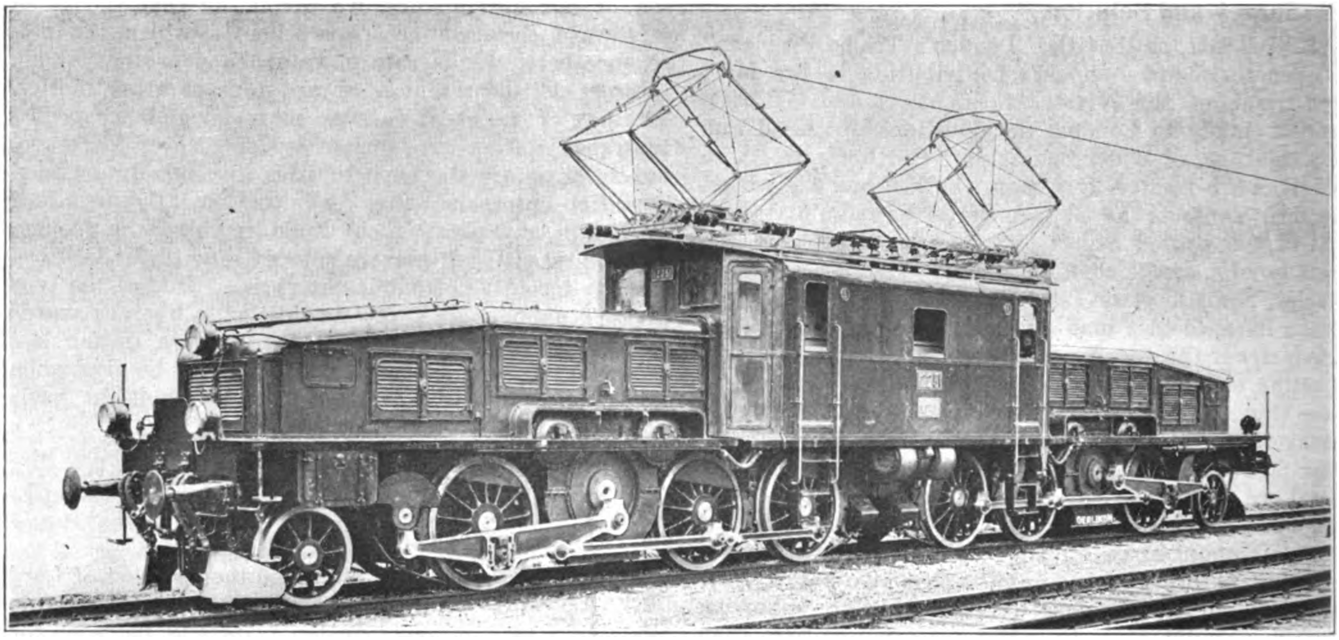
From our own experience with regulators who evade accepting the consequences of their regulations, we are not quite so hopeful about satisfactory co-operation between private operators and public controllers. Judging by our own history, we would say that the trend is toward service-at-cost operation in which the difference between the rate of return and ordinary bank interest will represent a reward for operating ability. The day of the great *entrepreneur* and of large profits in transportation development is gone, never to return, but so large are the opportunities in *conducting* transportation enterprises that no important city can afford to ignore any plan which would combine the money-making incentive of private enterprise with the welfare-making incentive of public enterprise. Men of the type of Lord Ashfield are surely as entitled to liberal rewards for their ability as are capable directors in far less important lines of endeavor. The day may be near when managements will be rewarded chiefly upon the basis of increasing usefulness to the community.

How the Bus and Tram Compare in Cost

WE HAVE purposely discussed the last part of Lord Ashfield's article first because it would serve to illuminate his comments on the respective fields of the means of transit—the street car, the non-surface car and the bus. Of the street car he says: "The tramway is accepted as the most efficient means of local communication in well-developed cities of a diameter not exceeding 10 to 12 miles." Even for London, in comparing the cost per seat-mile of each class of transportation his cost indices are 44 for a train to 27 for the seventy-eight-seat car and 43 for the very latest London bus of forty-six-seat capacity. He says, however, that the economic advantage of the tram is lost by the operation of lightly loaded units throughout the day. This condition, we believe, could be ameliorated by the operation of one-man cars for the base schedules. Indeed, Lord Ashfield himself says of American practice that one-man cars equipped with safety devices are being freely adopted and present advantages which must always seem denied to a motor omnibus. These and other means make tramways more effective, he says, but of course do not solve the capacity problems, which are better handled by rapid transit routes.

In comparing specifically motor bus versus tram in the London district, Lord Ashfield makes the point that the municipal authorities have often confused street widening with tramway development; so that the cost of the tramways is very high in the end. But this is not all.

While the motor bus in London has been operating free from street widening, paving taxes and the like, the London County Council Tramways have had the two-fold burden of taxation and extraordinarily high fixed charges because of so many obligatory miles of conduit construction. Then consider that the motor buses work from the rich, short-haul territory outward, while the tramways work from the thin, long-haul territory inward, and with but one real entrance into London's richest district. Under the circumstances, there can be no real comparison of bus and tram in London, but conciliation there must be, else the public loses doubly in the depreciation of transportation securities and demoralization of transportation service. Each side having "carried on" to the point of exhaustion, it is high time that competition should be succeeded by some sort of unified and co-operative management as set forth so ably by Lord Ashfield.



LATEST 1-C+C-1 FREIGHT LOCOMOTIVE

Swiss Federal Railways Buys New Electric Locomotives

Details Are Now Available Regarding the Unique Construction of the New Single-Phase Freight Locomotives Manufactured by the Oerlikon Company—Recent $25,000,000 American Loan Used for Purchase

INTEREST in railway and financial circles has recently been centered upon the $25,000,000 loan placed in this country by the Swiss Federal Railways for the purpose of extending and equipping their electrified section.

It will be recalled that electric traction was adopted upon the Swiss Federal Railways several years before the war. As a result of successful operation upon the Swiss Federal Railways, including Bern, Loetschberg and Simplon, and carefully prepared calculations and estimates based upon local conditions, it was decided during the war to convert an important section of the St. Gothard line, that between Erstfeld and Bellinzona, part of the main line from Switzerland to Italy, for operation as a 15,000-volt, 16⅔-cycle, single-phase trolley railroad.

Several types of locomotives were proposed and tried experimentally for both express and freight service. Four of the original test locomotives ordered in May, 1917, were described by Prof. Hugo Studer of Zurich, Switzerland, in the ELECTRIC RAILWAY JOURNAL, Sept. 7, 1918, page 411. In this article the freight locomotives are described in particular.

In March, 1919, the Swiss Federal Railways, which is electrifying its lines, placed a large order for electric freight locomotives for use upon the St. Gothard section of this system with the Oerlikon Company of Switzerland. Later, in the fall of 1919 and early this year, twenty-three additional units have been placed on order with the latter company, the delivery of ten of which has already begun. The Swiss Winterthur Locomotive & Machine Works co-operated in the mechanical design and construction.

The conditions under which these freight locomotives are expected to operate are particularly severe. Upon the Gothard Railroad between Goldau and Chiasso, a distance of 122 miles over which these locomotives are expected to operate, there is a difference in elevation of 5,100 feet, representing an average grade of nearly 1 per cent. The maximum grade is 2.6 per cent. The locomotives are scheduled to haul an 860-ton train over this distance and return in twenty-eight hours, allowing fifteen minutes at each terminus. Upon a portion of this run between Chiasso and Bellinzona the train load for a single 1-C+C-1 locomotive will be reduced to 625 tons. The temperature of no important electrical part is to exceed that specified in the standardization rules of the A.I.E.E. during this service. With loads of 430 tons a speed of 22 miles per hour is to be maintained upon the maximum grade of 2.6 per cent, while upon the same grade with a 300-ton load the trains are scheduled for 31 miles per hour. On grades over 1 per cent pusher locomotives will be used.

Their rating for continuous service is 1,250 kw., with overloads provided for one and one-half and one-quarter hours of 1,620 and 1,850 kw. respectively. Upon the maximum grade the locomotive must be capable of exerting 20 per cent excess power, either as the result of an increased torque, because of the necessity of operating at increased speed, or a simultaneous combined demand for both excess speed and torque. A torque sufficient to start a 430-ton train upon a 2.6 per cent grade and to accelerate to a speed of 22 m.p.h. in four minutes is specified. This corresponds to a rate of acceleration of approximately 0.09 m.p.h.p.s. With a 300-ton load a speed of 31 m.p.h. must be attained with an acceleration of 0.13 m.p.h.p.s. As the maximum speed rating is 40 m.p.h., upon a 1 per cent grade with a 300-ton train, it is practicable to operate passenger and express service upon mountain grades with the same equipment. The maximum starting tractive effort at drivers is 53,400 lb. Further details regarding the operating characteristics of these units will be found in accompanying curves.

MECHANICAL CONSTRUCTION

As will be seen from the accompanying illustration of the 1-C+C-1 type of freight locomotive a rather unusual frame construction has been adopted. Although two distinct interchangeable trucks, articulated at the center of the complete locomotive, are used, yet but one small cab is employed, which is located in the central third of the entire structure. Upon the top of this cab are mounted, with proper insulation for 15,000-volt service, the two pantograph bow current collectors. These are raised into position upon the contact wire by means of air pressure controlled from the operator's position in the cab. This cab is supported upon the inner ends of both truck frames by two spring pressure plates mounted within the truck frame upon each side of a pivot bearing. One of these pivot bearings is fixed permanently in the truck frame, while the other has a limited longitudinal motion, so that no pull can be transmitted through the frame of the cab.

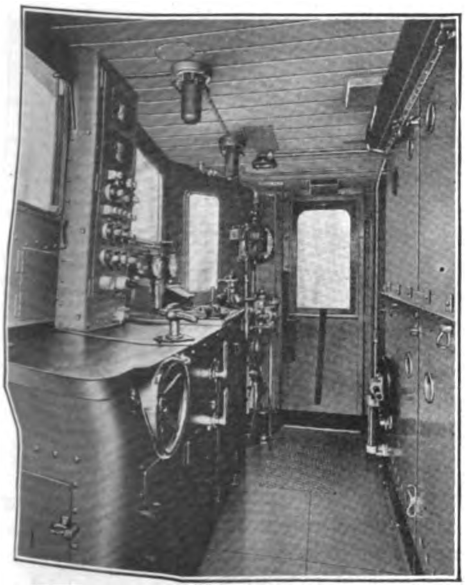
The ventilated motor housings shown in the illustration to occupy the outer ends of the two trucks are fastened rigidly to the truck frames. These hoods are sufficiently low not to interfere with the view of the engineer and are provided with the necessary side and top openings for inspection purposes. In fact, the motors located under these hoods can be inspected during operation by uncovering an opening and looking through small windows in the cab. The housings are readily lifted off the truck frames for repairs to the motors or other auxiliary equipment. The cab proper overlaps the end housings, giving the appearance of a single continuous superstructure. The construction also prevents the entrance of rain and snow.

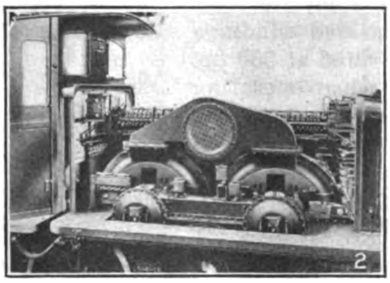
Each truck comprises three pairs of coupled drivers and a pony axle. The usual method of spring suspension of the truck frames has been adopted. In order to equalize the axle pressures, however, the supporting springs of the first driving axle are connected to the pony axle with a compensating lever, while the second and third drive axles are connected in a similar manner. The middle driving axle of each truck is provided with a side play of 1 in., while the pony axle is free to move transversely through a range of 3¼ in. This is to provide better tracking on curves. Upon re-entering tangent track from a curve the pony or leading axle is returned to its mid-position by the action of leaf springs. The truck frames are connected by means of a powerful short coupler containing a leaf spring element for the purpose of transmitting compression and tension forces from one truck frame to the other.

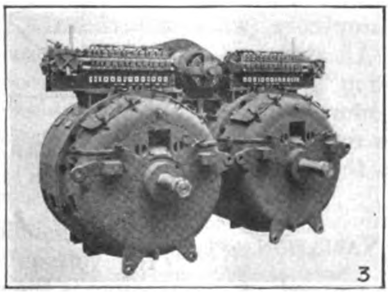
One pair of motors is mounted directly upon each truck frame between the first and second driving axles. Pinions upon either end of the motor shafts engage gears with crank pins. A triangular connecting rod transmits the power from the crank pin of the gear to the forward driver through the agency of a sliding journal. The end bearing of this connecting rod is flexibly supported from the truck frame at a point slightly ahead of the first driver. The motion of this countershaft bearing is limited by a heavy spring. The two other drivers are operated by means of horizontal side rods which articulate with a driving pin upon the triangular connecting rod. This rather complicated driving mechanism will be apparent from an inspection of the illustration.

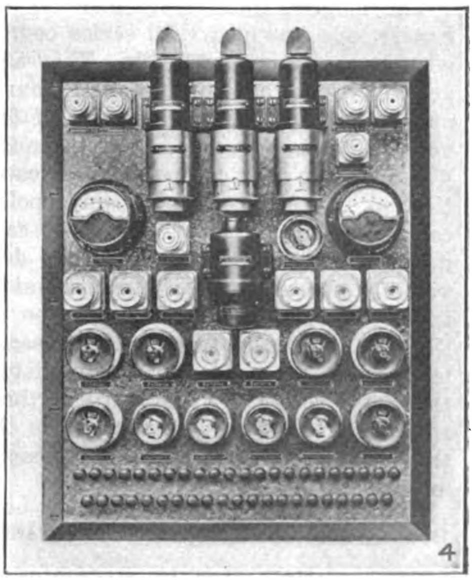
ELECTRICAL EQUIPMENT

The cab, centrally located in this type of locomotive, provides the most convenient mounting for the transformer, which is of the oil-insulated, air-cooled, outdoor type. The laminated iron core is so stacked and the transformer tank so designed as to form a central vertical shaft, open at top and bottom, through which air is circulated for cooling purposes by means of motor-operated fans. The cover of the transformer is really









1. The engineer has unobstructed view ahead. The control is at his left side.

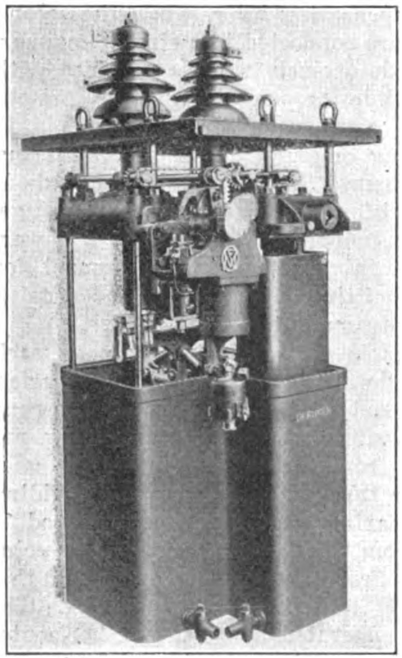
2. Two motors with inclosed pinions and gears are used per truck.

3. Control switches are located over motors under the end hoods of both trucks.

4. Overload and no-voltage relays are mounted upon control panels.

a part of the roof of the cab. The latter, however, is so designed as to permit the ready removal or repair of the transformer from the top, if necessary, when the current collectors are raised.

The transformer is designed for operation at either 7,500 or 15,000 volts at 16⅔ cycles. It is understood that a change will be made from 7,500 volts to 15,000 volts after the complete conversion has been made from steam to electrical operation. Variations in voltage up to 15 per cent may be permitted without serious operating difficulties by means of potential taps upon the low-voltage side. A rather unusual feature of the transformer winding is the provision of two distinct secondary circuits, one supplying the driving motors and the auxiliary equipment of the locomotive, while the other is connected to the heating circuit of the train. The former, or motor secondary, is made up of two coils equally distributed upon the two legs of the core and tapped at twenty-one different points. Twelve leads from these taps are carried out through the lower portion of the case to the tap switch as indicated in the outside view of the transformer. The two coils are normally connected in series with the middle point grounded. Each is wound for a maximum voltage of 567.



THE OIL SWITCH FORMS A PART OF THE CAB ROOF

COMPENSATED MOTORS ARE USED

The motors, four in number for the complete locomotive, are provided with series compensated windings with commutating field coils. They are rated at 550 hp. at drivers for one and one-half hours when operating at a voltage of 400 and a speed of 560 r.p.m. At 380 volts, other conditions being unchanged, the rating is 425 hp. The frames are semi-enclosed and forced ventilation is employed. As twelve poles are provided a corresponding number of sets of carbon brushes are mounted upon a cast-steel ring so designed as to provide for the shifting of the brushes upon the commutator. Open slots are used in the stator core, while those in the rotor are partially closed. An attempt has been made to avoid wave-form distortion by skewing the slots around the periphery of the rotor. Although resistance leads were used between the rotor coils and the commutator bars in former designs they have been omitted in the later types.

SPEED CONTROLLED BY VOLTAGE VARIATION

The principle used in controlling the speed of the locomotive is that of varying the voltage supplied to the motors by changing the taps upon the secondary winding of the transformer.

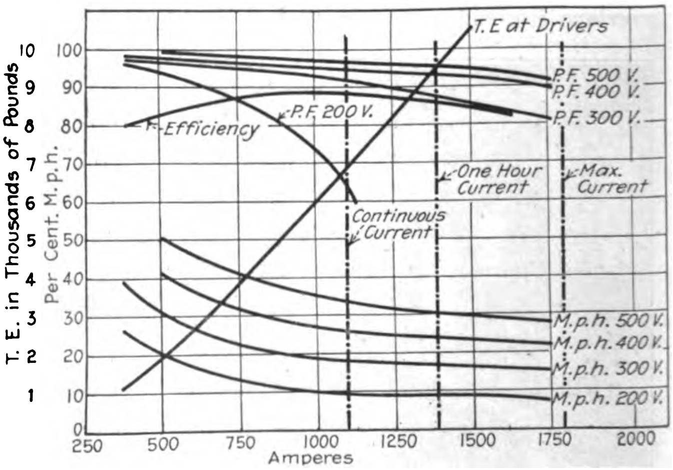
Two different types of tap switches are used, one for hand operation and one for pilot motor operation. The succession of connections is the same in both. The manual switch is provided with a cam-shaft which actuates contact levers with pressure contacts and a central magnetic blowout. This switch was developed for easy manual operation as the friction of the motor-operated switch proved too great. The motor-operated switch is of the drum type similar to those developed for the Loetschberg locomotives, except that in the new switch the two drums are located one over the other and the pilot motor, instead of running all the time, operates only when the drivers are in motion.

In addition to the two transformer tap switches previously described a control switch is mounted upon each motor frame. This furnishes two running points, two for regenerative braking and one "off" position. The four running points are manipulated pneumatically, but in case of emergency they may be controlled by hand. The "off" position can be manipulated only by hand.

REGENERATIVE BRAKING IS ADOPTED

One of the early forceful arguments against the single-phase system was the difficulty with which regenerative braking was accomplished. The advantages of such control upon down grades, including the elimination of wear upon wheels and brakeshoes, the absence of metallic dust, the saving of energy and the smoothness of retardation need no further elaboration. It is claimed that these advantages are now available with the single-phase system with but little added complication. One additional choke coil is included in the main line and a smaller one is connected in parallel with the commutating-pole windings during regenerative operation. The controllers and tap switches previously described are common to both running and braking circuits. The change of connections to the braking circuit is accomplished by means of a reversing switch.

Upon starting down a grade where regenerative braking is to be used the tap switch is first moved to the "off" position. The reversing switch is then thrown to the braking notch. The position of the running controller handle then determines the speed by changing the voltage impressed upon the motors. The speed range is the same as that available when running under power. This braking system also permits continued application until the locomotive comes to rest. It is claimed for this system by the manufacturers that



CHARACTERISTIC CURVES OF ONE MOTOR

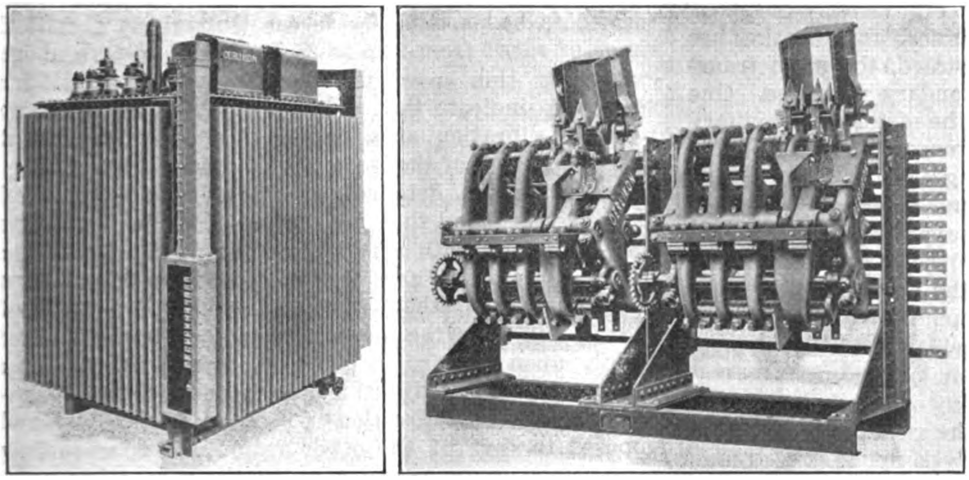
Gear ratio, 4.03; drivers, 53½ in. diameter; frequency cycles, 14.3

regenerative operation at the highest speeds is possible without causing sparking at the commutators or harmful disturbance in the system, nor is the braking process materially affected by fluctuations of voltage and frequency. In fact the full braking power may be interrupted suddenly without harmful results by the automatic opening of the high-tension oil switch as the result of the current collector leaving the contact wire.

After the braking operation is concluded the master controller and thence the tap switch are placed upon the "zero" position. After the reversing switch is then placed in the forward running position, normal operation is again possible. All switching operations are interlocked in such a manner that an incorrect sequence of switching is said to be impossible in both running and braking processes.

The efficiency of regenerative braking is claimed to be approximately 75 per cent under normal operating conditions. However, the power factor of the returned energy is low, ranging from 50 to 70 per cent.

The regenerative braking system is supplemented by the usual hand and air-brake equipment, consisting of a pair of brakeshoes for each pair of driving axles. A 15-in. brake cylinder is installed upon each truck. The air brake provides a maximum braking force equivalent to 80 per cent of the total adhesion weight of the locomotive. On each truck four sand boxes are mounted, two in front and two behind the coupled drivers.



AT LEFT, LOCATION OF TRANSFORMER TAPS INDICATED. IN CENTER, THE TAP SWITCH IS CONNECTED TO SECONDARY WINDING BY END LUGS. AT RIGHT, THE PILOT MOTOR TAP SWITCH MAY BE OPERATED BY HAND IF NECESSARY

CURRENT COLLECTOR IS UNIQUE

Each of the high-voltage current collectors is designed to carry the full current of the locomotive at the lower operating voltage. The second collector is therefore merely a reserve unit. The long radius arm used upon the current collecting mechanism permits considerable variation in height of the contact wire without corresponding movements in the pneumatically operated pantograph. The pressure of the shoe upon the contact wire is practically constant for all heights from 16 to 23 ft. of the latter above the rail. Both collectors may be raised from either control position within the cab by means of air pressure, the motion being so damped as to provide smooth and quiet operation at all temperatures. To provide for the possibility of raising the pantographs after long idleness, when no compressed air is available, a hand air pump is installed with which the necessary air pressure can be secured in less than one minute. The ladder leading to the top of the cab is pneumatically interlocked with the pantograph operating mechanism, so that no one can mount the ladder with the apparatus upon the top of the cab at high voltage. The entire roof equipment is subjected to ten successive tests at 60,000 volts, *i.e.*, four times normal operating voltage, for a period of thirty seconds at intervals of five minutes. During this test the parts normally grounded are connected to ground.

Between the current collectors and the main oil switch two high-voltage disconnecting switches are inserted which may be operated from within the cab to disconnect a damaged current collector.

PROTECTIVE DEVICES EMPLOYED

Like the transformer, the main oil switch is so constructed that its cover forms part of the cab roof, thus concentrating the high-voltage parts at the center of the cab, well out of reach. The grounding switch, contrary to the usual custom, is located inside the transformer case. In the whole locomotive there is no high-voltage conductor or terminal exposed in such a way that it may be touched either by mistake or in performing the duties incident to the operation of the locomotive.

The main switch can be operated pneumatically from both cabs. Manual operation is also possible in case of emergency. This switch is opened automatically by either one of two overload relays in the motor circuits and one in the transformer circuit. A no-voltage relay connected to the low-voltage side of the transformer opens the switch when the power supply is interrupted.

DATA ON 1-C + C-1 FREIGHT LOCOMOTIVE

Height	12 ft. 5 in.
Total length	63 ft. 6 in.
Wheelbase length	54 ft.
Wheelbase of truck	22 ft.
Fixed wheelbase of truck	15 ft. 5 in.
Width of locomotive	9 ft. 8 in.
Gage	4 ft. 8½ in.
Cab length	19 ft. 2 in.
Height contact wire (maximum)	23 ft.
Driver diameter	53⅛ in.
Crank pin stroke	23⅝ in.
Transmission ratio	4.03
Weight, mechanical parts	141,200 lb.
Weight, electrical parts	112,800 lb.
Total weight, locomotive	256,000 lb.
Adhesive weight	208,000 lb.

Axle loads 24,000 + 36,400 + (4 × 33,800) + 36,400 + 24,000 lb., respectively.

Additional protection against personal accidents is provided by a system of interlocking devices connected with the oil tank of the main high-voltage switch. For example, this tank is so arranged that it cannot be removed when air is supplied to the air line of the pantograph cylinder or when the grounding switch is closed.

In order to protect the locomotive from the application of sudden abnormal voltages due to surges or lightning, a choks coil is mounted upon insulators upon the top of the transformer and connected in series with the main high-voltage circuit near the pantograph current collectors. Previous experience has demonstrated that further protection is unnecessary upon the locomotive. It is considered better and sufficient to protect each section of the distribution system with excess voltage protective apparatus.

For the protection of the motors and transformer from excessive current when the process of regenerative braking brings the locomotive to a standstill an additional choke coil is inserted in the circuit of each pair of motors.

UNUSUAL PROVISIONS FOR TRAIN HEATING

Provisions made for locomotive and train heating are rather unusual. As previously stated, the main transformer is equipped with two secondary windings. One of these, entirely independent of the motor and auxiliary circuits, supplies a voltage of from 800 to 1,180 volts, with adjustable taps for a heating circuit. This circuit extends through an oil switch and coupler connections to the train. It is designed to supply for heating purposes 400 kw. of power at 1,000 volts or a maximum of 480 kw. at 1,180 volts during the preliminary heating process when cars are cold. During this period it is expected that the transformer will not be called upon to supply energy to the driving motors.

Railway officials and designing engineers will be interested to learn more about the results of operation of these rather unique locomotives upon single-phase lines at high voltage. Service under similar conditions of grade and heavy freight traffic has not been undertaken in this country with single-phase motors and time only will indicate the adequacy of the design and construction described.

All Cars in Service

OVER the Decoration Day holidays, from May 29 to June 1, and the Fourth of July holidays, from July 3 to July 5, the Long Island Railroad had all of its electrically equipped cars in service. This company owns 474 motor cars and 90 trailers. In order to accomplish this, it was necessary that extreme care be used in making repairs and on inspection to make certain that all parts of the equipment were in proper condition for continued operation and also that all other departments concerned co-operate. Credit is due the transportation department for its careful handling of trains, which prevented any serious accident to cars which might have resulted in their being damaged and withheld from service.

The passenger service on the Long Island Railroad has exceeded all previous records during this season and all departments have been impressed with the necessity of keeping all available equipment in service. This record over the holidays is particularly noteworthy, as it was accomplished with but a very small amount of overtime.

New Type of Gear on Swiss Locomotives*

AN INTERESTING problem in gear reduction has been recently solved in connection with an experimental electric locomotive for the Bernese Alpine Railway Company in Switzerland. Gears for the locomotives of this company have in the past been furnished by the Citröen Gear Company, but during the war they were produced by a German manufacturer under license.

It will be remembered that these locomotives are equipped with two motors each, mounted near the center of the locomotive considerably above the floor, and geared to an intermediate shaft carrying crank plates, pins and connecting rods. The pinions of this drive, of 2 ft. $2\frac{5}{16}$ in. diameter and $9\frac{13}{16}$ in. width, are of highest test forged steel, keyed to the rotor shaft. These mesh with special herringbone gears 4 ft. $11\frac{1}{4}$ in. in diameter, which consist of cast steel hubs, upon which are shrunk forged steel rims.

Although these locomotives operated successfully during test runs up to speeds of 24.5 m.p.h., the operating conditions at higher speeds at a later date developed a peculiar vibration of the whole locomotive frame, which seemed to be particularly severe throughout a critical range of speed from 24.5 to 25.7 m.p.h., although above and below this speed the phenomenon ceased. This seemed to indicate that the difficulty was due to some resonant vibration at a critical frequency, dependent upon the design of the locomotive frame.

Upon further detailed investigation, during road tests, it was found that the centers of the motor shafts were vibrating with a pendulum-like motion about the intermediate shaft as a center, first toward and then away from each other, with a maximum amplitude of nearly $\frac{1}{4}$ in. As the locomotive motors were mounted rigidly upon the frame plate, this indicated that the latter was itself in vibration. Such a motion was necessarily in the same direction of rotation as one rotor and opposed to that of the other rotor, and consequently excessive stresses were set up in the connecting rods, causing several to be broken.

Before the true cause of the broken connecting rods had been discovered they were sufficiently strengthened to resist the internal stresses, but the vibration still continued. The difficulty was finally overcome by the installation of special gears provided with rims free to move in either direction, about the shaft as a center, upon the steel spider as a base. Eight groups of radial laminated springs, mounted upon the spider and extending outward into recesses in the rim, limit the movement of the latter. They are so designed, however, as to permit motion in either direction circumferentially with respect to the shaft. It was at first considered necessary to equip both motors of each locomotive with such gears, but one only was found, upon trial, to suffice. No difficulty has been experienced at any speed since these new gears were installed.

An instructive forty-page pamphlet has recently been published by the Illinois Committee on Public Utility Information. It is a treatise by William Keily, giving in authoritative but brief form the history of the application of electricity to industrial purposes and a summary of the present situation. Considerable attention is given to the electric railway, and a plea is made for fair play for the "burden bearer."

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*Abstracted from *Engineering* (London).

High-Voltage Insulator Development Indicated at Portland Convention

Several Excellent Papers Presented at the Pacific Coast Convention, A. I. E. E., Show Changes Necessary in Suspension Insulators to Adapt Them for 220-Kv. Service

THE following are the principal causes of failure of the conventional type of suspension insulator unit and to some extent the multi-shell pin-type unit, according to W. D. A. Peaslee in a paper entitled "Factors Controlling the Design and Selection of Suspension Insulators"[1]: (1) The use of materials having widely different coefficients of cubical expansion, as in conventional cap-and-pin construction, which cause enormous stresses under temperature changes; (2) mechanical overloading; (3) shocks such as shooting; (4) lightning and power arcs; (5) actual electrical puncture; (6) leakage under adverse conditions, followed by flash-over and heavy power arc; (7) porosity.

The author supports the use of porcelain in tension and draws the analogy to the use of cast iron in a similar manner in many designs in place of steel, which is known to be much stronger in tension. A mechanical strength of from 9,000 to 10,000 lb. is considered adequate for a suspension unit up to 150 kv. operation if the unit is so designed that the repeated mechanical stresses do not injure the unit electrically.

The design of hardware must be a compromise between ease of assembly and security of the connection against failure or uncoupling. The author feels that in order to take advantage of a symmetrical design, conforming in outline as nearly as possible to the lines of force in the electrostatic field surrounding the insulator to avoid corona formation at too low a voltage, a departure will have to be made in the method of attaching the hardware to the porcelain.

Losses due to the absorption of moisture by the porcelain are considered rather serious, due to the resulting localized internal heating of the insulator produced by leakage current. It is disconcerting to read that "good glazing postpones the deterioration of porous porcelain but cannot eliminate it." The statement is challenged, which is said to be quoted from another manufacturer, to the effect that "a low moisture absorption is desirable, but it must not be assumed that any satisfactory porcelain can be made which will have zero absorption."

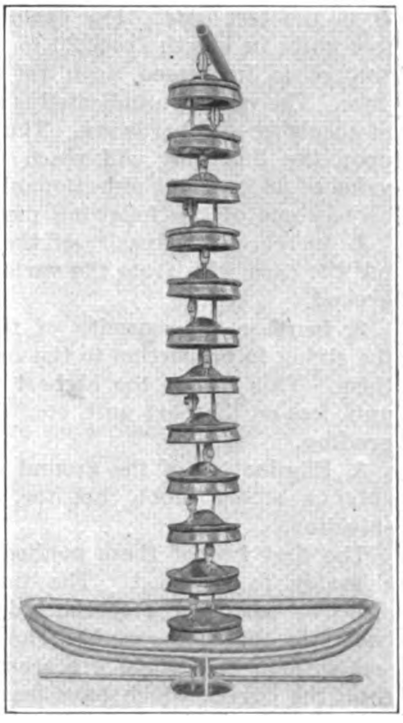
Attention is again directed toward the importance of puncture tests of insulators. The value of such tests has been a matter of controversy for years, involving widely varying opinions. Owing to the high time lag of highly damped, high-frequency transient voltages encountered upon transmission lines, it is predicted that the fundamental basis for the design of a rational suspension insulator unit should be to make the puncture voltage about three times the dry flash-over voltage.

The prevention of corona upon an insulator at relatively low voltages is advocated, and the necessity of adding extra units of high insulating value in some cases to prevent corona forming on the line units is quoted as an argument in favor of designs having higher corona-forming voltages.

A rather radical departure in the design and manufacture of suspension units is proposed which is illustrated on page 262. It will be noted that an attempt has been made to reduce the large mass of metal and its tendency to introduce thermal strains in the porcelain by the use of a spider construction embedded in the porcelain by means of a special alloy said to have sensibly the same cubical expansion as porcelain. One is immediately impressed with the relatively large mass of porcelain in this new unit, but improvements in manufacture are said to have been developed to overcome the weakness associated in the past with such a type. Tests both in laboratory and of a routine factory nature are outlined to substantiate the claims for this new design.

ELECTRICAL CHARACTERISTICS OF THE SUSPENSION INSULATOR[2]

A second paper upon this subject was presented by F. W. Peek, Jr., which points out in particular the comparison between the duties of the suspension insulator at voltages above 100 kv. with those imposed at lower voltages. That the deterioration experienced in line insulators after a few years of good service is due largely to mechanical causes is conclusively shown by the fact that many old types of insulators made of porcelain known to be inferior to that manufactured at present, but supplied with loose-fitting hardware, have shown a much better life record than modern designs.


ANTENNA SHIELD FOR EQUALIZING VOLTAGE ON INSULATORS

The solution of the deterioration problem seems to be to start with a design as free as possible from expansion troubles and the selection of a tough, non-porous porcelain. Years of service have been the best criterion of design. Regarding the selection of material, no present electrical test will anticipate future cracking due to internal strains or brittle porcelain or will indicate porosity in dry porcelain. The desired results can probably best be attained by testing a small percentage of the product to destruction from day to day after the usual electrical and inspection tests have been made, the object being to determine if the product is up to the standard and of uniform quality. The idea is not new, but is used in the manufacture of lamps and in other industries.

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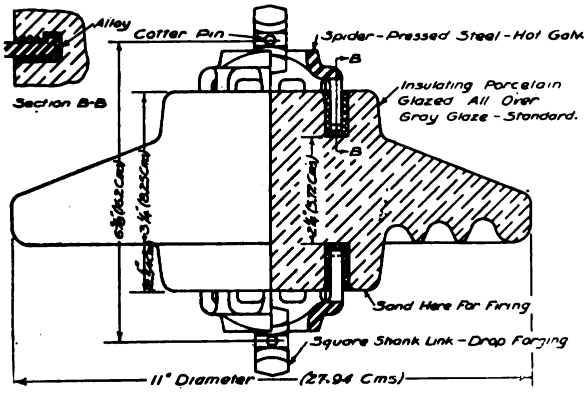
[1] Journal A. I. E. E., June, 1920, page 571.

[2] Journal A. I. E. E., July, 1920, page 623.

Electrical, mechanical and porosity uniformity tests are necessary. Extremely accurate tests are not necessary, but it is necessary to have tests that can be quickly made so that any fault can at once be detected and remedied.


Alloy
Cotter Pin
Spider-Pressed Steel-Hot Galv.
B
Insulating Porcelain Glazed All Over Gray Glaze-Standard.
Section B-B
B
Sand Here For Firing
Square Shank Link-Drop Forging
11" Diameter (27.94 Cms)

THE PROPOSED SUSPENSION UNIT WITH SPIDER CONSTRUCTION

Passing to the question of extra high voltage problems, the tendency of the unit nearest the line to absorb a constant percentage of the line voltage regardless of the number of units in the string is clearly noted from the test data. For example, in strings of over five units in length from 20 to 30 per cent of the line voltage is impressed upon the unit nearest the line wire. The variation indicated is due to different designs of insulator and hardware. Thus at 220 kv. the stress upon the line unit will reach the rather undesirable value of 38 kv. This objectionable value may be reduced by any one of the following methods:

1. Increase the capacity of the units without increasing the capacities from the various sets of hardware to ground.

2. Increase the capacity of the various units along the string in proportion to the currents flowing through them. This means the highest capacity upon the line unit, less on the next unit, etc. This is generally called grading.

3. Elimination of the ground capacities by means of antenna shield from the line. This may be called shielding.

The first two of these methods have been used considerably in the past. The third, which is brought about by means of a specially designed shield, is illustrated in the photograph. The results obtained with and without the shield are seen to be very creditable from the curves which have been reproduced herewith from the original paper. This result is expressed in a more forceful manner in the statement that "the maximum unit stress would be less upon a 220-kv. shielded string than on present non-shielded strings operating successfully at 100 kv. and less."

The effects of rain, dirt, corona discharge at high voltages upon both graded and ungraded strings are then described, with the conclusion that the use of shielding is likely to be more generally effective at extra high voltages than grading. Grading has the further disadvantage of requiring special units which must be kept in proper proportions for replacements.

An interesting method of measuring the voltage between the various units and ground is described in which such voltages are balanced against those existing upon the various taps of a water resistance connected between line wire and ground.

It was concluded that:

1. The old method of basing everything on electrical tests should be abandoned. Severe electrical tests are often harmful. The electrical strength is often secondary to other characteristics.

2. For the very high voltage lines that are at present being considered, greater reliability may in many respects be anticipated than for the lower voltage lines. The lightning arc-over voltage and dielectric strength will be relatively higher, and indeed lightning voltages, sufficient to cause arc-over, will be less than on low-voltage lines. Increasing the number of units decreases the probability of complete string failure.

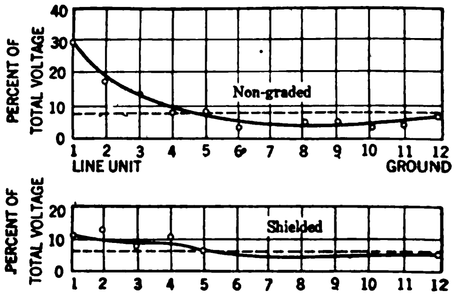
3. Uneven distribution can be corrected by shielding. Shielding prevents excessive corona on the line end units and tends to direct the power arc away from the string.

4. Briefly, outages due to insulator troubles will probably be less frequent at the higher voltages than at present.

UNIT VOLTAGE DUTIES IN LONG SUSPENSION INSULATORS[1]

A paper bearing this title was presented by Harris J. Ryan and Henry H. Henline, which sets forth some very interesting tests made at Leland Stanford, Jr., University. These tests involved varying numbers of suspension units per string, with and without shielding rings.

In order to study more fully the various voltage stresses upon the units of a string, a convenient ratio of maximum to average voltage for a string has been adopted. A standard string of 10-in. "bomb and link type units" is used to establish an empirical curve plotted between this voltage ratio and the number of units in a string. With this as a basis an equation is derived which may be used to determine the maximum voltage duty of cap and pin units at voltages not yet used in practice. For example, "when used to support and insulate a 220-kv. line a thirteen-unit cap and pin string would operate at maximum and average unit voltage duties of 25 and 10 kv. respectively. Many engineers feel that a duty of 25 kv. for a single 10-in. cap and pin type unit is too high because of corona formation and the injury to hardware and porcelain that may result, likewise because of the low factor of safety against flash-over by cascading. It is generally conceded, therefore, that in the present state of the art



VOLTAGE DISTRIBUTION ON A STRING OF TWELVE INSULATORS
(Laboratory hardware)

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[1] Journal A. I. E. E., July, 1920, page 631.

some additional means must be employed in suspension insulators for the 220 or 250-kv. lines whereby the maximum unit duties will not be excessive compared with those of present practice."

Results obtained by Dr. Leonard F. Fuller and one of the authors of this paper are quoted to show the reduction of maximum unit voltage duty for a double unshielded string for 220-kv. service from 23.5 to 15.5 kv. as compared with a single unshielded string and to 10 kv. for a double string equipped with static shields.

Test results quoted in this paper are confined to combinations of insulators of present standard manufacture for the very definite reasons stated as follows:

"Not until the manufacturer has amply demonstrated his immediate readiness to deliver by economic quantity production durable units in which radical changes have been made in design, size and rated mechanical and electrical duty, can the transmission engineer count upon the use of units that may thus differ materially from those in use at present for the support of extra high-voltage (220-kv.) power lines.

"Suspension insulators in common use can be satisfactorily employed for the make-up of insulators for 250-kilovolt lines.

"Increase in the number of strings in the suspension insulator will permit the use of a limited increase in line voltage.

"Static shields in requisite forms will lower maximum unit voltage duties so as to permit the satisfactory insulation of lines for the use of voltages far above 150 kv."

City Buys Lines in Berlin

Surface Railway System Badly Run Down and Fares Three Times Pre-War Figures Conditions Which Led to Purchase

BY E. C. ZEHME
Privatdozent at the Technische Hochschule, Berlin

THE system of the Grosse Berliner Strassenbahn was sold to the city of Berlin and neighboring municipalities as of July 17, 1919. The experts for the city had valued the property at 104,000,000 marks, while the company had raised its first figure of 198,000,000 marks to 349,000,000 marks! The latter price undoubtedly was excessive in view of the depreciated condition of the property. The associated municipalities, which may be considered to form the metropolitan district of Berlin, would have been obliged to pay 150,000,000 marks had they waited until the expiration of the grant in 1925. They offered 137,000,000 marks in view of the fact that 40 per cent of the track and much of the rolling stock demanded immediate replacement. They had also declared that if the company stayed in business they would not permit the continuance of the 17.5 pfennig fare (the original pre-war fare was 10 pfennigs), but would insist upon a return to a 12.5 pfennig fare, thereby forcing a decline in the shares and value of the property. Furthermore, a nationalization measure then under way would have led to almost any price the government saw fit to pay. So the municipalities' offer was accepted as a matter of necessity.

This purchase has ended a tenacious struggle of long standing between the community and the company. During the course of this struggle the city of Berlin had built some competing street railways, but neither these railways nor the lines of the Berlin Elevated & Underground Railway had proved sufficient to meet the growth of traffic, as may be deduced from the accompanying table.

The total number of passengers carried on the Grosse Berliner system in 1917 was 896,000,000.

MUNICIPALIZATION HAS NOT REDUCED FARES

The hope that municipalization would lead to a reduction in fare has not been fulfilled. Instead of a reduction to 12.5 pfennig, the fares were raised first to 20 pfennigs, then to 30 pfennigs, and at the present writing are 50 pfennigs. This figure, corresponding nominally to 12 cents, represents an enormous outlay to the Berliner, especially in view of his shorter average ride in comparison to New York.[*] The end is not yet because of the general rise in costs. Within the coming months we may expect to see fares of 60 pfennigs and later even of 80 or 100 pfennigs.

ANNUAL NUMBER OF RIDES PER INHABITANT, BERLIN

Year	Omnibus	Street Railway	City Steam Lines	Electric Rapid Transit	Total
1870	13	...	..	..	13
1875	15	16	..	..	31
1880	10	40	..	..	50
1890	18	74	13	..	105
1900	43	105	43	..	191
1910	70	150	53	16	289
1917	19*	264	48	33	364

* Withdrawal of gas-driven motor buses due to war conditions.—*EDITORS*

To judge from these initial experiences, the municipalities' experts were not in error in placing a low price on the property. The company had permitted it to run down in pre-war days by paying excessive dividends instead of putting more money into renewal funds. It is doubtful whether any other metropolis is burdened with a more out-of-date street railway. The twenty-year-old single-truck cars are in such condition that even on straight track they behave like bucking camels! On the large cars the trucks are out of square, hard riding and noisy. Most cars are still without vestibules. The method of fare collection is particularly annoying. As prepayment is not in vogue, the conductors are obliged to squeeze their way through cars that are so crowded that many a passenger rides free despite the requirement that each passenger must be able at any time to show a receipt for the fare paid. The ordinance calling for a 1 mark fine if the passenger has no receipt has proved neither just nor workable. Platform accidents and running by stops desired by passengers are numerous because the conductor is not on the platform when needed. Only a few cars have separate entrance and exit aisles, which are due to the influence of the American prepayment system.

The war intensified these evils. The fact that the street railway still shows heavier traffic from year to year is due largely to the small rapid transit mileage. The present route length of such lines in Berlin is now 23 miles (37.5 km.), with but 16 miles (20 km.) more under construction, which gives a total of only 39 miles (57.5 km.). The development of the Berlin transit system as a whole will be discussed by the writer in a later article.

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[*] Mr. Zehme's statement that the average ride in Berlin is shorter than in New York requires explanation. The average ride in Berlin is probably shorter than the average ride in the Borough of Brooklyn, but is probably not shorter than the 1.25-mile average estimated by Stone & Webster late in 1919 for the Manhattan Borough lines of the New York Railways Company. The flat fare system prevails throughout the greater part of the Berlin surface railways, but owing to the absence of transfers many rides are longer than they would be under the American system of shortening the ride through transferring instead of through-routing.—EDITORS.

Safety Cars in Trenton

Report of Inspector for Public Utility Commission of New Jersey Answers Objections Raised by Complainants

THE Board of Public Utility Commissioners of the State of New Jersey has recently made public a report on safety cars particularly as operated in Trenton, made by H. C. Eddy, electric railway engineer, in response to a complaint by a local blacksmiths' union.

This local had adopted a set of resolutions to the effect that the safety car as operated in the city is a deadly menace to the lives and limbs of the people of this community, that too much responsibility is placed upon the operator, that the cars are frequently overcrowded, resulting in distraction to the operator, that the speed of the cars is too great and that the number of accidents caused by the operation of the cars is excessive. The Board of Public Utility Commissioners caused an investigation to be made and the results incorporated with the inspector's report.

The report cited the fact that for several years inspectors of the board have been studying the subject and have accumulated much data. On the basis of these, the general situation is summarized. Attention is directed to the generally increasing popularity of the safety car, at least among employees, and the board's inspectors find that whereas the general attitude of the public when the cars were first introduced was rather unfavorable the cars are increasingly popular as the patrons become accustomed to them and learn of the advantages which accrue from their use. The cars appear to be more popular in the smaller communities, but it is believed that with their more general use in larger cities most of the popular prejudice against them will be eliminated. Such prejudice as exists appears in part to be caused by a misconception of the use of the car and to a feeling that reversion to the single-truck type is a step backward.

The report points out that there are undoubtedly certain disadvantages in the operation of the one-man car, particularly overloading, resulting in the crowding of the front platform, which in turn is liable to result in physical interference with the motorman in the operation of the car. This matter had been taken up previously by the board in connection with the city of Trenton, where it had been recommended that the load be limited to fifty passengers. Attention was also directed to an order of the board, issued Nov. 27, 1918, prohibiting the occupancy by passengers of the platforms of the cars operated by the Trenton & Mercer County Traction Corporation.

The report also took up the difficulty of ingress and exit to the safety car, especially when the car is crowded. This was said to be due entirely to the use of one opening for both entrance and exit, and no reason is seen why this car cannot be constructed so as to provide a double opening, permitting passengers to board and alight at the same time. Counts made by the inspectors indicate that the average time of loading and unloading per passenger and the average time for passenger interchange is practically the same in Trenton for both one-man and two-man cars, except at one point where there is considerable congestion and where the one-man car interchange is slower. However, as the cars are designed to accelerate more rapidly than the ordinary two-man cars, time lost through delays can be readily made up.

As to the complaint that too much responsibility is placed upon the operator, the report points out that most of the extra duties are performed while the car is at rest. Provision is made in the design so that if he has to handle fares or transfers, or use his hands for any purpose whatever other than operating the car, the control of the car can be transferred to his foot. The fact is that the operation of the one-man safety car does not involve any duties other than such as are required of the operator of an auto bus, and the latter has the added duty of steering the vehicle.

As to the alleged excessive speed of safety cars in Trenton and the liability to accident, the report states that the speed limits prescribed by ordinance in the city are low, and that 12 to 15 m.p.h. would be reasonable. It is true, however, that the safety car sometimes exceeds this limit, which is objectionable. However, the accidents which occurred have not been due to the type of car and most have been of a minor nature. Many were not in any way due to the operation of the car.

The claim that the one-man car causes a reduction in the number of employees is true only to a small degree generally and is not true at all in the case of the local company. The adoption of this car has been largely for the purpose of furnishing more frequent service, which is possible as but one operator and only one-half the capital investment per car are required.

CO-OPERATION FROM PUBLIC IS URGED

The report suggests that the full co-operation of the traveling public would be a great aid in the successful operation of the safety car, particularly in such matters as passengers having exact change, rapid movement in boarding and alighting, moving toward the rear of the car when entering, etc.

In conclusion the report points out that there is no evidence to show that the one-man safety car should be withdrawn from service, but recommends:

1. That whenever and wherever the so-called "one-man car," whether equipped with automatic safety devices or not, is operated within the territory coming under the jurisdiction of the board, said car being of such design as that it is fitted generally with cross seats and has a seating capacity of from approximately thirty to thirty-four persons, the maximum number of adult persons who shall be carried in such car at one time shall not exceed fifty, and that notices be posted on the inside and outside of said cars to this effect.
2. That on and after July 15, 1920, in all cases where cars of the types referred to in (1) are operated, such cars shall be provided with a removable guard rail, so located as to prevent passengers from being crowded against the operator of the car and also to prevent the occupation by passengers of at least a portion of the front platform.

Norfolk & Western President Talks to Public

IN A STATEMENT which N. D. Maher, president Norfolk & Western Railway, made recently to the public a new note was sounded. The purpose of the statement was to show that the company was doing the best that it could with its facilities to meet the constantly growing demands of the section which it served.

To prove this such facts were given as gross earnings, equipment of cars and locomotives, engines and cars out of service and other facts on operation to show what has been done and what could have been done with improved facilities.

Illinois Association Holds Annual Meeting and Golf Tournament

Two Supply Men Read Good Papers on Getting Traffic and Car Inspection—Result of Ten-Cent Fare in Joliet and Publicity Discussed

A GOLF tournament, a fine luncheon, given by the Sangamo Electric Company, and two well-received papers, by W. McK. White and L. E. Gould, were the features of the one-day annual meeting of the Illinois Electric Railways Association at Springfield, July 30. Although the association had not held a meeting since July 16, 1919, the attendance was disappointingly small, only seven railways being represented by eight men. In the absence of President W. C. Sparks, general manager Rockford & Interurban Railway, who was prevented from attending the meeting due to a long illness from which he was reported to be recovering, the meeting was presided over by First Vice-President E. M. Walker, general manager Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind.

In the report of the secretary-treasurer, R. V. Prather, the work of the year was briefly reviewed and the attention of the members called to the fact that public utility matters appear to be the main issue in the race for Governor. The propaganda being put out by certain of the candidates for Governor and other state offices and the action of the City Council of Chicago in sending out to all municipalities a resolution providing for the abolishment of the Public Utilities Commission, and requesting its adoption might, it was feared, cause a bad reaction against the utilities in the work of the new Legislature. In this connection members were urged to secure the co-operation of their local chambers of commerce, rotary clubs and other civic associations, and enlightened citizens generally, in counteracting the attack against state regulation in favor of home rule.

The secretary also made reference to the fact that the Illinois Gas Association had elected him secretary and had entered into the maintenance of a joint office with the Illinois Electric Light Association and the Illinois Electric Railways Association, the expenses of the office to be borne 75 per cent by the electric light association and 12½ per cent by each of the other associations.

Messrs. J. R. Blackhall, Joliet; Britton I. Budd and W. V. Griffin, Chicago, sent telegrams to the meeting expressing their regret that important matters made it impossible for them to attend. These men had been expected to take part in the program. A communication from Edwin C. Faber of Aurora directed the attention of the association to the meeting of the International Traffic Association, August 23 to 27, in San Francisco, at which it was expected that uniform traffic laws for use in the United States and Canada would be drafted. Mr. Faber's letter suggested that the electric railways should make some move to be properly represented at this meeting. D. E. Parsons, general manager, East St. Louis & Suburban Railway, remarked that he expected to be on the Coast at that time and intended to be present at the meeting, and that he would be glad to take care of any matters which any railway company might care to bring up before that meeting. No action was taken toward appointing an official representative.

The paper by Mr. White, which appeared in last week's issue practically in full, was then read and was discussed briefly by John Benham and Mr. Walker, who indorsed most of the points made in the paper. This was followed by Mr. Gould's paper, which appears elsewhere in this issue.

RESULT OF 10-CENT FARE IN JOLIET, ILL.

In the absence of Mr. Blackhall, who had expected to read a paper on the results of the installation of a 10-cent fare in Joliet, W. H. Heun, superintendent of transportation, Chicago & Joliet Electric Railway, presented some statistical matter from a letter prepared by Mr. Blackhall to show the results which had obtained.

Approval of the Public Utilities Commission to increase fares from 5 to 7 cents, effective Aug. 7, 1918, was the first move accomplished in the effort of the company to improve its revenue situation. Owing to the influenza epidemic that prevailed that year, reaching its height in October, it was impossible to determine just what effect this increased rate of fare had on traffic. The rate was further increased to 10 cents, effective Aug. 12, 1919. From that date to Dec. 31, 1919, the traffic showed a decrease of 1.4 per cent as compared with the same period in 1918, under a 7-cent fare.

Taking the first six months of 1920, under a 10-cent fare, and comparing this with the results obtained for the first six months of 1919, under a 7-cent fare, and the first six months of 1918, under a 5-cent fare, it was thought that a fair comparison of the results obtained could be made. The following table was presented to show the results during these three periods:

REVENUE PASSENGERS CARRIED

During six months ended	
June 30, 1918, with 5-cent fare	2,960,691
June 30, 1919, with 7-cent fare	2,485,633
June 30, 1920, with 10-cent fare	2,574,901

1919 over 1918, with 40 per cent increase in fare, there was a 16 per cent decrease in traffic.

1920 over 1919, with 42.7 per cent increase in fare, there was 3.6 per cent increase in traffic.

1920 over 1918, with 100 per cent increase in fare, there was 13 per cent decrease in traffic.

REVENUE FROM PASSENGERS

First six months of 1918, with 5-cent fare	$146,961
First six months of 1919, with 7-cent fare	174,005
First six months of 1920, with 10-cent fare	248,442

1919 over 1918, with 40 per cent increase in fare, there was an 18.4 per cent increase in revenue.

1920 over 1919, with 42.7 per cent increase in fare, there was 42.8 per cent increase in revenue.

1920 over 1918, with 100 per cent increase in fare, there was 69.2 per cent increase in revenue.

Mr. Blackhall's letter pointed out that it is reasonable to believe that if the fares had remained at 5 cents there would have been a natural increase in traffic and revenue in 1920 over 1918 of at least 12 per cent, so that the increase in revenue shown during that period cannot be entirely credited to increased fares. He thought it was safe to say, however, that 100 per cent increase in the rate of fare had resulted in increasing the revenue 50 per cent. On city lines 11 per cent more passengers were carried in June, 1920, than in June, 1919.

The additional revenue derived from increased fares, however, has been practically all used to pay increases in wages granted after the fares were increased. In each instance the increase in wages became effective two months before the increase in fare as approved by the commission became effective.

Asked about the attitude of the public toward the 10-cent fare, Mr. Heun said that there had been very little complaint about it; in fact, there had not been as much opposition to this rate of fare as there had been when the company asked for a 7-cent fare. It was also pointed out that the 10-cent fare has not developed any jitney competition. At one time, when the fare was still 5 cents, jitneys began to operate, but after a period of three months, when the city forced them to take out bonds they suspended operations.

Not by way of comparison, but simply to show how different conditions may be in different cities, Mr. Walker said that in Terre Haute for the twelve months of 1918 the total receipts had been $390,000, while for the first six months only of 1920 the receipts had been $335,000, the fare being 5 cents in both cases. The car-miles operated now as compared with last year have been increased 60 per cent, while the revenue has increased 65 per cent. The two cities were parallel only in that in both Terre Haute and Joliet the total revenue had about doubled this year as compared to last. Speaking of jitney competition Mr. Walker remarked that if the haul was short and the pavement good anything above a 5-cent fare was an invitation to jitney buses to begin business.

PUBLICITY SITUATION REVIEWED

B. J. Mullaney, who has been very active in the work of the Illinois Committee on Public Utility Information and the spread of this idea to other states, was then called upon. He said that committees had now been organized and were functioning in Indiana, Kentucky and Nebraska as well as Illinois, that organizations in Ohio, Iowa, Wisconsin and Missouri were getting started, while in Michigan and Texas plans were under way for completing an organization of a similar publicity committee. He said he also felt confident that co-operation on the part of the main national associations might be expected before long.

Mr. Mullaney urged the electric railway men to greater activity in putting before the public the simple and obvious facts of the utility business. He said that if all of the men of the industry would simply keep passing along the simple truths to all with whom they come in contact in the course of time this could not help but have a very beneficial result in securing an understanding on the part of the general public as to the true light in which they should look upon the public utility servants. The speaker said he regretted to say that the railway men were not yet doing as much as they should in this matter of proper publicity. He commented that many were not doing any advertising in their local papers, and it was his opinion that every company should be a fairly frequent space user in the local papers. He said that if we in the utility business do not look after our own interests in the perfectly legitimate way which is at our command there is no one else who is going to do this for us, and it will be our own responsibility if the public is not in due time made to understand that the welfare of the utilities is their own welfare.

Directing his talk to the supply men present, Mr. Mullaney said that they were vitally concerned in the welfare of the electric railway industry and should take it upon themselves to seize every opportunity to spread the proper knowledge of the industry to the general public. He pointed out the selfish interest of the manufacturers and supply men in the well being of the utilities, saying that the utility companies could now, for the most part, operate their properties as they are, on present rates, and "get by" so far as earnings are concerned. The real trouble which they face is the necessity to expand facilities and their inability to get the necessary money to make such extensions. Making extensions calls for the equipment of the manufacturers, and that is why they should take a keen interest in helping the utility companies to bring about a proper understanding of their problems on the part of the public so that popular sentiment will not react against the ability of the company to get new money for extensions. He said the supply men could help not only by direct activities in contact with the people but also by making suggestions to the railway men and the publicity committees as to ways and means of solving the problems.

Mr. Parsons stated that he had found that about the only way he could get the local papers to use the matter sent out by the Illinois committee was to make some comment upon that information, tying it up with the local situations. In fact, he said that the newspapers had flatly refused to publish the matter unless it did have a local aspect. In this connection he asked Mr. Mullaney if it would not be possible for the committee to send the information it expected to put in the hands of the newspapers to the local managers long enough in advance to give the operating man a chance to add some expression which would tie the general situation up with the local situation, so that the matter could go to the newspapers accompanied by this local interpretation. Mr. Mullaney said that this might be possible in a few cases, but that many times it would involve a delay which would make the news too old. It was pointed out that this local handling of the general information by the local managers was the manner of presentation that the committee was trying particularly to obtain.

Nic LeGrand, National Safety Car & Equipment Company, St. Louis, Mo., was called upon and he spoke briefly of the high prices which now obtain for safety cars and the present reluctance of the bankers to arrange long term car trust equipment notes providing for deferred payment. He said that two years was about the longest term the bankers would now make and that they wanted a rate of 8 per cent. He considered these conditions practically prohibitive. In explaining the slow delivery of safety cars he said that the car builders had been very seriously interrupted by the strikes in their plants, but that conditions were now much improved.

The nominating committee, of which Mr. Parsons was chairman and R. A. Moore, Joliet, and John Benham were the other members, recommended the election of the following officers for the ensuing year, and the convention approved, instructing the secretary to cast the unanimous ballot of the association.

President, E. M. Walker, general manager Terre

Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind.; first vice-president, W. L. Arnold, managing director Elgin & Belvidere Electric Company, Chicago; second vice-president, A. D. Mackie, general manager Springfield Consolidated Railways; secretary-treasurer, R. V. Prather, Springfield, Ill.

ENTERTAINMENT FEATURES OF CONVENTION

At the close of the meeting at noontime, the Sangamo Electric Company, in whose assembly room the meeting had been held, entertained the members and guests at a luncheon, which was so enjoyable and so elaborate that there were many remarks during the afternoon indicating that this was responsible for many of the low scores turned in in the golf tournament. After the luncheon the delegates made a brief inspection trip through the plant of the Sangamo company and saw the manner of making and testing meters from the beginning to the finished product.

In the afternoon, at the Springfield Country Club, a handicap match tournament against par for the president's cup was won by Robert E. Belknap, Bethlehem Steel Company, who with a handicap of 21 made a gross score of 86.

Basing Car Inspection on Energy Consumption*

Advantages of This System Over Mileage or Time Basis Pointed Out — This System Is Flexible, Accurate and Controls Length of Inspection Period According to the Work Done

BY L. E. GOULD
President Economy Electric Devices Company, Chicago, Ill.

PROMPT and regular inspection of electric railway rolling stock is of great importance, not only from the standpoints of safety and good operation but also because forehandedness in inspection results in lower over-all car maintenance costs, while deferred maintenance means mounting costs for repairs.

Most car inspection work now is based on mileage or a combination of mileage and time. With either of these a system of clerical records is required for calling in the cars for inspection. Extensive clerical work is necessarily expensive, particularly so when the keeping of mileage in the mechanical department duplicates similar work in the transportation or auditing department. The expense for accurate mileage keeping has deterred numerous roads from inspecting on the mileage basis, and therefore the time basis is being used, even though the time unit is generally recognized by engineers to be a much less accurate and less efficient unit.

The most accurate unit to use in determining when cars should be called in for inspection is one which will most nearly measure the punishment which the car has received. This unit should fill every situation developed in revenue as well as non-revenue service. And the unit should be one which will admit of applying a uniform factor of safety rather than one which does not take into account the actual work which the car has done. It should be a unit of punishment.

Consider first the time unit. It does not in any but a very approximate way take into account the distance a car is operated between inspections. Neither does it account for the kind of service treatment the car has received. Likewise, the mileage unit, of say, 1,000 miles, will call in a car for inspection only on the distance basis, irrespective of whether that car has been well or poorly operated; whether it has been in a fast or slow schedule; with or without a trailer, with or without heavy loads or on hilly or level track.

We believe the energy consumed is the most desirable inspection unit. Kilowatt-hour consumption between inspections is the safest, most accurate, most efficient and most readily available measure of work done by the essential parts that wear and need inspecting. It is the most accurate basis for measuring the car inspection interval, because most parts of the car require attention in direct proportion to the work done by the car motors.

Electrical equipment depreciates and wears in direct proportion to the energy consumed by the motors. The wear of truck parts, brakeshoes and wheels depends upon speed, number of stops per mile, condition of track, weight of car, etc., all of which are factors in determining the rate of energy consumption. If for any reason, such as faulty connections, open armature coils, short fields, binding brakes, tight side or center bearings, etc., a car is working unsatisfacorily, more energy will be consumed for a given mileage of the car than if the equipment were in good condition and the car will automatically be called in early for inspection.

If a car is on an easy-schedule line, having infrequent stops and level track, it will consume less energy than a car operating on a difficult schedule with frequent stops and severe grades. On a mileage or time basis each car would receive an equal number of inspections. On a kilowatt-hour basis fewer inspections would be given the car operating on the easy schedule, and thus a substantial saving in labor would be effected.

If the equipment is unsuited for the service to which it is assigned it will consume more energy and be punished more than the proper equipment for this service, and hence, on the kilowatt-hour inspection basis, will come in oftener for inspection. A car with tight brakes, nosing trucks, short-circuited fields or when roughly or improperly handled by the motormen will consume more energy and will need inspection more frequently. Inspection on the kilowatt-hour basis automatically shortens the inspection period on the roughly handled car and prolongs the period on the properly handled car.

Work done by a car operated by barnmen or in switching around the yards is not accounted for on a time or mileage basis. The kilowatt-hour basis measures every bit of work done by a car, no matter who operates it.

When a car is hauling a trailer it is required to do more work than when operated alone, but under the mileage or time basis of inspection this additional work is not taken into account, while on a kilowatt-hour basis this additional work is automatically taken care of. In brief, car inspection on the kilowatt-hour basis brings a car in for attention in direct proportion to the punishment that that car has received.

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*Abstract of paper presented at meeting of Illinois Electric Railways Association, Springfield, Ill., July 30, 1920.

DEVELOPMENT OF INSPECTION SYSTEM BASED ON ENERGY CONSUMPTION

The idea of car inspection on the work done or kilowatt-hour basis was first conceived as an alternative method of inspection on a large Eastern property which was at that time inspecting its equipment upon a time basis. The management of this property recognized that the time basis of inspection was unsatisfacory and the officials were desirous of changing to the mileage basis, but the local conditions made it almost impossible to obtain the car-mileage within a reasonable period of time. Hence there were many chances for missing inspections or for cars exceeding the mileage allowance between inspections. At about this time Economy power-saving watt-hour meters were being installed on this property and one of our engineers advanced the idea that the kilowatt-hours consumed could be used as a close measure of the car mileages. The proper inspection unit could be determined by finding, for each class of equipment, the average total kilowatt-hours consumed in running the desired mileage between inspections.

One of the first objections raised in this connection was that under some operating conditions a car might consume more energy than under other conditions and hence would come in for inspection more frequently than would happen under the mileage system As the general plan was developed, however, it was found that this seeming objection to the kilowatt-hour basis of inspection was one of the strongest points in favor of it, since it provided that the car would be inspected on a basis of the actual work it was required to do rather than upon the mileage covered.

In addition to these fundamental advantages there are also the following features in favor of this method of handling inspection intervals as developed for use with the Economy power-saving railway meter equipped with car inspection dials. (1) The meter automatically indicates without any clerical labor when a car is due for inspection; (2) the inspection periods are instantly indicated, no time being required to figure the mileage made, which, under the very best conditions, means a delay of a day; (3) the meter shows at a glance how much more work a car can do before inspection; (4) in case of a road failure the meter indicates how much work the car has done previous to the failure; (5) an inspection dial set-back feature assures that the foreman checks the inspection as having been made.

The kilowatt-hour basis of inspection is very flexible and the length of the inspection period may be changed to suit conditions. If it is found that the inspections are too frequent one need merely increase the kilowatt-hour interval to a point which will give the desired increase in the amount of work which a car will do between inspections. Experience on roads which are using this system shows that very substantial savings can be accomplished by this method.

ECONOMIES THAT HAVE BEEN EFFECTED

On a route on one property where this method of calling in cars for inspection has been used for nearly two years we have twenty-one cars operating out of a certain barn. Practically all of these cars are operated during the rush hours, while only five cars are operated during the non-rush period. Under the old method of inspection on a time basis these cars were inspected every four days. This required about 150 inspections per month. On the kilowatt-hour basis of inspection the average inspection period is a little more than twenty days, or a total of thirty-two inspections per month, as contrasted with 150 formerly, and the factor of safety has not been decreased. The average time necessary to make an inspection is said to be about two hours. Therefore, the adoption of the kilowatt-hour basis shows a total saving in time of 236 hours per month, or about ten hours per car per month. This saving in time may be absorbed either in more thorough inspection or by a reduction of the inspection force.

Another large road estimates that the reduction in maintenance labor, due to the decrease of the number of inspections by the use of the kilowatt-hour basis of inspection, will be about $30 per car per year. While this figure is not so high as that previously quoted, in the latter case it represents a reduction from the cost of inspection on a mileage basis as against a reduction from a time basis of inspection in the first instance, and experience is showing a reduction in road failures on the cars so far equipped for kilowatt-hour inspection.

Summing up these points in favor of this method of inspection, we have the following: It gives more uniform intervals of inspection based upon the actual work done by the car; it is flexible and allows a change of inspection interval when needed; it cuts down shop expense by eliminating unnecessary inspections; it indicates the inspection interval instantly and automatically, and in addition shows the shop men how much more work a car may do before inspection so that they map assign the car to the proper run which will bring it back to the barn at the time it will be due for inspection.

CONSTRUCTION OF METER FOR HANDLING INSPECTION WORK

In order to handle the kilowatt-hour inspection plan with Economy watt-hour meters a new meter train was designed and is now in production. Separate dials were added so that the indication of inspection intervals is automatic and in no way confused with the dial regularly read by the motorman when entering his power-saving records.

In the standard construction as now being made by the Sangamo Electric Company for a substantial number of roads the inspection dial has three circles placed at the bottom of the dial face. These are marked respectively A, B and C, and each has a successively higher value in kilowatt-hours per revolution. For example, the dials for safety cars are: A = 1,000, B = 7,500 and C = 30,000 kw.-hr.

Each dial is equipped with a red marker hand, which may be set at any desired inspection interval value, and a meter-driven hand can be set back to zero when the inspection is made. This reset hand is controlled by a key, so that it is impossible for any unauthorized person to change the setting when the key is withdrawn from the lock.

The red marker hand on dial A is set so as to indicate a value of kilowatt-hours equivalent to the usual inspection period for brakes and controllers. This is usually about one day's work, an average of 90 to 100 miles for city service and 100 to 200 miles for interurban service. When the black meter-driven hand reaches the marker hand the shopmen know that the car is due for inspection of brakes and controllers. Likewise the marker on dial B is set to indicate the proper inspection interval for oiling and dial C is set to indicate the proper inspection interval for general inspection. The values given for a complete rotation of each dial are made so as to allow a great deal of variation in the settings of these marker hands, thus allowing local conditions to be taken properly into consideration.

Three sets of gear ratios for inspection dials are manufactured, one for light-weight city cars, one for double-truck city cars and one for interurban cars. These, together with the wide range of settings of the marker hand on any one dial, make a very flexible and easily adjusted medium for the proper indication of inspection intervals.

Selling the Zone Fare Idea in San Diego

Carefully Planned Educational Methods Overcame Adverse Public Opinion—Girls Sell $5,000 Worth of Tickets in Advance

DURING the annual meeting of the California Electric Railway Association held at the Palace Hotel, San Francisco, May 25, 1920, William Clayton, vice-president San Diego Electric Railway, declared the new zone system of fares which went into effect in San Diego Jan. 1, 1920, by order of the California Railroad Commission, to be a complete success.

During the first four months to April 30, 1920, the revenue passengers decreased 164,196, or 2.06 per cent, as compared with the corresponding period during 1919, while the revenue received from the transportation of passengers increased $93,662, or 28.40 per cent. The company's income shows an increase of $91,036, or 25.35 per cent, and the outgo an increase of $34,880, or 7.20 per cent. As a result, the net increase for the first four months amounted to $56,155, or 44.87 per cent.

Mr. Clayton expressed the opinion that the zone system of fares was the best method of increasing the company's income, for the reason that under conditions existing in San Diego it is the best and most economic plan for the public and the company. At first the public did not believe this. In fact, with the exception of the Mayor, the entire official family of the city was opposed to the zone system, and in entire agreement with them were the real estate men, the Merchants' Association and the Chamber of Commerce. However, an educational campaign of such comprehensive scope was carried out that not only were a large number of tickets sold in advance, but in many other ways the riding public was so well prepared for the change from straight fare to zone system that there was no confusion or congestion when the new plan went into effect. Moreover, the public had been won over from opposition to approval so effectively that receipts since the change, as noted below, are highly satisfactory.

The educational work began with the company's own men first, and all transportation department employees attended one-hour classes (on company time) until they had been thoroughly grounded in the principles involved. These classes were addressed by E. J. Burns, assistant to the vice-president, the manager of transportation or the traffic man.

As it was believed that success could be attained only through personal contact with the public, it was deemed necessary to supplement the work which the company's own employees could do by extra help. Accordingly, twenty intelligent girls were selected and given a ten-day course of training. In this time they were coached not only on the matters involved in the zone system but also on the financial affairs of the company. The company made arrangements so that these girls were provided with tables where they would meet the public in banks, department stores and hotels. The tables were provided with placards and literature and the girls were to answer questions about the new zone system and to sell street car tickets. To encourage competition, prizes were offered the girls who sold the greatest number of tickets. The contest extended over ten days, just prior to Christmas, and the girls were provided with books of tickets containing coupons for forty rides, good until used. The books were neatly made up in Christmas covers and sold for $3. In this ten-day period this team of twenty girls sold about five thousand dollars' worth of tickets.

The fundamentals of the zone plan were explained to the heads of large industries, wholesale houses and department stores, and through their co-operation the street railway company employees were enabled to address the workers in these stores and industries. For example, the traffic man talked to a meeting of employees at every large mercantile or industrial establishment, explaining what the zone system was, how it would work and answering questions or objections that were raised. In each of these talks the traffic man was accompanied by platform men in uniform who sold books of tickets. Arrangements were ordinarily made with the employers beforehand so that any employee could get a book of tickets by signing a receipt, to be turned over to the company, which authorized a payroll deduction. It is notable that employers were willing to have employees attend these meetings during working hours even in the rush season just before the Christmas holidays. One of the most important features of the plan for "selling the idea" was to give platform men 3 per cent of ticket sales. Under the plan 3 per cent of all money received from the sale of 7½-cent tickets each month is set aside as a bonus for platform men and is added to their wages on the basis of the number of hours worked. The total number of platform man-hours is made equal to this 3 per cent fund and the number of hours each man has worked determines his share of the total.

Under this plan the conductors and motormen are always anxious to sell tickets, and in the several months' experience with the plan it is found that more than 95 per cent of all 7½-cent tickets sold are purchased on the cars. Under this plan the platform men are charged with so many books of tickets when they receive them, and accounting is simplified because each man is responsible for his supply.

Arrangements were made with the telephone company so that on New Year's Eve and New Year's Day every telephone subscriber was called up and reminded that the zone plan was going into effect. The usual conversation was "Happy New Year! This is the San Diego Electric Railway. Just to remind you that the zone system goes into effect Jan. 1." This telephoning was done from the four branch stations of the telephone company, in each of which special switchboards had been fitted up for the purpose. The railway company kept men on duty in each of these stations to answer inquiries which might call for more information than the girls could give.

Several days prior to the adoption of the new system cars carrying signs were sent over all lines of the system. A real test of public sentiment was made on Christmas Day, when 10,000 people had gathered in the stadium to witness a football game. For this occasion the company had one of its line wagons fitted up with signs bearing announcement of and statements about the zone system. This wagon made the circuit of the stadium between the two halves of the football game. Observers stationed throughout the crowd did not hear any adverse comments. In fact, platform men in uniform, who handed out pocket size maps showing the limit of the zones, as the crowd was leaving the grounds, sold some three hundred dollars' worth of tickets.

So many tickets had been sold and the details of how the plan would work were so thoroughly explained in advance that there was no confusion or congestion on Jan. 1. During the first week instructors were detailed to ride the cars and answer questions or aid the conductors in their work. A few days before the end of each month this plan is repeated.

Under the plan as used in San Diego tickets are not put in a fare box. The fare register rings up 5-cent fares on one side and tickets and transfers on the other. Ten-cent fares are registered by a portable neck register which the conductor carries. The company supplies a special vest equipped with pockets for tickets and transfers, which has been found to be most convenient for speedy service to the passenger. Under the San Diego plan there is only one collection per passenger on each trip, and identification slips, issued when fare is paid, are taken up when zone boundary is crossed. Transfers are issued in three colors, this being sufficient to identify the ride to which the passenger is entitled under the several combinations that are possible. Under this plan all looping is prevented.

Owing to the decrease in the number of men stationed at Camp Kearney, North Island and other military points in the vicinity of San Diego it was expected that there would be a considerable decrease in the number of passengers carried in the first four months of this year. As shown by the accompanying table, however, there has been only a 2 per cent decrease in the business in these months, and in the months of April there was a 1 per cent increase. In May this rose to 5 per cent. It is notable that the table shows a 29.50 per cent gross increase, which is the equivalent of a 6½-cent fare. This indicates, company officials believe, that there has been no shrinkage on account of the increased fare. and all of the short-haul business has been retained, which would not have been the case had an increased fare for the entire system been adopted. Moreover, the company has the great advantage that in the event that some later change may be necessary this can be accomplished by rearranging the zone limit much more easily than would be possible if it were necessary to change the amount of fare.

SAN DIEGO ELECTRIC RAILWAY COMPANY

Comparative Statement of Income and Outgo and Operating Statistics for the first four months, January-April, 1920, Compared with the corresponding peiiod of 1919

Item	First Four Months January-April, 1920 Amount	Per Cent	First Four Months January-April, 1919 Amount	Per Cent	Increase or Decrease Amount	Per Cent
Income:						
Revenue from cash-fare passengers	$152,771.65	33.93	$287,738.53	80.12	$134,966.88	46.91
Revenue from ticket passengers	270,667.39	60.13	42,038.31	11.71	228,629.08	543.85
Revenue from transportation of passengers	423,439.04	94.06	329,776.84	91.83	93,662.20	28.40
Other revenue from transportation	358.00	0.08	1,016.02	0.28	658.02	64.76
Revenue from other railway operation	22,348.82	4.97	25,316.47	7.05	2,967.65	11.72
Non-operating income	4,017.95	0.89	3,018.44	0.84	999.51	33.10
Total income	$450,163.81	100.00	$359,127.77	100.00	$91,036.04	25.35
Outgo:						
Way and structures	$24,551.36	5.45	$25,765.95	7.17	$1,214.59	4.71
Equipment	22,059.39	4.90	21,289.24	5.93	770.15	3.62
Power	64,583.07	14.35	55,508.13	15.46	9,074.94	16.35
Conducting transportation	138.964.12	30.86	120,263.59	33.49	18,700.53	15.55
Traffic	7,462.65	1.66	3,448.19	0.96	4,014.46	116.39
General and miscellaneous	47,974.90	10.66	50,591.08	14.09	2,616.18	5.17
Transportation for investment—Cr	186.19	0.04	24.09	0.01	162.12	673.54
Operating expenses	$305,409.30	67.84	$276,842.11	77.09	$28,567.19	10.32
Depreciation	91,306.84	20.28	103,547.06	28.83	12,240.22	11.82
Taxes	28,540.84	6.34	23,255.82	6.48	5,285.02	22.73
Rent of Point Loma Railroad	7,453.37	1.66	....	......	7,453.37	......
Interest on funded debt	62,066.67	13.79	62,733.33	17.47	666.66	1.06
Amortization of discount on funded debt	4,774.20	1.06	4,825.56	1.34	51.36	1.06
Sinking fund (retirement of bonds)	19,600.00	4.35	13,066.64	3.64	6,533.36	49.99
Total outgo	$519,151.22	115.32	$484,270.52	134.85	$34,880.70	7.20
Deficit	68,987.41	15.32	125,142.75	34.85	56,155.34	44.87
Operating statistics:						
Revenue passengers carried:						
Cash fare passengers	2,785,171	35.64	5,738,171	71.92	2,953,000	51.46
Revenue ticket passengers	3,873,862	49.57	1,147,663	14.38	2,726,199	237.54
Transfer passengers	1,155,201	14.79	1,092,596	13.70	62,605	5.72
Total revenue passengers	7,814,234	100.00	7,978,430	100.00	164,196	2.06
Car-miles and car-hours:						
Car-miles operated	1,258,619	......	1,170,229	......	88,390	7.55
Car-hours operated	132,117	......	129,631	......	2,486	1.92
Car-miles per car-hour	9.53	......	9.03	......	50	......
Platform hours and wages:						
Platform hours	235,730	......	234,034	......	1,696	0.72
Platform wages	$105,822.04	......	$97,925.50	......	$7,896.54	8.06
Average cost per platform hour	44.89c.	......	41.84c.	......	3.05	7.28
Average cost per car-mile	8.41c.	......	8.37c.	......	0.04	0.48
Passenger revenue statistics:						
Average revenue per cash fare and ticket	6.76c.	......	5.22c.	......	1.54	29.50
Average revenue per revenue passenger	5.76c.	......	4.50c.	......	1.26	28.00
Average revenue per car-mile	35.76c.	......	30.69c.	......	5.09	16.58
Average revenue per car-hour	3.41c.	......	2.77c.	......	0.64	23.10
Average income per day	$3,720.36	100.00	$2,992.73	100.00	$727.63	24.31
Average outgo per day	4,290.51	115.32	4,035.59	134.85	254.92	6.32
Average deficit per day	$570.15	15.32	$1,042.86	34.85	$472.71	45.33

London's Traffic Problem[1]

Comparison Given of Means of Transport in London and Other Cities on Basis of Carrying Capacities and Weights per Seat—As Auxiliary to Rapid Transit Lines Bus Has Many Advantages—All Transportation Means Should Be Co-ordinated with Unity of Financial Interest

By LORD ASHFIELD
Chairman and Managing Director London Electric Railway and Associated Companies

RAILWAYS, tramways, motor routes are alike in purpose, though different in form. The tendency is to judge them by their form and to insist on their diversity, forgetting almost wholly their essential likeness as carriers of passengers. If it is considered that a railway, or railroad, as it may be better named, is but a special type of street, one common aspect of the three is more quickly recognized and one common problem of the three more easily solved.

There is a street and in it passengers requiring to be carried along its way. At first the passengers are few and a motor omnibus serves, then the passengers increase in numbers and more and more motor omnibuses are added, until there comes a time when the street is full of vehicles. For, after all, the motor omnibuses are only a part of the whole vehicular traffic. The street must be widened to relieve the congestion, and the question that should present itself is whether a new and special street should not be built to take off one class of the traffic; it may be heavy goods, but it is much more likely to be passengers. This special street may be underground, as in London, or elevated, as in New York, but it is only a special street, where greater speed is possible and fewer interruptions from cross and converging traffic are experienced.

What is the position of a tramway? It is intermediate between a motor route and a railway. It enjoys severally the virtues of both, but it accumulates their defects. It can deal with the casual passenger of the street almost as well as a motor route. It can deal with a heavy occasional load of passengers almost as well as a railway. But it needs a costly special track with its equipment like a railway, and that special track is subject to all the hazards and delays of the street, which means no advance in locomotion over the motor route. Is it cheaper to widen a road to build a tramway or to build, above or below, a special railroad? The answer turns not merely upon the capital expenditure, though that may be decisive; it turns also upon the public advantage.

In America there are practically no motor routes. The motor omnibus (except for the Fifth Avenue Coach Company of New York, which has a special sphere of influence there and works about 300 motor omnibuses) is a new thing and its development is only just beginning. There have been street railways for many years, not stereotyped like the tramways of England, but always progressing in design and construction and in methods of operation. The street railway, as an intermediate type capable of dealing with long- and short-distance passengers, with heavy and light loads of passengers, has so far met the needs of the expanding cities in America efficiently and well. It fulfills its function. But there comes a time when the expansion is too great even for the most efficient street railway to meet the public demand for travel. It is generally recogized that when the population tends to reach the second million the time has come to resort to some other instrument of travel.

RADIAL ROUTES BECOME OVERLOADED

Two causes lead up to this conclusion. First, the city has spread out over a territory extending some 8 miles or more on every side from the center. The time taken on the journey between the center and the fringe of the built-up districts, under ordinary street conditions, is prolonged to fifty minutes or more, which is felt to be too extravagant a consumption of the working day. Second, out there the size of the city is the index to the magnitude of its business, and this business has filled the main radial routes with a great volume of vehicular traffic, to be in itself a hindrance to speedy movement, and has created a density of passengers at certain busy hours on those radial routes with which a street railway, still less a motor route, cannot satisfactorily cope. The task of decentralizing a city is one not to be lightly undertaken, and unless this can be achieved another remedy must be found. What is needed is grasped at once in America. It is a special street above or below the existing surface street upon which the passenger traffic can be carried conveniently and quickly. The obstacle in resorting to this remedy is the capital invested in street railways. There is rarely enough passenger traffic on a radial route to support both an expensive elevated or underground railway and an expensive street railway or tramway. American cities are one by one being compelled to face the loss which such a conjunction involves. It is this obstacle which is now slowly directing attention to the motor omnibus.

The motor omnibus is just what is required to supplement and feed a railway. It has no fixed capital in track and equipment. It is not tied to a route. It can follow the passenger traffic to its source or it can lead the way to new settlements. It can take up the casual short-distance passenger and by a complex ramification of routes, each independently worked, meet his closest requirements. All the while the main volume of passengers can be carried swiftly in the leading directions by the special railroad system without occupation of the street capacity. Once a city passes a certain size the street railway solution of the traffic problem is seen not to have been the right one. The street railway is an intermediate solution, good until a more highly specialized scheme of transport facilities is wanted.

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[1] [Lord Ashfield, formerly Sir Albert Stanley, has contributed an extended article on "London Traffic Problems" to the May issue of the *Nineteenth Century and After*. In this article he discusses the present transportation systems in London, in which the rapid transit lines and buses, with certain outlying trolley lines, are owned by private interests, while the tramways serving a large part of the central part of Greater London are owned by the London County Council. Lord Ashfield urges in his conclusions, among other things, the "transfer of all transportation agencies to private enterprise, subject to public control, and the establishment of a pooling scheme under which measure of co-ordination may be taken without prejudice to any specific interests." Outside of the purely local situation considered, Lord Ashfield's article contains much that is of general interest and application. The accompanying article is an abstract of that part of his contribution in the *Nineteeth Century and After*.—EDITORS.]

SPEED GOVERNS DISTANCE SERVED

More important than the capacity of the transport facilities, for mere multiplication of services will meet this, is the speed. The citizen of New York has made a fetish of speed. He gives himself pains to catch up a few minutes. He chooses instinctively not the most comfortable conveyance but the fastest. Thus he crowds the subway to distraction. Now that London is outgrowing the distance that can be covered by the ordinary stopping train it must learn the same lesson and by taking thought for the future it must avoid the misfortune that befalls the New York passenger.

What time will a regular passenger give for his journeying day by day between his home and his workplace? Not much more than 45 to 50 minutes, of which only 30 to 35 will be available for the actual journey by train, tram or omnibus, the higher allowance occuring where the time taken to reach the transport agency is less, as with the train or omnibus, on account of their more frequent stops. Given a practical time limit, such as this, the speed governs the distance that can be served.

The present average speed of the underground railways is about 18 miles per hour. By the present non-stop working this speed is raised to about 25 miles per hour. This corresponds closely with the average speeds reached on those portions of the main-line railways now electrified where the stops to be made are infrequent. The number of stops is the real factor governing the speed. The average distance between stations on the underground railways is about half a mile, on the main-line railways more than a mile. The demand for frequent stops on a railway is short-sighted, and the tendency for the future must be to space out the distance between stations on urban railways, leaving to the tram or omnibus the task of the more detailed distribution of the passengers and the carriage of those traveling comparatively short distances. It will then be possible, with the aid of improved equipment, to raise the average speed of a suburban railway service to 30 miles per hour and so cover the circle of 15 miles radius of the center in thirty minutes, which is, as nearly as may be, the problem to be solved.

Turning to street transport agencies, the omnibus is more speedy than the tram for several reasons. Trams running on a fixed track must observe a fixed order or sequence, and the slowest tram of a series determines the speed of all. Tram stops are longer than those of the omnibus, and at the same time more frequent, in consequence probably of the larger seating capacity of the tram. Trams are also more liable to delays. Whatever the causes, the result is that the average speed of trams in London is about 9 miles per hour and of omnibuses about 10.5 miles per hour.[2] The distances which they can cover in the allotted journey time are therefore 5 and 6 miles respectively. This affords the most conclusive argument against either of these agencies taking a place as the mainstay of passenger movement in a Greater London. Both must be auxiliary to railways, and as an auxiliary the omnibus has great advantages. Looking to American experience once again the best record for speed on a street railway system is 11 miles per hour, and this is only secured by careful and efficient operation and a scientific study of stopping places. It is exceptional.

CAPACITY A FUNCTION OF HEADWAY

Although the factor of speed is emphasized, it is not to the neglect of the factor of capacity. The real criterion of capacity is the number of seats in a traffic unit—a train, a tram with its trailer, a motor omnibus. When the underground railways were built the designers made inadequate provision for trains of the length which now seem to be requisite. The earliest tube, the City & South London Railway, has platforms capable only of accommodating a train of five small cars seating thirty-six passengers each. This railway is in urgent need of modernization and enlargement. The Central London Railway has platforms capable of accommodating seven cars of the present standard size seating forty-eight passengers each. The Baker Street & Waterloo section, the earliest portion of the London Electric Railway, has platforms to accommodate five standard cars, but the later sections of this railway have longer platforms for six cars. Working the platforms to their fullest limits and making such alterations as are feasible a standard of seven cars to a train, giving seats to 336 passengers, is the best prospect. Compare with this the present practice of New York, where ten-car trains, each car seating ninety passengers, are run.

Turning to street passenger vehicles, the standard tramcar of the London County Council seats seventy-eight passengers and when coupled with a trailer 132 passengers. The present motor omnibus seats thirty-four, and the new omnibus, under construction for the replacement of the present fleet, forty-six. This must not be regarded as the limit to the seating capacity of a motor omnibus. In Chicago there is already a motor omnibus seating fifty-four, and designs have been prepared and an experimental vehicle is being built in this country to seat fifty-six. In this connection it is important to consider weight. The tramcar seating seventy-eight passengers weighs 15 tons, or represents a dead weight per passenger of 400 lb. The present omnibus seating thirty-four weighs 7,300 lb., or represents a dead weight per passenger of just over 200 lb. The new omnibus seating forty-six weighs 4 tons, or represents a dead weight per passenger of 175 lb., while the still larger omnibus to seat fifty-six will weigh, it is expected, 8,500 lb., and this represents a dead weight per passenger of only 150 lb. It is a repetition of the old instance of the goods wagon where the argument for a greater load capacity was based upon the economic gain in the better relationship of tare to gross weight. The main weight of the empty omnibus is already there in the present small vehicle and the increase in weight for the increase in capacity is very slight. A better distribution of the load over the four wheels, improved springing and more resilient tires will mean less and not more road shock and vibration for the augmented weight. While, therefore, there is an excellent case for a larger omnibus, opinion is divided upon the question whether the tram is not too large and cumbersome. Certainly it is slow and ponderous in operation, and as the figures given above show, is a much less efficient vehicle from the point of view of dead weight.

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[2] [In the article by Walter Jackson on London Tubes and Buses, ELECTRIC RAILWAY JOURNAL, Oct. 11, 1919, page 708, the over-all schedule speed of the buses as officially approved by the company is given as 8½ m.p.h. This discrepancy may be due to the data having been taken at different periods or under dissimilar conditions.—EDITORS.]

The maximum capacity of a transport agency turns not only upon the possible size of the traffic units employed but also upon the frequency of service with which they can be operated. It is possible with electrically controlled automatic signaling to bring the capacity of a single track of railway up to 40 trains in the hour in one direction. The highest number worked in one hour on the underground system has been 43. The number of passengers which can be carried in the hour on the basis of the seating capacity of the trains is therefore about 13,500, or with 50 per cent of standing load about 20,000. A tramway track worked by trams and trailers attached is found by observation to permit of the movement of sixty-five units in one direction in the hour. The number of passengers which can be carried in the hour on the basis of the seating capacity is therefore about 8,500, or with a complement of standing passengers about 10,000. It is not suggested that sixty-five is the maximum possible movement. American results would suggest a higher figure by about 25 per cent, but to secure this a considerable simplification of routes and track would be necessary.[3] The maximum possible passenger movement may be taken as 12,500. An arterial road used by motor omnibuses is found by observation to permit of the working of 150 in each direction in the hour, which on the basis of forty-six passengers to the vehicle means a total possible passenger movement of about 7,000 in the hour, or, on the basis of fifty-six passengers to the vehicle, 8,500. In comparing tram and omnibus it is assumed that the roadway is sufficiently wide to permit of at least four lines of traffic, two in each direction; a less width were unsuited to metropolitan street conditions.

The railway on these figures is clearly best adapted to the movement of heavy densities of passengers, the tramway second, the motor route third, the difference between tramway and motor route constantly diminishing. The conclusion already indicated is therefore confirmed, which is that railways are essential to free and extensive passenger movement in a metropolitan area, and that as auxiliary to railways, which take off the heaviest traffic, the motor omnibus has distinct advantages over the tram.

COST OF ALL AGENCIES ABOUT THE SAME

This is more marked if consideration is given to the capital and operating costs. Taking capital first. A railway underground costs between four and five times a tramway, leaving out of count the cost of the street to the tramway and the cost of the acquisition of rights of way to the railway. If street cost were added to the tramway there would be many instances where it amounted to more than a railway. A tramway for a given maximum service costs more than thrice as much as a motor route worked to the same extent, ignoring differences in seating capacity. Next, taking operation, a tramway and a motor route cost per mile run almost the same sum, as might be expected, the advantage resting with the tramway, and both cost over half as much again as a car-mile on a railway. If all elements of cost, *i.e.*, operating expenses, reserves, fixed charges and reasonable interest, are brought together it will be found that the costs of the various transport agencies are approximately alike, being in the ratio of 21 for a railway car-mile to 22 for a tramway car-mile and 20 for a motor omnibus-mile.[4] It is only fair to add that the seating capacity is as 48 is to 78 is to 46, so that the cost per seat-mile is as 44 for a train is to 27 for a tram is to 43 for an omnibus, which brings out the economic advantage of the tramway. This economic advantage is, however, lost by the operation of lightly loaded large units throughout the day. If, in place of the seating capacity, the average passenger load carried were applied the ratio would be as 123 is to 71 is to 74. On this basis it is seen the same factor now prejudices even more severely the railway.

SCIENTIFIC ALLOCATION DESIRABLE

A study of the performance and functions of the various transport agencies on these lines is the only way by which a scientific and accurate allocation of duties in the carrying of metropolitan passenger traffic can be assured. Maybe there is a want of dispassionate argument in this paper, and it can only be put forward as an index to what is required. Unfortunately, while the case against the tramways from several points of view appears very strong, there is a large vested interest in the tramways of London already in existence amounting to £23,000,000. It is impossible in these days of economic hardship to advocate a bold and courageous policy of scrapping, even if it were right. The evidence is not sufficient to warrant the assumption that it is right, but it is sufficient to deter any further ventures in tramway enlargement and construction.[5]

The program before a tramway undertaking upon a review of modern progress must, it is suggested, be limited to the consolidation and completion of the existing system, the straightening out of routes and the modernization of their equipment. A policy of rerouting cars is adopted frequently in American cities, and every effort is made so to arrange the routes as to avoid intersections. By this means over 180 cars, including trailers, can be moved over a single line of track in the hour. The size and arrangement of cars are tested in relation to the speed of operation, and the smaller car used in England giving a higher speed has been the general tendency in design as giving a maximum result. One-man cars equipped with safety devices are being freely adopted and present advantages which must always seem denied to a motor omnibus. By these means tramways are made more effective, but all these means cannot confer on them a capacity which will enable them to maintain their position as against railways in a metropolitan area. This decision may come hardly to a tramway man and to a tramway authority. And here is the real difficulty: A tramway authority is a local authority, tramway capital is public money.

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[3] [In a report on Detroit in 1915 by Barclay, Parsons & Klapp, data are given showing the movement of 167 cars north bound and 167 south bound cars per hour on Woodward Avenue, 205 south bound and 189 northbound at Michigan and Fort and 181 cars in each direction per hour at Congress, Larned and Jefferson. This heavy traffic is opposed by conflicting traffic on cross streets amounting to 116 west bound and 45 east bound cars per hour on State Street, more than 100 cars per hour in each direction on Michigan and Monroe, 52 west bound and 56 east bound cars per hour on Fort and 85 west and 42 east bound cars per hour on Jefferson.—EDITORS.]

[4] Based on the costs at the close of the year 1919. [Author's note.]

[5] This paragraph refers only to metropolitan areas in which considerable distances are to be covered. The tramway is accepted as the most efficient means of local communication in well-developed cities of a diameter not exceeding 10 to 12 miles. The provincial tramway systems are eminently well adapted to provincial requirements at this stage of development. [Author's note.]

Politics conflict with a decision on scientific and statistical grounds.

And so the last part of this article is reached. How is the conflict of interests in London to be cleared up? How are traffic considerations to be divorced from politics?

CONCLUSION

The essential condition precedent to any attempt to achieve a satisfactory solution is to secure a unity of financial interest, not at all necessarily by municipal or state ownership, but preferably by a traffic pool, out of which the losses of one transport agency may be met out of the gains of another—a legitimate procedure where the gains on one side and the losses on the other side are the consequence of interference by some outside authority. Only where it has at its disposal the means to administer justice can any authority that may be set up enter safely upon a policy of interference with transport undertakings established and conducted with statutory or public sanction.

Upon the form there is no doubt that a single dictator would be most effective if he had a wise experience and a careful judgment. Because they doubt the existence of such a dictator, the advocates of bureaucratic control fall back on the combined wisdom and experience of three, and trust to the clash of opinion among them to insure a reasonable measure of good judgment. But opposed to them are other advocates who think that a bureaucratic control is contrary to the spirit of our English institutions, that executive action must be approved and confirmed by some representative body who must be responsible to the citizens for such action. The difficulties which beset this view are serious. A representative body is unwieldy, unswift, uncertain and uninformed. On the other hand it is always imbued with a spirit of compromise and endowed with a liberal measure of common sense, so long as the questions debated in it are not colored by party politics. There is the risk that traffic being mixed with party politics now, it may not be possible to unravel the two, and in such event control of traffic by a representative body becomes hopeless of benefit.

It is interesting to review in this connection the extent to which the local authorities have provided transport facilities compared with the extent to which private undertakers have done the same. The public moneys of the local authorities of Greater London invested in traffic facilities amount to about £18,000,000, but the public's own private investments in traffic facilities amount to about £80,000,000. The average dividend on the private investment as a whole has been about 3 per cent at the best. The average dividend on the public money has been higher, being about 3½ per cent. There are no profits to limit. Whoever owns the transport facilities becomes an academic question when the rate of interest on the capital will be the same whatever happens.

There are two alternative solutions of the problem of traffic control in London. There is the board or commission of three members, whose task is that of adjudicating in a fair and impartial manner upon the disputes coming before them with a view to smoothing out all the obstacles to a co-ordination and development of all transport agencies. Or there is the turning over of all transport agencies to private enterprise and the arming of the local authorities, severally and jointly, with such powers as may be requisite to secure the conduct of traffic in a fair and impartial manner toward the public. It is hard to conceive a permanent solution which is a compromise from one or other of these alternatives—a statutory independent board, or an elective representative authority.

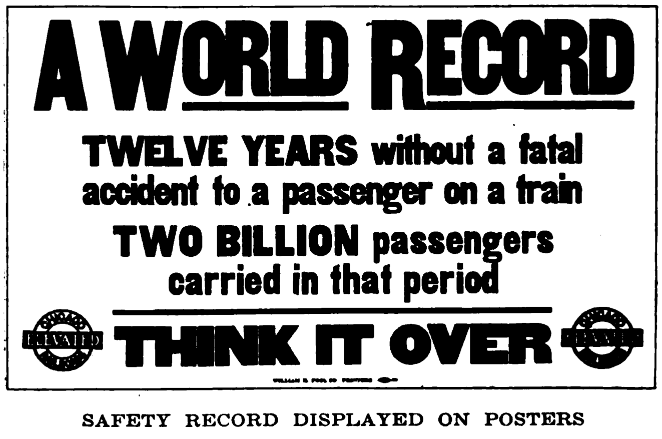
The advantage of private enterprise is that the business must be managed and conducted on a commercial basis, even on a competitive basis. We are apt today to underrate the advantages of the commercial outlook upon which the industry and prosperity of the country have been established in the past. The new spirit in affairs fights shy of the commercial spirit. It is agreed that they are not the same, but they are not antagonistic like oil and water; they will blend, and in their blending is the hope of the future. This admission is not to be taken as contradictory to the view already expressed that an ultimate unity of financial interest is the condition precedent to successful co-ordination. Competitive management does not imply competitive finance. The various transport agencies of London have their periods of prosperity and their periods of failure. Thrice already the omnibus industry has risen to opulence only to fall later into penury. When the common fund was set up under the London electric railway companies facilities act, 1915, the London General Omnibus Company was well enough off to assist the underground railways.

At the close of 1919, the underground railways had to come to the assistance of the omnibus company to meet its working costs. The old saying that what you gain on the swings you lose on the roundabouts is very applicable to London traffic and affords a good reason for some pooling scheme, which, subject to full publicity and with the supervision of those concerned with the public interests, cannot but be helpful and fair to all concerned.

The conclusions appear simple, but it is appearance only; underlying each of them, as this article has attempted to show, are controversies which can only be settled by men of good will.

Chicago Elevated Safety Record

IT WAS mentioned in the Jan. 31 issue of the ELECTRIC RAILWAY JOURNAL that the Chicago Elevated Railways was displaying a car card calling the public's attention to the wonderful record of the company in the matter of fatal accidents. The card referred to has since been obtained and is reproduced in the accompanying illustration.



A WORLD RECORD

TWELVE YEARS without a fatal accident to a passenger on a train

TWO BILLION passengers carried in that period

THINK IT OVER

SAFETY RECORD DISPLAYED ON POSTERS

Railway Operation in Buenos Aires

Railways Contribute to Pension Fund—City Fixes Wages for Employees—Thrift Stamps Used as Change—Cost Data

In December, 1918, the street railway companies of Buenos Aires, the Anglo-Argentine Tramway Company and the Lacroze Tramway Company, presented a joint petition to the municipality asking for an increase of 2 cents (0.85 American cents) in the 10-cent fare (4.25 American cents), at the same time requesting the Mayor to appoint three municipal accountants to examine the financial and economic condition of the companies.

The street railway companies were forced to take this step because of the necessity of obtaining relief from the desperate financial condition brought about by the enormous increase in the prices of all kinds of equipment and materials, fuel, freights, as well as by the loss in traffic, increase of wages, the establishment of the eight-hour day and the threatened adoption of the pension law, which would oblige the companies to contribute to the pension fund 8 per cent of the wages of their employces and workmen.

Three accountants were appointed by the Mayor, who made thorough investigation of the financial condition of the companies. In regard to the pension law they reached the conclusion that, legally, the companies could not be forced to contribute to the fund, since, under the terms of the concession, the taxation, which already amounts to more than 10 per cent of the gross receipts, cannot be further increased except with the consent of the companies. They proved also that it was financially impossible for the companies to comply with the pension law, the eight-hour day ordinance or the workmen's demands for an increase in wages.

The new burdens that would be imposed on the companies are shown in the following table:

	Anglo-Argentine Company	Lacroze Company
Contribution of 8 per cent of wages of employees to pension fund	$480,000	$87,000
Increase in wages required by the minimum wage ordinance	260,000	35,000
Increase in number of workmen and consequent wage increase, due to the eight-hour day ordinance	480,000	85,000
General increase of 10 per cent in workmen's wages	570,000	140,000
Total	$1,790,000	$347,000

The net earnings of the Anglo-Argentine Company dropped from $5,400,000 (American) in 1913 to $3,300,000 in 1918, while the capital investment in 1918 was $96,000,000. The annual interest charge alone on debentures amounts to $2,650,000. This company has not paid dividends on the common stock since 1914, on the second preferred stock since 1916 or on the first preferred since 1917. The net earnings of the Lacroze company dropped from $845,000 in 1916 to $680,000 in 1918. The company has a capital of $10,650,000 with a yearly interest charge on debentures of $478,000.

As the present fare could not produce a sufficient revenue properly to provide for depreciation and give an adequate return on the capital invested and leave a fair surplus for emergencies the committee of accountants studied different methods to obtain the relief asked for by the companies and reached the conclusion that the fairest solution for all concerned was to grant the petition for an increase of fares.

After the several hearings and one year after the petition was filed the City Council granted the increase of fares by introducing the following amendment to the concession, which recognizes the fact that every burden which is imposed on a public utility necessarily must eventually be transferred to the car rider.

ARTICLE 1—The city will enter into a new contract with the Anglo-Argentine and the Lacroze Tramway companies authorizing them to increase to 0.12 pesos paper the uniform tariff established in the ordinance of May, 1904; June, 1908, and December, 1909.

ART. 2—The increase referred to in the aforementioned article will be granted to the companies under fulfillment of the following conditions: (a) Establishment of a minimum daily wage of 4.50 pesos paper, or 120 pesos monthly, for all traffic laborers and workmen above eighteen years of age and 4 pesos paper daily, or 100 pesos monthly, for all car and track cleaners.

(b) Maximum working day shall consist of eight hours and shall not normally be exceeded, but if so, in all cases overtime will be paid separately. In so far as the traffic staff is concerned this wage will be calculated weekly, and in no case shall the working day consist of more than nine hours. The maximum working day for the subway guards and motormen shall consist of seven and one-half hours.

(c) General increase of 10 per cent shall be given on all the present salaries and wages which do not exceed 250 pesos per month.

(d) Immediate contribution by the companies of 8 per cent of all wages and salaries toward the formation of the pension fund.

ART. 3—The city will arrange with the tramway companies for the immediate incorporation, in their respective contracts of concession, of the pension scheme contained in the proposed law sanctioned by the Chamber of Deputies, thereby anticipating its definite promulgation.

ART. 4—The increase of 2 cents paper established in Art. 1 shall rule during the term of three years. In the event of the tariff being reduced to the present 10-cent fare the municipality will come to an understanding with the companies regarding the manner in which the contribution of 8 per cent to the pension fund, referred to in subsection (d) of Art. 2, shall be made.

ART. 5—Within two years following the signature of this contract the Anglo-Argentine and the Lacroze companies shall present to the city complete documentary evidence of their invested capital. All new investments must be approved by the city.

ART. 6—During the existence of this authorization the companies shall not earn a greater net profit than 8 per cent per annum upon the whole of their capital invested and approved, and the municipality shall have ample power to investigate all new authorized investments. Should the yearly balance show a net profit greater than the 8 per cent aforementioned the surplus shall be held by the municipality pending a decision regarding the possibility of reducing the fares. The books, balance sheets, reports and other documents shall be drafted and printed in the national language. The city is free to examine the companies' books and statistics at any time, to ascertain whether they comply with the conditions contained in the present agreement, and each company shall present to the city at the beginning of every half year a complete and detailed balance sheet showing the business records for the preceding year. The companies must not, on any account, impose fines upon their staff.

ART. 7—The workmen's fare shall be maintained at the present 5 cents paper tariff and the transfer tickets shall also be maintained at their present rate of 15 cents paper. In the workmen's cars during the morning hours return tickets will be sold, good for a return trip at any time after mid-day on any surface car.

ART. 8—To facilitate the sale of tickets, the companies are obliged to sell, on all their cars, coupon books containing five and ten coupons each.

ART 9—The Anglo-Argentine company promises to construct 30 km. of new tracks within the term of three years in accordance with specifications to be agreed upon between the municipality and the company.

ART. 10—In the event of any difference of opinion arising between the workmen and the companies, either individually or collectively, regarding labor matters, and always provided that the parties in conflict have been unable to come to an understanding, the company must submit the solution of the conflict to the arbitral judgment of the municipality.

The scarcity of pennies in circulation and the dislike of the people for them because of their large size introduced the difficulty of making change. To solve this problem the companies, besides selling books of five and ten coupons each for 0.60 and 1.20 pesos paper respectively, are authorized to offer postal saving stamps as change if the people prefer. The companies, however, do not accept these stamps in payment for the tickets or change.

This method is used to develop thrift in the people, and the Postal Savings Bank has extensively advertised this plan in the street cars. If the car rider does not buy coupons and does not have the exact change he is obliged to accept the saving stamps. For example, when he gives the conductor 15 cents the change given back to him is composed of a 2 cent copper and a saving stamp of 1 cent, as the 1 cent coppers are not in general circulation. There are many car riders who prefer the saving stamps to the cumbersome coppers. In exchange for the fare or the coupon the conductor issues to the passenger a fare receipt.

The coupon books are good for two months and the unused coupons are exchanged for new ones at the expiration of the term. To prevent fraud, frequent changes of color, design, etc., are made. The workmen's fare, 5 cents paper, has been unchanged and gives laborers the opportunity to buy during the morning hours, in the workmen's car only, a round-trip ticket for 10 cents paper and to return to work in any surface car after mid-day. The workmen's cars are trailers that run from 5 to 7 a.m.

The price of the transfer has also been unchanged and is 15 cents paper for most changes, including subway to surface lines and *vice versa*.

The minimum wages fixed by the City Council are the same as those fixed for their own workmen and for those of all contractors who are working for the municipality.

By this law the City Council has recognized two rights which are of great importance, *i.e.*, the right to earn an adequate return on the whole of its invested capital and the right to get compensation of some sort for the 8 per cent contribution to the pension fund, in case the fare is reduced to 10 cents after three years. There was no serious objection to the increase in fare on the part of the public.

A list of prices of materials and parts of equipment is given in the accompanying table:

PRICE INCREASE IN THE ARGENTINE

Material	Unit	—Cost in Dollars— 1914	1919	Per Cent Increase
Metallic filament lamps 25/115	Each	0.138	0.258	92
Controller fingers	Each	0.086	0.345	330
Trolley wire	Ton	396.00	775.00	96
Wheel tires	Each	7.34	43.80	500
Car axles (rough)	Each	9.05	34.50	400
Gears	Each	15.90	40.85	157
Pinions	Each	2.58	7.31	183
Springs (body end)	Each	3.50	9.50	171
Spring (body)	Each	0.22	0.86	292
Brake-shoe head	Each	1.11	2.80	154
Fish plates	Pair	1.51	4.30	186
Steel wire	Lb.	0.54	5.40	900
White enamel paint	Lb.	0.087	0.178	107
Window glass	Box	11.65	32.30	178
Rails	Ton	38.80	103.50	167
Calcium carbide	Lb.	0.055	0.127	132
Wrought iron in bars	Ton	51.80	147.00	183
Varnishes	Gal.	4.12	8.60	109
Sheet bronze	Lb.	0.352	0.714	103
Coke	Ton	21.600	60.30	180
Coal	Ton	25.00	38.900	50
Dynamo oil	Lb.	0.045	0.098	117
Wood (average)	Sq.ft.	0.14	0.23	64
Turpentine oil	....	9.45	25.80	173

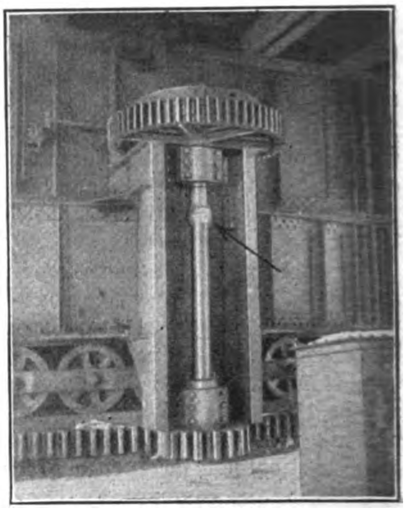
Power is purchased and in 1914 the price paid was $0.0268 gold per kilowatt-hour and in 1918 $0.0183 gold per kilowatt-hour. The approximate yearly consumption in kilowatt-hour during 1919 was 59,000,000.

Emergency Welding on a Railway Bridge

A SERIOUS traffic tie-up of considerable duration was recently averted when an emergency thermit welding repair was made on a broken 6-in. main turning shaft of a drawbridge located at North Chelsea, Mass., and over which the Eastern Massachusetts Street Railway operates about 600 cars per day.

When the shaft broke the entire load of turning the drawbridge was thrown upon a companion shaft, which it was feared would not be strong enough to stand the overload. The breaking of the companion shaft would have suspended operation of the drawbridge and the traffic over it for a week before a new shaft could be supplied and machined. In order, therefore, to avoid running this risk an emergency call was made to have it repaired by welding.

When the shaft was removed from its operating position it was found that the break was located 6 in. from the end and between a 12-in. bearing box and a large cast gear wheel. A weld made at this point would have required machining before the shaft could be replaced in the bearing. To avoid this weakening of the weld, it was decided to cut an additional piece from the shaft and weld on an entire new billet to the end.



BROKEN SHAFT ON DRAWBRIDGE OF THE EASTERN MASSACHUSETTS STREET RAILWAY REPAIRED BY THERMIT WELD

By 3 p.m. on the day of the accident the repair operator had arrived from New York and secured the necessary molding materials. The shaft was then lined up, a mold was built around the part to be welded, the mold was preheated and the molten steel was poured into the mold at 10:30 that night. In making the weld 125 lb. of thermit was used. The following day the mold was stripped, the billet was machined and the shaft returned to operation. An accompanying illustration was taken after the shaft had been back in operation for about a month.

Immigration Increases Slowly

THE agricultural and industrial demands for skilled labor, which are so evident throughout the country, have in no way been satisfied by the apparent increase in immigration to the United States during the past few months, according to a recent bulletin of the Inter-Racial Council, despite the fact that the total number of persons admitted is now greater than the total number departed. During the last half of 1919 the total number admitted was 162,883 and departed 166,212, a net loss of 3,329. In the same six months of 1913 (the last year of our normal immigration) the total number admitted was 734,869 and departed 153,790, a net gain of 581,079. During the first five months of 1920 the preliminary figures for the port of New York (which usually handles about 80 per cent of the total immigration and emigration for the country) show admitted 153,241 and departed 114,953.

It appears, however, that practically all of those who left the United States during these five months were able-bodied male wage earners, while of those who entered about half were women and children and a large part of the balance were natives of Italy and returning reservists. Many of the men admitted had previously been in the United States and practically all of them had definite destinations and knew exactly where they wanted to go. Comparatively few new able-bodied aliens are arriving, as a number of the European countries do not yet permit men of military age to leave their borders. Other causes given are our strict passport regulations and the enforcement of the literacy test.

Johannesburg Builds Own Car Bodies

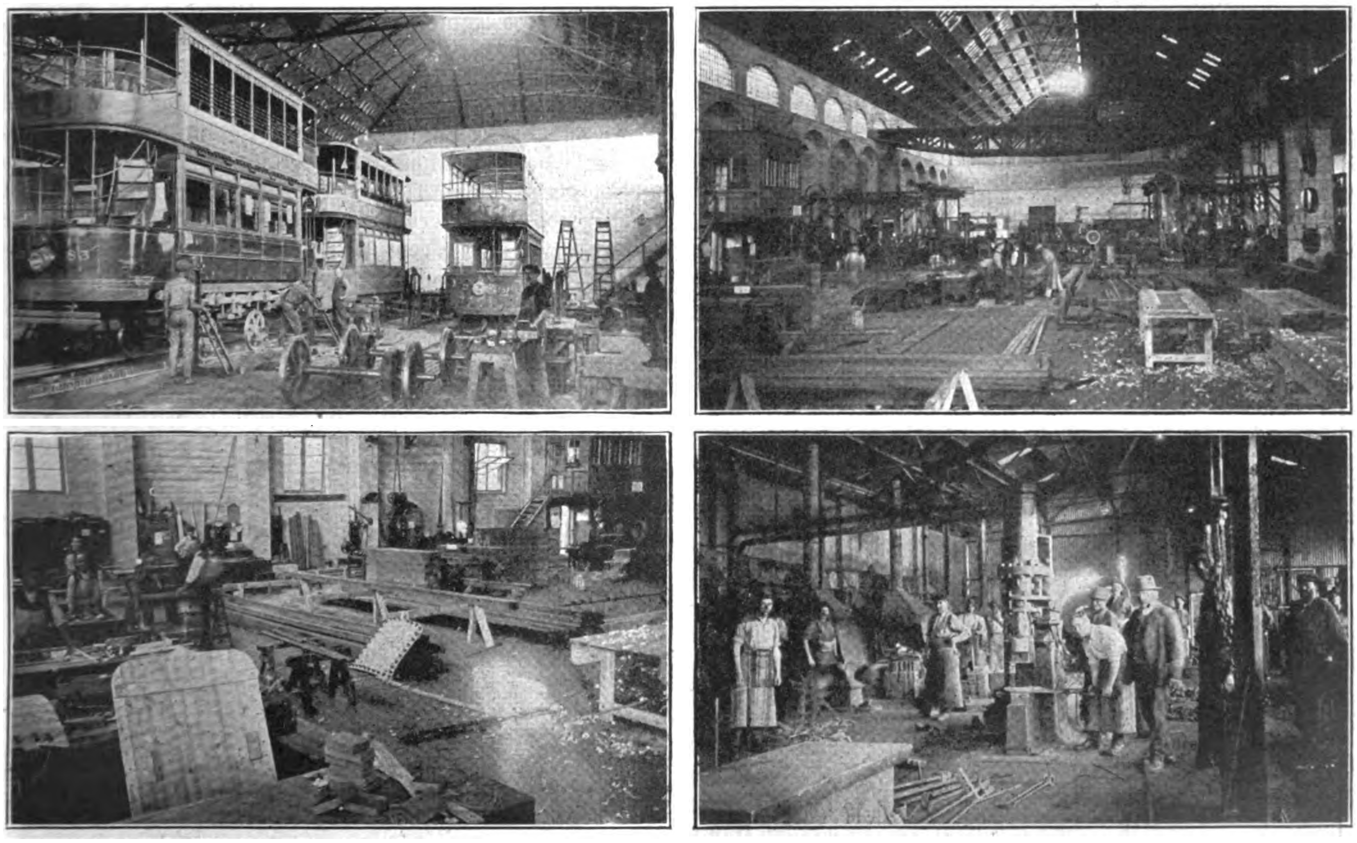
THE Johannesburg Municipality was unable to obtain electric cars for its system during the war period. At its close, however, it ordered trucks sufficient for forty cars from the United States and is now building the bodies of these cars in its own shops. These cars will be of double-deck construction, the upper deck being entirely inclosed. The seating capacity will be about eighty passengers. These cars will be fitted with Westinghouse brakes and General Electric control equipment. In addition to these forty cars, five single-truck cars are also being built in the shops especially for natives (blacks). The accompanying illustrations show the general arrangement of the shops at Johannesburg, as well as the type of cars and trucks that are used. The municipality now owns 120 passenger cars, and the rapid growth of the service makes it evident that extensive additions will be needed shortly.

Screw Thread Commission Reports

THE National Screw Thread Commission, first authorized by Congress in July, 1918, has reported to the Secretaries of War, the Navy and Commerce and recommends for approval six series of threads. The aim of the commission has been to eliminate all unnecessary sizes, and in addition to utilize present predominating sizes as far as possible. While from certain standpoints it would have been desirable to make simplifications in the thread systems and to establish consistent standards more thoroughly, it is believed that any radical change at present would be out of place, would interfere with manufacturing conditions, and would involve great economic loss.

The law provides that when the report is thus approved, it is binding upon all the departments in question and also must be used by other federal departments whenever possible.

The recommendations include a coarse-thread series, which is the present United States standard thread, supplemented below ¼ in. by the standard established by the American Society of Mechanical Engineers; a fine-thread series consisting of sizes taken from the standards of the Society of Automotive Engineers and the fine-thread series of the American Society of Mechanical Engineers. The committee also recommends the adoption in practically its present state of the American Briggs standard pipe thread sizes, as recommended by the American Society of Mechanical Engineers, and the fire-hose coupling sizes as established by the National Fire Protection Association. The report includes specifications, form of thread, gages, classification and tolerances. The full text of the report will be presented and will be available for distribution in a few months.



UPPER LEFT, SINGLE-TRUCK CARS BEING REPAIRED. UPPER RIGHT, GENERAL VIEW OF REPAIR SHOP. LOWER LEFT, THE WOODWORK DEPARTMENT FOR BUILDING ELECTRIC CARS. LOWER RIGHT, ONE OF THE STEAM HAMMERS IN THE MUNICIPAL TRAMWORKS

Employment Bureau for Trainmen

Cleveland Railway Creates New Department to Hire Men and Give Preliminary Training—New Building and Equipment

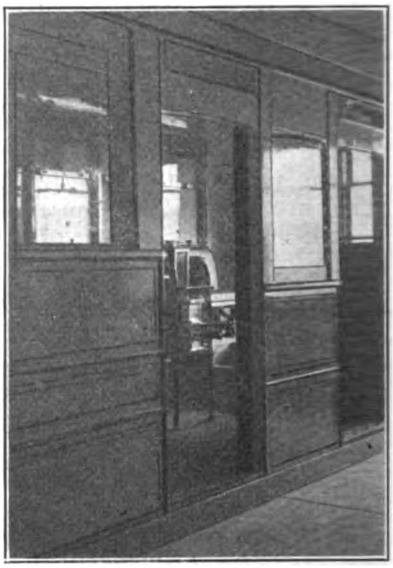
THE Cleveland Railway Company has created a bureau of employment, with H. W. Palmer as superintendent, for the purpose of concentrating the responsibility of hiring trainmen and giving them their preliminary training as motormen and conductors. About fifty men a week are taken on and put through the three days' preliminary training at the bureau of employment and then turned over to the several division superintendents to complete their ten-day instruction period. Before they are actually put on the pay roll they are sent back to Mr. Palmer, who thus has another opportunity for a final catechism and lecture. During the first three days those in charge of the course make every effort to win the interest of the men by explaining rules and equipment in great detail to them and answering all questions, carefully avoiding any appearance of bullying or attempting to embarrass the new men.

A new one-story six-room brick office building to house the bureau of employment was built on a piece of land included in the tract on which are located the Harvard shops and Harvard track storage yard. A man applying for a job is received in the superintendent's office at the front of the building. If he looks like good material he is sent into the adjacent room, where there are tables and facilities for filling out an application. When this is completed he is sent into the adjoining room, where there is a full equipment for making the physical examination and taking a photograph. From this point on, if a man qualifies, he is taken through the three-day preliminary training school in a class of perhaps ten men. After completing the physical examination, he is told to report the next day at a certain time to attend the class.

OFFICE BUILDING FOR THE NEW BUREAU OF EMPLOYMENT, CLEVELAND

Upon reporting the students assemble in the lecture room, which is equipped with standard side-arm classroom benches. They start with a course of instruction and practice in filling out accident reports, trip sheets, turn-in envelopes, shop reports, witness blanks for accidents, etc. This is followed or accompanied by a thorough lecture on accidents, wherein the principal points are emphasized and an effort made to fix them in the trainmen's minds by the use of a number of posters fastened on the wall across the front of the lecture room.

In the room adjacent to the lecture room there has been installed the central section of a standard Cleveland street car. This is equipped with fare box, air-operated doors, signals, selective lighting switch, etc. Taking turns, each man in the class acts as conductor and the rest of the class as passengers, and they give each other experience in handling tickets, change and transfers, and in the general duties of a conductor. This part of the equipment of the bureau of employment is of course primarily for conductors.

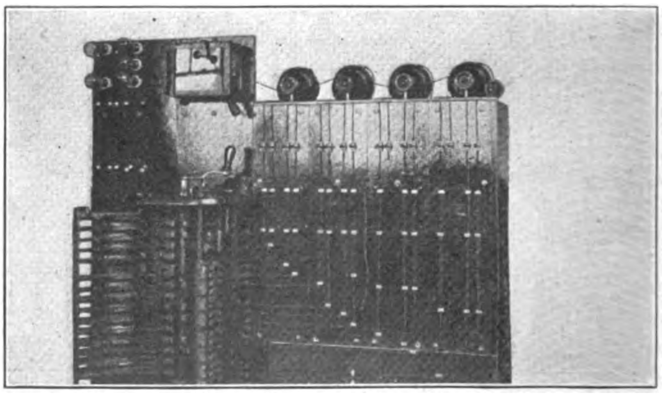


SECTION OF CAR FOR DEMONSTRATING CONDUCTOR'S DUTIES

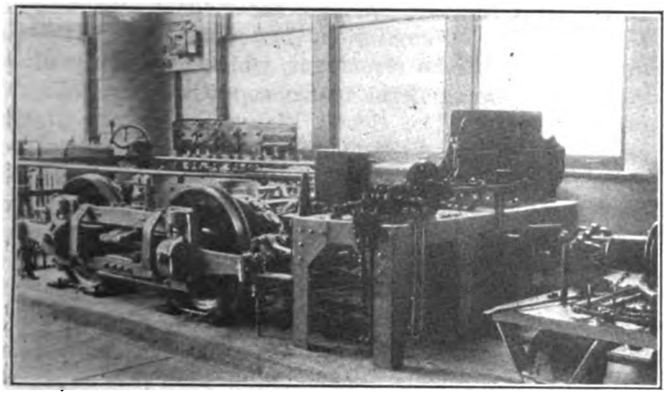
In a glass covered cabinet extending along two sides of this room are posted the schedules for all the city runs. From these the men are required to copy the running time for various assigned runs and to make out the full schedule for the runs, including the time points.

The sixth room of the building is equipped primarily for the motormen. Four 0.3-hp. series motors, belted together and to a flywheel for load, are connected up with open wiring to a standard K controller. The circuit includes a standard circuit breaker fitted with a glass case, lamps in series with the resistance notches on the controller, and plug type switches in the armature and field circuit of each motor. Speeding up the controller too rapidly will throw the circuit breaker, thus demonstrating proper feeding. The interior mechanism of the circuit breaker can also be observed. With the lamps lighting on the resistance notches and going out on the running notches the student will readily see where he should and should not leave his controller standing, and why. The plug switches make it readily possible to create an open or short circuit in the armature or field circuit of any motor and then demonstrate to the student how to cut out this trouble.

The other equipment of this room includes a standard controller, hand-brake and air-brake equipment connected up to a standard truck fully equipped with motors and brake rigging. A circuit breaker, resistance grids, air compressor, governor, etc., are also connected up to



STANDARD CONTROLLER AND CIRCUIT BREAKER CONNECTED UP TO FOUR SMALL MOTORS TO DEMONSTRATE STEPS IN CONTROL AND ELIMINATION OF TROUBLE represent the working parts of a car. There is also a small truck representing a trailer, which is equipped with the full air-brake equipment and an automatic coupler. This truck is moved up to the coupler on the rear end of what represents the motor car by means of an air cylinder installed underneath. This makes it possible to demonstrate the process of coupling and thereafter the action of the brake mechanism on motor car and trailer combined.



STANDARD TRUCK WITH FULL MOTOR AND AIR-BRAKE EQUIPMENT, INCLUDING TRAILER AIR-BRAKE EQUIPMENT AS SEEN AT EXTREME RIGHT

In giving a class of men their first lesson on this equipment Mr. Palmer first operates the controller and air brakes, showing the action of the large motors and change of speed with the different controller positions, the trucks being supported so that the wheels are free to revolve. After a lecture explaining the function and operation of each part each man in the class is told to operate the controller and air brakes. Mr. Palmer says that he can practically tell by the way a man steps up to the controller whether he will make a good motorman.

Seeing the various parts of a car close up, and having the complete operation and inter-relation of parts fully explained and demonstrated, the officials believe the student is in a much better position to profit by his experience on the platform of a car, for he then has some notion of what is going on underneath the car in response to his own control.

Well-Designed Oil Houses

IN A recent bulletin, No. 34, of the National Safety Council some desirable construction details for oil houses are given. This states that an oil house should preferably be a separate detached building of fire-resisting construction. A well-designed oil house would properly have the walls made of brick, stone or concrete, the roof of concrete without exposed metal and the floor of concrete drained to one point to a sewer through properly designed traps or oil separators. The door sill should be raised about 6 in. and the door should be metal covered and hung on an angle iron frame. The windows should have metal frames and wire glass and a drain pipe should extend from the floor through the roof.

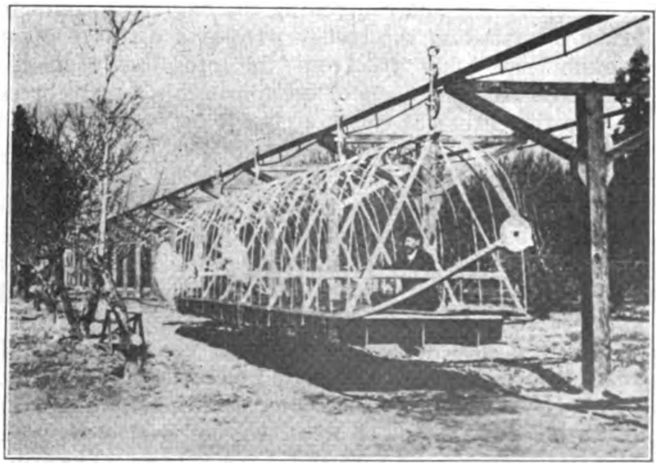
If there is sufficient space a satisfactory oil house may have walls and roof made of corrugated iron or steel on steel or timber frames. Containers should not be placed on wooden racks, but upon the cement floor or upon concrete, metal or other fire-resisting racks or shelves.

Under certain conditions it may be necessary or desirable to provide an oil room inside a building for the storage of limited quantities of inflammable liquids. Inside oil rooms should have the walls, floor and ceiling made of brick or concrete 8 in. thick, or of reinforced concrete 4 in. thick. All openings into the room should be provided with automatically closing fire doors; windows should be of wired glass in metallic sash and frames. To prevent the accumulation of vapors in pits and other confined places inside, oil rooms should not be below the grade lines nor immediately above a cellar or basement. Door openings should have sills raised 6 in. The floor should be waterproof and continued up the side walls about 3 in., making rounded corners that can be easily washed and cleaned. The floors should pitch to a drain pipe leading outside to a catch basin or terminating at a point where proper precautions have been taken so that surrounding property will not be in danger. No drain pipe should be made direct to sewer.

Proper ventilation should be provided for inside oil rooms. There is no system of ventilation that is applicable in all cases. The method adopted necessarily varies with the nature of the gas or vapor to be removed and depends upon whether it is heavier or lighter than air. Ventilation may be secured by arranging suitably screened openings near the floor or near the ceiling or both. It may be necessary to provide a similar system for exhaust ventilation by installing screw propeller fans at windows or at other openings in the wall. In such cases care must be exercised to prevent the exhausted gases or vapors from returning into the room or from entering any other place where their presence would be objectionable or dangerous. Fans should be driven by explosion proof motors or by belt and shafting. An exhaust system, with hoods which catch the gas or vapor at the point of origin, is likely to be more satisfactory than general room ventilation.

A Fine Car for a Warm Day

AN INVENTION which is being tried out in Durbeck, Col., is a street car body which has been fitted with a propeller and its driving motor. No surface rails are employed, the car being hung from an overhead trolley bar. The inventor is said to be contemplating the addition of a second propeller for use in case the original one is disabled. Information is not available as to the hopes of the inventor of this novel transportation unit in regard to the field which it might occupy, that is, whether he expects it to depose the standard car or merely to serve as a coin-getter in parks and the like.



Photograph from "World-Wide Photos"

NOT A BIRD CAGE, BUT A CAR WITH AIR PROPELLER DRIVE

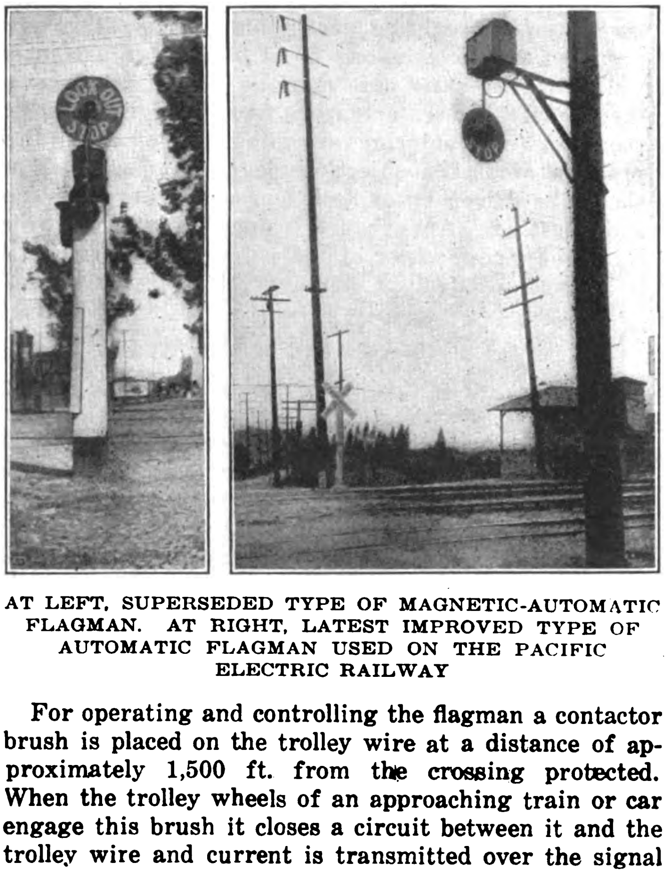
Pacific Electric's Automatic Flagman

An Automatic Flagman of the Magnetic Type with the Warning Disk Swinging Downward Is Giving Excellent Results

BY CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

IN a previous article published in the August 11, 1917, issue of the ELECTRIC RAILWAY JOURNAL an automatic flagman then in use on the Pacific Electric Railway's lines was described, together with some experiences in the developing of an electrically operated device of this character. Since that time further improvements have been made. The former magnetic type was designed so that the warning disk was elevated above the magnetic control box, and when set in motion the movement of the disk was in a horizontal direction. In the improved type the disk on the apparatus hangs and swings downward when placed in operation.

This flagman has no motors or gears, but is controlled by two sets of magnets, which when energized pull an armature from one side to the other, causing the warning disk to swing and a gong to sound.



AT LEFT, SUPERSEDED TYPE OF MAGNETIC-AUTOMATIC FLAGMAN. AT RIGHT, LATEST IMPROVED TYPE OF AUTOMATIC FLAGMAN USED ON THE PACIFIC ELECTRIC RAILWAY

For operating and controlling the flagman a contactor brush is placed on the trolley wire at a distance of approximately 1,500 ft. from the crossing protected. When the trolley wheels of an approaching train or car engage this brush it closes a circuit between it and the trolley wire and current is transmitted over the signal line to the relay signal. The operation of this relay closes the local circuit to the bell and sets the warning signal in motion. Another brush placed upon the trolley wire beyond the crossing causes the bell to come to rest when the trolley wheel of a passing car or train engages it. All lines are provided with intermediate and second intermediate contactors, which operate the relay in case trains are traveling close together, thereby preventing trains from crossing on a dead signal. The line wire used is No. 12 weatherproof iron wire, which was the same for the former magnetic type. The trunking and cable now used is No. 12 Kerite insulated wire.

The Pacific Electric Railway has 250 of these devices.

Features of South Water Street, Chicago, Improvement

Proposed Plan of Constructing Two-Level Marginal Thoroughfare Would Greatly Relieve Traffic Congestion in Loop District

J. ROWLAND BIBBINS, supervising engineer, the Arnold Company, Chicago, has made a report to the Chicago Plan Commission in connection with the improvement of the riverfront, which has a very direct bearing on the general traffic conditions in Chicago's Loop District. The South Water Street commission merchants are expected to remove their business center to some more logical point and the space now occupied by their buildings and the street, according to the plan, would be occupied by a two-level thoroughfare extending west and south along the river from the new Michigan Boulevard two-level bridge recently completed.

The principal features of the project are summed up as being to provide a new trunk highway or broad marginal street around the Loop boundaries; a distributing road from the great Michigan Boulevard which will greatly reduce the cross traffic interference in the Loop; traffic segregation, freight vehicles below, fast vehicles above; an upper level equalized with the level of the river bridges and a lower level equalized with the dock level; continuous dockage along the riverfront; a clear by-pass route between the north and west sides of the city, avoiding traversing the Loop streets; unobstructed motor by-pass routes between freight streets; increased use of the Chicago freight tunnel system; union freight station facilities, convenient to both the Loop and the docks; relief of the central business district streets from freight traffic, and a number of other advantages.

One of the controlling considerations in developing the proposed plan was the enormous increase in the number of motor vehicles in Chicago. The January, 1920, registration shows a total of 74,112 passenger motor vehicles and 19,373 motor trucks within the City of Chicago. This is an increase of 100 per cent in four years. The construction of the two-level riverfront road would greatly facilitate the movement of these vehicles through its by-pass and distributing advantages. Thus the principal accomplishment of the proposed plan would be the elimination in very large measure of the trucking of freight which now takes place on the Loop streets.

The principal group of freight terminals is now and will be for many years located in a pocket at the northwest corner of the Loop District, necessitating a great volume of trucking across the Loop. The next important group, in the Twelfth Street district, also requires much trucking across the Loop at present, both transfer and consigned freight. The development of by-pass trucking routes such as would be provided by this new construction would therefore seem to be the most important need of the present situation, as it would tend materially to lessen the economic loss imposed by the various cumulative delays resulting from increasing railway and street congestion and extra man-handling. Perhaps the greatest sufferers of this character of delay are the surface street railway companies.

The report points out that Chicago's greatest need is a terminal delivery which will quietly fit into the rail terminal operations and effect the delivery and transfer of tonnage with as little encroachment as possible upon the capacity of downtown streets, whose total capacity is required for retail and general business. Of the possibilities for meeting this need, the report states that the Chicago freight tunnel, already in existence, is of greatest value. The Chicago tunnel has developed unobtrusively a downtown network of 65 miles of freight tunnels connected by elevators with all the freight stations and with most of the large business houses. This tunnel could readily handle from 70 to 95 per cent of all the l.c.l. freight tendered in most cases. It makes use of 5-ton cars drawn in trains by electric locomotives. But for various reasons the tunnel is being used to less than one-fifth of its capacity of perhaps 10,000 tons per day. To move 10,000 tons per day by truck would require somewhere in the neighborhood of 4,000 motor trucks a day, the report estimates, thus indicating what must be the result from a traffic standpoint of continuing to handle this business district freight by trucks. It is pointed out that the Chicago freight tunnel is the only instance in this country where a complete duplicate sub-level street system has been provided for freight haulage. As such, it must be regarded as an important element in local freight transportation and one to be conserved, if for no other reason than to contribute to the relief of street congestion. From the standpoint of the City of Chicago, no transportation agency could be more effective in solving the problem of existing street capacity and no effort should be spared to make this institution one of permanent success.

In justifying the marginal street plan to relieve congestion in the Loop, the report points out that "there is only one general solution to the problem of street capacity in downtown Chicago, namely, by double-decking, either by elevating the streets for fast vehicles or pedestrians or depressing the car lines below the present streets. The first alternative seems problematical, at least until far in the future. Passenger subways are of course practicable, but offer an available solution only if the city can be prevailed upon to act promptly. But even with all this possible increase in effective capacity, there still remains the fact that the efficiency and usefulness of all the Loop streets as distributors could be vastly improved by means of unobstructed clearing or marginal thoroughfares. Such a system of marginal clearing streets is introduced by the South Water Street improvement."

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Many Committee Meetings

THE last few weeks have been busy ones at Association headquarters, with many committee meetings scheduled, to complete reports due for the October meeting.

During the week ended July 31 three committees held meetings, namely, those on merchandising transportation, collection and registration of fares and entertainment. During the current week a meeting was held of the committee on code of traffic principles, and as this paper is going to press a two days' meeting is being held of the standards committee of the Engineering Association.

Statistics Recently Compiled

THE Bureau of Information and Service of the American Electric Railway Association announces the completion during July, 1920, of the following special compilations and reports. These are available to member companies on request.

"A Series of Charts Showing Effects of Increases in Rates or Fares on Operating Revenues and Passengers Carried, for a Number of Typical Companies."

"A Bulletin on Wages and Working Conditions of Street Railway Employees Other than Trainmen." This covers employees in the engineering department, shops, carhouses, substations, power houses, overhead lines, maintenance of way and transportation departments.

"Claims Statistics." This is a summary of the replies of companies to Data Sheet 207, showing classified expenditures by the claims department of various companies and the number and cost of various kinds of accidents.

"Summary of Electric Railway Strikes for the Years 1918, 1919 and 1920 to Date." This contains a brief account of each individual strike.

"Legal Requirements Covering the Carrying of Jacks on Cars." This compilation is based on replies to the circular letter issued by the bureau and dated June 11, 1920.

In addition to the above, the bulletins on wages of trainmen, cost of living studies, bulletins on the fare situation, covering all cities having increased rates and those in which fares have not been increased; and regulations covering restrictions of jitney operation, have all been brought up to date.

Letter to the Editors

Standardize Motor Bearings

NEWPORT NEWS AND HAMPTON RAILWAY,
GAS & ELECTRIC COMPANY
HAMPTON, VA., Aug. 4, 1920.

To the Editors:

In its July 10 issue ELECTRIC RAILWAY JOURNAL published an article by R. H. Dalgleish entitled "Let's Dig Ourselves Out." One point brought out in this article appeals strongly to me and I believe it well worth consideration by electric railway engineers. It is the standardization of wearing parts of equipment. I agree with Mr. Dalgleish that interchangeability of parts is desirable and feel that much good would be accomplished if the matter were given serious consideration.

For illustration, why not start with motor bearings. Surely different makes of motors of the same horsepower could be designed to use the same size bearings and not hinder the development of new motors.

I would like to see the matter referred to the standards committee of the Engineering Association for discussion and recommendation.

N. E. DREXLER,
Chief Engineer.

Recent Happenings in Great Britain

Difficulties of London County Council in Getting Right for Extensions—Through Municipal Bus Service Delayed

From Our Regular Correspondent

A fine example of how man proposes but the gods dispose is to be found in the fate of the bill promoted in Parliament by the London County Council to authorize it to construct additional tramways and to run motor omnibuses as linking routes to and extensions of the tramways. Man in this case is the County Council and the gods are the London borough councils and Parliament. When any of the other great municipalities in England promote a parliamentary bill for the purpose of extending tramways or running omnibuses there is usually not much difficulty in obtaining the powers desired. But when London County Council tries the same game a veritable hornet's nest of local interests is stirred up against them, and Parliament is so influenced that little success is obtainable. The borough councils under their power of veto choked off the tramway proposals.

As to the powers for omnibuses, the County Council has tried to get these before without success, though other municipalities get them almost as a matter of course. A committee of the House of Commons heard evidence and arguments at great length during June for and against the Council's omnibus proposals, and on July 1 it decided to grant the Council power to run omnibuses in a considerable area of Central London, for the purpose of linking together central tramway termini, but it refused to assent to other proposals to enable the Council to work omnibuses to connect tramway routes in the suburbs and to serve housing schemes either within or without the county of London. The monopolistic hold which the London General Omnibus Company has with regard to omnibuses all over the London area is no doubt a factor in this decision. The committee also stated that the County Council would have to satisfy the Ministry of Transport that the proposed services were for linking together tramway routes and were not general roving services.

BUS PLAN OUTLINED

Some little time before the decision of the committee was given, an important agreement was reached between three county councils in the adjoining metropolitan area in regard to the running of omnibuses. Though the agreement was subject to the passing by Parliament of certain bills, and though the London bill has for the most part been rejected, the principle involved in the agreement is of much importance as pointing the line of future development in the working of municipal omnibus services. The proposed scheme, now of course in abeyance, may accordingly be outlined. The London County Council proposal was to run omnibuses not only in the county of London but in the parts of the metropolitan police district which extend into the counties of Middlesex and Hartford. The councils of these two counties petitioned against the London Council's proposal, but at the same time they were promoting bills to enable them to run omnibuses within the metropolitan police district where they would be in competition with other local omnibus companies.

It was arranged that clauses should be inserted in the three bills of a kind already approved by the Minister of Transport in the case of several bills promoted by provincial local authorities in which it is proposed to enable the local authority to work omnibuses outside its own district. The main provision is that each county council running omnibuses outside its own county shall pay to the appropriate road authority for road maintenance such sum per bus-mile as may be agreed, or, failing agreement, as determined by the Minister of Transport. Provision is also made for similar agreement or determination as to payment toward the cost of any necessary adaptation or reconstruction of roads for the omnibus traffic.

Now that the London County Council's proposals as regards the outer areas have been rejected the matter is once more in the melting pot. There are only two possible satisfactory solutions. One is the constitution by act of Parliament of the proposed London Traffic Authority with full powers over the whole of the metropolitan police district (which extends far beyond London proper). The other is to give the whole control to a special department of the Ministry of Transport. The main difficulty in the way is the multitude of conflicting interests, both of local authorities and of companies. These will have to be overcome if chaos is to be removed.

MINISTRY OF TRANSPORT ATTACKED

There was a good deal of Parliamentary excitement and of outside interest in the end of June and the beginning of July over the first annual estimates of the Ministry of Transport, which, it may be recalled, was established in August of last year. The Parliamentary opposition averred that the Ministry was of no use and should be abolished, while its supporters pointed to good work done and to the absurdity of expecting large results in such a gigantic new undertaking in such a short time. The debates were confined almost entirely to the steam railway aspects of the subject. Meantime the Ministry of Transport has issued an official memorandum advising the amalgamation of all the main railway companies of the country into half a dozen great groups for the purposes of consolidation, co-ordination and economy of working. In order to carry out such a scheme new legislation will be required, and that can hardly come this year. There promises to be great opposition to it. The main electric traction interest in the proposal is the suggestion that one of the groups should consist of the London local railways.

GLASGOW LINES SHOW DEFICIT

For the first time on record the accounts of the Glasgow Corporation Tramways show a deficit. This, it may be recalled, is the undertaking which has enjoyed such a career of prosperity that some two years ago it completed the repayment of its capital, so that interest and sinking fund charges ceased to exist. In spite of this, the net profit a year ago had, owing to the continual rise in working expenses, fallen to £14,772. The accounts for the year ended May 31 last bring out a loss of £108,531. It is fair to say, however, that this result is arrived at after setting aside to renewal and depreciation funds a sum of £186,242. Apart from this there would have been a credit balance.

At a meeting of the Glasgow Town Council on July 8 Mr. Kelly, the chairman of the tramways committee, said that the increased revenue they had received since the fares were raised on June 1, which date was the beginning of the new financial year, was most satisfactory, and if the increase was continued they would have an additional revenue at the end of the financial year of between £400,000 and £500,000.

The accounts issued a year ago of London County Council tramways showed that they were just about making ends meet without allowing for renewals and depreciation fund. The accounts issued on July 3 for the year ended March 31 last show a much worse state of things, for they bring out a deficiency of £100,722. This will be increased to £161,511 if the government decides that all renewals must be met out of revenue. The last increase in fares did not come in time to affect these accounts, but on the other hand neither did the last large increase in wages. The revised estimates for the year now current show a deficit of £749,442, which will be increased to £929,512 if the government does not agree to half the cost of renewals being charged to capital, and to no less than £1,038,512 if a proposal to repay the capital debt on the annuity system be not approved. The last mentioned sum is equal to a rate of 6d. in the £1 on all ratable property in the county of London. It is proposed to apply to the Ministry of Transport to sanction an increase of fares above the statutory maximum of 1d. per mile. The general condition of the London County Council tramways is acute and apparently the only relief for the bad financial condition can be expected through increased fares.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Governor to Decide

New York Board Hears Buffalo Wage Case—Company Stands Pat on Open Shop

Governor Alfred E. Smith of New York must take the next step in the wage controversy between union platform employees and the International Railway, Buffalo. The State Labor Board, which heard evidence presented by the employees and the company, adjourned on July 30 without any concessions being made on either side. At the outset of the hearing Herbert G. Tulley, president of the company, filed a formal statement declaring that the company will stand pat on the open shop question and will not consent to make retroactive the wage award which might be agreed upon.

CLOSED SHOP A FAILURE

The Labor Board was told by President Tulley that the management of the company has been unsuccessful since its relations with the Amalgamated, both in a financial way and in its relations with the public. The board was told that the company desires to establish more direct contact with its employees and will enter into no further contract which does not recognize and assure uninterrupted continuance of the open shop principle.

President Tulley said the International remains ready to accept a third arbitrator appointed by Governor Smith, for the reason that the State will then have the power, through its arbitrator, to determine the rate of wages to be paid, and the State also will have power concurrently to determine and authorize, through the Public Service Commission, the amount of increased fare necessary to make the payment of such increased wages possible.

Questioned regarding the decision of the company not to make retroactive to May 1 any increase in the wage scale which might be agreed upon by the board of arbitration, President Tulley said the wage award could not be made retroactive because of the depleted condition of the company's finances and added that all of the money received by the company in the form of additional revenue from the 7-cent fare had been paid to the employees in higher wages.

RETROACTIVE PAY OPPOSED

Representatives of the carmen agreed to leave the entire matter in the hands of the arbitrators. James H. Vahey, of Boston, the employees' representative on the board of arbitration, said the open shop is not the bone of contention. He said the men are willing to leave that question also for the arbitrators to decide. Henry W. Killeen, of counsel for the International, contended the question of an open shop is not subject to arbitration.

CHARGES UNION VIOLENCE

Charges of violence on the part of union representatives to intimidate non-union employees of the company were made at the hearing by Mr. Killeen, who presented the company's side of the case.

For the present at least the men have given up the idea of a strike. They resolved on this course in compliance with the wishes of the union leaders.

Duluth Men Urge Fare Referendum

Employees of the Duluth (Minn.) Street Railway recently have placed in circulation petitions for a second referendum vote on the 6-cent fare ordinance, defeated at the municipal election on June 21 by a vote of 5,963 to 7,286. Following the rejection of the measure the men asked for an increase in wages. The company refused on the ground that it was unable to pay higher wages from its present revenue. On July 20 the employees struck and car service was suspended for one day. It was agreed that the men should return to work and a new ordinance should be placed before the voters.

The city charter requires that the referendum petition contain the names of 20 per cent of the voters at the last general election. The employees expect to obtain 3,500 names, more than enough to place the ordinance before the people again. The date for the election will be between forty and fifty days after the petition has been accepted by the City Council.

City Attorney John E. Samuelson gave an opinion to the Council that it could not legally pass the fare ordinance at this time because the franchise under which the company is operating and which was granted by the Legislature in 1881 provides that the fare can only be changed at five-year periods. This would tie the Council's hands until 1921, he said. The ordinance which has now been proposed differs from the one submitted last June in that it provides for an increase of 10 per cent in the wages of employees. It is also stipulated that the company shall pay the employees "an amount not less than one-half of the gross passenger revenue received as fares."

Small Road Strike-Ridden

Review of Fare and Wage Vicissitudes of Small Canadian Line—Wages and Fares Raised

The Levis (Que.) County Railway has been the victim recently of a one-day strike and a semi-strike, so to speak. Most of the circumstances attending upon these happenings have however, been brushed away and the company is now operating at an advance in fares and the employees are working at an advance in pay.

COMPANY IN A QUANDARY

The Public Service Commission inquired on May 25 into the finance of the company and the cause of the strike on the part of the employees. Judgment was reserved so far as the motion of the city of Levis and Bienville was concerned. The commission, however, issued an order to the company to operate its cars in the Town of Lauzon upholding the contract in one sense, but ignoring it in regard to a clause in the contract covering force majeure and strikes, by which the company is exempt from operation.

The company was unable to obey this order, as the employees refused to operate the cars in the limits of the Town of Lauzon, so the situation remained unchanged in spite of the order from the commission. The company being unable to pay the increased wages the employees refused to operate in Lauzon and also advised the company that should it obtain men to operate the cars in the town of Lauzon there would be a strike on the rest of the system.

NEW APPEAL TO COMMISSION

On June 8 the town of Lauzon again asked the commission to force the company to find money to pay the increased wages, so that the cars would operate. Judgment was rendered on June 9. In the case of Lauzon the commission refused to entertain the motion or force the company to run its cars by borrowing money, and it would not entertain any further motions of the town of Lauzon with the object of forcing the company to run under the conditions that existed. Further the commission would not accept any motion on the subject until all four municipalities agreed to revise the franchises or submit the matter to the Public Service Commission.

With regard to the city of Levis and Bienville, the commission stated that as the other two municipalities would not apply to the commission for investigation and decision the commission was unable to give any definite decision in regards to Levis and Bienville. Had, however, the other two municipalities shown their good faith and submitted the matter to the commision the commission would have issued a judgment. Therefore, until all four municipalities agree to go before the commission, the commission could not give any decision in regards to the fares, etc.

On June 10 all the employees went out on strike. The Mayor of Levis, on behalf of Levis and Bienville, met the company, and guaranteed to readjust the passenger fares to enable the company to pay its employees increased wages. The employees started operations again on June 11 in Levis and Bienville only. The city of Levis arranged to grant the following tariff: Cash fare to remain at 10 cents; regular tickets, four for 30 cents or fifty for $3.50; school tickets, at the rate of fifty for $2; children's ticket, ten for 25 cents.

Denver Cars Tied Up

Men Walk Out in Violation of Court Order — Rioters Wreck Cars — Two Persons Killed, Many Hurt

Service on the lines of the Denver (Col.) Tramway was completely suspended at 5 a.m. on Sunday, Aug. 1, through a strike of the members of the local branch of the Amalgamated Association. This action was taken by the union in the effort to enforce its demands for an increase in the wage scale of trainmen to a minimum of 70 and a maximum of 75 cents an hour, with corresponding increases for the employees in the other departments. A new working agreement was also asked for. As demanded by the union the proposed contract is to be patterned along the lines of the agreement which expired by limitation on June 1, but with the elimination of certain clauses objectionable to the men and the inclusion of additional provisions relative to working conditions.

SERIOUS rioting broke out on Aug. 5 between the strikers and their sympathizers and strikebreakers employed by the company. Two men were killed in the fighting and thirty-five others, including the chief of police and a dozen patrolmen, were wounded. Five electric cars were wrecked and the plant of the Denver *Post* was damaged by the crowd. Early in the day fighting became general and continued for hours in various parts of the city. It was announced that troops would be rushed from Fort Logan to take possession of the city and to restore order.

UNION CONTROL DEMANDED

In addition to asking for higher pay, the strikers presented the following demands:

No employee to be discharged by the company until approved by the union.

No person who is eligible for membership in the union to be put to work until he has secured a working card from the union.

The company to suspend union members who do not pay all union dues and fines.

No motorman who makes a coasting record of 25 per cent or better to be censured by the company.

Union members who have been in continuous service for one year or more to receive fourteen days' vacation each year with full pay, payable in advance.

No member of the union to be listed in the superannuated class until it has been proven to the satisfaction of the union that he is not able to do a day's work.

Numerous meetings between the company and union representatives during the past week resulted in a deadlock, as the employees insisted upon a provision in the agreement that the higher wage question be arbitrated after Oct. 15 and that it be made retroactive to July 1, 1920. While not adverse to the principles of arbitration, General Manager Hild very flatly and finally refused to agree to any arbitration which did not take into consideration the company's ability to pay, and further stated that under no circumstances would the company agree to any wage settlement on a retroactive basis.

Under the present wage scales the payrolls of the company show that the trainmen who are willing to work twenty-six days a month are earning from $150 to $200 a month. The company therefore considers that the trainmen are now receiving an adequate wage and feels that if there is to be any increase in fare a good portion of the additional revenues derived from such increase should be expended in the interest of the public for bettering service. With this stand the company firmly believes the public is in hearty accord.

COMPANY SUGGESTS COMPROMISE

Three proposals were made by Mr. Hild which the union representatives declined even to consider. These provided for:

A reasonable and simple bonus system under which the trainmen, through savings in operating costs, would be able to earn increased compensation of 2½ cents an hour, provided a 7-cent fare be authorized by the rate-regulating authority.

A co-operative plan for settling and determining industrial relations with full participation by the union and formed along the lines of the National War Labor Board.

Arbitration by the Colorado Industrial Commission of any questions or disputes which may arise and which cannot be settled by the company and the association. Such arbitration to take full cognizance of all related facts, including the right of the public to "good, adequate and convenient service," the right of the employees to just compensation and good working conditions, and the right of the company's investors to a secure and reasonable return upon their investment as represented by the fair value of the property.

The company's position, which has been sustained on two recent occasions by the Colorado Industrial Commission, is that the revenues from the present 6-cent fare are inadequate to pay the present wage scales, which were awarded by an arbitration board on March 18, 1920, and that wages higher than the present 58-cent scale would therefore require a fare in excess of 7 cents.

Anticipating that radical action might be taken by the union the company had previously made all preparations which the short time interval permitted. The public was assured that the cars would be operated and normal service resumed as soon as it is humanly possible to do so.

Notice was served on the union officials by the city authorities that the full police and military power of the city would be used to protect the men employed by the company to maintain service, and also to protect the public against any acts of violence which might be attempted or perpetrated. The city authorities also announced that they would proceed against the union, basing their action upon the order of District Judge Whitford in which the men were forbidden to strike.

Opposes Akron Grant

Councilman Files Suit to Restrain Company from Collecting Straight Five-Cent Fare in City

Gus Kasch, the only member of the Akron (Ohio) Council who did not vote for an increase of fare for the city lines of the Northern Ohio Traction & Light Company, applied to Judge H. C. Spicer of the Common Pleas Court on July 29 for an injunction to restrain the company from collecting a straight 5-cent fare and, further, to restrain it from refusing to sell six tickets for 25 cents or twenty-five tickets for $1. Judge Spicer directed that notice of the application be given the company officials.

The petition alleges that in collecting a flat rate of 5 cents the company is violating the contract entered into with the city in 1889 and that the action of the Council in granting it the right to collect this rate of fare is invalid because no consideration is named whereby the company is obligated to do anything for the city in return for the increased fare. It is also alleged that under the charter, which has been in force since Jan. 1, 1920, no ordinance affecting the rates to be charged by public service corporations can be enacted as an emergency measure, all such ordinances being subject to a referendum vote.

Should an injunction be granted, the only result would be to force the City Council to re-enact the ordinance in the regular way. This would require three separate readings and then it could not go into effect for thirty days and would be subject to a referendum should a sufficient number of voters sign petitions requesting its submission.

Mr. Kasch filed the suit in behalf of himself and as a member of the Car Riders' League. It is reported that this organization adopted a resolution instructing him to take action in the matter.

New Orleans Men Return

Service Restored After Tieup Lasting Three Weeks—Arbitrators to Pass on Wages and Fares

Twenty-three days after they had gone on strike, demanding higher pay and union recognition, the carmen employed by the New Orleans Railway & Light Company, New Orleans, La., voted to return to work pending settlement of the questions at issue by a board of arbitration. Service was resumed on July 25 and 26, ending the longest strike in the city's history. It is announced that if the men are awarded a pay increase the fares must be raised. A 7-cent fare is considered insufficient to meet the company's needs, and a fare of 8 or even 9 cents is a probability.

INTERVENTION by Mayor Behrman played an important part in bringing the tieup of the city's transportation system to an end. On July 20 the Mayor filed in the Federal District Court a petition asking permission of Judge Rufus E. Foster for the city to inject itself into the receivership proceedings. The judge was also asked to consent to a modification of the court order in which J. D. O'Keefe, receiver of the railway, was forbidden to contract with the men through the Amalgamated Association of Street & Electric Railway Employees. To the concession asked by the Mayor, Judge Foster consented.

TERMS OF AGREEMENT

The agreement reached by the Mayor, Receiver O'Keefe and James Rodgers, representing the carmen, provided that three arbitrators should be selected by them, acceptable to the federal court, who should investigate the various questions pertaining to the controversy and report their findings to the court, subject to its approval or disapproval.

The carmen were to return to work at once, at the same wage rate and under the same working conditions that obtained before the strike. It was understood that if an increase in wages was allowed the carmen the increase should be retroactive to the time the men resumed work.

No reference was made to the Amalgamated Association, whose recognition was the bone of contention between the railway and the men, although the hope was expressed by the representatives of the carmen that the arbitrators would recommend that the Amalgamated Association be recognized by the receiver. The report was to be submitted within three weeks.

ARBITRATORS BEGIN WORK

The informal committee, composed of Mayor Behrman, Receiver O'Keefe and Mr. Rodgers, lost no time in selecting the board of arbitration. The board, as approved by Judge Foster, consists of Charles J. Theard, George H. Terriberry and J. P. O'Leary. Besides fixing carmen's wages the arbitrators are to determine to what extent, if any, fares must be increased. The matters to be determined by them were outlined as follows:

1. The capital charges properly to be earned by the utility under existing conditions.

2. The terms and conditions under which labor should work and the return therefor which the labor should receive under existing conditions.

3. The fare necessary for the company to receive in order to meet the just charges upon capital, labor and management.

4. A program whereby the utility might be assured the fare, labor and capital their return, and the progress of the utility through receivership and into the hands of the competent owners be expedited.

When this report is rendered the attorneys of the parties at interest will appear in court for argument and presentation of testimony and argument upon any issue remaining.

When and if the report is approved by Judge Foster, the parties at interest, in their several capacities, are to perform their respective functions as promptly as possible.

ASKED $150 A MONTH

In their original demands the men asked a wage of at least $150 a month for platform men, an eight-hour day and a six-day week. They struck after refusing an appeal of commercial bodies and labor organizations that they remain at work until the pending difficulties could be looked into and measures of relief put forward by the city's business men.

Jersey's Problems Analyzed

Expert for Cities Addresses Governor Edwards on State's Electric Railway Needs—Situation Grave

Delos F. Wilcox has laid before Governor Edwards of New Jersey a review of local transportation issues in that state. Dr. Wilcox was the chief expert for the New Jersey State League of Municipalities in its original fight before the Board of Public Utility Commissioners against the 7-cent fare on the Public Service Railway lines two years ago. Again last year he represented the Associated Municipalities in the zone-fare case, which finally developed into the valuation and rate proceeding still pending before the commission.

The memorandum covers eighty-three mimeographed pages. Dr. Wilcox takes up in four separate sections: (1) the Public Service Railway's attack on the jitneys; (2) the present crisis in public control over public services; (3) the results of conflicting theories of valuation, and (4) the need for a definite and constructive State policy.

Dr. Wilcox says that regulation should be effective before monopoly is granted. Local transportation service should be developed in an orderly and economical way. Jitneys ought not to be permitted to destroy the electric railway when they are unable to take its place. Common carrier service by motor buses should be developed as an auxiliary to the street car, not as a competitor to it. Nevertheless, says Dr. Wilcox, a private monopoly upon which a great community is dependent for an essential public service, when such a monopoly has manoeuvered itself into a position where it cannot be effectively regulated is intolerable.

In conclusion Dr. Wilcox says that the big things upon which definite light is needed include (1) the whole matter of jitney service in its relations to trolley traffic, trolley revenue and trolley fares; (2) the ability of the Public Service Railway to render adequate service without the help of the jitneys; (3) the value of the railway company's property devoted to public use; (4) the rate of return which the railway company should be allowed to earn on its property; (5) the extent to which the cost of railway service could be reduced by improved operating methods; and (6) the extent to which public co-operation is possible and necessary in reducing the cost of transportation service.

Urges Salary Increases for Engineers

The Engineering Council recently addressed a letter on classification and compensation of engineers to State governors, mayors of the leading cities, directing heads of Federal bureaus having jurisdiction over engineering work, and civil service commissioners. Engineering heads under these various officials were also addressed. The letter first calls attention to the serious hardship to all branches of the engineering profession during the past three years, from the great decrease in the buying power of the dollar. It then gives the Council's standard classification of grading for engineering service, with a tentative schedule of standard rates of compensation in each of the proposed grades. This list follows:

Adopted Grades	(Tentative) Compensation Schedule
Junior Aid	$1,080 to $1,560
Aid	$1,680 to $2,400
Senior aid	$2,520 to $3,240
Junior assistant engineer	$1,620 to $2,580
Assistant engineer	$2,700 to $4,140
Senior assistant engineer	$4,320 to $5,760
Engineer	$5,940 and upward
Chief engineer	$8,100 and upward

In conclusion, the letter solicits the views of the recipient as to the feasibility of adopting Engineering Council's schedule of grading and compensation and offers to furnish any information desired on special problems.

Sixty Cents for Albany Men

Employees of the Albany and Troy divisions of the United Traction Company, Albany, N. Y., have accepted the company's offer of an increase in pay of 15 cents an hour and a four months' contract from July 1, 1920. The acceptance of the offer ends a series of conferences that had been under way for a month and does away with the possibility of a strike. The men were receiving 41 and 45 cents an hour; under the new scale they will receive from July 1 56 and 60 cents an hour.

City's Appeal Wins

Circuit Court of Appeals Holds Toledo Vote Legal, Overuling Judge Killits—Issue to People

The people of Toledo may yet have the opportunity to vote on the $7,000,000 bond ordinances to provide a municipal transportation system. Prosecuting Attorney Allen Seney, on behalf of the election board, filed an eleventh hour appeal with the Circuit Court of Appeals for the sixth federal circuit at Grand Rapids, Mich., and that body heard arguments on Tuesday and Wednesday of this week. The court thereupon suspended the injunction barring the referendum, holding the restraining order to be illegal under the city charter. In the ordinary practice the case would have gone to Cincinnati to be heard there by the same court but there would have been such delay that the election of Aug. 10 would have been impossible.

After Judge Killits issued his order restraining the board of elections at Toledo from permitting the bond ordinances to be placed on the ballot, the members of the municipal ownership commission and the city authorities declared that they would not ask any appeal but rather would lend their efforts to perfecting the ordinances by repassage in accordance with the city charter and in time for the November election.

Forces Court Action

The prosecuting attorney took matters into his own hands and forced a fight before the higher court. He fought the order on the grounds of lack of jurisdiction, arguing that Judge Killits did not have the right to interfere with a political action.

Granting that the ordinances are illegal, Mr. Seney declared that the Toledo Traction, Light & Power Company, a holding company, could not sue because it has another legal remedy and the present issue is too remote. Mr. Seney stated the city's side of the case as follows:

> The merits of the municipal ownership or service-at-cost plans of settlement of the traction issue are not at issue. That makes no difference now. The principle at issue is whether a federal court can enjoin the city from holding an election. That is more important than whether I walk or ride, and street cars are a necessity to me.

The court decided it would hear the case on Mr. Seney's request and a bond of $300 was filed by the prosecuting attorney. The traction company interests are represented by George D. Welles, who argued the case before Judge Killits. He has introduced several new angles into the dispute.

In his motion for dismissal of the appeal, Mr. Welles declared that voting in Toledo is in progress under the "absent voters'" law, and that many have already been deprived of right to vote on the bond ordinances, so that there can be no complete expression of the will of the voters of Toledo.

Technical Errors Alleged

He also alleged that the city clerk failed to send each voter a copy of the ordinances as is required by the charter; that the bond issue ballots ordered by the election board had been destroyed by the printer, and that new ballots can be printed only after ten days' advertising for bids, which would throw the matter beyond Aug. 10. He also put in an argument to the effect that a better municipal ownership ordinance would result if the voters were to wait till the November elections or until some still later date.

It is doubtful whether the twin ordinances would be adopted if they came to a vote on Aug. 10. The municipal ownership campaign has gone forward since the injunction appeal was taken to the higher court, but the commotion raised at the hearing before Judge Killits has almost crushed the chances of the municipal ownership plan.

No concerted campaign has been carried on in behalf of the cost-of-service plan since it was ratified by Mr. Doherty. As soon as the measure receives the approval of the City Council, which is practically guaranteed by the terms of the ordinance under which the cars were brought back from Michigan last fall, the combined strength of four business men's clubs and the Chamber of Commerce will be thrown into the campaign.

Providence Considers Jitney Regulation

At a recent meeting of the ordinance committee of the City Council of Providence, R. I., it was voted unanimously that there would be no public hearing on the jitney problem. According to Chairman William Hughes, the members feel they can best get at the heart of the matter by calling, individually, representatives of the jitney men and the Rhode Island Company. The committee, it was said, will not start drawing up regulative legislation for jitneys until both sides have had an ample opportunity to explain their stands.

A petition, signed by officers of the banks, trust companies and savings institutions in the city asks that the electric railways be granted some relief by "enacting such ordinances as will place the jitneys and other motor vehicles operated for hire more nearly upon an equality with the railways and thus, to some extent, remove this unfair competition without depriving the public of whatever benefit a properly regulated jitney service may afford where it is necessary." The petition says:

> The loss to the electric railways through this unregulated and unfair competition is estimated by the receivers, after careful observation, at not less than $750,000 per year and is probably much more.
>
> Unless some regulation is enacted we see no hope of reorganizing the electric railway service or of keeping it in operation. The money required for reorganization cannot be obtained.
>
> We do not feel that we are justified in permitting the capital of the people for whom we are trustees to be any longer used in the public service without any return. Much less de we feel that we can call upon them to advance more capital upon which there is no prospect that they will ever receive a return.
>
> We feel that we might properly ask for a removal of the ruinous competition to which the electric railways are subjected, on the ground that it is unfair to those whose savings are invested in the railway properties which have so long served the community. But aside from these investors, we believe that the whole public is vitally interested in the preservation of the electric railway system, and that your honorable body, as the representatives of the public interests, should not permit it to be destroyed.
>
> The system of competition which may destroy the electric railways does not and cannot pretend that it will supply the public needs for transportation when once the destruction is accomplished. That it cannot do so has been the verdict of the public utility commissions throughout the country which have studied the subject.

Rapid Transit Lines for Staten Island

Several proposed methods for connecting the Borough of Richmond by tunnel with other sections of New York City were submitted to the Board of Estimate & Apportionment of the City of New York recently by Transit Construction Commissioner John H. Delaney. The report, which was prepared in response to resolutions adopted by the Board of Estimate, gives details and estimates of costs for six tunnel schemes, and for a great bridge spanning the Narrows that would have capacity for rapid transit, freight and through passenger service, as well as for vehicular traffic between Staten Island and Brooklyn.

The cost of carrying out the various schemes ranges from $6 000,000 to $100,000,000. Two of the schemes analyzed, which have been advanced by residents of Staten Island, involve a combination tunnel and viaduct along the New Jersey shore of the bay, extending from St. George, Staten Island, to the Battery in Manhattan.

A Kind Word for the Manager

The Roanoke *Times* recently contained an editorial "The Street Car Service," reproduced substantially in full:

> It is quite the custom here, as in other American cities, to growl about the street car service. It is a typically American habit and doesn't really mean anything. The street car company, the ice company and the local newspapers are looked upon as fair game and it doesn't do at all to take seriously everything said about them.
>
> More or less extended observation has convinced us that the street car service here compares favorably from many standpoints with that of a number of other places. The schedule is all that could reasonably be asked, the rolling stock is in good condition, the employees are courteous and obliging—and the fare is only 5 cents. Aside from a street car ride, what can be named offhand that sells today for exactly the same price it brought before the war?
>
> Roanoke people, who go away from home and submit without grumbling to the higher prices charged elsewhere, rarely have a good word to say for the local service. It might be better in some respects, of course. But it averages up pretty well as compared to other places and most of the "knocking" is unjustified. Manager Hancock is thoroughly reasonable and approachable, and a legitimate kick is always sure of attentive consideration, something that cannot be said everywhere.

Nation Stands to Lose

Mr. Porter Says Financing of Public Utilities Is Country's Biggest Job —Appeals for Square Deal

H. H. Porter, vice-president and general manager of the Brooklyn City Railroad, in a recent statement to the press of New York, attributes the present plight of the traction companies basically to war's dislocation of industry; abnormal increase in wages and in cost of all materials, including coal; the heavy burden of direct taxation, as well as indirect taxation costs, embracing paving systems, etc.; the necessity of giving longer rides and more transfers, without additional compensation; operation of non-paying extensions and employment of improved facilities, coupled in many instances with decreased riding, due both to jitneys and private competition of automobiles.

FINANCING GREATEST PROBLEM

Mr. Porter illustrated the unfavorable situation by stating that a total of about 7,000 miles of track, representing almost 16 per cent of the entire track mileage of the electric railways of the country, was in the hands of receivers or had been abandoned or junked. He sees signs of a more encouraging viewpoint in the regulatory authority, and cites particularly the attitude of the State of California as expressed by Edwin O. Edgerton, president of the Railroad Commission. Mr. Edgerton declares that the greatest single problem faced by both California and the nation is the job of financing public utility enterprises. California alone, it is estimated, will need at least $50,000,000 for this purpose in the next decade. These figures are quoted by Mr. Porter to indicate the huge sums which must be devoted to the similar tasks which confront New York.

Mr. Edgerton stressed the need of recognizing the human factor. He insisted that punishment was not the way to promote efficiency in public utility corporations any more than in men and women. He urged California to apply that principle "to the fellow who has money to invest," recognizing, he said, that "we cannot get money out here from the East into California by threat, by argument, by any form of punishment, by any suggestion that because of investment already made they cannot quit. I recognize that the money must come by inducement and, in my judgment, it can be induced without paying exorbitant and unreasonable prices for it."

INCENTIVE OF REWARD IMPORTANT

Mr. Edgerton holds that having begun to take care of the investor and having produced a situation where his investment is safe and intact, his return regular and sure, then the organization of the company itself should be stimulated by offer of reward.

This general statement, according to Mr. Porter, is applicable to the transportation situation in New York and Brooklyn. Thus the Brooklyn City Railroad is largely a Brooklyn enterprise, a great number of its shareholders being Brooklyn men and women. Of a total stock list of 1,472 holders, representing 1,200,000 shares of the par value of $12,000,000, 391,951 shares of a par value of $3,919,510 are held by 742 women. Trustees, administrators, executors, guardians, life insurance companies, charitable institutions and colleges numbered 208 holders and held 407,799 shares of a par value of $4,077,990. Other corporations, individuals and others, to the number of 522, hold 394,250 shares of a par value of $3,942,500.

Mr. Porter cited these figures to show the character and diversity of the interests which must be protected under any equitable plan of readjustment.

Holland Commission Arrives to Study American Electrification Conditions

A commission made up of railway experts to study American methods of electrification has been sent by the Government of the Netherlands to this country. The party is headed by L. M. Barnet Lyon, member of the Board of Control of the Netherlands Railways. J. J. W. Van Loenen Martinet is secretary of the commission. Other members of the party are H. J. Van Lessen, H. Doyer and W. J. Burgersdijk, the latter being manager of the Holland Interurban Railway. The first government line in Holland to be equipped will be that between Amsterdam and Rotterdam, a distance of about fifty-five miles. Other electrifications will follow. A superpower system is also proposed. The equipment will be largely multiple-unit, though locomotive operation will also be required.

The commission will make a thorough study of American electrifications and will remain in this country for some two months. Visits have previously been made to Sweden and Switzerland to inspect the electric lines.

Appeal from Paving Order Sustained

The Public Utilities Commission of Maine has ruled upon the appeal of the Cumberland County Power & Light Company from the order of the municipal officers of Portland in relation to paving and resurfacing certain sections of certain streets and relocating tracks of the Portland Railroad, which it operates under lease. The appeal is sustained, the decision being signed by all three commissioners.

There are certain points, such as the percentage of cost of work, upon which the company and the city must come to an agreement. The commission holds the case open until such agreement is reached and the commission further orders that a report of such agreement be made to the body. When all the evidence has been submitted in this case, together with the arguments of counsel, the commission will determine the questions raised by the appeal and apportion the expenses involved in the matter submitted.

Freight Rates Advanced

Electric Railways Enjoy the Same Advance as Steam Roads Under I. C. C. Decision

In its opinion authorizing increased railroad rates, made public Aug. 1, the Interstate Commerce Commission has the following to say with regard to freight rates on electric lines:

> Petitions have been filed in this proceeding by a national organization of electric lines, seeking permission to increase their rates in the same proportion as the rates of trunk lines are advanced. The operating costs of these lines have, on the whole, increased in approximately the same ratio as those of steam railroads. In some instances there is competition between the electric lines and the steam railroads. We conclude that the freight rates of electric lines may be increased by the same percentages as are approved herein for trunk lines in the same territory. This is not to be construed as an expression of disapproval of increases, made or proposed in the regular manner, in the passenger fares of electric lines.

Athletic Park for Rail Workers

"Tramway Park," the new athletic field provided and equipped by the Kansas City (Mo.) Railways for its employees, was opened recently with a game between the "Tramways" and another team in the Inter-City League of Greater Kansas City. Although the grounds were intended primarily for the use of employees, indications point to the park, becoming an important factor in the stimulation of athletics in the city. A factor particularly helpful to the success of the park is *The Railway Athlete*, the weekly paper of sports published and financed by railway employees. The scores and reports of games in the semi-pro leagues are published by *The Railway Athlete*. It is becoming the official organ of amateur baseball; and is building a large circulation among employees of business institutions which have ball teams in the local leagues. The availability of Tramway Park, where games may be played with convenient arrangements for charging admission, offers opportunity for many more games to be scheduled than could be done before.

Philadelphia Chamber on Labor

With the purpose of protecting the public from industrial warfare, an industrial relations committee has been established by the Chamber of Commerce of Philadelphia. It declares for the open shop, for the recognition by employer and employee of their full responsibility and for the faithful performance by them of the agreements or contracts into which they enter. It calls for the highest efficiency and production in industry consistent with the health and welfare of workers, and opportunity for the worker to develop his fullest earning capacity and command his maximum wage. These and other principles are summed up in eleven paragraphs, of which the one relating to utility operation follows:

> The paramount interest of the public in the operation of the agencies of transportation and other branches of public utility service must be asserted and maintained against any attempt to bring about an interruption in the service of any public utility in furtherance of any private purpose or interest.

Bus Plan Attacked

Chamber of Commerce Condemns New York Bus Scheme—Analyzes City's Transit Situation

A proposed solution of the transportation difficulties of New York City is contained in a report of the transit committee of the Brooklyn Chamber of Commerce, presented at a public hearing of the Board of Estimate of New York City on July 28. This report declares that while the motor bus has recently proved its worth in urban transportation sufficiently to justify the conclusion that it is here to stay, its usefulness will not be found as a separate and independent system but rather as a feeder to existing trolley and rapid transit lines. The experience in various cities in this country and particularly abroad is quoted to justify this position.

The establishment of an independent bus system in New York, operated by the city or by private corporations, it is said, would mean a revival of the old principle of competition as a means of regulating this public utility service, a principle which was discarded years ago, when public utilities were made subject to State regulations. Such a competitive enterprise, in the opinion of the committee, would only tend further to disorganize the transportation service and result in added discomfort and inconvenience to the traveling public.

It is also pointed out that if the recent New York municipal bus lines had not taken only the cream of the service they would have been unable to operate on a 5-cent fare.

$50,000,000 NEEDED

The report estimates the cost of installing a comprehensive bus system in New York and estimates that to do the work of the present surface cars it should consist of from 5,000 to 6,000 buses at $8,000 apiece, which, with shops, garages, etc., would mean an initial investment of from $50,000,000 to $60,000,000. This system, it says, would naturally compete with the $250,000,000 investment which the city now has in the present subway systems. Finally, the buses would add greatly to the street congestion, which is one of the tasks before the city to reduce. In commenting on the need for a settlement of the New York transit situation, the report says in part:

> Neither party to the contract under which our transit systems are operated has yet given evidence of that spirit which is so essential to a just and equitable settlement of our transit difficulties. The companies merely ask for an increase in fare. The city administration in reply proposes municipal ownership and operation of existing lines or the establishment of city owned and operated bus lines. The companies, obligated under their contracts to give service at a 5-cent fare, ask the city to surrender this advantage without evincing any willingness to surrender to the city any of the advantages which they secured under their franchises and contracts. The city, on the other hand, tries to ignore the partnership relation existing between the companies and the city and is apparently seeking a complete disintegration of the service.
>
> The Brooklyn Chamber of Commerce for a year and a half has been urging the companies to consent (1) to the abandonment of the preferentials granted in existing contracts, (2) to the elimination of the outstanding perpetual franchises, (3) to the abolition of the numerous holding companies and the endless maze of subsidiary companies, and to a proper readjustment of their capitalization, in exchange for a fair consideration of their financial needs; but in all of the communications issued by the officials of the companies or the receivers appointed by the courts calling the attention of the public to the seriousness of their financial condition and the dire need of financial relief, there has not been a single hint or suggestion that the companies are willing to meet the public half way and, in return for concessions which they ask the city to make, to surrender any of the unfair advantages which the public believes the companies secured when they drove a hard bargain in the framing of the original contracts and franchises.
>
> ### CITY FAILS TO CO-OPERATE
>
> On the other hand, the uncompromising and hostile attitude of the city administration toward the companies gives the public no more encouragement for an early and constructive solution of the problem than does the unyielding attitude of the companies. When the companies appear before the Board of Estimate and Apportionment to present and defend their case they are not met with open-minded consideration. No constructive plan can be developed in such an atmosphere of hostility and suspicion. The city administration might find justification for its present attitude if it were intended as a preliminary to securing an advantageous position in negotiating a constructive plan of readjustment; but this hostile attitude has been maintained so long that the public has come to believe that the administration has no constructive plan, but that its policy is one of more obstruction, which, of course, leads nowhere.
>
> If the Mayor is seeking a constructive solution of the transit problem in the interest of the public and if the companies are really desirous of arriving at a working agreement with the city and the public there is nothing to hinder the simple but customary procedure of the parties to the agreement meeting about the conference table, adopting the policy of absolute frankness and fair dealing, laying all their cards on the table, face up, and each evincing a willingness to make concessions in the interest of the larger public which they both serve.
>
> If the Mayor and the board will give their attention to this simple and fair method of procedure they will move much more rapidly toward a solution of the transit problem than they will by suggesting and discussing a city-wide bus system, which would result only in freezing out or starving to death the existing transit companies—a result disastrous not only to the stockholders but to the entire traveling public, which is so fully dependent upon existing transit facilities.

News Notes

Wage Offer Rejected.—Platform men in the employ of the Berkshire Street Railway, Pittsfield, Mass., have rejected the offer of a 15 per cent flat increase made by General Manager C. Q. Richmond of the company in answer to the union's request for a 40 per cent increase. The union voted to hold out for the full 40 per cent increase.

More Pay for Oklahoma Men.—The Oklahoma Railway, Oklahoma City, Okla., has increased the wages of its platform men 3 cents an hour. The pay award is retroactive to June 1. The company has announced that it will grant a further increase of 3 cents an hour to take effect on Oct. 1. The company has an application pending for an increase in fare from 5 cents to 7 cents before the City Commission.

Dayton Arbitrators Named.—Thomas Elliot, consulting engineer of the Cincinnati Traction Company, has been selected by the electric railways operating in Dayton, Ohio, as their representative on the board of arbitration which is to determine a permanent wage plan for the Dayton carmen. J. Ernest Duncan will represent the men. It is proposed to consolidate the several local unions.

Men Reject Winnipeg Award.—Carmen in the employ of the Winnipeg (Man.) Electric Railway on July 19 voted by a small majority to reject the 10 per cent wage increase awarded them by the Myers board of arbitration. The company had previously announced that it would accept the findings of the board, although they would entail an additional expense of $300,000 annually. The men demanded an increase amounting to practically 50 per cent. It was proposed to take a second vote later on the question of calling a strike to enforce these demands. At a hearing before the Manitoba Public Utilities Commission on July 20 counsel for the shareholders of the company appealed for an 8-cent fare on the Winnipeg lines.

Citizens Plan Des Moines Campaign.—Citizens' organizations plan to take an active part in settling the traction difficulties of Des Moines, Iowa. Tentative plans have been made to call a meeting of all the presidents and secretaries of local improvement leagues to form a city-wide organization to intervene in the controversy between the city and the Des Moines City Railway. It is proposed to seek the co-operation of all commercial and civic organizations so that the new federation will be entirely representative. O. M. Brockett, legal adviser for the Des Moines Chamber of Commerce, who was chairman of the franchise committee of the citizens' general committee which last year sought to work out the Des Moines railway problem, has written a letter to Mayor Barton proposing a service-at-cost basis.

Safety First With a Vengeance.—The Japanese equivalent to "ca 'canny," says the *Electrical Railway & Tramway Journal*, London, was exemplified in a recent strike on the Tokio tramways, where the employees on that system brought a "Go slow" strike to a successful conclusion in one day. Their method, states the *Globe*, was to discover defects in the mechanism of the cars and then run them into the depots for repairs. As the cars are not exactly new, there are few of them on which this game cannot be successfully worked. But after being conceded an increase in wages, the men who had declined to break the regulations by driving unsafe cars were soon rattling them over the streets at the old breakneck speed. The municipality surrendered in the afternoon. The men were conceded a minimum wage of 5d. an hour, with an eight-hour working day, a bonus of six weeks' wages twice yearly and pensions at the end of service.

Financial and Corporate

Revenue Increases $250,000

$42,000 Deficit of Utah Light & Traction Company Changed to Profit of $29,350

After paying all interest charges, including $801,000 bond interest, and after placing $150,000 in its depreciation fund, the Utah Light & Traction Company had profits for the year ended Dec. 31, 1919, of $29,355. This compares with a net loss to the company for the previous year of $41,868 and makes an increase of 170 per cent.

INCOME STATEMENT—UTAH LIGHT & TRACTION COMPANY

Year Ended Dec. 31:	1919	1918	Percentage Change Over 1918
Total railway operating revenue	$1,855,281	$1,602,000	15.8
Total railway operating expenses, including taxes	1,245,752	1,142,893	9.0
Operating income	$609,529	$459,107	37.7
Non-operating income	382,988	364,437	5.1
Gross income	$992,517	$823,544	20.5
Deductions from gross income:			
Interest on bonds	$800,869	$786,317	1.9
Other interest and deductions	12,293	54,095	—77.4
Depreciation	150,000	25,000	500.0
Total deductions from gross income	$963,162	$865,412	11.3
Net income transferred to profit and loss	$29,355	$41,868*	+170.0

* Deficit.

The total railway operating revenue for 1919 was $1,855,281, as compared with $1,602,000 in 1918. This was an increase of $253,281, or 15.8 per cent. On the other hand, the operating expenses increased only $130,000, being practically $1,138,000 in 1919. The net revenue from operations was about $718,000, or an increase of approximately $123,000 over 1918. Due to a reduction of $37,000 in the income tax paid, the amount of taxes paid in 1919 decreased $28,000 over 1918. For 1919 the operating income increased to $609,529. This was an increase over 1918 of $150,422, or about 38 per cent.

Non-operating income was made up chiefly from the Utah Power & Light Company for the rental of power plants. **The gross income was $992,517 for 1919. In comparison with 1918, this was an increase of $168,973, or 20.5 per cent. From this gross income, interests on bonds of $801,000, depreciation of $150,000 and other interests of $12,000 were deducted, leaving the net profit at $29,355, or an increase of $71,000 over 1918.**

The traction company has 92.1 miles of main line track, of which 71.11 miles are in Salt Lake City, and 52.70 miles of second track, of which 49.05 miles are in the city. Of the total operating revenue given $1,820,000 is in passenger revenue and about $20,000 in freight revenue. Passenger conductors and motormen were paid $466,000 during the year of 1919, or $43,000 more than in 1918. In spite of heavier traffic, the power bill decreased $4,000, due to the skip-stop system and less frequent schedules on some lines.

TRAFFIC INCREASING

The total number of revenue passengers carried during 1919 was 33,908,484, of whom some 5,500,000 used transfers. The total passengers carried increased 3,346,520, or 9.3 per cent over 1918. Each passenger paid an average fare of 5.37 cents. The revenue per car-mile was 35 cents, while the expenses per car-mile were 23.5 cents. Operating revenue per car-hour was $3.53, and the operating expenses per car-hour were $2.57. The operating ratio decreased from 71.3 per cent in 1918 to 67.2 per cent in 1919.

STATISTICAL INFORMATION—UTAH LIGHT & TRACTION COMPANY

Year Ended Dec. 31:	1919	1918	Percentage Change
Miles of single track	146	146	.....
Car hours	5,303,783	5,466,576	—3.0
Car house	525,216	544,084	—3.4
Ratio C.M. to C.H. (speed m.p.h.)	10.09	10.02	0.7
Total passengers carried	39,521,505	36,174,985	9.3
Average number of cars operated	80	83	3.6
Statistics per car-mile:			
Operating revenue (cents)	35.0	29.4	19.0
Operating expenses (cents)	23.5	20.9	12.4
Net income (cents)	0.55	0.77	—28.6
Number of passengers	7.45	6.62	12.5
Car-miles per passenger carried	0.134	0.151	—11.3
Statistics per car-hour:			
Operating revenue	$3.53	$2.95	19.6
Operating expenses	$2.57	$2.10	22.4
Net income (cents)	5.6	7.7	—27.3
Number of passengers	75.3	66.4	13.4
Operating ratio, per cent	67.2	71.3	—5.6

Railway Properties Run at Loss

The Northern Ohio Traction & Light Company, Akron, Ohio, has issued income statements for its **railway lines in Canton, Massillon and Akron. All three lines have large deficits after providing for depreciation of property, and allowing for a return of 10 per cent per annum on an estimated' investment. The lines in Canton, however, were operated at a small profit, if the allowances for depreciation and for a return** on the investment in the property are disregarded.

$47,035,000 St. Louis Value

Commission Appraises Property of United Railways—Has Used $50,000,000 as Rate Basis

The Missouri Public Service Commission made public on July 27 its audit of the United Railways of St. Louis. The valuation of the entire property of the company is fixed by the commission at $47,035,120. The appraisal of the property by engineers for the commission has not been completed, but the engineers worked in conjunction with the accountants and the valuations are expected to be about the same. The book value of the property as shown by the records of the company is $101,436,776 and the outstanding indebtedness $121,000,000.

The audit of the company's books reveals a continuous policy of pyramiding inflated values. Original values of the properties of the companies taken over in the consolidation of the various lines are shown to have been multiplied by many times their actual cost.

COMPANY'S ESTIMATES CUT

As carried on the books of the company the property is divided into two classes, namely, property purchased from original companies and new construction and equipment. The company's books carry purchased property at a value of $83,740,813 and that of new construction and equipment at $17,695,963, making the total of $101,436,776. The company's figures for new construction and equipment were accepted at almost face value, but the total value of original property purchased was cut from $83,740,813 to $30,939,847, a reduction of approximately $53,000,000.

The items which were deducted from the valuation by the commission consisted principally of franchise values, promotion expense, commissions and other items which do not represent physical property. In many instances these items amounted to from 50 to 75 per cent of the original book value of separate lines.

Pending the results of the valuation the Public Service Commission has been using a tentative value on the property of $50,000,000 in fixing the rate of passenger fares. The company will shortly ask a fare increase.

Shore Line Sold

Portion of Road on Which Service Was Abandoned Last Year Will Be Junked

Fifty miles of line belonging to the Shore Line Electric Railway, Norwich, Conn., have been sold to the United States Rail & Equipment Company, Memphis, Tenn. The purchaser proposes immediately to dismantle the entire line and to dispose of the material and equipment. The sale has been approved by Judge George E. Hinman of the Superior Court and papers in the transaction have been signed. The sale involved $340,,000. Practically all of the stock in the line sold is owned by the estate of the late Commodore Morton Plant.

COURT APPROVES SALE

Robert W. Perkins, as receiver of the Shore Line, obtained an order from the Superior Court on June 15 authorizing him to dispose of the line at public or private sale, subject to approval by the court. The property to be removed comprises trackage, turnouts, sidings and materials, starting from State and Ferry Streets in New Haven and extending to Old Saybrook, Chester, Guilford, Stony Creek, Branford, Flanders Corner and East Lyme. The portion of the road sold has not been in use for about a year, operations having ceased when the employees went on strike in July, 1919. The New London division, formerly operated by the Shore Line, under lease from the Connecticut Company, was returned to the latter recently by court order, through abrogation of the lease.

A statement of assets and liabilities of the portions of the Shore Line still being operated for eight months ended May 31, 1920, filed with the clerk of the Superior Court, shows a deficit of $83,198.

By months, the deficit is made up as follows:

October, 1919	$21,851
November, 1919	3,571
December, 1919	4,405
January, 1920	9,853
February, 1920	26,346
March, 1920	12,043
April, 1920	2,693
May, 1920	2,436
	$83,198

The report of operation for the month of May shows that on the first day of the month there was cash on hand amounting to $10,511. The cash receipts for the month were $53,540. Cash disbursements for the month of May were $47,812, leaving a cash balance on June 1 of $5,728. Total cash on hand at that time amounted to $16,239.

Suburban Line Improves

Advance in Zone Fare and Addition of Zone Increases Net, but Do Not Permit Dividends

The annual report for the year ended Dec. 31, 1919, of the New Bedford & Onset Street Railway, New Bedford, Mass., indicates that the net income increased about $10,000 over the previous year. This is due largely to the recent increases in the zone fares. The first advance was in August, 1918, when the rate per zone was increased from 6 cents to 7 cents and reduced rate tickets which were sold at 14.3 per cent discount were made universally valid instead of being accepted only on certain portions of the line. The second increase was made on Feb. 11, 1919, when the unit zone fares were increased from 7 cents to 8 cents. Ticket rates were increased also 1 cent per zone. The change in fares apparently produced a 26 per cent increase in passenger revenues and a 2.5 per cent increase in the number of revenue zone passengers carried, due not to an increase in traffic, but to the increase in the number of fare zones on the line. In reality, the traffic fell off during the year, and the number of car miles operated decreased 9.75 per cent.

The above table shows in detail the income and traffic handled during the past year as compared to the year 1918.

STATISTICAL INFORMATION, NEW BEDFORD AND ONSET STREET RAILWAY

Year Ended Dec. 31	1919	1918	Per Cent Change + Inc. — Dec.
Mileage—first main track (miles of line)	37.59	37.59	......
Total—all track	44.00	44.00	......
Average total miles operated	40.00	40.00	......
Revenue zone passengers	1,922,502	1,875,718	+ 2.50
Revenue car miles	(a) 430,642	(b) 492,870	(c) −11.15
Car mile statistics—			
Operating revenue * (cents)	38.85	37.40	+ 3.90
Operating expenses* (cents)	25.10	21.72	+15.60
Net income (cents)	2.68	0.295	......
Passenger traffic	4.47	3.81	+17.40
Passenger car miles per revenue zone passenger	0.223	0.255	—12.55
Mileage statistics—			
Operating revenue per mile of line	$4,450	$3,590	+24.0
Zone passengers per mile of line	51,200	49,900	+ 2.6
Number of persons employed—Dec. 31	50	......	......

*Exclusive of power sold.

(a) Passenger car miles only.

(b) Passenger car miles 478,699 only.

(c) Decrease is for passenger car miles

Dallas Deficit Grows

The total deficit of the Dallas (Tex.) Railway for the thirty-three months during which the company has been operating under the present franchise now amounts to $547,223, according to the statement of operating results for June. During June the company earned $36,584, or $15,114 less than the amount necessary to yield a 7 per cent return on the agreed-on valuation of $8,862,685. The gross income for the month amounted to $254,123.

Argentine Lines Do Well

Report Net Income of $448,000 for 1919—Expenditures 78 Per Cent of Gross Receipts

For the year ended Dec. 31, 1919, the Anglo-Argentine Tramways, Ltd., Buenos Aires, Argentina, reports a net income of $448,000 in spite of labor troubles and a great increase in operating expenses. The gross receipts were about $16,000,000. The total expenditures for the year amounted to $12,480,000, this being an increase of $962,000, or 8.35 per cent, over the working costs in 1918. Traffic expenses, in which the chief item is wages and salaries, were $4,100,000, an advance of about $500,000, or 13.9 per cent. This advance was mainly represented by increased wages of $281,500 and strike expenses of $173,250.

BUILDING OWN CARS

Under the head of maintenance, $1,342,000 was expended, principally on rolling stock, as against $1,180,000 in 1918, an increase of $162,000, or about 13.7 per cent. There are now in the service 1,684 motors and 869 trailers. In view of the delays and difficulties in obtaining deliveries of new rolling stock from Europe, cars are being constructed in the company's own workshop from native woods. General rates and taxes, at $1,513,000, showed an increase of $123,500, or 8.9 per cent, over 1918. The new capital expenditure during the year was $677,000.

The net profit for the year, $448,000, was arrived at after providing $470,000 transferred to renewal reserve, $342,000 as rent of leased lines and interest amounting to $2,680,000 on the three series of debenture stocks. Other amounts charged before arriving at the net profit were, for the redemption of preference and ordinary share capital, $33,950, and for the redemption of debenture stock, $235,500. The total stock redeemed and canceled in this way is $2,065,000 to date. The sinking fund for the redemption of the share capital is $410,000. To the year's profit of $448,000 there is to be added an undistributed balance of $402,500 from previous years, making a total profit for the year's operation of $850,500.

TRAFFIC RECEIPTS INCREASE

The redeeming feature of the year's operation was the continued and steady increase in the traffic receipts, notwithstanding an estimated loss of about $348,500 due to labor troubles. This indicates a great revival of business activity in Buenos Aires. The number of passengers reached the record total of 370,734,985, an increase of 6.14 per cent over 1918, although at the same time the car mileage increased only 1 per cent. The population of the city being 1,658,269, it follows that the inhabitants were carried 224 times over in the year.

The company has 387 miles of single track surface lines and 8½ miles of single track subways.

Financial News Notes

Rumor of Merger.—The Princeton (W. Va.) Power Company is said to have been approached with the proposition to take over from the Appalachian Power Company the electric railway system in Bluefield and make it one with the interurban and Princeton system.

Will Meet Bond Payment.—The International Railway, Buffalo, N. Y., has notified holders of its refunding and improvement 5 per cent gold mortgage bonds that on presentation to the Bankers' Trust Company, New York City, all interest coupons due May 1, 1920, will be paid together with all interest due on the bonds up July 12.

Railway Sold at Auction.—The property of the Plymouth & Sandwich Street Railway, Plymouth, Mass., was sold at public auction on July 27, to Louis Zuensky of Cambridge for $55,200. The sale included all of the real estate and personal property of the company. The sale covered 17.8 miles of track and overhead and the carhouses in Sagamore and Plymouth. Operation of the line ceased April 1, 1918, and the sale was the result of a decree of the Supreme Court. The road is expected to be junked, although there is some talk of operating a portion of the line.

Sale Halted Pending Hearing.—T. S. Riley recently appeared before Judge J. C. Pritchard, of the federal court, in behalf of the Grafton Light & Power Company, the Grafton Traction Company and the Grafton Gas & Electric Company, Grafton, W. Va., in bankruptcy. He requested an order of stay in sales of the property of the companies. An order was issued postponing the sale until the matters in the case can be heard. T. F. Lanham, trustee, was ordered to proceed no further with the sale until further order of the court.

Borrows for Jacksonville Lines.—E. J. Triay, receiver for the Jacksonville (Fla.) Traction Company, has received permission from the United States District Court to borrow $143,690 and to issue certificates of indebtedness to cover this amount. The receiver asked for the funds to meet the cost of street paving and to pay State and county taxes. The receiver in his petition showed that the income from the operation of the lines, under the present rate of fare, has continued to be less than the expenses of operation; also that it has been impossible to accumulate or set aside any amount to meet more than the current expenses.

City-Owned Line Going Into Debt.—On July 22 the board of directors of the Norton, Taunton & Attleboro Street Railway, Norton, Mass., met and discussed the report of the company. The report was complete only to May 31 and showed that the system had been conducted at a loss since the taking over of the lines by the cities of Norton, Taunton and Attleboro. The operating expenses were $42,218, while the operating revenues amounted to $35,600. There are also more than $17,000 in vouchers payable. The road was to have been abandoned because the return on the investment was inadequate. In order to retain the service the line was purchased by the cities concerned.

Allows 6 Per Cent Return.—Justice Charles E. Nichols of the State Supreme Court has rendered an opinion in the case of the Municipal Gas Company (Albany, N. Y.) vs. the State Public Service Commission, in which he holds in effect that the company may charge a sufficient rate to secure a 6 per cent profit on the capital invested, over and above the actual cost of production, "until such time as the expenses of production shall decline to where they were previous to 1918." The commission had refused to permit the company to charge more than $1 per 1,000 cu.ft., in compliance with the terms of a State law fixing the rate for gas at not more than this amount.

Utilities Bear Tax Burden.—Public utilities operating in the State of Ohio are bearing the burden of taxation in that State, according to an address made by Clarence Dalton, tax representative for the Toledo Railways & Light Company, before the Ohio Electric Light Association. Mr. Dalton pointed out that in its report for 1917 the State Tax Commission stated that "public utilities in Ohio today are paying taxes on a valuation more than 4.63 times greater than the 1910 value, and the increased amount of taxes that are paid into the counties and their subdivisions are in proportion to the increased valuation." This figure has been increased in many instances since 1917.

Trust Issue Approved.—The New Jersey Public Service Commission has approved an equipment trust agreement between the Public Service Railway, Newark, and the Osgood Bradley Car Company under which $1,820,000 of trust certificates will be issued. The certificates will bear interest at the rate of 7½ per cent a year and will be used to purchase 200 one-man safety cars, 100 center exit trailer cars, fifteen double-truck snowplows and fifteen single-truck sweepers. The commission has also approved an application by the company for permission to issue $410,000 in promissory notes to yield 7½ per cent. Of the total, $205,000 is payable in two years and the remainder in three years.

Offer Car Trust Certificates.—The Northern Ohio Traction & Light Company, Akron, Ohio, through Cassatt & Company, Philadelphia and New York, is offering for subscription $1,000,000 in 8 per cent gold certificates at 100 and interest, to yield 8 per cent. The certificates are issued under the Philadelphia plan in denominations of $1,000. The Fidelity Trust Company of Philadelphia is trustee. The certificates are dated Aug. 1, 1920, and are due serially $100,000 Feb. 1 and Aug. 1, from 1921 to 1925. They are secured by twenty steel interurban passenger cars, fifty-six Peter Witt city passenger cars and ten Cleveland type trailers, costing more than $1,340,000. The company is now paying dividends on $5,451,000 preferred stock and 7 per cent dividends on $9,100,000 common stock.

Bonds Exempt from Taxation.—Judge Louis B. Ewbank, sitting in the Circuit Court at Indianapolis, Ind., has ruled that bonds issued by the Indianapolis Street Railway and the Indianapolis Traction & Terminal Company and later bought up by the companies and put into the sinking fund are not taxable. The ruling was in a suit brought by the State for collection of $313,413 in taxes said to be due on the bonds for the years from 1904 to 1918. Of this sum $192,653 has been placed on the tax duplicate on alleged valuations of the bonds from $38,104 in 1904 to $1,138,310 in 1918. The taxes were placed on the tax duplicate after a report was made by W. F. Charters, a tax expert, that the bonds were being withheld from tax returns. The companies appealed the case to the Circuit Court. In announcing his ruling, Judge Ewbank said that he was unable to see how he could increase his wealth by writing checks to himself, or by keeping a promissory note which he had given and redeemed.

Toronto Railway Seeks City's Help.—The Toronto (Ont.) Railway finds itself with extraordinary charges to meet. Among them the payroll of the company will be about $2,000,000 more for the year commencing July 1 than it was for the previous year. In consequence the company has asked the city for permission to defer for the present current payments to the city. Under its agreement with the city the company pays the city a graded scale of percentage on its gross earnings in monthly installments. The company now finds that under the present rates of fare it cannot meet its obligations promptly and pay the percentages monthly as in the past, and has requested the indulgence of the city to allow the payments, or such part of them as the company may require, to be deferred until the end of the franchise, so as to enable the company to meet the payrolls, ordinary expenses of the company and other obligations, on the understanding that the accumulated percentages owing to the city will be a first charge on the assets of the company, to be deducted out of the award of the arbitrators when the property is taken over by the city on Sept. 1, 1921. The company has suggested that it would simplify the proposition were the company to meet its monthly obligations by giving promissory notes, payable at such dates as would be agreeable to the city.

Traffic and Transportation

Bridgeport Still Trolleyless

City Authorities Fail to Move for Return of Electric Cars—Company Stands Pat

Bridgeport's electric cars are still on vacation. Although more than a week has passed since the Connecticut Company halted service on its Bridgeport city lines there is little prospect of immediate resumption of operation. The city authorities have taken no steps to end the trolley-jitney deadlock which resulted when Judge Banks on July 22 refused to dissolve a temporary injunction restraining the city from enforcing the terms of an ordinance which proposed to halt this competition with the railway lines.

Judge Banks, while ruling that the measure as passed by the City Council was illegal, pointed out that the city had the power to regulate the buses. He also indicated what steps should be taken by the Council to secure this end. Nevertheless, the Council has taken no action looking to passage of a new anti-jitney law. Latest indications, according to newspaper reports, are that the Council is ready to legislate if the cars will come back.

BUSES STILL POPULAR

Buses are still the Bridgeporters' chief means of conveyance. Several hundreds of the vehicles are still operating through the streets formerly occupied by the trolleys. Apparently the total number of buses operating remains about constant. They are giving a service which is handling the traffic which is offered to the satisfaction of a large part of the people who are using the buses.

Some interesting sidelights on the situation of a trolleyless city are beginning to show up. While the traffic offered is being handled, the records of the merchants of the city are in many cases indicating that the traffic that used to exist does so no longer. In other words, some of the larger stores are finding that their sales are much below normal, and they attribute this to the fact that large numbers of their better customers are not coming in on buses, whereas they used to come in on the electric cars.

Individual traffic officers say that their problems at the corners are not changing much, but viewing the city as a whole it has been found necessary to add about sixten more officers to place on additional corners which have never had traffic officers before, and to double up on some of the busier corners. This is apparently to give greater protection to pedestrians, with a larger number of units passing at a somewhat higher speed.

There is still present the cream-skimming jitney owner of the type who owns a little store and leaves it under the care of other members of the family while he operates his bus on profitable routes in the busy morning, noon and evening hours. While this assists in handling the rush-hour problem, it reduces the total number of available buses for steady work, and some parts of the town are experiencing service headways three to four times as long as under the electric car operation.

SENTIMENT FAVORS TROLLIES

There is a changing sentiment in the press and public opinion which might be characterized as the result of the novelty of the situation having worn off. Criticisms of the bus service are commencing to appear in greater numbers.

Fair weather has continued to assist the jitneys and buses in the transportation problem without the trolleys.

Memphis Needs Higher Fare

T. H. Tutwiler and Frank S. Elgin, receivers of the Memphis (Tenn.) Street Railway, have filed with the federal court at Memphis a report of the results of the service-at-cost plan, in force on the company's lines for the past three months. While no direct request for an increase in the rate of fare from 6 to 7 cents is included in the report, the receivers show that the company is now operating at a loss. The report shows a detailed deficit of $7,936 in the past three months.

Under the original order issued three months ago a full report was to be made to the court by the receivers showing the earnings of the company and the expenditures for a three months' period. The court is to be the judge of whether any increase in fare is justified.

The report shows expenditures for the three months April 1 to June 30, inclusive, of $831,854, with revenues of $823,918. In addition to the deficit of $7,936 the report shows a deficit in the "fare index" fund of $42,524 for the six months from Jan. 1 to June 30, 1920, while for the entire year from July 1, 1919, to June 30, 1920, the deficit in this fund is $54,872. This fund was set aside to stabilize the fare. The court decreed the fund should reach the sum of $60,000 before the company would be entitled to an increase on the 6½ per cent allowed as a fair return on the investment of the stockholders. The deficit in the operation of the system as well as the deficit in the fare index fund must come out of the revenue in addition to the operating expenses, according to the report.

"Safeties" in Los Angeles

Forty-five One-Man Cars Soon to Be in Service—Rerouting Results Satisfy

With the introduction of one-man safety car service on July 9, the Los Angeles (Cal.) Railway entered the final phase of a thorough reorganization of the system which began with the rerouting of all lines on May 9. Forty-five Birney safety cars are to be placed in operation, twenty-two having been received up to the present time. The company proposes to have 100 of the cars in service eventually.

Operation of the safety cars was started on two lines. One, known as the Vermont Heights line, is a shuttle which serves an outlying district and connects with the terminal of two lines that run through the main business section of Los Angeles. Two cars are operated in the morning and evening rush hours and one at other times. The second line on which safety cars are operated is the East Jefferson-Thirty-eighth Street run. It traverses a cross-town street approximately three miles south of the main business district and connects ten lines running to the business district. Two of the cars are operated throughout both the day and night.

REROUTING RESULTS SATISFACTORY

While preparations were being made for introduction of the safety cars the Los Angeles Railway and the Los Angeles Board of Public Utilities co-operated in making an exhaustive check of results from the rerouting of the company's lines. The company furnished the men necessary for the check and co-operated in every way. Conductors issued to passengers a small card with these questions:

1. Your destination?
(If in business district state cross streets.)
2. Will you transfer?
3. Are you satisfied with the route of this car from the RESIDENTIAL district to the BUSINESS district?

Added to this saving in time for passengers and an increase in the feeling of good will toward the company, there has been a saving of 700 car miles daily, with proportionate reduction in power consumption, depreciation, etc. The daily mileage total for all lines under the old system was 84,804 car miles. With the rerouting this has been reduced to 84,095 car miles. The average number of cars in service daily is 753.

In advising the public of the rerouting changes, considerable newspaper advertising space was used for several days before the contemplated changes. The advertisements carried the detailed routing under the new plan. Folders containing this information, together with the signs and schedules, were placed on the cars and distributed through public organizations. Cards showing on what streets to get cars in the downtown district were attached to lamp-posts in the business district by special permission of the civic authorities.

Ten Cents Cash on Chicago "L"

Four Tickets for 35 Cents—New Temporary Order Became Effective on Aug. 4—Ruling on Valuation

In response to the petition of the Chicago (Ill.) Elevated Railways filed on June 24 last, for authority to place in effect a 10-cent cash fare in order to enable the company to meet the increases in operating expenses incurred since the commission authorized a rate of 8 cents cash and two tickets for 15 cents, the Illinois Public Utilities Commission on July 31 authorized a new temporary rate of 10 cents cash with four tickets for 35 cents within the city limits. Between any two stations north of Howard Street, the city limits station, the fare is made 7 cents. Through tickets between any station south of Howard Street in Chicago and any station north of Howard Street in Evanston or Wilmette will cost 13 cents, but where a through ticket is not purchased the fare is made the sum of the two local fares, or 17 cents.

THE order of the commission points out that the possible number of passengers that will be carried during the ensuing year is 190,000,000 and that by charging the rate authorized, including revenue accruing to the companies from sources other than transportation of passengers, the elevated roads will earn approximately $17,570,000. With respect to the expense account the commission finds that the companies will be required to expend during the year for maintenance of way and structures, $1,400,000; for maintenance of equipment, $1,450,000; for power, $1,360,000; for conducting transportation, $7,575,000; for traffic, $35,000; for general and miscellaneous expenses, $725,000; for taxes and car licenses, $1,070,000, and for rentals, $330,000; or a total of $13,645,000.

Deducting this amount from the estimated total revenue there remains available for depreciation and return upon the investment, the sum of $3,625,000, which is equivalent to a rate of return of 5.1 per cent upon the value of $70,943,000, fixed in an ordinance passed by the Chicago City Council on Aug. 14, 1918. The commission points out that this return would be substantially reduced if adequate allowances were made for the depreciation constantly accruing on the properties.

EXPECT MORE TICKET SALES

With the ticket rate of two tickets for 15 cents, which has just been superseded, the number of ticket fares collected was approximately 74 per cent of the total. With the new ticket rate of four tickets for 35 cents, which makes a greater differential in favor of the ticket fare, it is logical to assume that there will be a higher percentage of ticket fares to total fares collected.

Effective June 1, 1920, the wages of all employees of the Elevated Lines were substantially increased, adding to the operating expenses an estimated sum of $1,756,000 annually. This formed the controlling consideration in the decision of the commission to grant a temporary order at this time, the companies having been unable to meet the increased wages. In this connection the employees have been very considerate of the position of the company, and have acquiesced in the necessity to defer payment of the increases until the company should find itself in position to pay them through increased fares.

COMPANIES' NEED URGENT

With reference to the justice of the temporary orders increasing the fares, the commission has this to say:

> That the petitioners are entitled to the financial relief hereinafter authorized is beyond question. At the time the fares were increased from 5 cents to 6 cents, an advance made necessary by the action of the National War Labor Board in increasing wages, it was thought by many that the close of the great war would cause a quick return to normal conditions, and that higher fares would be in effect only a comparatively short time. But the prophesies of these persons have not been realized.
>
> Results of operation under the increased fares heretofore authorized by the commission clearly show that the relief then granted has been the minimum that could escape a judgment of confiscation in our courts. In no case have the advanced fares thus authorized produced a rate of return which any court would consider reasonable on the least possible value which could be assigned to the properties, but we have been of the opinion that these rates would enable the companies to operate without serious injury to their financial condition or the services they provide until the value of the property and other factors vital in a rate-making proceeding could be placed in evidence. But the recent large wage increase is a burden greater than the companies can bear without assistance, and it seems plain that they could not reasonably be asked to wait for further relief until such time as the issues in this case have been finally decided. Believing thus, we are of the opinion that the relief which is provided by the rate hereinafter authorized cannot justly be deferred until the final determination of the questions involved in this case.

HISTORY OF FARE CASE

The rate situation of the elevated roads first came before the Public Utilities Commission on Sept. 2, 1918, when the companies filed schedules which proposed to advance the passenger fares from the flat rate of 5 cents to one of 7 cents on all lines within the city limits. On Nov. 19, 1918, the commission entered a temporary order authorizing the companies to increase the rates from 5 cents to 6 cents. The application was admittedly of an emergency nature, and no attempt was made by the companies to place in evidence all the elements that were necessary to enable the commission to determine the fair rate-making value of the properties.

Subsequent developments in the case were as follows:

> On Aug. 4, 1919, the companies applied for a further increase in rates made necessary by the increase in wages of $2,435,515 per annum which became effective Aug. 1, 1919. This petition also stated that the deficiency in net earnings while operating under the 6-cent fare between Dec. 1, 1918, and July 1, 1919, amounted to $588,889. On Aug. 6, 1919, therefore, the commission entered an order authorizing an increase in rates from 6 cents to 8 cents. On Feb. 1, 1920, the commission issued a supplementary order authorizing a cash fare of 8 cents, or two tickets for 15 cents, within the city limits, and a cash fare of 6 cents north of Howard Street and a through-ticket rate from Evanston to Chicago of 12 cents. This order was to remain in effect until July 31, 1920, on which day it was superseded by the order authorizing the rates of fare set forth in the first paragraph.

VALUATION CASE NEAR END

As to the valuation proceedings in the elevated case, the commission has ruled that the city of Chicago must complete its evidence prior to Sept. 20, 1920, after which the companies will have ten days to cross examine witnesses for the city or to present such rebuttal evidence as they desire. The companies have already placed before the commission voluminous evidence concerning the original cost of the properties, their cost to reproduce using prices prevailing (1) in 1916, and (2) at the time of valuation in 1919, with these costs depreciated to correspond with the physical condition of the units.

Investigation of this evidence submitted by the companies has been carried forward so that the commission has reached conclusions on part of the evidence. From this investigation the commission takes exception to a portion of the maintenance expense, to the replacement reserve, the expense of making the valuation submitted to the commission, and the federal income tax deduction which the company made. In reference to maintenance the commission states that evidence clearly shows that during the past year the companies have spent much more for maintenance of road and equipment than the average in the eight years prior to 1918. After making due allowances for increased costs of labor and materials the commission holds that it is obvious that in the past year a larger volume of work than usual has been done. It is pointed out, however, that it is not to be concluded that the work done by the companies is unnecessary.

Referring to the "replacement reserve" the commission states that beginning Oct. 1, 1919, the companies opened an account designated under this heading, to which has since been charged $65,113 each month, or a total of $586,017 in the nine months ended June 30, 1920. It is pointed out that other than indicated by its name, the purpose of this fund is not made clear by the evidence and that the amounts charged to this account form merely an additional burden upon operating expenses, and one which evidence thus far adduced fails to justify. The commission makes it very clear, however, that it does not in any way question the right or the desirability of the creation by the companies of a fund that will adequately care for the replacement of various articles when they shall have come to the end of their useful life, and states that in subsequent orders due consideration will be given this matter.

Connecticut Fares Up

Commission Grants Company 7-Cent Basic Rate to Meet Emergency —Permanent Order Later

The Connecticut Public Utilities Commission on July 30 granted the petition of the Connecticut Company, New Haven, for a 7-cent basic fare on all its lines except the New London division. The commission limited the time of operation of the new fare to the period ending Sept. 30, when it will reopen the fare question. The mileage-basis zone system put in effect by the company on Nov. 2, 1919, and which was upset and superseded by the commission's substitute zone system on May 9 of this year will give way on Aug. 8 to the new system, which approximates that obtaining when the company charged an initial fare of 6 cents. The initial fare will allow a person to travel to any point within three miles of the traffic centers of cities and two miles from the traffic centers of towns, with a cost of approximately 3 cents a mile for all distance traveled thereafter. All transfers are to be free.

Emergency Relief Needed

Because of the urgent nature of the situation, the commission states that an emergency plan of relief is needed. It is not certain, however, that the 7-cent basic fare plan is best calculated to meet the needs of the company and the public. It therefore makes the new rates temporary. Monthly commutation tickets ars to be sold by the company at the rate of 2¼ cents a mile. These are to be issued for use between the traffic center of any incorporated city or borough having a population of 25,000 or more and points more than five miles distant therefrom.

The commission's order says in part:

> It is hereby ordered that the rates now in force under commission's order dated March 30, 1920, issued under docket No. 3243, be and the same are hereby suspended from on and after Saturday, August 7, 1920, and the petitioner, the said Connecticut company, is hereby authorized and permitted until further order of the commission in the premises, to put into effect on August 8, 1920, a flat rate system of fares, socalled with an initial fare of 7 cents for the first zone and 6 cents per zone thereafter; the zones in cities to be approximately three miles in length, radiating from traffic centers, and corresponding substantially to the present three one-mile zones; and all other zones to be substantially two miles in length, corresponding approximately in length to, and including two of the present mile zones; with free transfers at all transfer points.
>
> The company shall issue commutation tickets, good for round trip daily between the traffic center of any incorporated city or borough having a population of 25,000 or more, according to the latest authenticated census, and points more than five miles distant therefrom, on all lines radiating from such traffic centers, for the number of days in any month less Sundays and legal holidays; said commutation tickets to be sold at the rate of 2¼ cents per mile; to be issued to the individual commuter; to be non-transferable,, and to expire at the end of each month. School tickets shall be issued at one-half regular rates.
>
> On account of uncertainty of zone limitations in the 7-cent zone plan submitted by the company, and the creation of new fare limits thereby, it was deemed advisable to establish a 6-cent zone for areas already substantially determined under the present mile zone system, but retaining 7 cents as the initial fare.
>
> The commission is not satisfied that the temporary rate herein authorized is a proper rate or that it will produce the revenues needed and expected by the company, but it is permitted on the urgent request of the company as a temporary and an emergency rate. * * *
>
> The commission is of opinion that if there is to be a return to the flat rate system, the general public would be better satisfied with a return to substantially the old flat rate zones or fare limits, but it is now claimed by officers of the company that a flat rate of 7 cents on the old flat rate areas would not produce sufficient revenue to allow the company to continue operation. * * *

The new 7-cent fare limits are within the limits of the old 5-cent and 6-cent flat fares which the Connecticut Company formerly used. Also under the former 5-cent and 6-cent basis the suburban zones were from 2⅛ to 2⅞ miles in length; with the present zone markers set approximately a mile apart it occasioned much less difficulty to instal two mile zones at 6 cents than to reinstate the former zones at 7 cents, which was suggested.

Collection Plans Vary

There will be several methods of fare collection. On the whole the fare collection scheme will be based on the pay-as-you-enter principle, on all of the two-man cars equipped for that purpose. On cars running outside of the 7-cent zones, pay-within collection will be used for the additional zones. An exception will be made in the case of the through interurbans, in which the interurban tickets described in the issue of March 6, 1920, page 480, will be used. A few old-type cars for city service will operate entirely on the pay-within principle, whereas all the one-man cars being operated entirely within the 7-cent fare limit will be operated pay-as-you-enter approaching traffic centers, and pay-as-you-leave outbound from traffic centers.

The metal tokens which the Connecticut Company introduced under the 6-cent fare regime will be reinstated as 7-cent tokens. A few of these are still out, and those which cannot be located will of course have to be accepted for 7 cents.

Interurban Handles Freight in Strike

The Galveston-Houston Interurban Railway, running from Galveston to Houston, Tex., has recently entered the lists of freight carriers. With the tie-up at Galveston resulting from the strike of longshoremen, and the urgent demand by merchants and others for freight tied-up in steamer holds or in waterfront warehouses, an agreement has been reached under which merchants of Houston and other points are receiving their merchandise at shipside and are re-shipping to destination. This step was decided on when the authorities at Galveston promised armed protection to such merchants in their unloading freight from steamers and transporting it from waterfront to freight depot. Hauling out of Galveston is being done by the interurban, a rate of 35 cents a hundred pounds from Galveston to Houston being put into effect for such shipments, exclusive of drayage.

Discipline by Bonus

Pacific Electric Railway Tries Out Merit System in Transportation Department—Extra Pay Allowed

A system of discipline based on a plan of merits and demerits is now in operation in the transportation department of the Pacific Electric Railway, Los Angeles, Cal. The new regulations apply to motormen, conductors, brakemen, yardmen and gatemen. Employees having no demerits marked against their names will receive at the end of the year $5 in the form of a bonus for each month worked.

Access to Records

An individual record is kept of each employee to which the employee is permitted access at any time. An accumulation of seventy-five demerits results automatically in discharge from service. If extenuating circumstances exist and under proper authority reinstatement is approved it will be with fifty demerits aganst the employee's record. A second accumulation of seventy-five demerits will result in permanent dismissal.

Credits are allowed for commendable acts, deeds of heroism and loyalty and good judgment in emergencies. For meritorious service avoiding accident, or unusual assistance in crisis, or any commendable act out of the strict line of duty, ten merits are credited, subject to the approval of the head of the department. A clear record for six months brings fifteen credits and if fradulent transportation is detected five merits will be granted.

Demerits are issued for a number of causes. Among these are reporting late to work or missing runs, discourteous acts toward passengers, smoking or reading on duty, inattention to duty, careless handling of equipment, disregarding signals, laxity in flagging, leaving switch locks open, general neglect in reporting accidents, lack of neatness, careless conducting of transportation in its various forms, and for various other causes.

$5 Monthly Bonus

The company is setting aside a fund equivalent to $5 a month beginning April 1, 1920, for each employee in the above classes. This will be credited to the record of the individual on Dec. 1 of each year, but on Nov. 30 of each year there will be deducted $1 for each demerit received during the period. The balance will be paid to the employees who have been continuously in service for the period since the last payment. The fund accumulated by these deductions will be set aside by the company for hospital or other relief purposes for its employees as it may elect.

Employees laid off on account of reduction in force, through no fault of their own, will be entitled to receive bonus pro rata for the period worked With this exception no one not in the employ of the company on Nov. 30 of each year will participate in the bonus.

Transportation News Notes

Will Abandon Freight Service.—Effective Aug. 9, the freight service of the Ohio Valley Electric Railway, Huntington, W. Va., will be discontinued. Following a recent fire the company was ordered by the State fire marshal to tear down the freight station at Third Avenue and Seventh Street.

Six Cents Despite Mayor—The City Council at Canton, Ohio, has passed an ordinance over the veto of Mayor Herman R. Witter, giving the Northern Ohio Traction & Light Company the right to a rate of fare of 6 cents or seventeen tickets for $1. The measure was first passed by the Council on July 2.

Higher Fare in Gary.—The Indiana Public Service Commission has authorized an 8-cent car fare for the Gary & Interurban Railroad, Gary, which operates in and between Gary, Hammond and East Chicago. The commission also fixed a price of $1 for a book of fourteen tickets. It permitted no change in transfer privileges.

Conductor Dies in Rear-End Smash.—A conductor in the employ of the Toledo Railways & Light Company, Toledo, Ohio, was killed on July 27, when a car of the Toledo, Fostoria & Findlay Railway crashed into the vestibule of his city car. Eight persons were injured. This is the second rear-end collision between interurbans and city cars in Toledo within the present year. Failure of brakes has been given as cause in both instances.

Fare Increase Asked.—The Columbus, Delaware & Marion Electric Company, Columbus, Ohio, has introduced an ordinance in the Marion City Council granting a fare of 6 cents cash or five tickets for 25 cents and free transfers on its lines in that city. The company addressed a communication to the Council explaining that the increased cost of labor, power and material made an increase necessary and showed comparative statistics of fares in other cities

Fare Action Deferred.—Because of lack of a quorum at the meeting of the City Council of Lima, Ohio, July 30, no action was taken on the proposed increase of fare from 5 to 6 cents on the city line of the Ohio Electric Railway. J. H. McClure, vice-president of the company, stated that the wage demands of the 1,100 employees cannot be met unless Lima, Newark and Zanesville grant the company relief before Aug. 10, when a conference with the men is to be held.

Safety Platforms in Fort Worth.—The City Commission of Fort Worth, Tex., has announced that platforms will be built as markers of the safety zones established for persons boarding or leaving electric cars. These platforms will be 1 ft. wide and twenty-four feet long and raised about four inches from the level of the street. Iron cones that now mark the safety zones will be placed at the ends of the platforms as protection against automobiles and other vehicles.

Would Charge 7 Cents.—At a hearing before the State Public Service Commission on an application of the Charleston (W. Va.) Interurban Railroad to increase city fares to 7 cents the company stated it had lost $13,398 during the last six months after allowing for interest payments and depreciation. Since the 6-cent rate went into effect four months ago the company has lost $5,600. There has been no diminution in the number of passengers because of the 6-cent fare.

Eight Cents in Port Arthur.—The City Commission of Port Arthur, Tex., has granted the Port Arthur Traction Company authority to install an 8-cent fare. The new rate was put into effect on July 27. The fare ordinance provides that tickets shall be sold at the rate of fifteen for $1. This action was taken by the city authorities on application of the company officials, who contended that service would have to be suspended unless higher fares were charged.

Ten Cents in Portland, Me.—The Maine Public Utilities Commission has authorized the Cumberland County Power & Light Company, Portland, to file a new schedule of rates on one day's notice to the public. The present ticket fare will be increased from 7 cents to 8 cents, and the present cash fare from 9 cents to 10 cents. The commision refused the company's request for a 9 cent ticket fare on the ground that through loss of patrons the company would eventually lose revenue.

Mayors Ask Higher Fare.—Resolutions recommending that the South Carolina Railroad Commission be petitioned to grant to the Charleston-Isle of Palms Traction Company, Charleston, such rates of fare and such relief as is provided by law under an act of the Legislature which was approved March 11, were adopted recently at a joint meeting of the Mayors, Aldermen, Wardens and Commissioners of Charleston, Mount Pleasant and Sullivan's Island. The company seeks to increase its fare, stating that unless a higher rate is granted it must cease operation.

Freight Service Expanded. — The Louisville & Southern Indiana Traction Company, New Albany, Ind., is now engaging in extensive freight service, hauling from eight to ten carloads of cement daily from Speeds, Ind., to Louisville, Ky. The haul is about twelve miles long. The plant of the Louisville Cement Company is located at Speeds and in past years some difficulty has been experienced in bringing an adequate supply of cement to Louisville. Louisville is said to be one of the few cities in the United States which is getting an adequate cement supply. A carload of cement is unloaded in Louisville two hours after it has been loaded at Speeds.

Mileage Rate Proposed.—Elimination of the present blanket rate to the various beach cities in the vicinity of Los Angeles, Cal., with rates to be entirely on a mileage basis, was proposed by C. A. Smith, general passenger agent of the Pacific Electric Railway, in his testimony before the State Railroad Commission at a hearing on July 19. Mr. Smith stated that by doing away with the blanket charge the company hoped to be able to increase its revenue approximately $266,000 over and above the $1,750,000 deficit for which general increases in rate of 33 per cent are being asked. The commission adjourned the hearings to Aug. 12.

Fare Rate Held Illegal.—An opinion recently handed down by Judge Smith of the Federal District Court holds that the rates charged by the Charleston-Isle of Palms Traction Company, Charleston, S. C., are illegal in that they violate the terms of a State law limiting fares to 3 cents a mile. The State Railroad Commission last year authorized the company to charge a straight fare of 3 cents a mile with a minimum charge of 5 cents. The company was later ordered by the commission to cease charging these rates. The company thereupon sought an injunction to restrain the commission from interfering with it in the collection of the 3-cent rate. The court held that the company has the right to abandon operation and to liquidate its assets.

Tries Out Five-Cent Fare. — By agreement with the Barre and Montepelier city authorities the Barre & Montepelier Traction & Power Company, Montepelier, Vt., will continue to charge a 5-cent fare on its lines in these cities for a period of four months. Although previously authorized to charge a 6-cent fare the company several months ago notified the municipalities that for a period of four months it would charge a 5-cent fare with the understanding that if the revenue proved to be greater than for the same period a year ago, when a 6-cent fare was charged, the 5-cent rate would be considered in force. Owing to the fact that the company's lines were tied up for several weeks last March, as the result of a severe snowstorm, the company suggested the continuance of the trial period for another four months.

Fare Rise Unopposed.—No opposition developed at the hearing on July 29 before the Public Service Commission for the Second District on an application of the Fonda, Johnstown and Gloversville Railroad, Gloversville, N. Y., to increase its rate of fare to 8 cents in the cities through which it runs and 12 cents between Gloversville and Johnstown. The net operating revenue of the company was only $710 for 1919. The operating revenue for 1919 was $274,840 and the operating expense totaled $256,000. Taxes and other necessary expense left $710 as net revenue. The company has been negotiating with its employees for an increase in pay which is to be retroactive to May 1, and the understanding that the company has with the municipalities was that any increase in rates that the commission might allow should go to the men as wages.

Will Fix Capacity of One-Man Car.—Rankin Johnson, president of the Trenton & Mercer County Traction Corporation, Trenton, N. J., at a hearing before the Public Utility Commission on the operation of one-man cars, said the company might have to call upon the police to limit the load of the cars to fifty adult passengers each. H. C. Eddy, of the utility board, recommended that the company paint on each car in large letters the phrase "Load Limit 50 Passengers." He suggested that the company also place on the cars a removable guard rail designed to prevent passengers from crowding upon the front platform. Mr. Eddy said that he observed as many as sixty-seven passengers on a one-man car, and that frequently the loads are greatly in excess of fifty. He said the crowded conditions interfere with the work of the operator. The commission will issue an order later.

Would Raise Springfield Rate.—P. E. O'Brien, general manager of the Springfield (Ohio) Railway, has presented to the Springfield City Commission a petition for an increase in the fare charged by the company. The present fare is 6 cents. No specific rate is asked in the petition. If the present wage scale of employees continues, Mr. O'Brien told the commission, he could meet expenses with a 7-cent cash fare and a 6½-cent ticket. If an increased wage scale is demanded by the railway employees when their contract expires Oct 1, he said it would take an 8-cent fare to meet expenses. Announcement has already been made by the employees that an increase will be sought. The increase in wages from Oct. 31, 1919, to May 1, 1920, as compared with the previous wage scale is approximately $30,000. Under present financial conditions, there is no market for the company's securities, and its borrowing capacity is exhausted.

Wheeling Company Wants Eight Cents.—The City Railway, Wheeling, W. Va., has applied to the Public Service Commission for an increased fare to 8 cents. The hearing was set for July 29. The company also desires to be authorized to sell six tickets for 40 cents, and wants higher express rates. The Wheeling Public Service Corporation, operating between Wheeling and the Pennsylvania state line at West Alexander, Pa., a distance of 16 miles, has also applied for new rates, as follows: From Twelfth and Chapline Streets, Wheeling, to Elm Grove, a distance of 5 miles, or between intermediate points, 10 cents a passenger. Between Elm Grove and other points the fares are to be 7 cents to Triadelphia, 14 cents to Roney's Point, 21 cents to Valley Grove, 28 cents to West Alexander. The company also asks higher rates for school children, express packages and milk transportation. The Wheeling City Council has agreed to withdraw its opposition to the proposed increase on the city lines.

Buses Jeopardize Franchises.—Unlawful jitney competition with the lines of the Public Service Railway, Newark, N. J., is jeopardizing the company's corporate existence, according to an argument by Frank Bergen, general council of the company, at a hearing before Vice-Chancellor Griffin in Jersey City on July 26. The company some time ago filed suits in chancery to enjoin individuals and municipalities from operating buses in competition with the railway. Mr. Bergen contended that the defendent jitney companies have no right to operate on the public highways without first complying with the provisions of the so-called Kates act passed in 1916, requiring owners of jitneys, before beginning operation, to obtain the consent of the board or body having control of the public streets in the cities where they propose to operate. It was asserted that in many cases the defendants had not obtained the consent required by the Kates act, and hence are unlawfully competing with the company.

Jitneys Lose in Court.—Pending final court decision as to whether the city of Seattle has the power to halt jitney competition with the lines of the Seattle Municipal Street Railway, buses have continued operation in that city. Judge Everett Smith of the Superior Court recently signed an order quashing an alternative writ of mandamus obtained by the jitney drivers and dismissed from court the suit brought by the jitney interests to compel Comptroller H. W. Carroll to count the names of unregistered as well as registered voters in determining the sufficiency of the jitney initiative petition. The effect of the court order is that Mr. Carroll will not be compelled to count the signatures of 11,812 persons on the initiative petition, whose names do not appear on the registration books of the city. The jitney men will have to strengthen their petition by approximately 2,000 names before the City Council can be compelled to submit to popular vote in a special election an initiative ordinance in substitution of existing jitney regulations, permitting the buses to operate.

Approves Schenectady Rise.—The Schenectady (N. Y.) Railway has been granted the authority by the Public Service Commission for the Second District to raise its fare from 6 to 7 cents in Schenectady and in outside territory where a 6-cent fare is now charged. Transfer privileges are included and the company may sell five metal tokens for 35 cents. The new fares will become effective on three days' notice to the public and the commission and will remain in force for one year unless otherwise ordered by the commission. The new rates are controlling on the tracks of the Schenectady Railway and those of the United Traction Company, Albany, and the Hudson Valley Railroad. Increased wage payments on June 1 which will amount to $300,000 a year was one of the main factors in seeking to increase the fare. The city of Schenectady waived a limitation of fare under its local franchise so as to allow the increase in the city. There will be no changes in the through fares on the Albany division. The through fares on the Troy and Saratoga divisions will be a combination of the zone fares.

Hope for Louisville Rise.—With two ordinances now in the course of preparation to replace the service-at-cost bill withdrawn from the City Council of Louisville, Ky., by the Louisville Railway, members of the company's executive committee express confidence that "city officials will meet the situation in a spirit of fairness and save the company from receivership." Churchill Humphrey, a director and assistant general counsel of the company, is drawing up one ordinance and William T. Baskett, assistant city attorney, is drafting the other for presentation to the Council. The company's ordinance provides a 7-cent fare until rescinded by the Council, and for the payment by the company to the city of $168,000 annually for street repairs as long as this fare remains in force. The city's ordinance provides for the payment of a 7-cent fare for two years, with an automatic return to 5-cent fares at the end of that time, and the payment of $168,000 annually for street repairs "every year hereafter." It also stipulates that a valuation of the entire property of the company shall be made during the two-year period.

Six-Cent Fare in Richmond.—At a meeting of the City Council of Richmond, Va., on July 28, final approval was given to a 6-cent fare on the local lines of the Virginia Railway & Power Company. The Mayor approved the ordinance the following day and it went into effect on Aug. 1. Under the new ordinance the fare is 6 cents, or five tickets for 30 cents. The only reduced fares remaining are the 2½-cent school tickets. Free transfers are continued. This increase is an emergency measure pending a complete revamping of the company's franchise, and was asked for at this time in order to increase the pay of the carmen to that received by the employees on the Norfolk division, where a 6-cent fare has been in effect for about a year. The company's petition was unanimously indorsed by all the local civic organizations. Because nearby cities have 7 and 8-cent fares, and were thus able to offer better wages, the company's men were leaving for those cities, as well as for other lines of business which offered better pay. This resulted in many cars remaining in the carhouses because the company lacked men. The railway management candidly laid the situation before the public through advertisements in the daily papers.

Personal Mention

Mr. Ogburn Resumes Law Practice

Following the submission to President Wilson of the report of the Federal Electric Railways Commission, Charlton Ogburn, executive secretary of the commission, will resume the practice of law, with offices at 67 Exchange Place, New York City. The winding up of the commission's affairs will mark the conclusion temporarily, at least, of Mr. Ogburn's connection, which began three years ago, with the electric railway industry.

Early in the war Mr. Ogburn enlisted for military service, but because of inability to meet the physical requirements he took up government work in Washington and was placed in charge of the electric railway division of the National War Labor Board. He concluded more than 100 arbitration hearings involving disputes between electric railways and their employees, preparing the report and the tentative award in each case. He also served as personal arbitrator in a number of electric railway wage cases in Massachusetts, New Hampshire, Pennsylvania and New Jersey. Out of more than 100 arbitration awards made following his recommendations, in not a single instance did either party refuse to abide by the award.

Mr. Ogburn is a native of Georgia. Since graduating from the Harvard Law School twelve years ago he has engaged in the active practice of law. During the past six years his practice has been in the East, largely as representative of southern financial institutions. He has specialized in bonds and securities generally.

E. M. Walker Heads Illinois Association

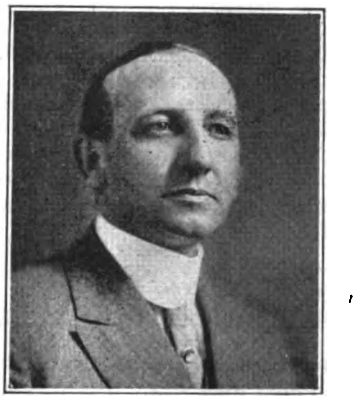
Edwin M. Walker, general manager of the Terre Haute Traction & Light Company, Terre Haute, Ind., has been elected president of the Illinois Electric Railways Association. Mr. Walker is well known to the industry through his record as an operator and through his work for the American Electric Railway Association and the state organization.

Mr. Walker has been in charge of the Terre Haute traction and lighting system for the past three years. Before going to Terre Haute he served as general manager of the Dubuque (Iowa) Electric Company. He entered public utility work shortly after his graduation from Williams College with the degree of A. B. in 1897. After serving in various capacities with gas and electric light properties, he went to Muscatine, Iowa, as general manager of the Citizens' Railway & Light Company. He was later appointed general manager of the Union Electric Company, Dubuque, continuing in a similar capacity with its successor, the Dubuque Electric Company.

Directs Commission's Work

O. C. Merrill Appointed Executive Secretary of Water Power Commission —Drafting of Regulations Begins

Oscar C. Merrill, now chief engineer of the United States Forest Service, has been appointed by Secretary of War Baker to be executive secretary of the Federal Water Power Commission, formed under the provision of the water power act signed by the President last June. Complying with a request from Mr. Merrill, the Secretaries of War, the Interior and Agriculture, ex officio members of the commission, have designated the advisory committee to draft regulations for the granting of licenses under the act. General Crowder will represent the War Department, Herman Stabler the Interior Department and Mr. Merrill himself the Department of Agriculture.



O. C. MERRILL

Mr. Merrill began work for the Forest Service by making a special study of water powers in California. Soon thereafter he was designated district engineer, with headquarters in San Francisco. In the following year he was placed in charge of all water powers coming under the jurisdiction of the Forest Service. When in 1914 he was ordered to Washington to become chief engineer of the Forest Service he retained under his personal direction the matters pertaining to hydro-electric development.

Mr. Merrill was born in Manchester, near Augusta, Maine, in 1874. Following his graduation from the Massachusetts Institute of Technology in 1905, he spent one year as an instructor in the engineering department of the University of California. He then became associated with Charles G. Hyde and began his specialization in water-power consulting work.

Obituary

James Mitchell, Traction Financier

James Mitchell, president of the Alabama Power Company, and one of the leaders in the electric railway development of South America, died at his home at St. James, Long Island, N. Y., on July 22, following a stroke of paralysis. Mr. Mitchell had not been actively engaged in business during the past year.

Mr. Mitchell was born in Pembroke, Canada, fifty-four years ago. He came to the United States when a boy and settled near Milton, Mass. As a young man he worked for the Thomson-Houston Company, afterward part of the plant of the General Electric Company, at Lynn, Mass. He went to Brazil for this company and installed the first electric cars in South America. He also made some of the first electric railway installations in this country, his first being at Denver, Col. He contributed a number of important improvements of electric cars and other electrical equipment. He was one of the founders of the Brazilian Traction, Light & Power Company.

Axel C. Ekstrom, consulting electrical engineer of the Delaware & Hudson Company, New York, N. Y., and its allied lines, died on July 1 at his home in Ballston Spa, N. Y. As consulting engineer for the Delaware & Hudson Mr. Ekstrom had an important share in the management of the United Traction Company, Albany, N. Y., one of the D. & H. subsidiaries. He was well known to the electric railway men of New York State and was a prominent figure at the conventions of the American Electric Railway Association. Mr. Ekstrom was born in Stockholm, Sweden, August 24, 1861. He came to this country more than thirty years ago. He became affiliated with the Thomson-Houston Company of Lynn, Mass., later merged with the General Electric Company. In 1904 he left the General Electric Company to go with the Delaware & Hudson Company, with office at Albany, N. Y., as consulting electrical engineer. In the year 1906 he designed and constructed the steam power plant at Mechanicville, N. Y., which, from that time, has been furnishing electrical power to the Delaware & Hudson and subsidiary companies. He was also connected as electrical engineer with the Hudson Coal Company of Scranton, Pa.; the Chateaugay Ore & Iron Company, Lyon Mountain, N. Y., and was a director of the United Traction Company and the Schenectady Railway.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Graphic-Recording Meter Market Growing

Raw Material Supplies Rather Low But Shipments Can Be Made in Four to Six Weeks

Manufacturers of graphic recording meters uniformly agree that demand today is probably greater than ever before in that line, and not only have sales for the first half of this year greatly exceeded those of last season but inquiries seem to be steadily increasing. The remarkable favor in which this instrument stands can be traced to the growing tendency of power consumers and power producers to check up their costs. According to one of the big producers of recording instruments, hardly a single electric power installation is now made without including a graphic recording meter in the equipment. This of course has made it harder to make shipments to power house users.

A survey of the field reveals very short stocks in the hands of the manufacturers, but this condition is not so alarming as at first appears, in view of the fact that most of these meters are made to order and light stocks are usually the rule. But even so, the available supplies are rather sub-normal and the main factor promoting this condition would seem to be the rapid increase of demand, which has outstripped facilities for adequate production, even though that production at present seems to be proceeding at normal capacity, as judged by the standards of the past. Another consideration, of course, has been the freight muddle, and to some extent supplies of raw material, although this latter item was in several cases reported in pretty fair shape.

Under these conditions, deliveries in this market are considered pretty fair, although some manufacturers were much worse off than others in that respect. From four to six weeks were the best dates quoted, and other estimates ranged as long as ten or even twelve weeks. One of the producers who was among those able to make the quickest deliveries, stated that his shipments were sent only by express.

An entire absence of order cancellations is noted. Prices for graphic recording meters have remained stationary for about two months.

Should Supply Orders Be Scheduled Far Ahead?

Systematic Methods of Advance Buying Can Help Manufacturers and Buyers with Both Deliveries and Stocks

Purchasing agents of electric railways and other public utilities have learned to their cost since the days of pre-war deliveries that machinery and heavy apparatus cannot be had upon demand. The extension of time required in manufacture has not only enforced the placing of orders as early as possible but it has involved purchasing departments in "follow-up work" of a very expensive kind. Until materials become much more plentiful and until transportation conditions are greatly improved many of these practices will be obliged to continue, but this does not mean that economical purchasing is beyond realization, at least in connection with materials and supplies in general.

Recent observation of the purchasing agent's work emphasizes the continuing importance of applying the same systematic methods in the buying of miscellaneous supplies that have become essential in the ordering and checking of shipments of larger units of equipment such as motors, machine tools, rolling stock parts and pole line supplies. Forward ordering, should be cultivated to the maximum extent, feasible with the keeping of sufficient stocks for current needs. The necessities of operation, however, will always result in a certain measure of rush orders or belated buying. These must be cut down to the lowest possible terms if deliveries are to be anything like satisfactory, certainly until factory and jobbers' stocks are built up sufficiently to permit a return to the old practice of ordering for immediate shipments.

Something like a budget system is needed in determining the quantities and character of material wanted over a period of six to nine months, instead of letting orders drift until the operating departments put in hurry calls for material whose shrinkage might have been recorded and foreseen with a simple loose-leaf or card-index system applied intelligently to so-called "minor" supplies as well as to the more impressive items.

If more system is used in such buying, manufacturing requirements will become known farther in advance, material can be ordered more advantageously, labor will be assigned with reduced lost motion between successive jobs and production in general will become better controlled. This need not mean ordering for heavy stocks, but rather advance ordering for shipment when the material is to be utilized. Anything which permits the manufacturer to plan farther ahead tends to hold costs down, if not to enable actual reductions to be realized by the buyer. There is a load factor in sales of manufacturing-plant products no less than in the utility generating station, and the aggregate purchases of smaller supplies by electric railways are a decided factor in the manufacturing program, taking it the year through. Mass production of supplies means lower costs in the long run, closer competition for business and hence lower prices.

High Prices Postpone Buying of Material

The present level of high prices tends to encourage the railway purchasing agent in postponing supply orders until the gap between his stock room and attainable deliveries becomes dangerously small. Price cuts in the leather and textile fields have unquestionably resulted in postponing many orders for electrical material which otherwise would have gone through promptly. The quotation of "price at delivery" has discouraged long-distance buying. It would seem as though an understanding might be reached between railways and manufacturers on this subject. Well-scheduled orders placed in good faith far ahead of current requirements are an asset to both sides and deserve some concession as to price.

There is little evidence yet that electrical material prices will undergo any substantial reductions during the present year. The class of material in mind here is absolutely essential to operation and must be had regardless of price, barring the development of satisfactory substitutes. In the interests of continuous and reliable service, the purchasing agent, it seems, is justified in advance ordering beyond the limits that would be the criterion of normal times. No commission can justly condemn expenditures made in good faith to safeguard the service which must be rendered, so long as electric traction is a modern transportation agency. On the other hand, it is in the long-run interest of the manufacturer to co-operate with all efforts to schedule purchases far ahead, and if a fair profit is all that is sought, it should not be difficult to make price readjustments in settling bills for material in cases where the railway purchasing agent has helped both the manufacturer and his own company by far-sighted planning and placing of orders.

Chicago Surface Lines Plans to Buy Rolling Stock

Illinois Public Utilities Commission Releases Depreciation Fund for Purchase of New Cars

The Chicago Surface Lines, Chicago, Ill., has under preparation specifications for new cars, and these will presumably be placed in the hands of the car builders for bids within the next two weeks. The plans of the company have heretofore been to purchase 200 trailers and convert an equivalent number of present motor cars for hauling them. The recent order of the Illinois Public Utilities Commission making the funds ordinarily paid to a renewal and depreciation fund in accordance with city ordinance available for the purchase of new equipment will now make possible the financing which has heretofore held back the placing of an order for new cars. The commission ordered the company some time ago to purchase 200 new cars. With this money made available, it is possible that motor cars as well as trailers will be purchased, the number of each not having as yet been determined.

New Mogul Condulets

To meet a demand for condulets having an unusually long cover opening and big wiring chamber, the Crouse-Hinds Company, Syracuse, N. Y., has developed for the market a new series of "mogul obround" condulets. These are made in eight types, each type in eight conduit sizes ranging from 1 in. to 4 in. Four sizes of composition and cast-iron covers are made, the composition covers finished blank with from one to nine holes, the iron cover finished with or without round rubber gasket.

Rolling Stock

Gary & Hobart Traction Company, Hobart, Ind., will purchase one new safety car at a cost of $6,000. The company will pay $1,500 in cash for the car and permission has been granted by the Public Service Commission at Indianapolis for the issuance of notes to cover most of the balance.

Harrisburg Railways Company, Harrisburg, Pa., has purchased two McGuire-Cummings snow-sweepers for fall delivery.

The City Railway Company, Dayton, Ohio, expects to buy from fifteen to twenty new street cars.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., advises it will purchase ten new 41 ft., double end, center entrance, 2-motor, double-truck, steel passenger cars, equipped with Westinghouse 514-A motors and H. L. control. Pantasote curtains, Keystone illuminated signs, Hale & Kilburn seats, Johnson fare boxes, Pittsburgh drop brake handle and hand brake, O. B. air sanders and Ideal trolley catchers will be installed.

Mesaba Railway Company, Virginia, Minn., will purchase one or two double truck, four-motor, pay-as-you-enter safety cars.

Morris County Traction Company, Morristown, N. J., is going to purchase one sweeper.

Escanaba Power & Traction Company, Escanaba, Mich., announces it has bought one single-truck McGuire Cummings sweeper, and two McGuire Cummings 45 ft., double-truck, 40,000 lb. passenger cars, equipped with two G. E. 57 motors, one of the cars being already in operation.

Detroit United Railway, Detroit, Mich., states it has completed fifty double-truck trail cars and is now building fifty double-truck motor cars. These will be followed by fifty additional trail cars which will be completed early next year it is expected.

Track and Roadway

Mobile (Ala.) Light & Railroad Company.—The Mobile Light & Railroad Company has placed contracts for the building of 1½ miles of carhouse tracks, curves, etc. The Lorain Steel Company has the contract for thirty-five curves.

Calgary (Alta.) Municipal Railway.—Commissioner A. G. Graves has prepared an estimate of the cost of completing the Centre Street extension of the Calgary Municipal Railway. An expenditure of $9,475 will be required exclusive of the rails.

Public Service Railway, Newark, N. J.—The Public Service Railway has laid new tracks from Camden to Moorestown to take the place of the tracks of the Burlington County Transit Company, which were removed by the latter company.

Public Service Railway, Newark, N. J.—The Public Service Railway has petitioned the Trenton City Commission for permission to run its tracks into a building on South Warren Street, Trenton, and to convert that structure into a terminal.

Hagerstown & Frederick Railway, Frederick, Md.—Plans are being worked out for the extension of the Hagerstown & Frederick Railway system from Hagerstown, Md., to Martinsburg, W. Va. Surveys are being made at the present time.

NEW YORK METAL MARKET PRICES

	July 1, 1920	August 3, 1920
Copper ingots, cents per lb	19.00	19.00
Copper wire base, cents per lb	22.50 to 23.00	22.50 to 23.00
Lead, cents per lb	8.00	8.50
Nickel, cents per lb	43.00	43.00
Zinc, cents per lb	7.95	8.02½
Tin, cents per lb	49.00	48.25
Aluminum, 98 to 99 per cent, cents per lb	33.00	33.00

ELECTRIC RAILWAY MATERIAL PRICES

Rubber-covered wire base, New York, cents per lb	28.00	28.00
Weatherproof wire (100 lb. lots), cents per lb	29.00	29.00
Standard Bessemer Steel Rails, per gross ton	....	45.00 to 63.00
Standard open hearth rails, per gross ton	....	47.00 to 65.00
T rail, high (Shanghai), cents per lb	3.00	3.00
Rails, girder (grooved), cents per lb	3.00	3.00
Wire nails, Pittsburgh, cents per lb	4.00	3.25 to 4.50
Railroad spikes, drive, Pittsburgh base, cents per lb	3.85 to 4.25	4.00 to 5.75
Railroad spikes, screw, Pittsburgh base, cents per lb	7.50 to 9.00	....
Tie plates (flat type), cents per lb	3.00 to 4.00	4.00
Tie plates (brace type), cents per lb	3.00 to 5.00	4.00
Tie rods, Pittsburgh base, cents per lb	....	7.00
Fish plates, cents per lb	3.75 to 4.75	3.75 to 4.75
Angle bars, cents per lb	3.75 to 4.75	3.75 to 4.75
Rail bolts and nuts, Pittsburgh base, cents per lb	6.00	6.00 to 7.50
Steel bars, Pittsburgh, cents per lb	4.25 to 4.75	2.35 to 4.00
Sheet iron, black (24 gage,), Pittsburgh, cents per lb	4.20 to 6.85	4.20 to 7.85
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.25 to 8.05	5.25 to 8.55
Galvanized barbed wire, Pittsburgh, cents per lb	4.10 to 4.45	4.45

OLD METAL PRICES—NEW YORK

	July 1, 1920	August 3, 1920
Heavy copper, cents per lb	15.00 to 15.50	15.50 to 16.00
Light copper, cents per lb	13.00 to 13.50	13.50 to 13.75
Heavy brass, cents per lb	9.00 to 10.00	9.25 to 9.50
Zinc, cents per lb	5.00 to 5.25	5.50 to 5.75
Yellow brass, cents per lb	7.00 to 7.25	7.25 to 7.75
Lead, heavy, cents per lb	7.00 to 7.25	7.25 to 7.50
Steel car axles, Chicago, per net ton	32.00 to 33.00	33.50 to 34.50
Old carwheels, Chicago, per gross ton	36.00 to 37.50	36.00 to 36.50
Steel rails (scrap), Chicago, per gross ton	27.50 to 28.00	28.00 to 28.50
Steel rails (relaying), Chicago, gross ton	31.50 to 32.50	35.00 to 36.00
Machine shop turnings, Chicago, net ton	9.50 to 10.00	9.50 to 10.00

ELECTRIC RAILWAY MATERIAL PRICES

Galvanized wire, ordinary, Pittsburgh, cents per lb	3.70 to 3.95	4.20
Car window glass (single strength), first three brackets, A quality, New York, discount*	17%	17%
Car window glass (single strength), first three brackets, B quality, New York, discount	37%	37%
Car window glass (double strength, all sizes AA quality), New York, discount	79%	79%
Waste, wool (according to grade), cents per lb	21 to 24	17 to 23
Waste, cotton (100 lb. bale), cents per lb	16	15 to 17½
Asphalt, hot (150 tons minimum), per ton delivered	....	38.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	....	42.50
Asphalt, filler, per ton	....	45.00
Cement, New York, per bbl	4.80	5.10
Linseed oil (raw, 5 bbl. lots), New York, per gal	1.63	1.58
Linseed oil (boiler, 5 bbl. lots), New York, per gal	1.65	1.605
White lead (100 lb. keg), New York, cents per lb	15½	15½
Turpentine (bbl. lots), New York, cents per gal	1.75	1.65

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*These prices are f.o.b. works, with boxing charges extra.

Mesaba Railway, Virginia, Minn.—The Mesaba Railway expects shortly to purchase line material for 8 miles of track. The grade has been completed and the steel purchased.

Durham (N. C.) Traction Company.—The Durham Traction Company expects to build 1½ miles of new track, including an extension of ½ mile.

International Railway, Buffalo, New York.—Plans for the immediate expenditure of $570,000 by the International Railway, are being made, according to Edgar J. Dickson, vice-president of the company. This money will be used for relaying tracks and improving the roadbed in many streets in all parts of the city.

Hamilton (Ont.) Street Railway.—The Hamilton Street Railway proposes to construct a line from Margaret Street to Paradise Road and from Paradise Road west to the Dundas line.

Portland Railway, Light & Power Company, Portland, Ore.—Plans and specifications have been adopted by the Public Dock Commission for the extension of the St. Johns line of the Portland Railway, Light & Power Company to municipal terminal No. 4. Engineer G. B. Hegardt has been directed to advertise for bids for the work. The dock commission will furnish the rails, fastenings and specials, and bids will be asked for these.

Philadelphia (Pa.) Rapid Transit Company.—The Council's committee on transportation has considered favorably the petition of the Philadelphia Rapid Transit Company to construct an extension of its Sixtieth and Spruce Streets line to Overbrook.

Quebec Railway, Light, Heat & Power Company, Quebec, Que.—Application has been made by the Quebec Railway, Light, Heat & Power Company to the Railway Commission in Ottawa for permission to extend its lines in Belvedere Ward to St. Malo.

Dallas (Tex.) Railway.—The laying of a track on Masten Street has been started and the finishing of the work will be a matter of four or five months.

Texas Electric Railway, Dallas, Tex.—J. F. Strickland, president of the Texas Electric Railway, has inspected the three routes of the Dallas-Wichita Falls interurban line and in his opinion no definite route can be decided upon without further consideration.

Memphis (Tenn.) Street Railway.—The tracks on Main Street will be relaid. Work on Beale Street and several suburban streets is also in progress, the former being about completed.

Monongahela Valley Traction Company, Fairmont, W. Va.—The Monongahela Valley Traction Company proposes to install at Farmington, W. Va., a siding that will give the Mannington line of the company a connection with the Baltimore & Ohio Railroad tracks at that point.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The Puget Sound Traction, Light & Power Company will build a double track from Champion Street to Kentucky on Cornwall Avenue, in Bellingham. The work will include the laying of 7,100 feet of steel and will cost approximately $40,000.

Power Houses, Shops and Buildings

Regina, Sask.—The City Commissioners will construct a spur line to the new power house at the Parliament buildings. The cost will be $4,000.

Mesaba Railway, Virginia, Minn.—The Mesaba Railway expects to build within the next few months a substation near Hibbing, Minn.

Fairburn & Atlanta Railway & Electric Company, Fairburn, Ga.—The Fairburn & Atlanta Railway & Electric Company expects to complete an office building within the next two weeks.

Morris County Traction Company, Morristown, N. J.—The Morris County Traction Company expects to build within the next four weeks a repair shop extension and a station and office.

Eastern Pennsylvania Railways, Pottsville, Pa.—The Eastern Pennsylvania Railways has purchased one 3,000-kw. steam turbo-generator set and four new Coxe stokers.

Mobile (Ala.) Light & Railroad Company.—The Mobile Light & Railroad Company has purchased and is now installing one 578-hp., 200-lb. pressure Sterling boiler. The company has purchased one 1,000-kw., Westinghouse, 600-volt geared turbo-generator.

Mobile (Ala.) Light & Railroad Company.—The Mobile Light & Railroad Company is building one steel carhouse, 100 ft. by 192 ft., with pits. There will also be open tracks outside for the storage of cars after inspection.

Los Angeles (Cal.) Railway.—At a substation of the Los Angeles Railway new facilities are being installed to tap the Southern California Edison Company's transmission line. At present the power is carried to a point near the downtown district and back to this substation. Another item of $15,000 expenditure is the installation of new feeders.

Trade Notes

The Pacific Car Building Company has contracted for a $150,000 factory in Woodland, Yolo County, Cal.

The Alphaduct Company, 136 Cator Avenue, Jersey City, N. J., has filed plans for an extension to its plant at 33-35 New Street.

The Electric Storage Battery Company, Philadelphia, Pa., has increased its capital stock from $18,000,000 to $30,000,000.

S. F. Bowser & Company, Inc., Fort Wayne, Ind., held its annual sales convention June 28 to July 2; it was the largest convention ever held by the company.

The Welch Armature Company, Welch, W. Va., manufacturer of electrical equipment, etc., has awarded contract for the erection of a three-story building, 63 ft. x 65 ft., to cost about $25,000.

The Delta-Star Electric Company, 2437 Fulton Street, Chicago, is having plans prepared for the erection of an addition to its plant, one and two stories, 100 ft. x 110 ft., to cost about $40,000.

The Spencer Turbine Company, 484 New Park Avenue, Hartford, Conn., manufacturer of blowers, etc., contemplates building an addition to its plant, 60 ft. x 125 ft., to cost about $45,000.

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces the appointment of G. B. Kirker as manager of the railway division of the Los Angeles district office.

The National Association of Purchasing Agents will hold a convention in Chicago on Oct. 11, 12 and 13. A committee is working on a standardized invoice form which is attracting widespread interest because of its possibilities.

Willis H. Gilbert is now established at 710 Conway Building, Chicago, Ill. Mr. Gilbert is producing and selling Southern white cedar poles. He has opened distributing points at Atlanta, Washington, Birmingham, Cleveland, New Orleans and other points throughout the South and East.

Autocashier Company of America, 111 Broadway, New York, N. Y., has been incorporated under the laws of Delaware with an authorized capital stock of $5,000,000, to manufacture money-handling machines for use on street cars. The "autocashier" is electrically operated, handles coins of any denomination, retains and registers fares and automatically returns the exact change to the passenger. First deliveries of 10,000 machines are expected about October 1.

New Advertising Literature

Oil Separator.—Bulletin No. 1130, describing its Bundy oil separator, is being circulated by the Griscom-Russell Company, 90 West Street, New York City.

Electric Tools, Carbon Brushes, Etc.—Gilfillian Brothers Smelting & Refining Company, Los Angeles, Cal., is circulating catalog No. 7 on its electric tools, carbon brushes and ignition parts.

Brushes for Electrical Machinery.—The Morganite Brush Company, 519 West Thirty-eighth Street, New York City, has issued bulletin M.B.C. No. 1, in which it describes its different types of Morganite brushes for electrical machinery.

The Duff Manufacturing Company, Pittsburgh, Pa., has issued bulletin No. 304, describing a new automatic lowering jack of 15-ton capacity, suitable for use in the electric railway field.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
C. FRANCIS HARDING, Special Editorial Representative L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative
GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Asst. News Editor

Volume 56 New York, Saturday, August 14, 1920 *Number 7*

No Magic in Operation of an Electric Railway by Municipality

THE city fathers of Seattle have found, as they were bound to do, that a nickel is a much smaller coin than they supposed when they contended that it was plenty for a local car ride. They now think that the dime is more appropriate, which it is, in view of the present purchasing power of this coin. Of course in Seattle riders who purchase tickets will be charged a considerably lower fare for the present, but with a base fare of 10 cents the ticket rate can be varied readily to produce the required income. Our conviction is that the present ticket fare of 6¼ cents will not be found adequate. At any rate Seattle has cut loose from the nickel. Recent difficulties in meeting the payroll made the urgency of doing this very apparent.

In Seattle the electric railway department is to be forced to pay its own way. No taxation of the general public for the benefit of the car rider is to be permitted. As the monthly budget for railway operation comes up for consideration by the City Council, the estimate of receipts will appear in close juxtaposition thereto. This is well, for if the ratio of operating cost to income were not kept clearly in view there might be a tendency to give service below cost, at least for a time. Seattle will find, as the railway company in nearby Portland has done, that once the weird spell of the nickel has been broken the fare can be readily adjusted without public resentment. In Portland it was much easier to go from 6 to 8 cents than it was from 5 to 6 cents. Naturally the fare boost in Seattle has given fresh hope to neighboring utilities that are struggling along under the handicap of inadequate income. It will no longer be possible to cite this city as an example of how good management can make ends meet with the nickel.

Research—an Asset to Electric Railways

A RECENT bulletin of the National Research Council contains a list of 300 industrial firms that have research organizations. These firms are engaged in all phases of industry and range from Sears, Roebuck & Company to Stone & Webster and the Detroit Edison Company. If research organizations are not profitable elements of business in a productive sense, then why are their numbers increasing so rapidly?

If a central station, hardware manufactory or mail order house finds a research organization an asset to its business, it seems there might be in the railway industry opportunity—or perhaps we ought to say more opportunity—for such organizations.

The existing personnel of most railways is fully occupied with the direct business of conducting transportation. The number of executives is a minimum in the present precarious condition of the industry and each executive has little time to investigate ideas or equipment that might or might not be successful. Every man has detailed and exacting duties assigned him essential to the routine operation of the system. The superintendent of the power house, shop, carhouses, lines, etc., cannot take time to study details of untried new methods or to make experimental researches in their respective fields.

A research department is the missing element in such an industry, as its duty is to carry out the suggestions of the superintendents and furnish the experimental and engineering skill needed to develop new methods in the industry. The research organization has no executive duties, is not directly occupied in conducting transportation, yet might prove the element needed to change failure into success.

An industry working under financial handicaps and with a great variety of unsolved problems, such as the railway industry, cannot afford to miss any opportunity for improving conditions, and a research organization will ultimately be a part of all large railway organizations. Modern industry has proved that new development is the keynote to success.

"Times Change and We Change with Them"

DURING the war the War Labor Board made numerous wage awards in the electric railway field which very nearly sapped away the life blood of the companies affected. These awards were based on the principle that the ability of the company to pay formed no part of the considerations leading to the determination of a fair wage. The awards in many cases were entirely beyond the ability of the company to pay, and while the whole industry remonstrated against the principle pronounced by the board, yet the companies responded to their patriotic duty and operated at a loss.

But times have changed. During the last few months we have seen an exactly opposite manifestation of the obligations of the railway in this matter of wages to its employees, particularly in the Middle West. At Des Moines a few weeks ago a federal judge reviewed the decision of an arbitration board granting substantial increases in pay to employees of the Des Moines City Railway for the purpose of directing the action of the receiver. The judge ordered a rate of pay 10 cents an hour less than the arbitration award and made any further pay subject to the ability of the company to pay, after the obligations for other operating expenses, maintenance, depreciation and fixed charges had been deducted from the net.

In Akron more recently an arbitration of a wage dispute on the properties of the Northern Ohio Traction & Light Company brought a decision in which the increase in wages granted was made contingent upon an increase in fares sufficient to meet the operating expenses. While the men were in accord with this finding, they later went on strike in Akron and Massillon in order to force the local city councils to understand that they must acquiesce in a fare increase in order to enable the company to pay the men a fair wage—and they did.

In Dubuque the company was unable to pay the wages demanded because the city authorities would not grant an increase in fare to cover the increase in operating expenses which would result and the men struck. After sixty days, in which not a wheel was turned, a federal judge brought an end to the deadlock by setting aside the 5-cent clause in the franchise, permanently enjoining the city from imposing this franchise provision as to a fixed fare, and established an 8-cent fare, subject to later review, in order that the company should be able to meet the demands of its men. If we assume that the position of the company that it could not pay the wages asked on the rate of fare in force was well founded, this again was recognition by a federal officer that money cannot be paid employees that is not earned, or that a railway company cannot be expected to continue indefinitely to operate at a loss. Other cities in which the same principle has been expressed or upheld in recent wage and rate negotiations are Minneapolis, Buffalo, New Orleans, Duluth, Davenport and Rochester.

In fact, it may be said that the whole trend of utility regulation is now to make rate revision closely follow, if not actually anticipate, necessary increases in the wage scales. The general tendency to recognize the direct relation between rate of wage and revenue is also the very essence of the service-at-cost type of franchise, which is now the form of grant almost universally considered whenever a new arrangement between company and municipality is brought to the fore. All of these situations point unmistakably to the fact that there has been a decided change in the interpretation of the relation between earnings and disbursements—if the rulings of the War Labor Board could be taken at any time as an expression of the common sense of justice.

Loyalty of Employees an Encouraging Sign

AN ENCOURAGING result of this condition which we have just described is the closer feeling of interest and co-operation which is apparent in many recent cases between management and men. We have already referred editorially, under the titles "The Coaches Cannot Do It All" and "There Are Teams Now at Work," to certain conspicuous instances of loyalty of the kind mentioned. Most noticeable of these is probably the recent action of the employees of the Philadelphia Rapid Transit Company in acquiescing to a postponement of a higher wage scale to which they were admittedly entitled. This case has inspired wide publicity, possibly because it followed spectacular accounts of a disagreement between the financial and operating powers of the company in question. The expression of confidence in the management by the men was a compliment to the success of Mr. Mitten in handling labor.

Yet we hardly agree with the inference which might be derived from some of the articles which have appeared in the daily press on this subject that the incident marks the beginning of a new era of co-operation between management and labor. For, shorn of the colorful circumstances which beget publicity, the employees of a number of other companies in various parts of the country during the past six or eight months have quietly borne with their employers until the latter could place the company in a position to pay an increase. We have no desire to deprecate Mr. Mitten's accomplishment, but merely wish to point out that this incident is not an isolated example of the new spirit between managements and men. There are several places in the industry where there prevails a very fine spirit of this kind of understanding and co-operation. Even in some cases where strikes have occurred there was no quarrel between the company and its men, but with the hands of the company tied as to ability to pay more wages, the men used the strike weapon as their only means of forcing the necessary action on the part of the municipal authorities. Philadelphia has a good labor situation, but it has not an entire monopoly of it.

For Good Public Relations the Employees Must Be Boosters

WERE one to go to Marshall Field's store to make a purchase and be confronted with an increased price for a staple, and upon discussing the cause with the clerk would hear this employee of the store say that there was no reason for the increase, that the Fields were a bunch of robbers, were profiteers, were not content with their millions, but wanted to mulct the public out of other quick millions, etc., would this attitude of an employee beget confidence or would it not tend to create a bitter feeling toward the corporation and drive away patronage and support. Also, what would Marshall Field & Company do with such an employee?

Yet it is just that sort of disloyalty that one frequently finds in conversing with the platform men—the one personal contact between the street railway corporation and its patrons. What headway can a company hope to make in bettering public relations with such absence of co-operation—not to say condemnatory influence—on the part of employees?

Every company needs to better its public relations. The place to begin work and to continue work is with the employees. This should never be lost sight of, for the attitude of the employees toward the company is a tremendous force in the psychology of public sympathy and understanding.

When a passenger boards a car and says, "What about this fare increase, Conductor; does the company really need it?"—imagine the vast difference in reaction toward the company in whether that conductor answers, "You bet it does; it's costing us a third of a cent out of our own pocket every time we give you a ride for 5 cents," or whether he says, "Oh, I don't know; they say they do; but if they didn't have a bunch of ignoramuses up in the main office I guess they could get along." And just that superficial remark on the part of an employee is all that is needed to convince a great many people that the company is sincere in its contention for a higher fare or is misrepresenting for the sake of the "bloated bondholders."

One of the principal objections to municipal ownership is the tremendous force that could be used for political purposes of the large numbers of employees required on a street railway property. Why not take advantage of this force to strengthen the company's position in the community served? It can be done if a sincere effort is made to inform the employees continuously on the company's finances, its earnings, where the money goes, what is being done to improve the service—in general, what a really great interest the company has in providing good service.

A spasmodic or short-lived effort along this line will not be very fruitful. But to make the work of informing employees and inspiring in them some pride in the company and its ideals of service a part of the regular business, just as is the inspection of equipment or the auditing of conductors' returns, will surely yield a tremendous influence toward obtaining satisfied patrons, and contented employees as well.

Why Cannot Railways Here as Well as Abroad Electrify?

IS AMERICA to be recognized as more conservative than foreign nations in its reconsideration of problems of electrification of steam railroads after the war?

The family man who has been waiting during this period of hostilities for a time when he could build for himself a home is still cognizant of the fact that materials and labor are high and scarce. "Wait for better times," is his motto.

The manufacturer, desirous of expanding his business, or even of placing it upon a firm financial status, after having devoted his staff and equipment to specialized war products, finds either that new capital loans are prohibited by the Federal Reserve Board or his credit is questioned and rates of interest are abnormally high. "Not just yet," is his final slogan.

The steam railroads, involved in the throes of experimentation with the federal act which returned them to private ownership on March 1, 1920, and the problem of meeting the recently awarded increase of wages from the Labor Board and of renewing and rehabilitating their equipment, say "Possibly later, but not now."

And yet simultaneously we read, in our contemporary publications abroad, in the reports of the annual meetings of British railway companies such items as the following:

> The London & Northwestern Railway appropriated £150,000 for widening its line between Chalk Farm and Willesden for electric service, and work of completing the electrification of suburban lines, postponed during the war, is in progress. The London & Southwestern Railway has decided to supersede the present electrical equipment of the Waterloo & City underground line with modern equipment and to extend the length of the trains at a cost, including additional cars, of £750,000. The Great Eastern Railway has authorized its general manager to prepare a scheme for the electrification of its lines. The London, Brighton & South Coast Railway, which has been operating its minor suburban trains electrically for some years, is encouraged to hope that at an early date the company may be able to electrify its lines throughout the whole of its suburban area. The Lancashire & Yorkshire Railway directors have recommended that the line between Manchester and Oldham, and on to Shaw and Royton, be electrified. The Great Western Railway is electrifying the Ealing & Shepherds Bush Railway. The North Eastern Railway has under consideration proposals for the electrification of the main line between York and Newcastle, 80 miles.

We must all admit surprise at reading last month in our own press of the gigantic loan of $25,000,000, at an interest rate of 8 per cent, financed by American agencies in order that the Swiss railways might be further electrified at once.

Editorial columns of our daily papers were for days discussing the causes and practicability of the high interest rate paid. The fact remains that it was paid. These steps are being taken by governments certainly no better off financially nor with respect to labor conditions than ourselves.

Are we not inclined to look upon electrification as an untried luxury rather than a well-worked-out economy? It has proved to be economically applicable to practically all railroad conditions, *i.e.*, tunnels, terminals, difficult mountain grades, through-passenger trunk-line service and heavy freight traffic. It is generally recognized as a means of conserving coal, labor and equipment. It makes very effective use of the water power which should now be readily developed upon a large scale in this country. Is it not a problem to which we must necessarily turn as the solution of some of our present difficulties of railroading instead of an ultimate goal to be coveted for some future and better day? We commend the electrification of steam railroads to our readers as an immediate need in this period of reconstruction.

Who Will Regulate the Improved Highways?

TRANSPORTATION has many agencies and each must earn a return on its investment to exist. Two complicating elements enter into a practical application of this principle, a determination of the investment and of who pays the return.

A single airplane used for transporting a few passengers a certain distance affords an example of a simple case where the investment is easily ascertained and the cost of service easily divided among the passengers and collected, but a glance at court records shows how complicated in application the principle becomes when applied to railroads and railways.

The recent advent of the motor bus and motor truck as agencies for transportation has now opened a new field for legal and engineering work to determine these items. The farmers along a state highway who have paid one-third of the cost of a good road, the county which has paid another third and the state which has paid the other third, all on the plea most suited to get the money from each, are beginning to look with new and selfish interest at the question of transportation. The farmer who gave his money to get a road so he could haul his crops to market and avoid freight rates kicks and howls because in a short time the road is ruined by heavy trucking from manufacturing plants and because touring automobiles monopolize the road and force him to drive in the gutter, if at all. The state and county object to the high maintenance on the road and accuse the solid-tired trucks and farm vehicles of doing the damage. The touring class objects to the slow movement, congestion and bad roads due to heavy trucking and wagon transportation.

This condition is bringing into being a general idea that some agency must regulate highway transportation and determine on a cost-of-service basis who should pay the bill and what it should be. As one farmer has put it, "I paid for one-third of that road on a mile frontage and am taxed for the other two-thirds, while that steel mill over there only paid for a quarter mile frontage, yet is using it fifty times as much for its trucking."

The problem is complicated by the number of individuals concerned, the interlocking of investments in highways and the diversified rolling stock used, yet it is getting to be of primary importance, and perhaps, when commissions get to working on highway cases, it will be the turn of the steam and electric roads to look on, smile and say, "Go to it."

This Is Number Six of a Series of Articles on Salient Phases of the Electric Railway Situation

California and Her Tractions—Part I

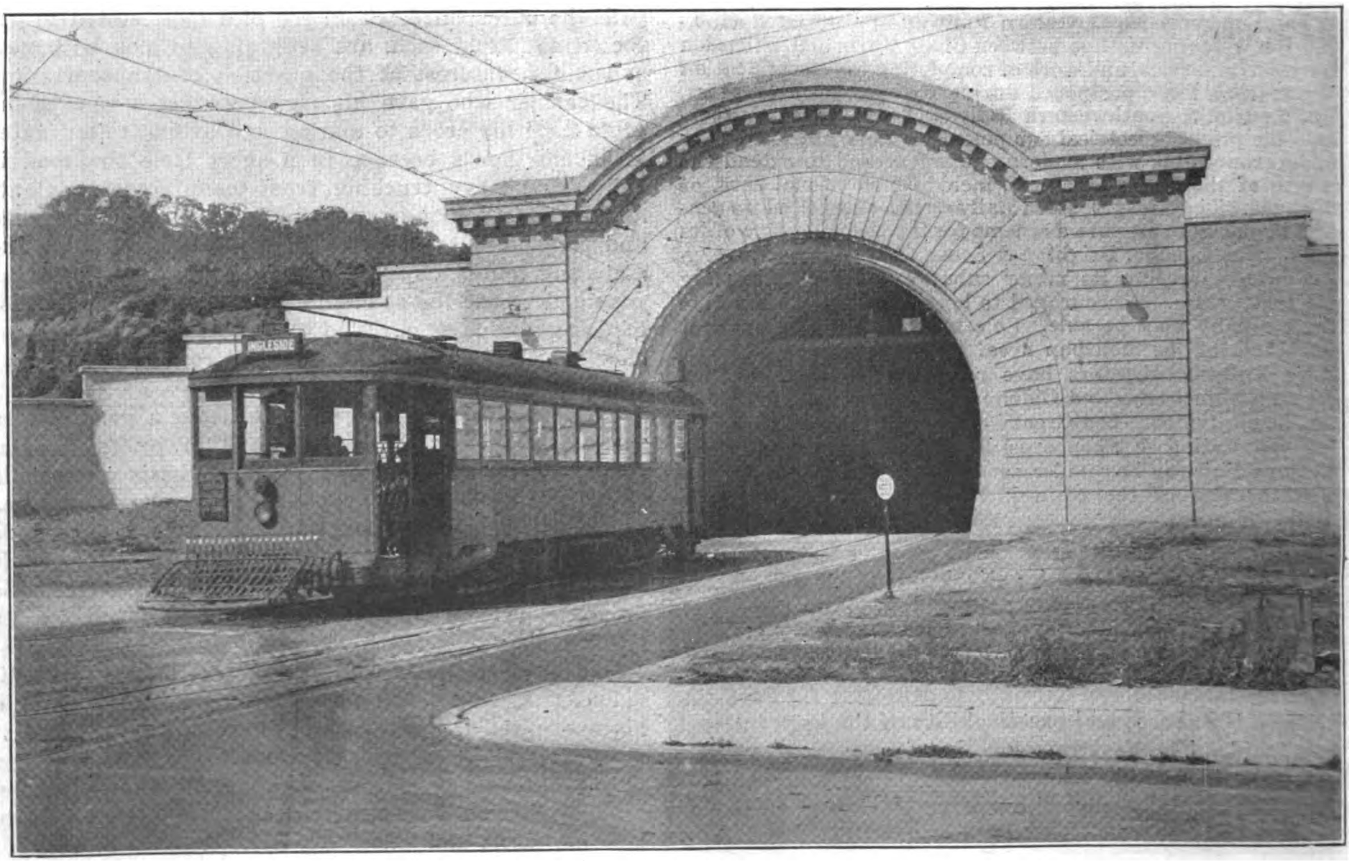
By Edward Hungerford

In this article Mr. Hungerford tells the story of active competition between the municipal railway in San Francisco and property privately owned. In his opinion one system must eventually come in the interests of efficient operation.

When one comes to the western edge of the country he finds the entire traction situation considerably different from that in the eastern and middle sections today. If he observe but superficially he will come to a quick decision that most of the tractions in California are doing very well indeed. Their cars seem to be in excellent condition, their tracks and terminals well maintained, their platform personnel of a high standard. Moreover, most of them are still charging 5-cent fares; a very few 6 cents, none that I discovered more than this last figure.* It looks like the good old days of before the war. And nowhere more so than in San Francisco, where not only is the 5-cent fare still stoutly maintained but a remarkably short headway of the cars at almost all hours. No city in the land has better street car service today; few, indeed, have as good.

If one be thoroughly converted to the theory that competition in transportation is fundamentally necessary to its real success then San Francisco is his apple. In no other community in the United States is there real competition. Out by the Golden Gate the municipal street railway enterprise, now eight years old and come to some 168 cars and 63 miles of track, no longer is a mere toy, but has become a real street railway system. Two years ago it may be said to have attained its majority; not in years of course, but by the annexation of the whole of Market Street—San Francisco's greatest street—and running three straight miles from the huge ferry house up to the portals of the new tunnel under the Twin Peaks.

I have neither the time nor the desire to go deeply into the policy that actuated the grab of this important thoroughfare, whose interests already were served, and very well served indeed, by several lines of the



A car of the Municipal Railway passing out of the west portal of the Twin Peaks tunnel. This tunnel has just been completed at a cost of about $4,000,000.

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*Since this article was written Seattle has gone to 10 cents.—EDITORS.

United Railroads, which used and still uses the street as the main stem of its own great system of 275 miles. Many years ago its two tracks in the middle of the street were paralleled for the mile leading from the ferry house up to the beginning of Sutter Street by two more tracks of the old time Geary Street lines. A few blocks beyond on Market Street was the terminal of the Sutter Street line. It was this line, whose franchises had expired, which was taken over by the city of San Francisco as the nucleus for its proposed municipal street railway system, which then hardly passed the formative stages. It built additional tracks in Market Street to link Sutter and Geary Streets and began running the Geary Street cars through to the ferry house.

Four tracks in Market Street from the ferry house to Geary Street were quite bad enough. But when Mayor James Rolph, Jr., in accordance with his oft-expressed plan to make the street railway service of the city exclusively municipal, seized upon the idea of continuing his two municipal tracks right up that thoroughfare to the Twin Peaks Market Street became a nightmare. With but two trolley tracks in its center—originally they were cable tracks—there still has been left a comfortable roadway for vehicular traffic in either direction. Two more trolley tracks completely spoiled the thoroughfare, while a great press not only of private automobiles but of jitneys completed the assassination of the street.

Today property upon its south side—across the tracks from the chief shopping and hotel and theater district of the town, its best residential districts, too, is virtually marooned. The descending values of that side of the street tell the story. Store after store stands empty. Office after office is the same. Folk will not risk their precious lives and limbs in crossing that bedlam. So they do not cross, and the merchant or the professional man whose official habitat is upon its south side suffers, and looks for new quarters in the well-congested districts to the north of Market Street.

Nor is the United position in the matter to be envied. It possessed the two center tracks; those of the Municipal Railway are placed as closely as possible alongside them, with the direct result that the United's tracks might almost as well be lined with a high board fence for their entire course up and down Market Street, for it is far easier to cross that strenuous thoroughfare than for any nervous or timid person to attempt to board the cars upon its inner tracks. The outer tracks—those of the Municipal line—are easy enough. And the facility of boarding the city's own cars is increased by the heavy stone waiting stations or landings along Market Street through the heart of the town. With the result that the United Railroads gets practically no

The ferry house at the foot of Market Street in San Francisco is the portal through which thousands of commuters from the cities on the east side of the bay enter San Francisco on the morning of every workday and leave in the evening. It is an important electric railway traffic center.

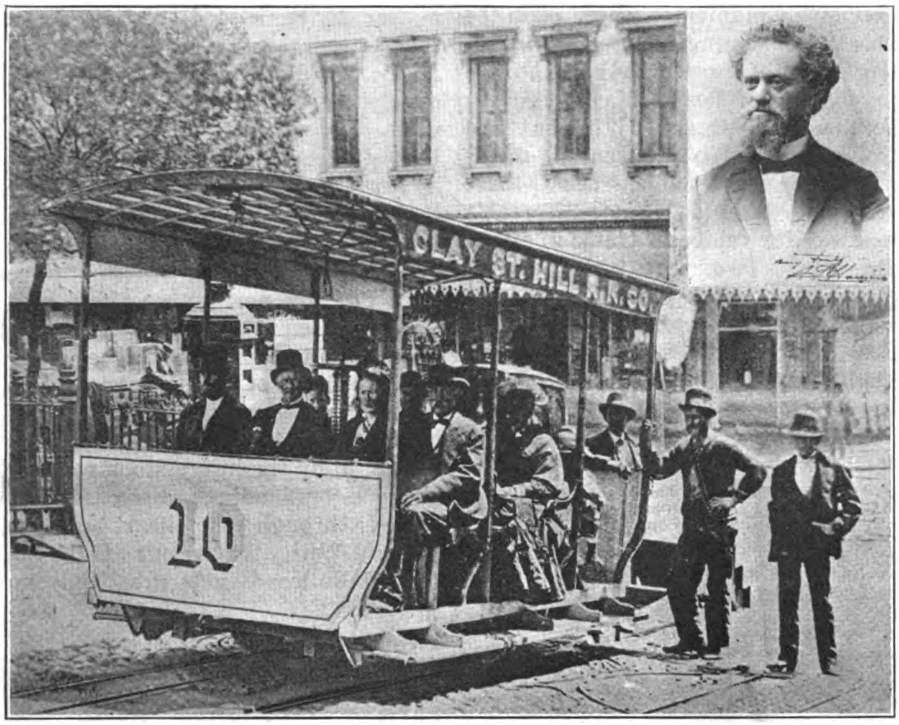
opportunity whatsoever at the fine short-haul business which comes at all hours between that heart and the ferry house, which is virtually the exclusive portal of the great communities of Oakland and Berkeley and Alameda, across the bay, some 300,000 folk all told.

CABLE CARS STILL RUN IN SAN FRANCISCO

San Francisco is the city of the short-haul rider. Her most peculiar conformation has made this possible. Long ago her great hills bade defiance to the growth of the town. They seemed an impassable barrier to its development. And so as it grew it struggled for a foothold on the narrow sand stretches around their bases—until the day came when a genius of an engineer laughed at Nob Hill and Russian Hill and promptly proceeded to overcome them.

What, haul street cars by a rope? Of course, replied the genius. His name was Andrew S. Hallidie, and he was just a plain, ordinary sort of man, even as you and I; yet a man with a very real idea. Because it was a real idea it presently came into being. And San Francisco was the first city of all the world to ride upon a cable railroad. That was in 1873. It has been riding upon them ever since.

Does your friend the banker down in California Street, which is the Wall Street of San Francisco, tell you to run up to the Pacific Union Club for a bite of lunch with him? Presto! You hop aboard one of the gaily painted and caparisoned little cars of the California Street Cable Railroad, whose equipment has not been changed in style or appearance for nearly forty years, and the gay little car hauls you up four or five fearful city blocks, at a grade of from 18 to 20 per cent for most of the way. The little cable road looks obsolete. On the contrary, however, it is very much of a going institution, paying 7 per cent on a fair capitalization and putting aside $20,000 or $25,000 a year in cash surplus. It takes off its hat to none of its larger brethren.


CLAY ST. HILL R.R. CO.
10

One of the first cable cars to operate in San Francisco (reproduced from an old photograph). In the panel is a portrait of Andrew S. Hallidie, who built the line on Clay Street, the first cable line in San Francisco.

Nor is the cable car of San Francisco apt to doff its chapeau to its bigger and more powerful brother of the trolley at any time in the immediate future. Even the most optimistic of electrical engineers shake their heads at the idea of propelling street cars over 20 per cent grades in 100 per cent of safety. So San Francisco, like Seattle, bids fair to continue the unique method of street transportation to which it gave birth. And these two cities are the only ones in the entire United States to cling to the method of propulsion that once swept like wildfire all the way across the land.

The problem of eventual control in the city by the Golden Gate is not nearly so easily solved as that of the mere mechanical means of propulsion. For, as most traction men already know, it is there that the municipally owned and operated street railroad has attained its stoutest foothold in all the United States. I have referred already to this second distinctive feature of San Francisco street transportation in its connection with the most difficult Market Street situation. Now consider for a moment or two how it has attained its real strength.

HOW THE MUNICIPAL ROAD BEGAN

The Geary Street line, which was its first link, was in the beginning also operated by cable. Its franchise rights expired a little more than eight years ago, and the city, taking over the street to itself, announced that here would be the beginning of its municipal railroad experiment. It paid nothing for the existing property of the old company, but pulled out the cables and scrapped its cars and tracks, replacing them with a brand-new electric line, running from the ferry house—the great head and front of San Francisco trolley traffic—right through to the ocean; some nine miles all told. The old cable road had had its downtown terminus right at Market Street. That did not satisfy the city administration. Its traffic sense said that the line must run through to the ferry house. And so it bended it right into Market and by new trackage to the existing four tracks for the short distance between Sutter Street and the waterside. The outer tracks for this short distance belonged to the United Railroads. But the city administration did not quibble at that. Nor hesitate. It appropriated them for its own purposes, and the assassination of San Francisco's chief business street was begun.

Translate "city administration" into Mayor Rolph, Jr., who has been the alcalde of San Francisco for four terms now, or the eight years in which the municipal railroad enterprise has been in existence, and you begin to get the right understanding of the whole situation. With no desire whatsoever to write a treatise on San Francisco politics, permit me to say that Rolph frankly is a labor union mayor. A rich man himself and keenly successful, he makes no hesitation in saying that he represents labor and the things for which labor stands there in the fine new city hall, and rarely fails to be consistent.

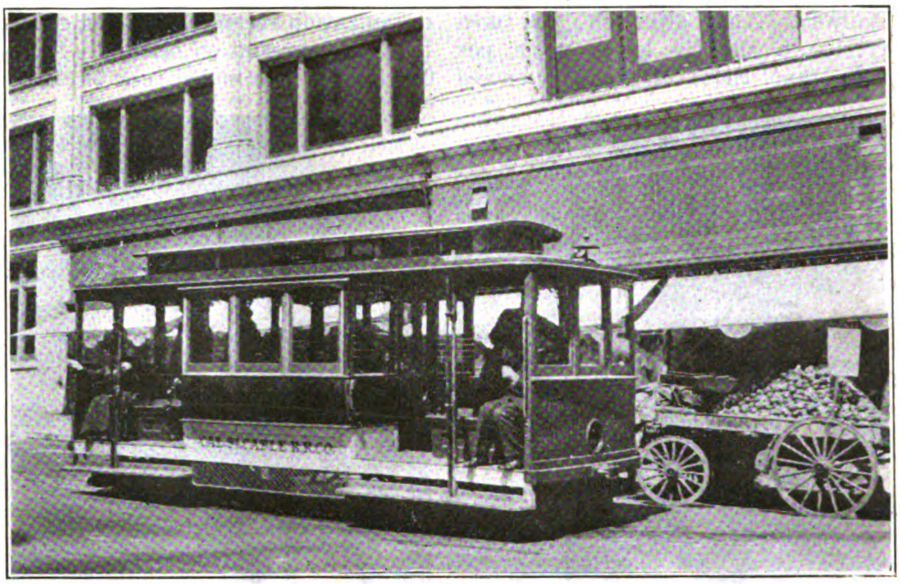
No better inaugural link for a city municipal railroad could readily be imagined than the Geary Street line. From the beginning it has paid and paid well. It hardly could fail to pay, cutting through the heart of the city's best wholesale and retail districts and then threading a high-grade residential district closely built in for almost the entire distance out to the ocean. With his venture in municipal operation so auspiciously begun, Rolph found little difficulty in summoning public approval to future experiments along these lines.

THE MUNICIPAL ROAD GROWS

The next of the small independent city railroads of San Francisco whose franchise expired was the Union Street line, running from the Presidio district under and over Russian Hill close to the waterfront and the almost inevitable ferry house. In the days before the great fire of 1906 this too had been a cable road. Yet after that supreme catastrophe electricity was used as power, despite the fact that some of its grades attain 13 per cent, and 10 per cent is regarded by most San Francisco engineers as the maximum for electric power there. The Union Street line was another good thing. The municipal railroad's books responded to its acquisition.

After Union Street came California Street, the section out beyond the cable line, and which was quickly made a branch of the original Geary Street main stem. The coming of the exposition of 1915 made a logical excuse for the municipal railway beginning brand-new construction on its own account; a line was projected the entire length of Van Ness Avenue, linking together Market Street and Geary and Union. Van Ness Avenue originally had been designed as a boulevard. Repeated requests from private corporations to occupy it with tracks had always been sternly refused. And the United Railroads had been forced in turn to occupy the parallel Polk Street, one block to the east.

But what is the city to the city? Mayor Rolph asked Mayor Rolph if the fastest growing municipal railroad could occupy Van Ness Avenue and Mayor Rolph replied to Mayor Rolph that certainly it could. And it did. While soon afterward came the full assassination of Market Street. That thoroughfare was essential to the Mayor's plans. It was neither good traction nor good politics to develop the section north of Market and completely ignore those to the south. So lines were projected south from the great main street at Church and again at Potrero. To place these in any efficient competition whatsoever with those of the United Railroads Market Street was essential to the Mayor's needs. The United already held the center of that thoroughfare. But the Muncipal was upon its sides all the way from Geary to the ferry house. What mattered such a nightmare for another mile or two miles then? So Mr. Rolph's decision. And followed decision with the laying of tracks.


Cable cars are still running in San Francisco. They are used on streets with grades of 18 per cent or more, on which electric cars would not be suitable. This view of a modern cable car shows that those now in operation do not differ greatly in appearance from the original cars of 1873.

Up to this time the Goliath-like United Railroads had confronted the fresh onslaughts of the traction David; not without protest, but without definite action. But the robbery of its exclusive rights the full length of Market Street was quite too much. It began a legal battle against that invasion of its privileges which carried all the way east to the Supreme Court at Washington. There it lost. But the decision which permitted the Municipal Railway tracks to remain in the street also said that the United Railroads might bring suit for any damages which it felt that it had incurred by the invasion of the street by its competitor. This it is proceeding to do. It already places its bill of damages at something in excess of $8,000,000 and is prepared to press the bill to great lengths—even up to the United States Supreme Court once again if that be necessary.

In the meantime the Mayor of San Francisco has executed another *coup* in the completion of the 12,000-ft. double-track tunnel through the very heart of the Twin Peaks, at a cost somewhat in excess of $4,000,000. This important engineering work virtually continues Market Street in a straight line through and past what for years has been a seemingly impregnable barrier and opens up a great new section of the city for immediate development. But only for the Municipal Railway. It may and does traverse the great bore at no rental charge whatsoever. The United Railroads may not operate upon these tracks under any consideration. And, I should add, at this moment is not particularly anxious to do so.

WHAT THE FUTURE HOLDS FORTH

Its own future, no matter how large a part of its $8,000,000 damage bill it may yet gain, is most uncertain. Its important franchises have until 1929 to run. Until then it cannot be ousted from any of its streets in San Francisco. It is today in the process of financial reorganization. Its bonded indebtedness is being reduced to a point at which it is expected a 4 per cent interest can readily be earned. As for the stockholders, I might ask what business a man has being a tracti company stockholder today, unless be in some ancient family affair lik the time-honored California Stree Cable Railroad. But these do no grow in every civic bush. For verification ask the stockholders of the United Railroads who sent $8,000,000 in gold out to San Francisco at the time of the great fire for the rehabilitation of their property so that it might again be serving the citizens of that sore-stricken town.

One might expect the *morale* of a street railroad system which had been so constantly under successful attack to be waning. As a matter of fact the exact opposite is true of the United Railroads. I found by a little investigation that it not only had the lowest labor turnover of any street railway upon the Pacific Coast but, with two noteworthy exceptions, of any industry whatever in that great section of the country. It is well below that of the Municipal Railway. And although its men receive a slightly lower wage per hour than those of the city-owned system, who are paid $5 for an eight-hour day and permitted no overtime whatsoever, through their overtime they not only equal but generally exceed the weekly earnings of their civic competitors.

Looking down Market Street toward the ferry house, which is about three-quarters of a mile distant. This view was taken between Second and Third Streets at a time when there were only two tracks there

ONE SYSTEM MUST EVENTUALLY COME

What will be the eventual outcome of this perplexing dual situation in San Francisco?

I think that this is not very difficult to foresee. The Municipal Railway, young and triumphant in its strength, must acquire the lines of the United Railroads; preferably in the very near future rather than to wait for the 1929 crop of expired franchises.

If the city of San Francisco is fair—I am not saying a word about generosity—it will pay for those lines at a fair valuation. The men who personally have been of greatest aid to the Mayor in the achievement of his traction triumph say this themselves. It is only the bitterest of radicals who demand that the old private corporation be clubbed entirely to death and that its property be paid for at junk rates—if ever paid for at all. Better reason tends toward the fair valuation process. And to this the United Railroads is now quite willing to accede.

Today the Municipal Railway has achieved a real success. There is no use in trying to evade that fact, even though one may very much question the methods by which its triumph was attained. It is not extravagantly operated, although the organization recently has been eating into its depreciation account—$116,000 for the year ended June 30, 1919; probably some $400,000 for these next twelve months.

"But," reply its managers, "steadily and for years past we have annually charged off 18 per cent of our gross receipts as depreciation. How many traction systems are doing that today? We have more than $1,500,000 in accumulated reserve. Out of the $5,500,000 in bonds which we originally issued for the construction of this property we have retired $600,000, and the bond issue represents 18 additional miles of line, builded at a cost of $60,000 a mile, in addition to the 45 miles that it was originally supposed to carry."

They make a good case for themselves, these managers. And with so good a case, such confident strength, they should, and I believe in the long run they will, make not only a decent but a very fair bargain with the United Railroads. No matter what may have been the shortcomings of that property at times in the past, the fact remains indisputable that it was and still is a genuine servant of San Francisco, serving it in good seasons and in bad. And faithful servants are not generally turned away merely because they have become broken.

Will the Municipal Railway be able to continue, despite rising operating costs, at a 5-cent fare?

That is another and a very different question. With the steady eating into the depreciation account—which, as we have just seen, is merely a matter of bookkeeping when there is so generous a depreciation charged off—that problem begins to confront the Mayor and his advisers. I do not believe that they underrate its seriousness. Yet if the keen-minded Mayor of San Francisco, who is very much of a law unto himself, is led at all by the advice of some of the wisest of his associates he will not hesitate at the fare-raising step when the next wage advance—the French would call it a crisis—arises. This bids fair to come in the near future. The men of the Municipal Railway are discontented with their $5 a day, even though San Francisco is today perhaps the cheapest city in the United States in which to live. But the street cleaners—another arm of the city service—are beginning to get $6 a day.

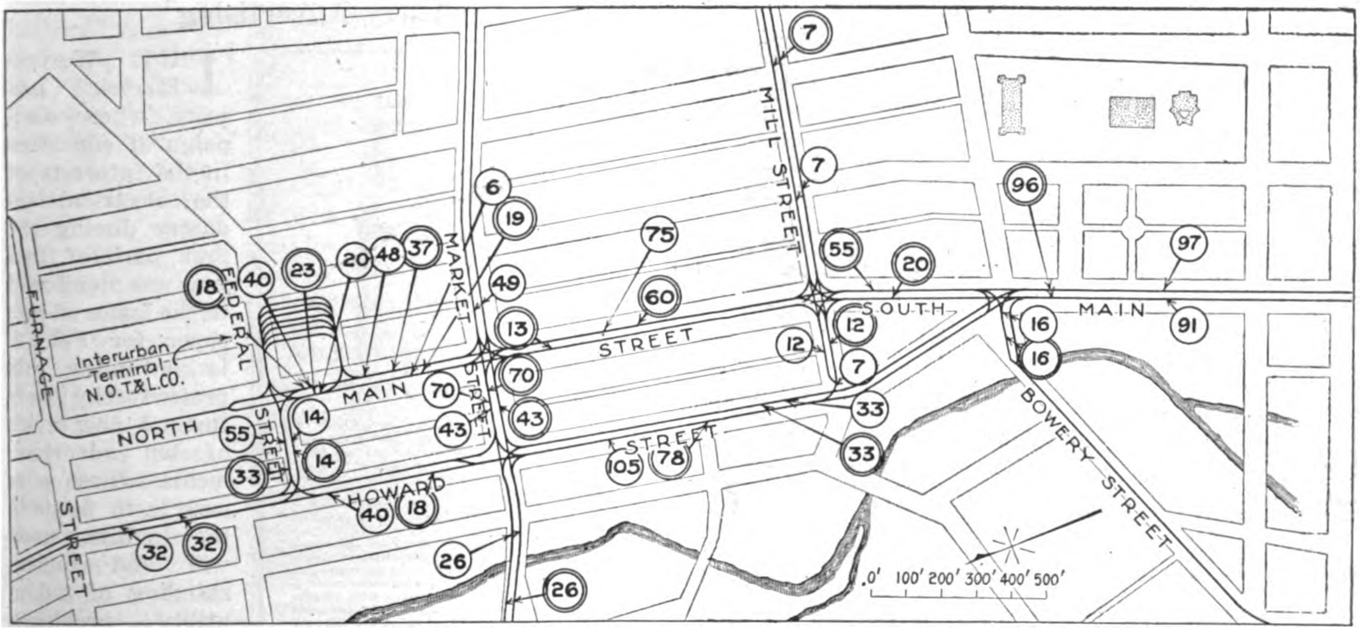
Surely it takes more brains to run either end of a trolley car than to manicure the cobblestones or the asphalt? That is what those selfsame trolleymen are already beginning to ask of one another. Out of such questionings there can come but one inevitable answer—a demand for $6 a day, or more, which must be met by the City Hall. That is politics. When politics intermingles with actual business strange problems such as this arise. When the Municipal Railway completely swallows the United Railroads they will multiply. Then it will be faced with the necessity of operating not merely lines which are unprofitable because they are remote, but other lines which are unprofitable because they are too closely set together. A decade of competition multiplies street railways and places them, not always for the best public interest but in the strongest strategic position.

These problems the Municipal Railway of San Francisco will yet have to meet and to solve. And upon its method of solution will rest, in no small degree, the fate of other municipal railway projects in the United States. Of this I am very sure.

Rerouting in Akron Saves $60,000

Installation of Some Through Routes and the Shifting of Others in the Downtown Section Result in the Speeding Up of Cars

A PLAN of through-routing certain lines and rerouting others in the downtown section of Akron, Ohio, was recently worked out for A. C. Blinn, vice-president and general manager Northern Ohio Traction & Light Company, by J. F. Layng. This plan has been installed and has so reduced the mileage and improved the speed of the cars through the congested section of the city that a saving in operating expenses of from $60,000 to $75,000 a year is expected to be realized. The plan of rerouting and the extent to which it changed the maximum number of cars per hour over any section of track may be seen in the accompanying map of the central section of the city, on which the final results of the rerouting study as to number of cars over each section of track are entered.



MAP OF AKRON BUSINESS SECTION, SHOWING THE NUMBER OF CARS DURING THE RUSH HOUR ON EACH SECTION OF TRACK BEFORE AND AFTER ADOPTING REROUTING PLAN. THE CARS FORMERLY ON EACH ROUTE ARE SHOWN IN SINGLE CIRCLES, THOSE UNDER THE NEW ROUTING IN DOUBLE CIRCLES.

To begin with, the number of cars passing over any section of track during the rush hour between 5 and 6 p.m. was compiled and entered on the map, with details of the number of cars from each line contributing to the total. These total figures are shown inclosed in the single circles, though the details as to the lines and number of cars of each line have been omitted in the accompanying reproduction. With this information entered on the map for every block of track it was comparatively simple to see which sections of track were worst overloaded, when the amount of vehicular traffic was taken into consideration. The study to readjust the routes so that these overloaded sections would be relieved and to eliminate dead mileage wherever practicable could then be made.

As the changes in routing were worked out, the new figures showing the number of cars during the rush hour were also put on the map. The figures which appear in the double circles on the map are, of course, the result of the completed plan. On the original of this map the data for conditions before and after rerouting were entered respectively in black and red ink, making the references simpler than in the reproduction given here.

The more important changes made in the routing were as follows:

The Spicer line, which formerly entered the downtown district from the east over Mill Street and looped back by turning north on South Main Street, west on Market Street, south on Howard Street, and back east on Mill Street, was through-routed with the Wooster Avenue line, the Spicer cars thus turning south instead of north at South Main Street and eliminating altogether the dead mileage of this downtown loop. This provided through operation from the Wooster Avenue district to the Goodyear Rubber Company plant and eliminated the necessity for numerous passengers to transfer.

The Lakeside cars, which formerly looped around the same square as the Spicer cars, were through-routed from the south on Main Street to the west on Market Street, with the Rose Avenue line. Northbound these cars operate over South Main Street to Market Street and thence west, but southbound they turn off Market Street at Howard Street, which converges a few blocks further south with South Main Street. The Lakeside cars previously received a large transfer load from the west Market Street cars, but this is greatly reduced with the new operation, which gives a direct line from the Market Street residence district to the Goodrich and Firestone plants.

The Kenmore cars formerly came up North Main Street from the south and looped back through Federal and Howard Streets. These cars are now turned back at Market Street instead of Federal, thereby eliminating the dead mileage of one square. Another change was the looping of the Barberton cars through the interurban terminal station instead of via Federal and Howard Streets. These cars now discharge their passengers in the terminal, but do not load until after leaving the terminal and proceeding south to a loading point established at the opposite end of the block from the terminal, in front of the Portage Hotel. This routing of the Barberton cars removes traffic interference with the interurban cars entering the terminal and clears the northbound track for the Silver Lake and Gorge Loop cars.

The old and new routing for any line can be traced out on the map by studying the data entered there as to lines contributing to the total number of cars over any section of track.

RESULTS OF THE REROUTING

By comparing the corresponding figures in single and double circles it will be noted that considerable reduction in the number of cars during the rush hour has been obtained in several cases. The heaviest traffic under previous routing was over the southbound track on Howard Street, between Market and Mill Streets, and here the number of cars was reduced from 105 to seventy-eight. On Federal Street the westbound traffic was reduced from fifty-five to thirty-three cars, and so on.

The saving in car mileage per day resulting from the elimination of loops and the cutting back of the loop of the Kenmore cars is summed up as follows:

	Number of cars and saving per car	Saving per line
Kenmore line	97 cars x 1,200 ft.	116,400 ft.
Barberton line	No saving in miles	
Wadsworth line	21 cars x 250 ft.	5,250 ft.
Spicer line	154 cars x 2,600 ft.	405,600 ft.
Lakeside line	153 cars x 3,400 ft.	520,200 ft.
Wooster-Rose line	211 cars x 250 ft.	52,750 ft.
Total saving		1,100,200 ft.

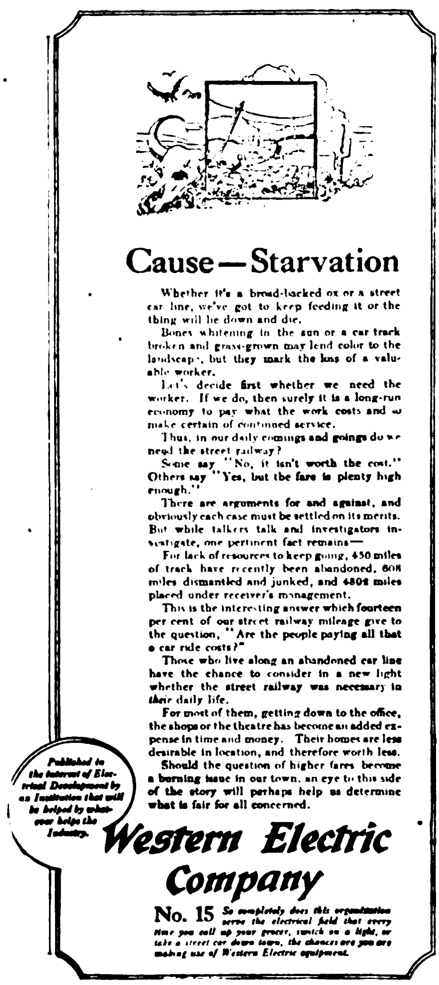
This is equivalent to 209 car-miles per day. If the mileage saving is figured at 35 cents per car-mile and the time gained from relieving traffic congestion and speeding up cars is included the estimated saving is placed at from $60,000 to $75,000 per year.

Two Accidents Analyzed

A REPORT of the Bureau of Safety, Interstate Commerce Commission, on accidents 639 to 657 inclusive, for the last quarter of 1919, contains reports on two electric railway accidents. The first was a rear-end collision on Oct. 4, 1919, between two passenger cars of the Buffalo & Lake Erie Traction Company, and resulted in the death of six passengers and the injury of twenty-five passengers and three employees. The rear car was an interurban car, whose forward bumper was 18 in. higher than the rear bumper of the local car and overslid the latter. The report says, in part: "Investigations also develop that it is not required that red lights be displayed on the rear of the local cars, it being believed by the officials that the white lights in the rear vestibules and the reflection of the ceiling lights are sufficient protection against following trains. The assistant general manager stated that the officials endeavor rigidly to enforce rule 84, requiring trains running in the same direction to keep at least 1,500 ft. apart. The absence of a red light or marker on the rear of car No. 400 undoubtedly contributed in a measure to the accident."

The second accident reported was a rear end collision on Dec. 21, 1919, between two electric motor cars on the Detroit United Railway, resulting in the death of one employee and the injury of two passengers. According to the report of the commission, "this accident was caused by the failure of the motorman of the following car to have his car under control when approaching the scheduled meeting point for his train. While there is no evidence of anything having been wrong with the air brakes, had there been anything wrong and had the motorman complied with this rule (to test air brakes 1,500 feet ahead of junctions, crossings, etc.) he would have been able to stop his car in time to avoid the accident."

Western Electric Continues Its Series of Industry Advertising



Cause—Starvation

Whether it's a broad-backed ox or a street car line, we've got to keep feeding it or the thing will lie down and die.

Bones whitening in the sun or a car track broken and grass-grown may lend color to the landscape, but they mark the loss of a valuable worker.

Let's decide first whether we need the worker. If we do, then surely it is a long-run economy to pay what the work costs and so make certain of continued service.

Thus, in our daily comings and goings do we need the street railway?

Some say "No, it isn't worth the cost." Others say "Yes, but the fare is plenty high enough."

There are arguments for and against, and obviously each case must be settled on its merits. But while talkers talk and investigators investigate, one pertinent fact remains—

For lack of resources to keep going, 450 miles of track have recently been abandoned, 608 miles dismantled and junked, and 4808 miles placed under receiver's management.

This is the interesting answer which fourteen per cent of our street railway mileage give to the question, "Are the people paying all that a car ride costs?"

Those who live along an abandoned car line have the chance to consider in a new light whether the street railway was necessary in *their* daily life.

For most of them, getting down to the office, the shops or the theatre has become an added expense in time and money. Their homes are less desirable in location, and therefore worth less.

Should the question of higher fares become a burning issue in our town, an eye to this side of the story will perhaps help us determine what is fair for all concerned.

Published in the Interest of Electrical Development by an Institution that will be helped by whatever helps the Industry.

Western Electric Company

No. 15 *So completely does this organization serve the electrical field that every time you call up your grocer, switch on a light, or take a street car down town, the chances are you are making use of Western Electric equipment.*

"GOOD WILL" ADVERTISING

THE Western Electric Company, whose campaign of education in the interests of the electrical industry during the first part of this year was mentioned in the issue of this paper for Feb. 7, is continuing this praiseworthy effort. A new series of ten advertisements, whose purpose is to promote the public good will and understanding of public utility problems, has been prepared and during the last half of this year will appear in eleven popular publications. Two of these advertisements relate directly to the electric railway industry, while others argue the case of the central station, telephone company, steam railroad, contractor and architect and engineer. One of the street railway advertisements is illustrated herewith.

As the purpose of these advertisements, in the words of the president of the Western Electric Company, is to "change public prejudice into public trust," the company offers to furnish electrotypes of these advertisements in any size upon request to utilities for use in their local papers, or permission will be granted to use the copy in any way desired, either with or without a reference to the Western Electric Company's name.

Battery Cars Changed to Safety Cars

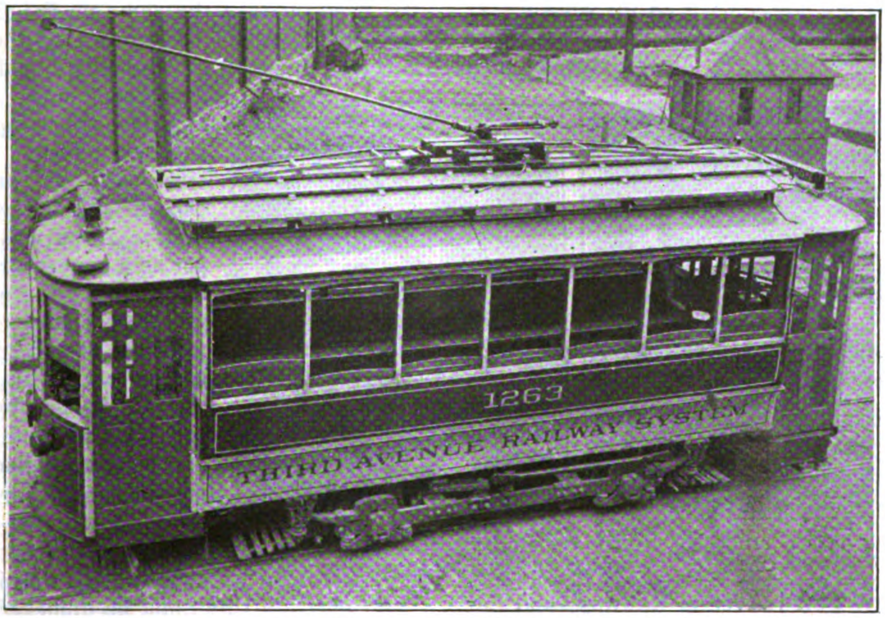
Conversion of Fifty Storage Battery Cars to Safety Cars for One and Two-Man Operation by the Third Avenue Railway, New York, for Use in Outlying Districts Presents Some Interesting Features

By R. H. PARSONS
General Foreman Third Avenue Railway, New York, N. Y.

TWO PROBLEMS, both important, are being solved by the Third Avenue Railway, New York City, with the reconstruction of fifty cars, formerly operated by storage batteries, to one-man safety cars equipped for service on 550-volt overhead lines. First, the withdrawal of the storage battery cars from some lines and an overabundance of battery cars to serve the remaining lines made these car bodies available for reconstruction. Second, the developing of short-haul riding and the habit of riding in certain districts where the lines served principally as feeders for rapid transit lines was necessary. As described in the ELECTRIC RAILWAY JOURNAL for May 18 and Aug. 10, 1918, the Third Avenue Railway began operation with converted safety cars with this object in view more than two years ago. Twenty-five cars, each weighing 26,000 lb. light, were put into service, equipped with foot control and safety devices for one-man operation. These proved very successful and resulted in a marked increase in the number of passengers carried. A year later fifty standard closed cars, weighing 30,000 lb. each, were equipped with foot control and pneumatically operated doors and were used as one-man or two-men cars as desired. These also gave perfect satisfaction. From the results of this operation it was evident that many of the lines which previously had not been considered as paying propositions could be made at least to pay expenses and others could be turned into revenue-producing lines by the use of smaller cars operated by one man on short headways.

This led to the reconstruction of two of the older storage battery cars into safety cars as sample equipments. New trucks and new equipment were installed and changes made in the car body construction as were necessary for this operation, and the final result is shown in the accompanying illustrations. Additional cars to make a total of fifty are now being reconstructed as rapidly as possible.

The first difficulty encountered in changing these cars from battery operation to trolley was the fact that the car body and roof were not of a sufficiently strong construction to sustain the weight of a trolley base. This was overcome by reinforcing the roof with a 1½ in. x 1½ in. angle, bent to fit the shape of the corner post header, ventilator end pillar and end rafter, as shown in an accompanying illustration. An additional truss running the length of the car was also installed, which was well fastened at each corner of the car and made fast to each side post. In the illustration showing this construction a fair idea can be gained of the method of wiring. As much of the wire as possible was placed behind the sign panels, molding, etc., as the experience of this company has been that less trouble results and a much safer installation is provided by this method than in any other way, even when the wires are installed in conduit. This arrangement is also much lighter than conduit construction, which is an essential factor in this equipment.

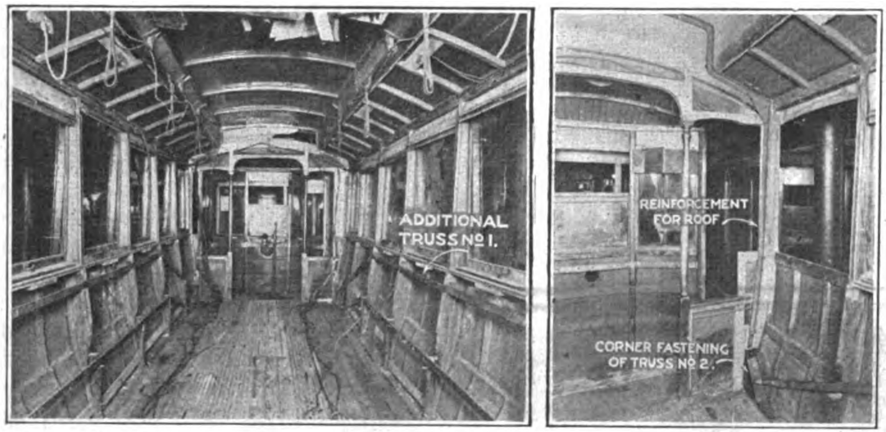


FINISHED CAR WITH TRUSSED TROLLEY SUPPORT, FOLDING DOORS AND STEPS AND LATEST DESIGN OF SAFETY TRUCK

The illustration of the completed car shows the construction of the trolley base supports, which are trussed so as to give strength to the roof, to provide support and insulation for the trolley base, and at the same time to leave a convenient and protected place for the fuse box and choke coil for the lightning arrester. The choke coil is installed underneath the support for the trolley base and the fuse box is installed at the end of this support. The roof board is arranged for two trolley stands and poles, but one, however, is used at present.

SUBSTANTIAL SUPPORT FOR EQUIPMENT PROVIDED

In addition to the reinforcement provided inside the car and on the roof an angle iron framework is added underneath the car body. Some details are shown in the view of the underneath car body construction. The storage battery car truck as originally used consisted mostly of a top frame piece, which was a 3 in. x 5 in. x ½ in. angle. As these battery trucks are not used with the new construction, this angle was available for the car body reinforcing. It has thus been saved and is bolted to the car body along each lower edge. To these side angles trusses for the car body, the car equipment itself is bolted. Two 3 in. x 3 in. angles are fastened to the inside edges of the side angles to provide substantial supports for the air compressor, the brake cylinder and the control group switch. These also help to tie the sides together. Additional angles running lengthwise on the car body are installed to these cross members to provide support for the equipment in the location necessary. The heavy equipment is thus supported entirely by this angle framework independent of the car body. As the body end and center spring caps are bolted directly to the side angles the weight of this supporting framework, together with the equipment parts, is transmitted directly through the end and center springs to the truck. The truck used is the standard Brill No. 79-E with 24-in. wheels.



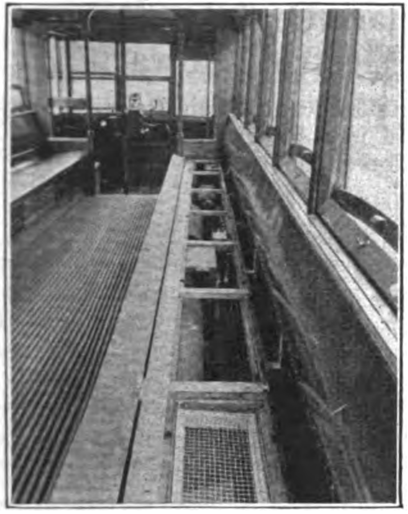
AT LEFT, END AND SIDE TRUSSES USED TO STRENGTHEN CAR BODY. AT RIGHT, END TRUSS CARRIED ACROSS CAR TO SUPPORT ROOF

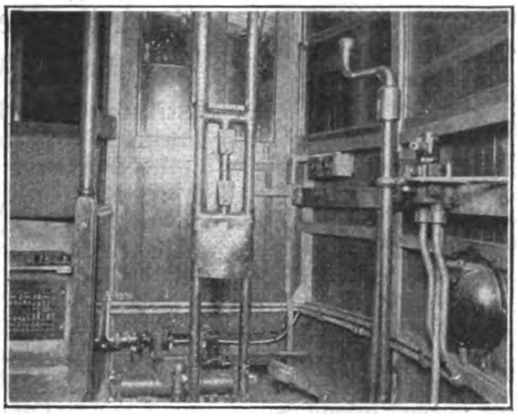
The control and operating equipment for the car is of a new type designed by J. S. McWhirter, superintendent of equipment Third Avenue Railway, and built by the Westinghouse Electric & Manufacturing Company. Its chief feature is the arrangement for foot operation of the control, air brakes and doors so as to leave the operator's hands free for collecting fares, issuing transfers and other necessary duties. All of the well known safety features commonly used for car operation by one man are provided but are accomplished by new methods. The "dead man" feature for cutting off power and applying the air brakes includes in addition to the emergency application of the brakes the exhausting of air from the door operators, so that the doors can be readily opened by hand. Interlocking of door and control circuits also makes it impossible to start the car with doors open or to open them before the car stops. The control and operating equipment consists of the following apparatus: Two 506-A motors, two 33-A selector switches, two 494 control and reset switches, two 503 canopy switches, one 108-B automatic sequence switch, one 801 switch group, together with the necessary rheostats for the control and motor circuits, and the foot attachment to the controller and air brake valve, as shown in the illustrations of the platform equipment.

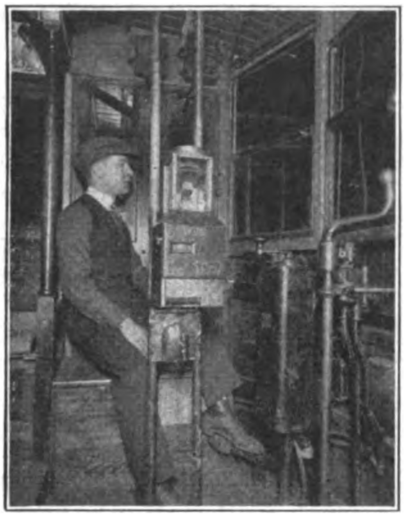
The functions and the various features of the apparatus will be best understood from a description of its operation. The selector switch, which is more commonly known as a master controller, has besides its neutral position three points forward and three reverse. The three points used for forward movement are, first, a position with the two motors in series and all resistance in circuit; second, a point with both motors in series and all resistance cut out, and, third, a full parallel position with all resistance cut out. The closing of the circuit for the operation of the various switches in the switch group is accomplished by pushing down the foot pedal by the operator. Thus, to operate the car forward, the handle of the selector switch is placed in any of its three positions, according to traffic conditions, and the operator by pushing down on the foot pedal then closes the auxiliary control circuits and the car will automatically accelerate to the speed desired and the car will continue to run at that speed until the handle of the selector switch is placed in another position, at which time the control will adjust itself to the changed position.

Of the three reverse points on the selector switch the first two are the same as the first two for forward movement, except of course that the car will run in the reverse direction. The third point, however, is an emergency one. In this position the circuits are established for bucking the two motors. Line voltage is entirely cut off and the circuits are closed, so that the counter electromotive force will cause one motor to act as a generator, through the various windings of the other motor, and thus provide an emergency means for stopping the car should the air brakes and power fail. This position of the handle for the selector switch is mechanically interlocked, so that when the handle is once placed in this position it must remain there until it is unlocked by pulling down a short wire which projects from underneath the selector switch. To return the handle to its "off" position this must be unlocked and held in the unlocked position with one hand, while the other hand returns the handle to the desired position. This feature is to avoid the possibility of operating in and out of this emergency point, as there is danger of burning the controller contacts should the circuit be closed or immediately opened before the car stops.

The contacts in the selector switches close the circuit for operating the group switch, which consists of five contactors electrically operated. These contactors close the main circuits for the series and parallel positions of the motors and for the cutting out of the main motor resistance. The "on" movement of the various contactors in the group switch is regulated by a sequence switch, which prevents the changing of connections for cutting out an additional step of resistance or for changing from series to parallel position until the current value for that particular point has dropped to a safe limit. This sequence switch, however, is not a time or current limit, but is controlled by the load on the main motors. The sequence switch consists of a small drum which has segments for making contact with fingers similar to the ordinary controller. This drum is operated by a small motor connected in parallel with one of the main motors and drives the drum through a worm gear. The speed of this motor varies with the load on the main motors operating the car, so that the acceleration of this small motor is controlled by this load. The circuits established by the selector switch in







At left, much of the electrical equipment is located underneath the longitudinal seats. In center, the door operator is located opposite the unused left hand door. At right, a box covering for the door operator serves as a seat for the motorman.

LOCATION OF EQUIPMENT UNDER LONGITUDINAL SEATS AND IN VESTIBULE MAKES INSPECTION AND REPAIR AN EASY TASK

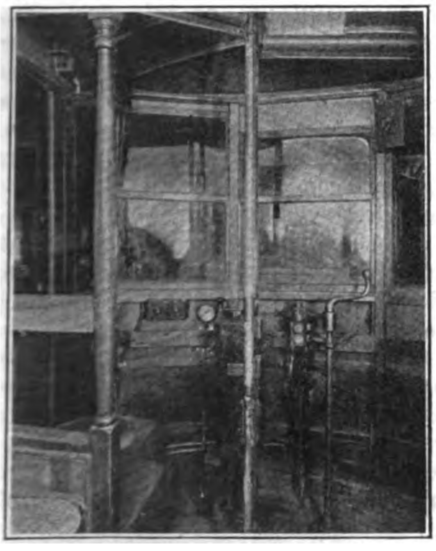
turn control the operation of the contactors, so that the acceleration of the car is in reality controlled by its load and the speed at which it accelerates with this load.

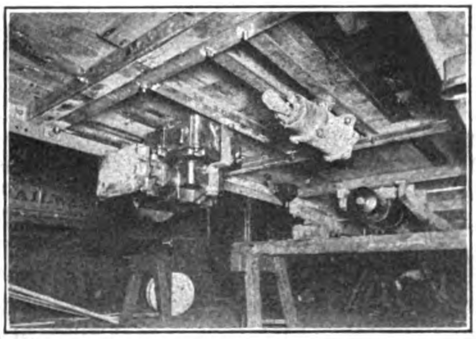
Foot Operation of Control

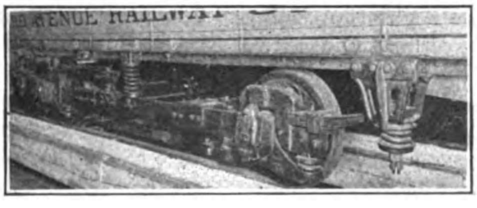
The foot-control mechanism consists of a pedal hinged so that the front portion operates up and down. The rear end of this pedal is weighted so that the front end is kept normally in its "up" position. Through its mechanical connection to the brake valve and its mechanical and electrical connections to the control equipment with the pedal in its "up" position power is cut off from the motors and the brakes are applied in emergency. The so-called "dead man's" feature is thus provided with this equipment, in a similar manner to equipments having hand operation, except that in this case the emergency application occurs when pressure is released from the foot pedal. This pedal is made so that it will fold out of the way when the operator is not using that end of the car.

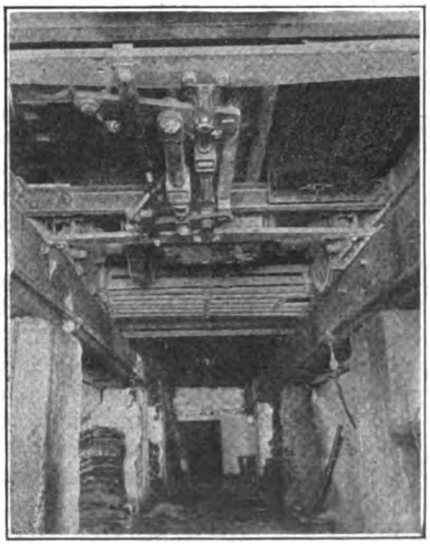
By pushing down the foot pedal necessary connections are established for closing the door on the operator's end or both doors if they are open. Interlocks are provided to the doors, so that when they are closed circuits are established for the operation of the control and the movement of the car. The circuit for opening the door is interlocked through the line switch, so that the doors cannot be opened while power is on, and also through a relay which is operated by the regenerative voltage of the main motors, so that the doors cannot be opened while the car is coasting. This interlocking of the control and the door-operating equipment provides another much desired safety feature, which is that the car cannot be started with the doors open and the doors cannot be opened while the car is in motion.

In the view showing the operating equipment as installed on the platform of these cars two push buttons may be seen just to the left of the selector switch. These push buttons are furnished by the Consolidated Car Heating Company and are arranged for use on 600 volts. Each has its distinctive function. The left push button of the two is for opening the doors. This establishes the circuit through the magnet of the door engine, which is of the National Pneumatic Company's type of electro-pneumatic engine. The push button to the right of this is an emergency button for the operation of the car and it enables the operator to start the car with the doors open by holding in this button. This









AT LEFT, THE FOOT PEDAL FOLDS BACK OUT OF THE WAY WHEN NOT IN USE. TOP, CENTER, HEAVY EQUIPMENT IS SUPPORTED FROM ANGLE IRON FRAMEWORK UNDERNEATH CAR BODY. BOTTOM, CENTER, SAFETY CAR TRUCKS AND LONGITUDINAL ANGLE REINFORCEMENT OF CAR BODY. AT RIGHT, SIMPLIFIED BRAKE RIGGING MAKES SLACK ADJUSTER INSTALLATION EASY may be used in case a door is inoperative or at other locations where it is desirable to operate the car with the door open.

The air line to the door engine is charged through what is known as a standard Westinghouse "on" magnet, which allows air to enter this line only when the valve is energized electrically. This magnet is connected with the foot pedal and control mechanism in such a way that whenever the air brakes are applied in emergency application or whenever power is lost by the pole coming off the trolley wire this magnet is deenergized and immediately air is bled from the door engine line, so that the doors can be readily opened by hand. Otherwise, with the air pressure on the door engine they are locked and cannot be opened except as controlled by the operator.

HAND-OPERATED SANDING PROVIDED

To the left of the operator and convenient for him as he sits on his seat is the sand lever, which is operated by pulling toward the operator. This is within easy reach and as both hands of the operator are free in the major operation of the car sand can be applied as is desired.

Directly above this sanding lever may be seen the end of a bell cord which rings a gong on the roof. As the operator uses his feet on the pedal, hand operation of the gong is essential, also its location on the roof apparently has added advantages in ease of inspection and repair.

Standard straight air brake equipment is provided for these cars. This equipment is not new, and with the exception of the brake cylinder, which is 6 in. x 10 in., the other parts were taken from cars of the company not at present in service. The air brake equipment includes a National A-3 compressor, National type PV brake valve, a Westinghouse type E governor and standard Westinghouse gages. As already mentioned, operation of the brake valve is by means of the foot pedal. These cars are also equipped with standard Peacock type G brakes, with drum sheaves to reverse the motion of the chains. In the view of the car showing the underside completely equipped, the compressor, group switch, brake rigging and a Gould slack adjuster may be seen. The car body brake rigging as installed provides a very simple arrangement.

OTHER CONSTRUCTION AND EQUIPMENT DETAILS

On each platform just to the right of the operator are two upright stanchions, which serve as guides for the curtain used to protect the motorman from the light when operating at night. These stanchions also serve as supports for a Johnson fare box. Its location is directly in front of passengers as they board the car and within easy access of the operator.

Other equipment used on these cars are Consolidated Car Heating Company's panel heaters, of which six are provided for each car; Utility Company's thermostat and heater switch for controlling heat regulation, which is standard for the Third Avenue system; a coasting recorder, Hunter illuminated signs and a General Electric electrolytic lightning arrester.

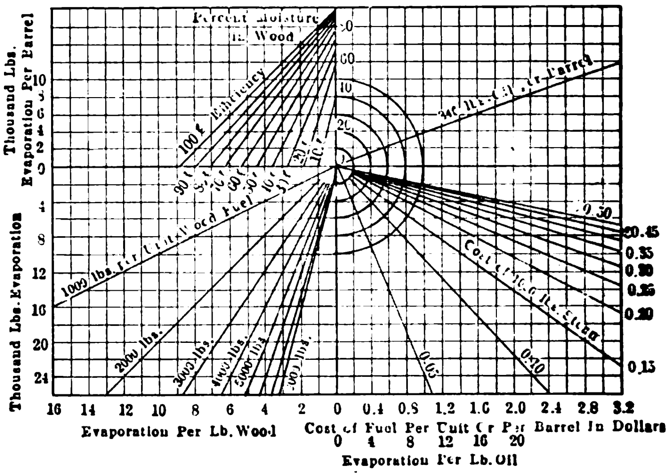
These cars as reconstructed weigh 15,000 lb. and have longitudinal seats which seat twenty-six passengers. At this writing fifteen cars are in service and arrangements have been made for equipping a total of fifty of these cars as rapidly as the equipment can be delivered by the manufacturers.

Fuels to Replace Coal Are Being Sought by Electric Railways*

Substitutes Were Proposed and Their Relative Advantages Presented in a Recent Paper Before the Portland Convention of A. I. E. E.

BY DARRAH CORBET
With Charles C. Moore & Company, Seattle

SAWMILL refuse, ranging from fine sawdust to large blocks of hard wood, at least 1 ft. square, is available for fuel in power stations in many sections of the country, particularly in the Northwest. Such fuel has been successfully used by the Portland Railway, Light & Power Company. Extensive tests made in connection with the use of this fuel by the latter company are included in the paper. Analyses of the various kinds of wood available in such refuse are given, together with their heat units and relative fuel values. An average of approximately 8,500 B.t.u. per pound of dry non-resinous wood is used in the tabulation.



CURVES OF COMPARATIVE VALUES WOOD AND OIL FUEL
Evaporation from and at 212 deg. F.

This fuel can be readily stored for a considerable length of time, either in fuel houses or in the open air. There is unquestionably some depreciation in the fuel value of such refuse after storage. Cases are cited, however, of successful use of this fuel after several years' exposure. The amount of ash and moisture was found to be somewhat increased, however. The storage and use of this fuel are not considered to be a great fire risk, and no record has been made of any fire having been started in a fuel house or a pile of fuel due to spontaneous combustion. Few fires have occurred which have destroyed fuel houses.

Although it is probable that better efficiency could be secured with hand firing and special furnace design, in the majority of installations the original furnace is fed in a more or less continuous stream, the fuel being delivered through a hole in the top of the furnace and allowed to pile up in a cone on the grate. Such a method is very economical of labor, as one man can readily take care of several thousand horsepower of boilers in a properly designed plant. Desirable changes in furnace design are included in the paper in considerable detail.

Although there are several methods of determining the available heat value of such fuel, the accompanying diagram showing a comparison between the economies of such refuse and fuel oil is expressed in terms of the calculated total heat in a pound of dry wood. The unit of measurement for such fuel has been rather arbitrarily established as 200 cu.ft. Of course, the weight of the various fuels per unit will vary somewhat.

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*Abstract of paper presented at Pacific Coast convention of American Institute of Electrical Engineers, Portland, July 21-24.

"As an explanation of the use of the curve we can assume the following conditions and follow through a determination: Oil, $1 a barrel; 12 lb. evaporation per pound of oil; sawmill refuse fuel, containing 45 per cent moisture, weighing 20 lb. per cubic foot; efficiency 60 per cent. The problem is to determine what can be paid for sawmill refuse fuel per unit to equal the fuel value of oil at the price stated.

Starting with the value of 12 lb. of evaporation per pound of oil, directly above this at the point of intersection with the line indicating the pounds of oil per barrel, we note that on the left the total evaporation per barrel of oil is 4,080 lb. Transferring this below the line as indicated by the semicircle and carrying 4,080 lb. evaporation across to the right we note that over the figure $1 per barrel the cost of 1,000 lb. of steam is about 24½ cents.

Starting again with 45 per cent moisture in the sawmill fuel and going to the left to the point of intersection of 60 per cent efficiency, we note that the evaporation per pound of wood is approximately 2.3 lb. water, or with 4,000 lb. per unit this is equivalent to about 9,200 lb. of water per unit of fuel. Carrying this to the right to the point of intersection with the line indicating cost of steam 24½ cents per 1,000 lb., we note $2.25 as the equivalent cost of a unit of fuel.

On the same basis, if oil cost $2 a barrel the equivalent cost of sawmill refuse would be twice the above, or $4.50 a unit. In this manner a ready reference is secured and the curve can probably be read far more accurately than will be the assumptions made.

With regard to the use of powdered in place of ordinary coal, the results obtained by several power stations, particularly in the Northwest, are quoted.

At the plant of the Pacific Coal Company at Renton, Wash., about 200,000 tons of sludge coal have accumulated during the past fifteen years, which tested with 20 per cent moisture, 25 per cent ash and about 7,500 B.t.u. per lb. This fuel is practically useless in its present form, but after being pulverized an average evaporation at this plant of 5 lb. of water from and at 212 deg. F. per pound of coal was secured. An evaporation of more than 9 lb. per pound of dry Issaquah screenings containing 11,400 B.t.u. per lb. was also obtained.

As a result of the readiness with which powdered coal can be used in handling overloads, because of the possibility of lighting and putting out fires quickly, it is quite probable that this fuel will be used quite extensively in the future. It is stated that the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has recently decided to install a powdered-coal burning equipment for a new 40,000-kw. station, to contain eight 1,308-hp. boilers to be operated at 250 per cent of their rated capacity continuously.

Although the problem of using fuel oil in the future is dependent upon the extent to which its cost is likely to rise, the author feels that the installation of oil-burning apparatus, making use particularly of mechanical methods for atomizing the oil, is worthy of serious consideration. This is especially true in the case of standby equipment. Details are given in the paper regarding five rather extensive tests made by the Babcock & Wilcox Company, making use of Lodi mechanical oil burners in connection with its boilers.

Summing up the information contained in this article it seems probable that it will be necessary to curtail somewhat further developments in the use of oil fuel. This leads to the greater consideration of coal, which will unquestionably be more extensively used in the future, both in stokers and in powdered form. There is a limited field for the use of sawmill refuse, but where it is possible to secure this fuel at approximately present prices it can unquestionably be used to greater advantage, and a more extensive use of it may develop a better and more efficient means of handling and burning it than we have at present.

Railway Situation Analyzed*

Investment Bankers' Committee Believes Eventually Electric Railway Securities Will Again Attain a High Investment Standing

THE real question as to the security of electric railway investment is not to be answered by the income statements they have shown. Electric railway securities are a good example of the kind of investment that has suffered most, for the present, from the war's effects. High labor costs, high material costs, high capital costs, combined with a low price for the product, transportation, could not possibly result in anything but discouraging statements. Since electric railroads perform a public service and are subject to regulation, they have not been able promptly to adjust the prices for their product to the cost, as competitive industries have done. Financial statements may indicate the progress that is made in readjustment, but sound judgment as to the real worth of investments in electric railways must go much further.

THE QUESTIONS AT ISSUE

Intelligent judgment of the future worth of street railways must be based upon the answers to such questions as the following:

Will there continue to exist a sufficient demand for the kind of transportation service that electric railways have furnished?

Is the automobile supplying this service and will it gradually supply the greater part?

Is it possible to charge fares that will pay the operating costs and leave sufficient margin to attract capital?

If there are fares that will do this will the public consent to the increase?

The mere putting of these questions suggests what is actually taking place. The sheep are rapidly being separated from the goats. Unquestionably there are roads, particularly small suburban and interurban lines, which, due to local conditions, are finding that the automobile has taken away sufficient traffic to make the remainder much too small to keep the line alive with any fare possible to collect. It is usually true, however, that these lines are the very ones that were unprofitable even when all conditions were favorable. The first effect of the discovery that there are electric railways that cannot be successful is to create doubt that any can be successful, but so superficial a view is sure to be modified and the credit of sound roads is likely to be benefited through a confidence that is the result of intelligent analysis and real conviction.

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*Interim report made by Russell Robb, chairman of subcommittee on street railway securities of the standing committee on public service securities of the Investment Bankers' Association of America.

There is a widespread feeling that since the advent of the automobile the electric road has lost a large part of its traffic. Studies of traffic statistics do not bear out this supposition. There has been a great amount of transportation created by the automobile and it has absorbed a part of the normal increase that would have come to the electric roads, but in city systems particularly studies show that with considerable uniformity electric roads are carrying many more passengers than they did ten years ago, or even five years ago, and are even furnishing many more rides per capita. In many cases this increase has occurred in spite of little increase in facilities because of the difficulty in attracting new capital.

TRAFFIC INCREASING DESPITE AUTOMOBILES AND HIGH FARES

In the great majority of places there is every reason to believe that the answer to the first and second questions will prove to be that there will continue to exist a sufficient demand for the kind of transportation service that electric railways have furnished and that the automobile, though subtracting something from what the electric road might have had, will not prevent the electric car business from growing.

Even a very large and a growing business will not bring prosperity with low fares. Costs of everything have about doubled. Doubled fares would be not more burdensome than items every one is meeting at every turn, and very many riders have twice the wages with which to meet them. If doubled fares were paid with the readiness that has been shown in retail purchases, it is safe to say that the street railway business generally would be more prosperous than it has ever been before.

Improvements in operation, however, the use of the light one-man car, the betterment of station efficiency and all the economies stimulated by adversity have made it possible for roads to approach a prosperous condition with considerably less than doubled fares. There was fear at first that increased fares would so reduce the riding that it might not be possible to charge the fare necessary to pay the operating costs and leave sufficient margin to attract capital. This fear is fast disappearing. Agitation and the stimulation of discontent with the increase do of course prevent the full benefit that might be obtained, but the experience has been that though there is at first a considerable decrease in riding when fares are increased the passengers carried gradually tend toward the number that rode before the increased fares were put into operation.

Whether the public will consent to the increasing of fares seems to be largely a question of the political advantages there may be in opposing the increase, and these political advantages depend very largely on local street railway history and the public relations established by the management. The modern street railway operators through frank disclosure of all the facts and a courteous attitude toward the public and its representatives do much to remove old time prejudices and to secure local and official support and fair treatment. The state commissions for the regulation of public utilities have very generally granted increases and there is a formidable list of cities with fares of 6, 7, 8, 9 and 10 cents now in force. In fact the cities where fares have not been increased above pre-war levels are in a rapidly dwindling list.

ULTIMATE BENEFIT FROM PRESENT TROUBLE

It is not unlikely that in the end many electric roads will be found to have benefited from the very severity of the blow they have received. For many years before the war electric roads were suffering from their burdens. Costs had even then risen considerably and returns on capital were low, there were constant importunities to build extensions and to add service, taxes were increased steadily and paving burdens were laid wherever possible. The popular belief that the roads were enormously profitable was so strong that no denial was credited and regulating bodies seemingly dared not judge street railway situations on their merits because of the preconceptions of the public. The last six years have dissipated the fiction. It has become plain to the dullest that a public franchise has no peculiar power to produce surpluses from deficits. The willingness in some cases to abandon lines, in others to sell to municipalities, in others to rest in the arms of receivers have convinced the public at last that, like any other business, there are investment costs, receipts and operating costs, and that these are all determinable. Many state commissions have not only listened without bias to the street railway rate cases but in their decisions have admirably set forth the principles that should be followed in future treatment. The rate cases have established values which from now on will serve as starting points. Service-at-cost franchises are being worked out that will assure the security of the investment and regulate fares so that they will be no more than necessary, but still sufficient to keep the business healthy and progressive.

Your committee hardly looks for spectacular improvement in street railway credit or sudden rise in the values of their securities, but it believes that the change in the public attitude toward the business, the constructive work being done by the commissions, the clearness with which the basic facts of the business are coming to be understood are all working toward secure conditions for the industry and will result finally in income returns which even though moderate will, by their steadiness and surety, give again to electric railway securities their high investment standing.

Welding Economies

THE wear of journal boxes used on electric cars is chiefly at the pedestal guides. Frequently these wear entirely through at these points and on many roads the journal boxes are then scrapped. The Chattanooga Railway & Light Company is repairing worn journal boxes by welding ¼-in. steel chafing plates into the pedestal guides. The cost of repairs made in this manner averages but 50 cents per box, while the cost of a new box would be at least from $6 to $10.

Another example of quick repair work done in the shops of this company is the welding of spouts to sand boxes. Extra sand boxes are rarely kept in stock and the replacement of a damaged box ordinarily takes several days. By the use of an Oxweld blowpipe broken spouts are quickly restored and the cost is less than 75 cents per operation.

Analyzing Kansas City Traffic

Fourth and Fifth Sections of the Beeler Report on Traffic Conditions Set Forth Limitations on Grand Avenue and Walnut Street and Make Remedial Recommendations

THE fourth and fifth sections of the report by John A. Beeler, consulting engineer, New York, on traffic conditions and methods of improving the service of the Kansas City (Mo.) railways deal respectively with the situations on Grand Avenue and on Walnut Street, both being important streets extending through the business district of the city. The various conditions which combine to slow up the movement of the cars are analyzed and recommendations are made as to changes in the number and location of passenger stops, double berthing, use of elevated platforms, limitation of automobile parking, intersection movement of cars, etc. Similar recommendations were made to improve the conditions prevailing on the streets covered in the first three sections of the report, which were treated in the Feb. 14 and April 3, 1920, issues of the ELECTRIC RAILWAY JOURNAL.

Grand Avenue, the street dealt with in section four of the report, is the one wide thoroughfare in Kansas City's business district. The report points out that this roadway is of sufficient width that street cars and vehicles should be able to make excellent progress, but because of congestion at the intersections and the large number of vehicles using the street all traffic is badly impeded. In addition, street cars are loading heavily in both directions when the congestion is worst, and with present loading facilities the stopping time is prolonged. Practically all lines operating on Grand Avenue are outbound and therefore subjected to heavy loading during the afternoon rush hour as they are receiving outbound traffic. The total number of cars passing over this street is not excessive nor is the unbalancing of traffic in the two directions large. The worst conditions exist between Thirteenth and Fifteenth Streets, where fifty-five cars are scheduled northbound and seventy-nine southbound during the hour between 5 and 6 p.m. At the five principal intersections with Grand Avenue, however, there are a total of 946 car movements scheduled during this evening hour, which is partly responsible for the slow speed prevailing on this street. At the Eighth Street intersection there are 241 cars scheduled to pass during the evening rush hour, which is more than at any other point in Kansas City. Yet this intersection is now occupied by cars but 50 per cent of the hour.

In commenting on this situation at the Grand Avenue and Eighth Street intersection the report points out that previous to the Eighth Street changes, described in an earlier section of the report, 203 cars were observed in a maximum hour, while a later count, after the changes recommended by Mr. Beeler had been installed, showed 240 cars passing through the intersection in the same period. This not only represented a gain of 18 per cent but showed that it is now possible to get the scheduled cars through, even though the number of cars making the right-hand turn has increased nearly 100 per cent. As a result of the changes in location of car stops and other improvements for facilitating the movement of cars, the crossing time was decreased for every kind of car movement required, westbound cars showing 33.7 per cent improvement in intersection efficiency, southbound cars 26.7 per cent and eastbound to northbound cars 18.5 per cent.

At the Fifteenth Street and Grand Avenue intersection a total of 171 cars passed through the intersection between 5 and 6 p.m., occupying the intersection 2,103 seconds, or 58.5 per cent of the hour. Car movements at this point were much slower than at Eighth Street, where 240 cars were passed in 2,155 seconds, or in practically the same time. The speed of cars in the Fifteenth Street intersection is also shown compared to that at Eighth Street. The crossing time per car at Eighth Street averages 10.2 seconds, while at Fifteenth Street the average is 12.5 seconds, which is over 22 per cent more. The large number of turning movements required is the primary cause of the lower speed existing at this intersection. It is shown that 34 per cent of the 175 cars scheduled through this intersection must make either the right or left hand turn, of which 24 per cent make the slow left-hand turn. Rerouting of lines so as to reduce the number of cars turning will minimize delays at this point. Until such changes can be effected double berthing and a slight rearrangement of passenger and positive stops will afford much relief.

The average speed of southbound cars between Seventh and Fifteenth Streets on Grand Avenue was found to be but 4.18 miles per hour during the evening rush hour. From Seventh to Eighth Street the cars averaged but 3.03 m.p.h. and from Tenth to Twelfth Street 3.93 m.p.h. The northbound cars, although these are less in number and some are not loading heavily, do but little better, as the average speed from Fifteenth Street to Seventh Street is only 4.83 m.p.h., while from Thirteenth Street to Twelfth Street it drops to 3.49 m.p.h. During the fifteen-minute period from 5:30 to 5:45 the southbound cars averaged but 1.64 m.p.h. between Seventh and Eighth Streets.

EFFECT OF VEHICLE PARKING SHOWN

Referring to the effect of vehicle parking along Grand Avenue, the report states that although the roadway has a width of 69 ft. from curb to curb vehicular parking often interferes with both vehicular and car movement. The greater width of street invites parking in double rows, and observations show that even during the heavy rush hour vehicles often stand in triple rows at the most congested point. A vehicular count taken during the morning rush hour at Twelfth Street shows that 1,251 vehicles passed through the intersection in one and one-half hours from 7:30 to 9 a.m., of which number 617 came from the north and 463 from the south. The striking feature is that at this morning rush hour jitneys constituted 59 per cent of the vehicles from the north and 27 per cent of those from the south. During the two hours from 4 to 6 p.m. 2,104 vehicles passed through the intersection at Twelfth Street. Of this number 955 entered from the north and 780 from the south. During the hour from 5 to 6 p.m., which is the maximum rush hour, jitney traffic constituted over 30 per cent of the total at this intersection. Similarly, at the Eighth Street intersection, of 860 vehicles passing through the intersection, 32 per cent were jitneys. From the above it may be seen that a very large proportion of the congestion on Grand Avenue is due to the number of jitneys operating both north and south bound over this avenue during the morning and evening rush hours.

In order to determine the service rendered by jitneys a count of all automobiles was made at Twelfth Street and Grand Avenue. This showed that from 4 to 5 p.m. 951 vehicles transported 1,900 persons through this intersection, or at the rate of two per vehicle, including the driver. Included in the above total, 231 jitneys carried 527 passengers through this intersection, which is only 2.3 passengers per jitney. From 5 to 6 p.m., when the streets are necessarily congested, 353 jitneys crossing the intersection transported 1,501 passengers, or 4.3 passengers per jitney. During this period seventeen street cars, or 8.7 per cent, added to the existing service would have provided ample transportation facilities for all jitney patrons and the vehicular congestion would have been reduced over 30 per cent.

In general, the large number of vehicles moving north and south bound on Grand Avenue is the cause of much street car congestion and the slow movement of this service. Vehicles block the space between cars and sidewalks, especially when both cars and vehicles are standing at an intersection, so that pedestrians and street car patrons find it difficult to cross the street or board a waiting car. Intersections are congested and boarding movements are greatly delayed. Cars are slowed down and thrown off schedule. This results in poor service for street car patrons as well as congestion and slow speed for all vehicular traffic.

MEASURES RECOMMENDED FOR RELIEF

The measures recommended in Mr. Beeler's report to expedite traffic movement were as follows:

1. Arrange the rear door of all safety cars so that they may be opened by street collectors, enabling faster loading for this type of car.
2. Use raised platforms in the streets at seven important passenger stops in the congested districts.
3. Combine and relocate passenger stops so that boarding and alighting facilities will be improved, including double berthing arrangement at twenty-three locations.
4. Give Grand Avenue cars the right of way over less important intersection lines.
5. Reroute some of the car lines so as to reduce the number turning into and out of Grand Avenue.

As these recommendations are much the same as were made in connection with conditions treated in earlier sections of the report, and described somewhat in detail in the previous issues of the JOURNAL referred to, the details will not be taken up here.

The result of the recommendations as to stop changes in the section of Grand Avenue between Third and Twenty-seventh Streets, a distance of 2.25 miles, would be to reduce the number of passenger stops from fifty-three to thirty-eight. They would average 8.4 to the mile, as against 11.78 stops per mile under present operation. This is a reduction of 17 per cent. Positive stops on Grand Avenue would be reduced from thirty-two to eight. This would give the right of way to Grand Avenue cars over those of less important intersecting lines. Seven "slow" signs were recommended as safety measures to be observed by Grand Avenue cars.

Section V of the report deals with Walnut Street, which is a high-class retail thoroughfare. Operating on this street there are three lines which furnish service in both directions and four other lines which furnish service in one direction only. Between Tenth and Fifteenth Streets 75 per cent more cars are scheduled northbound than southbound, and from Eighth to Tenth Street there is an excess of 35 per cent in the opposite direction. This unequal distribution of northbound and southbound cars gives an unbalanced traffic movement that is a factor partly responsible for the congestion during the evening rush.

There are 944 cars scheduled through seven Walnut Street intersections during the evening rush hour. There are also a large number of right and left hand turning movements required at these principal intersections. This points to the obvious desirability of providing sufficient berth capacity and keeping the straight track open at intersections where large numbers of cars are turning. In this connection it is pointed out that the changes recommended and later installed on the Eighth Street lines brought about a decrease of over 20 per cent in the crossing time for cars making the right-hand turn at Grand Avenue and over 40 per cent for cars making the left-hand turn, while the average decrease for all cars was 17.5 per cent. This resulted in the crossing being unoccupied 3.5 per cent more of the time, despite the fact that 22 per cent more cars were passed through the intersection during the maximum hour. Recommendations similar to those for Grand Avenue were made as to the rearrangement of stops and a co-ordination of vehicular and street car movement by traffic officers for the Walnut Street intersections.

Time study made as to the running time of cars along Walnut Street between Eighth and Fifteenth Streets during the rush hour from 5 to 6 p.m. showed that southbound cars move at the rate of 4.62 m.p.h., while from Tenth to Twelfth Street they average only 3.08 m.p.h. Northbound cars in the first instance make but 3.57 m.p.h., while this is reduced to 2.41 m.p.h. between Tenth and Eighth Streets. The slowest speed observed was made by northbound cars between Tenth and Eighth Streets, where for a period of 15 minutes their speed was reduced to 1.45 m.p.h.

The location of passenger stops, their close proximity to each other, the lack of double berthing and the poor loading facilities, vehicular parking, congested street traffic and unbalanced routing of cars are factors all contributing to the slow car speed prevailing on Walnut Street.

PARKING OF VEHICLES

On Walnut Street any parking of automobiles compels moving traffic to run so close to the car tracks that street car movements are retarded. Occasionally double rows of parked vehicles force the moving traffic on the car tracks at loading points. This prevents street cars from pulling into the berths, keeps patrons from reaching the cars and destroys regularity of service. The consequent delay of the street cars is the cause of much overloading which otherwise would be largely eliminated.

Between the hours of 4 and 6 p.m. 1,369 vehicles passed through the intersection at Walnut and Twelfth Streets, carrying a total of 3,343 persons, including the drivers. This is at the rate of 2.4 persons per vehicle.

Deduct the jitney and truck drivers, and less than two passengers per vehicle are carried. This vehicular traffic is a major cause of congestion, slow loading and consequent slow speed. At the intersection at Eighth and Walnut Streets 1,134 vehicles pass through in the rush-hour period between 4 and 6 p.m.

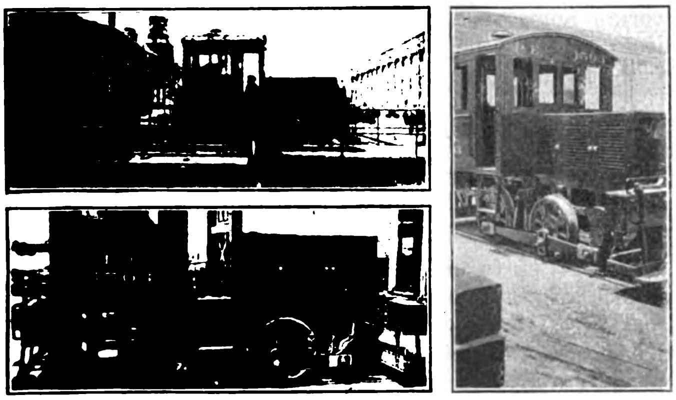
During the maximum evening hour the jitneys operating over Walnut Street through the congested district constitute over 50 per cent of the vehicular traffic in each direction. The vehicle passenger counts made show that an additional street car every five minutes would care amply for all the jitney passengers and would reduce the vehicular traffic movement 60 per cent in the heavy direction of travel. This gives some indication of the inefficiency of the jitney as a common carrier.

The recommendations made as to relocation and reduction in the number of passenger stops were shown to reduce the passenger stops from thirty-three to twenty-three, or about 30 per cent, and positive stops from twenty-seven to ten, with slow-speed signals increased from four to seven. The recommendations covered also the installation of double berth passenger stops at eighteen points on Walnut Street and three points where car lines are turning into Walnut Street.

Novel Type of Yard Locomotive

THE mechanical department of the Pacific Electric Railway has designed, built and placed in operation a new yard locomotive for use in the yards at the new Torrance shops.

The locomotive has a draw bar pull of 3,000 pounds with a weight of 22,000 pounds on the 32-in. drive wheels. The length of the locomotive is about 20 ft. A six-cylinder, 70 to 90 hp., automobile type gasoline engine is the power source for the locomotive. The engine is connected by a friction disk clutch and propeller to a jack shaft, to each end of which the side rods are attached by means of cranks and pins.



VIEWS OF A NOVEL TYPE OF YARD LOCOMOTIVE USING AUTOMOBILE ENGINE WITH A JACK SHAFT AS THE SOURCE OF POWER

The locomotive is intended to be used solely in moving cars from one shop building to another or to and from the transfer table. It permits quick handling of disabled cars on dolly trucks.

The Ontario Safety League, Toronto, is sending to school children copies of letters from the Mayors of Canadian cities commending the work of the league and giving suggestions as to how they can assist in reducing accidents.

Invites Charter Members

Federated American Engineering Societies Ready for Business—First Annual Meeting of American Engineering Council in November

THE joint conference committee of the four "founder" engineering societies has just issued the following invitation to all engineering and allied technical organizations in the country:

> The joint conference committee of the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, acting as the ad interim committee in accordance with the authorization of the organizing conference held in Washington, D. C., June 3-4, 1920, extends to your organization a cordial invitation to become a charter member of The Federated American Engineering Societies and to appoint delegates to the first meeting of the American Engineering Council, of which due notice will be given, to be held in the fall of this year.
>
> There has been previously sent to you an abstract of the minutes of the organizing conference, at which there were in attendance 140 delegates, representing seventy-one engineering and allied technical organizations. It was the unanimous opinion of the conference that there should be created an organization "to further the public welfare wherever technical knowledge and engineering experience are involved and to consider and act upon matters of common concern in the engineering and allied technical professions," and that this organization should consist of societies or affiliations, and not of individual members.
>
> On the basis of these fundamentals the attached constitution and by-laws were unanimously adopted by the conference. These contain full information concerning The Federated American Engineering Societies, the American Engineering Council, its executive board, and of the various officers and committees. The basis of representation therein stated for the American Engineering Council is one representative for from 100 to 1,000 members and an additional representative for each 1,000 members or major fraction thereof.
>
> At the gathering in Washington,* which was the greatest event in the history of the engineering and allied technical organizations in this country, steps were taken which created "The Federated American Engineering Societies," which will have a far-reaching influence on the future of these professions. The fact that this action was taken without a dissenting vote indicates that the psychological moment had arrived and that there was a unanimous desire on the part of the representatives of these professions for the organization formed.
>
> The joint conference committee, the ad interim committee, would ask each organization invited to take favorable action in the matter of membership in the organization at the earliest possible moment and to advise the committee promptly of the names of the delegates who will attend the first meeting of the American Engineering Council in November of this year.
>
> The joint conference committee is confident that with the universally acknowledged need for such an organization there will be a prompt affirmative response to this invitation.

The committee has also recently issued its Bulletin No. 3, outlining in some detail the purposes of The Federated American Engineering Societies. This bulletin also outlines the various past activities of Engineering Council, at present consisting of representatives of six societies, A. S. C. E., A. I. M. & M. E., A. S. M. E., A. I. E. E., A. S. T. M. and A. R. E. A., and shows how the way has been opened for American Engineering Council, the operating organization of The Federated American Engineering Societies, to succeed Engineering Council and speak for the whole body of engineers and allied technologists on matters of general public interest and welfare.

The bulletin also answers the question as to what the federated societies intend to do and says in this respect:

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*See ELECTRIC RAILWAY JOURNAL, June 12, 1920, p. 1213.

> What it intends to do is to use its power for the service of the community, state and nation in public affairs wherever engineering experience and technical knowledge are involved and to consider and act upon matters of common concern to the engineering and allied technical professions.
>
> In the conduct of many public matters which are essentially of an engineering nature it is vital to the public welfare that engineers and allied technologists should lead.
>
> * * * * *
>
> It is the duty of the engineer to take up public service work. It is incumbent upon him as a citizen to "do his bit." and there is the added responsibility due to his special knowledge and experience which is primarily of importance in the execution of public work.
>
> The Federated American Engineering Societies will speak for a group of citizens who by reason of special training and knowledge represent a high order of intelligence, and who individually and collectively would be derelict in their responsibility for the talents they possess if they did not apply them unselfishly for the common weal.
>
> In unity of action there will of necessity be strength and power.

Bulletin No. 4, just issued, gives a story of the Washington organizing conference as reflected by excerpts from the editorial and other comment in the technical press.

A comprehensive survey of the editorials, reports and comments which appeared in the technical press and society journals was published recently by the McGraw-Hill Company under the title "Engineers Unite."

The headquarters of the joint conference committee are in the Engineering Societies Building, 29-33 West Thirty-ninth Street, New York City, and various bulletins and items of information are gladly furnished upon request.

Junior Accountants Neglecting Opportunities

Spare Time Should Be Used for Study—Advancement Possibilities Real and Attractive —What Books Should Be Read

By I. A. May

Comptroller the Connecticut Company, New Haven, Conn., and president American Electric Railway Accountants' Association

THOUSANDS of junior accountants in the street railway business have opportunities before them today that they little realize. It is a well known fact that the accounting done by steam railroads, electric railways and public utilities in general is more standardized, and we might say on a much more scientific basis, than the accounting in all other industries, except perhaps in some of the largest manufacturing concerns.

A junior accountant after passing through all of the accounting divisions of a fairly large electric railway little realizes that if he would use to advantage the spare time outside of the regular office hours in studying a few of the excellent accounting books now on the American market he would within a short time be in a position to pass the examination held in his state for the degree of C.P.A.

If he is successful in passing the examination positions are open which pay from three to five thousand dollars per year for junior public accountants and from five to fifteen thousand for senior accountants.

While the above figures may seem like a dream to the young accountant, yet they are facts, and I want to call your attention to other facts, namely, that in applying the spare time in studying accounting books they will find within a short time that their daily work appears to be very much easier as a result of the education and the training that they are receiving, and they will soon begin to apply the theory obtained from the books to their daily work, improving and bettering it in that way.

This improvement and betterment is bound to be recognized by their superior officers, and the chances are they will receive an increase from their present employers and, no doubt, promotion.

One of the greatest men of the last century, Mr. Gladstone, gives us the following:

> Believe me when I tell you that the thrift of time will repay you in after life with a usury of profit beyond your most sanguine dreams, and that the waste of it will make you dwindle, alike in intellectual and in moral stature, beneath your darkest reckonings.

Some one has enlarged upon the above, and I quote as follows:

> Any one who used his time to its best advantage between the ages of fifteen and thirty-five will surely be in a position to do what he likes with it from thirty-five on. If young men could realize this fact, every available hour would be given to study. When you waste your time in occupations and amusements that are unnecessary to body or mind do you know what you are throwing away? Let us enumerate a few of the things:
>
> Freedom from anxiety in middle life and old age.
>
> The best educational and social advantages for your children.
>
> The treasures of art and literature which come with the leisure and cultivated taste of middle life.
>
> Respect and influence in the community, which the best men treasure as one of their richest acquisitions.
>
> The broadening and refining which result from travel in foreign lands.
>
> The satisfaction of a well-developed and well-spent manhood.
>
> What a price that is to pay for laziness or passing pleasures.

There are perhaps some who would not agree with this, but I believe every word of it and hope by calling the attention of junior accountants to this illustration that more attention will be given to study and to their work. Some readers might be interested in a list of books which I believe to be extremely helpful in the study of accountancy and a short list* is given below:

Auditing, Theory and Practice—Montgomery.
Corporation Organization and Management—Conyngton.
Corporation Accounting—Bennett.
Cost Accounting—Nicholson.
Accounting Practice and Procedure—Dickinson.
Principles of Depreciation—Saliers.
Office Management—Galloway.

In addition to the above I would recommend to those particularly interested in accountancy as a future the *Journal of Accountancy*. This journal has a students' department which is given over to accounting questions, answers and discussion of accounting questions. The journal is the official organ of the Certified Public Accountants and is published monthly by the Ronald Press, 20 Vesey Street, New York City. This company also published the above mentioned books, as well as other good accounting books.

For general all-around street railway education "Electric Railway Transportation," by Blake and Jackson, and other similar books may be obtained from the McGraw-Hill Book Company.

As president of the American Electric Railway Accountants' Association I pass this information along to all junior street railway accountants and to accountants employed in the various other public utilities. My advice is to begin immediately and work hard. Do not neglect opportunities which are right at hand.

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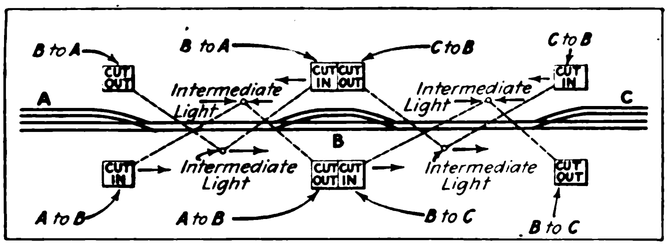
*Mr. May's modesty apparently prevents him from mentioning his own book, "Street Railway Accounting," the Ronald Press, which is the standard in street railway accounting practice.—EDITORS.

Dual Control Signals on the Pacific Electric

Improved Type of Signal Light Circuit Adopted for Single-Track Line to Minimize Hazardous Operating Conditions

By CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway, Los Angeles

SOME of the single-track lines of the Pacific Electric Railway serve territory that does not demand frequent service. In some cases this territory is thickly settled and has a dense growth of orange trees through which the lines wind and which affords very little straight-away view for the trainmen. Due to the limited traffic on these lines a heavy investment for block-signal protection is not always advisable, in spite of the fact that the company takes a hearty interest in safeguarding the traveling public. The past practice has been to protect certain highly traveled single-track lines with either all-electric automatic block signals or with a staff signal system. The less important single-track lines with limited travel and infrequent service have been protected with a single type of signal-light circuit controlled by a switch-light box at each end of the circuit. Recently this type of signal protection has been improved to what is known as dual control and has been developed in our engineering department.



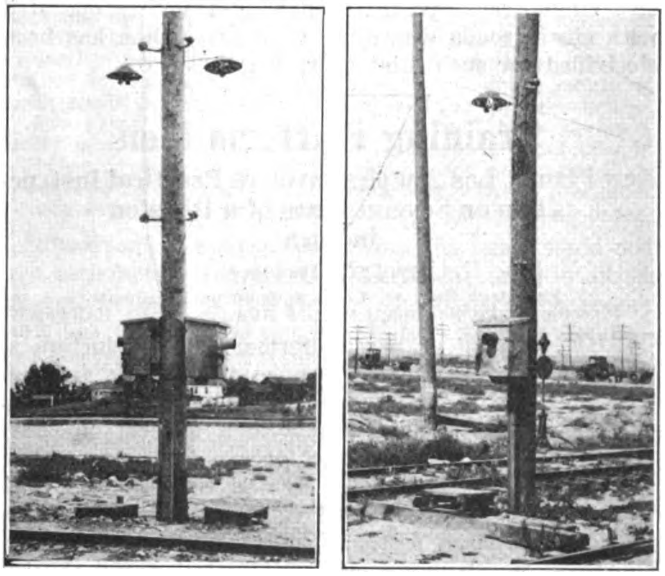
SINGLE TRACK LINE THROUGH ORANGE GROVES PROTECTED WITH NEW DUAL CONTROL SIGNALS

An accompanying illustration shows a single-track line, with sidings, recently protected with this improved type of light circuit. The length of the protected line is approximately 10,000 ft. The illustration shows a tangent line, but in fact the line traverses territory densely covered with orange groves, a large portion of the line curving in and out among the groves. The double signal-light circuit with its intermediate signals was installed and placed in operation in accordance with the details shown in the drawing. The further details of its operation are explained as follows:

When a train inbound arrives at Station A and desires to proceed to the siding at B the conductor throws the signal-light circuit at the switch box marked "A to B cut in," thus setting the circuit against opposing trains at Station B, at switch box marked "A to B cut out." Upon arrival at Station B and wishing to proceed to Station C the conductor clears the line from A to B by throwing the circuit at box marked "A to B cut out" and throws the switch at box marked "B to C cut in." Upon reaching C the conductor clears the circuit at box marked "B to C cut out." In reverse operation when a train at C desires to proceed to B the conductor operates the switch in the box marked "C to B cut in." Upon reaching B the conductor clears the circuit at the box marked "C to B cut out" and operates the switch in the box marked "B to A cut in." He will cut out the circuit box marked "B to A cut out" upon reaching Station A. In accordance with the arrangement of the signal switch boxes, train crews will always use switch boxes on their right-hand side only.

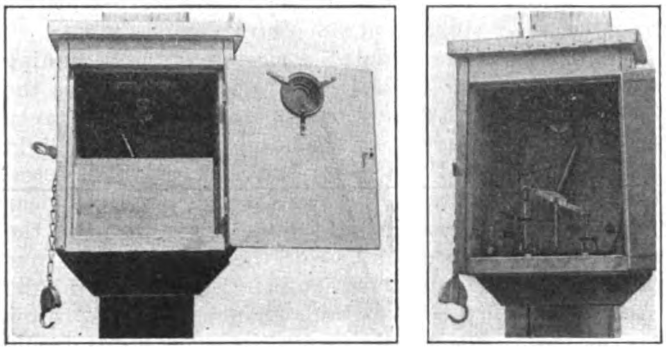
The intermediate signals are located at the beginning and end of curves. When the train crew operates the switch to enter the circuit, this operation causes a green light to appear in the switch box, while a green light also shows up on the pole for the motorman's observation. This operation also causes a red light to appear in the opposing intermediate signal, as well as in the switch box at the other end of the light circuit, thus preventing two trains from entering the circuit at the same time. In case two trains should chance to throw the switch at exactly the same time red lights would show up in each box as well as on the poles at both intermediate signals.

An improved type of switch for controlling the new type of circuits was perfected. A walking-beam relay switch without its coils was placed in each switch box and a three-point double-pole, double-throw switch was connected at the top of the relay for operation either to the right or left as shown in switch-box cut. The installation of the switch on the relay was so devised and installed as to insure the safety of trainmen against shocks from excessive current entering the relay from the circuit. This was accomplished by inserting two removable redwood strips in front of the switch. These are easily removed for maintenance work. This safety precaution is also illustrated in the switch box. The cuts of two switch boxes and banks of lights on a pole in the middle of a circuit at which point another line branches off and a switch-light box and bank of lights on



AT LEFT, SWITCH BOXES AND LIGHTS ON POLE IN MIDDLE OF CIRCUIT. AT RIGHT, SWITCH BOX AND LIGHTS ON POLE AT END OF CIRCUIT a pole at the end of a circuit show method of installation. It will be noticed that the slatted platforms are anchored to the pole to prevent removal.

The improvement of the dual control type of light circuit over the single type is the elimination of confusion and misunderstanding of trainmen as to who has the right-of-way when two trainmen, one at each end of the circuit, simultaneously throw the switch-light circuit. This improvement reduces the hazard of accidents, should a trainman under such circumstances enter the old type of light circuit in the face of a possible approaching train, the crew of which has taken a similar action and proceeded through the circuit. The improved type of light circuit also eliminates frequent delays to the train schedules, due to the more positive method of assurance to the trainmen that the single-track line is clear. This type of circuit has also been successfully used by the company for operating exclusive single-track freight branch lines jointly operated with steam roads where the steam road line has been electrified for such joint operation.


AT LEFT, SWITCH BOX WITH SAFETY PRECAUTION FOR TRAINMEN. AT RIGHT, ARRANGEMENT OF SWITCH PARTS INSIDE BOX

Training Platform Men

New Plan at Los Angeles Involves Practical Instruction on Several Lines of a Division in Turn

By J. G. Jeffery
President East St. Louis & Suburban Railway
Director of Public Relations Los Angeles (Cal.) Railway

THE training of new motormen and conductors so that they will enter service thoroughly familiar with one line of a division and capable of handling it efficiently rather than begin with a general but hazy knowledge of all lines is the feature of an instruction system recently established by the Los Angeles Railway. The territory served covers 365 square miles, including annexed districts, so that car lines of considerable length are necessary for adequate service. Runs of from 14 to 21 miles are the rule, rather than the exception, so that the task of familiarizing new men with stops and transfer points assumes extensive proportions.

Formerly a new trainman was given three days' instruction in the general principles of car operation on one line. Then he would spend a day each on perhaps ten long lines and under as many different instructors. If he was assigned, after his "breaking-in" period, to the first line his knowledge with regard to it was apt to have become hazy, with resultant decrease in his efficiency. Further, while riding with ten different motormen or conductors in ten days, the new man might encounter a careless instructor who would trust to the next man to straighten out the learner on details he did not feel disposed to explain adequately.

Under the new system a new man spends from six to ten days on one line, under the same instructor. If he shows ignorance in punching transfers or any of the other details of operation the one man who gave the instruction is held responsible. Recruits receive one general instruction lecture before going on a car, covering the fundamental principles of good car operation.

Motormen are given instruction on a specially built car which shows the entire electrical equipment. After his training experience on a car the man is given other lectures on such matters as preparation of trip reports, accident data the company needs, method of procuring the names of witnesses and numerous other details.

The instruction department then turns the new man over to a division superintendent as qualified to man a car on the line on which he has received instruction. He is placed on that line and works a full shift for ten or fifteen days.

To apply the principle that the best training for a man is in handling a car and dealing with the public, the Los Angeles Railway executives arrange to have the new man take a morning rush-hour car on the run that he has studied, and then to spend the remainder or part of his time in learning the details of another run of the same division.

The length of time needed by a man to learn the new run naturally depends on himself, but in the end he is so trained that he can take it on regular duty. He can shift between the first and second lines to meet the service requirements and can then gradually learn other lines until he is capable of handling any one of them efficiently.

The new plan contemplates written examinations for new men instead of the present oral examination which is given in connection with the advanced instruction lectures.

A new trainman is paid $1.50 a day while learning to take a regular job providing he stays at least until the first pay day after he qualifies. After he has qualified to take a car on regular service he begins earning pay on the usual scale. When he begins training on a second or third run his pay is altered. He is paid for his morning rush-hour work on the regular scale, then while he is learning another line he receives 25 cents per hour. This is the scale for waiting time. It is higher than the rate paid during the initial training period, thus recognizing that the man is not entirely "green."

The average new man can become fully efficient on a half dozen lines of a division in fifteen days under the new system. The men take to it well and, on the whole, receive thicker pay envelopes than under the former plan. The "one-line instruction" has found favor with the officials of the Los Angeles Railway and has come to stay.

An appropriation of $85,000 has been authorized to the Bureau of Standards for the investigation of standards of practice and methods of measurements of public utilities, such as gas, electric light, electric power, water, telephone, central station heating and electric railway service and the solution of the problem arising in connection with standards in such service.

Bridgeport Traffic Analysis

Recent Report Shows Buses Alone Are Uneconomical—More One-Man Cars Recommended, with Bus as Auxiliary and Operated by Railway

THE Bridgeport (Conn.) Chamber of Commerce has just made public the "Report on the Most Satisfactory and Economical Method of Mass Transportation for Bridgeport," submitted to it about March 1, 1920[1], by Walter Jackson, consulting engineer. The report as printed is really an abstract by its author and occupies more than six pages in the Aug. 1 issue of the chamber's semi-monthly publication, the *Bridgeport Progress.* A copy of this issue is being sent to every important Chamber of Commerce in the United States.

The problem has been to study the Bridgeport transportation requirements of carrying about 150,000 people per day in a city whose population is 200,000 and to see whether either the bus or modern electric car alone or whether a combination of trackless and track vehicles should be used to meet these requirements.

Taking the bus operation alone, first, the report says:

> In view of the wonderful development of the motor bus, it will naturally be asked whether this more flexible means of mass transportation could completely take the place of the existing railway system, first, from a physical standpoint; second, from a financial standpoint. The answer must be that even the smaller buses are *physically* practicable. L. S. Storrs, like many other electric railway operators, holds that this cannot be done. However, this opinion is based upon the assumption that the bus must necessarily use the same thoroughfares as the street car. It is perfectly true that the existing bus services of Bridgeport do, with few exceptions, follow the same routes as the electric cars; but that policy of confinement to a few streets would not have to be followed by an organized bus monopoly.

The report then quotes London figures and traffic conditions[2] to show that narrow streets are not a bar to a large bus traffic, and then says:

> As a matter of cold-blooded fact, the buses of Bridgeport actually have been carrying 50 to 60 per cent of all the traffic at a higher schedule speed than the cars in spite of the rule that prohibits any vehicle from passing a standing car while interchanging passengers. If there were no cars at all, and effective regulations against parking machines along the curbs of Fairfield Avenue and of Main Street were maintained, it is obvious that there could be two lines of traffic in each direction instead of one. However, this advantage would not obtain with larger buses approaching street car width.

But turning to the question of financial practicability, the author says in the report that he has analyzed every possible kind of bus operation, including data obtained first hand from the Bridgeport bus operators themselves, and then adds:

> Before quoting any costs and deductions, it may be well to put the cart before the horse for once by stating that the leading busmen and dealers themselves realize that a city like Bridgeport could not possibly depend upon the present haphazard individual ownership scheme for reliable and economical bus transportation. If they had the job of laying out an all-bus system, they would form a co-operative company (as proposed by Schwartz) or a railway type of organization with uniformed men (as proposed by Mills)[3]. None of the bus advocates interviewed had, however, a true conception of the size of the problem and of the true costs. It is now in order to see what each kind of automotive equipment would accomplish.

Following this are statements of operating and revenue figures, as well as some traffic and operating details, for several bus lines in other cities, such as for the Fifth Avenue Coach Company of New York, the proposed Detroit 10-cent fare bus, the Chicago Motor Bus Company, the Baltimore Transit Company and the Rhode Island Omnibus Company. As most of the data and facts with reference to these companies have been given in these columns they are omitted here[4]. It is worth while, however, to quote one remark pertinent to applying these data to Bridgeport. In discussing the Fifth Avenue bus, the report says:

> As a matter of fact, two sixteen-seat Bridgeport buses at a 5-cent fare easily earn more than one forty-four-seat New York bus at a 10-cent fare. The 10-cent fare of this company is, of course, largely possible because of a visitors', shoppers' and healthseekers' clientele unparalleled in scope; it would not have a chance in Bridgeport. To get anything like the same revenue, it would be necessary to carry twice as many passengers, assuming that the average ride in Bridgeport was the same as in this largely short-ride traffic. Double the riding would be possible only if the top deck were enclosed, as American winters are not conducive to open-air riding. Another factor that militates against the use of a large double-deck bus is its slowness.

The report then discusses actual earnings and costs in Bridgeport. These have already been given in the columns of the JOURNAL more extensively and based on more complete and later information than those in the report[5]. As a result of the study, however, the following conclusion is reached:

> From all the data gathered in the field from bus operators and elsewhere from bus manufacturers, one must come to the conclusion that thirteen to sixteen-seat buses could hardly be run in Bridgeport for less than 20 cents to 25 cents a mile without allowing for the real taxes that an organized company would have to pay, also bearing in mind that everything would have to be kept to a higher standard and that many bus-miles would have to be run whether there was any traffic for them or not. It has been indicated that by taking advantage of additional streets, it would be physically possible to handle all present bus and car traffic. It cannot be gainsaid, however, that the resulting street conditions would not be improved for the pedestrians. In any event, the matter of physical limitations becomes purely academic in the light of the foregoing proof that if individually owned buses of this size cannot earn more than 20 cents to 25 cents a mile, they can hardly prove profitable if the overhead and running expenses are on the same order.

Subsequent to his conclusion that the buses could not give satisfactory service on a 5-cent fare within all or the greater part of the area of Bridgeport, the report examines the possibilities of what he terms "modernized electric car operation" and makes suggestions for the application of light-weight one-man cars to the Bridgeport traffic problem.

The question emphasized is not the increase in cost of electric railway operation, but rather whether "any resources of the art have been developed to offset this increase in cost, and, if so, to what extent the Connecticut Company has availed itself of these resources."

The report suggests that the Connecticut Company has done all that it can in saving power through the education of motormen and by means of power saving recorders, but that a far greater saving of power could have been possible through the earlier adoption of light-weight automatic one-man cars. The author infers that the Connecticut Company has been slow in the installation of equipment of this sort and states the belief that if the one-man car had been installed to a sufficient degree and the 5-cent fare retained the jitney bus would have been automatically eliminated.

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[1] Since this report was made two fare changes have taken place (see issues of April 10, page 777; July 24, page 193; July 31, page 244, and Aug. 7, page 294) and electric car service has been discontinued (July 26) (see issues of July 10, page 101; July 24, page 93; July 31, page 245, and Aug. 7, page 292.)—EDITORS.

[2] See ELECTRIC RAILWAY JOURNAL, Oct. 11, 1919, page 708; Feb. 28, 1920, page 425.

[3] See page 330 this issue.

[4] See ELECTRIC RAILWAY JOURNAL, May 29, page 1088; July 3, page 11; July 31, pages 209-218—"Fifth Avenue Bus," Tables XV-XVII; "Chicago Motor Bus," Tables XVIII-XX; "Baltimore Transit," Table VII; "Rhode Island," Table VI.

[5] See ELECTRIC RAILWAY JOURNAL, July 31, page 211, Table V.

The report then includes an analysis of one-man car costs compared with two-man car costs and an estimate is given of what the effect would be in Bridgeport. The report then goes on to say:

> Although the jitney bus has struck deeper root at Bridgeport than anywhere else except Newark, N. J., it is doomed to disappear against faster and more frequent electric car service as in other communities. The margin of profit in running a jitney bus is wiped out whenever the electric railway finds it possible to add 50 to 100 per cent more car-miles. Against a ten-minute car interval a bus driver may pick up twenty passengers on a half-trip; against a five-minute car service, he will be lucky to pick up fifteen, and fifteen will not be enough to make the business attractive. Although the Main Street safeties have been running only since Dec. 12, any one can see that they are hurting the buses. In the residential section, particularly, people now deliberately let a bus go by because they see one of the new cars right behind. If they will do this in the face of the convenient nickel fares of the bus, what chance will the latter have with a 5-cent fare on the car? Indeed, Leader Schwartz, who sees the handwriting on the wall, says the busmen will sell six tickets for 25 cents in that event. That element of the population which is supposed to be permanently against corporations is too small to keep the bus business going on a large scale, and many of these people will soon forget their grievances with the coming of better service and lower fares.

But the solution even with one-man cars could not eliminate the two-man cars entirely, as two-man car train operation would then be desirable or even necessary in order to handle rush-hour peaks.

And even with electric railway service "modernized," there is still room for the bus, the report says; even need for it, not as a competitor, not even necessarily as a direct money maker in itself. This means that buses are not adapted to exploitation by private operators. But they are often "economically justifiable if handled in co-ordination with the existing electric railway service." An example of a useful service is quoted, in that Warner Brothers, a corset manufacturing concern, had encouraged a direct "factory-to-home" bus service, by which some 500 out of 3,000 employees were routed by bus and saved about one-half the time ordinarily taken by electric cars and busy corners avoided. About twenty-three buses were in this service, now discontinued. Mr. Jackson then argues that if similar service were introduced to such an extent that 20 to 25 per cent of the rush-hour travel could be kept away from the Bridgeport busy center crossing, Main and Fairfield Streets, the traffic relief would tend to speed up the railway service.

There are then suggested five typical routes for buses, to fit certain detailed local conditions. The characteristics of these routes are of interest, as indicative of the field of the bus in such a community in co-ordination with the electric railway. In general, they fit the definition of serving districts in which no service by rail could be justified, or of providing crosstown service from certain residence districts to factories in which many persons from the particular districts are employed. One interesting route would be to a factory employing 2,200 people, and here a service of two or four times per day, except for an occasional bus, is suggested.

Mr. Jackson would make the bus routes flexible, having them run from certain districts to factories at time of travel to and from work and shift to shopping or business downtown districts for the other parts of the day.

But the interesting economical point of fares and transfers then comes up, and on this the report says:

> If the various bus services outlined are given in co-ordination with the electric railway service it will be natural for the public to expect transfer privileges and the same scale of fares. As regards transfer privileges these ought to be kept down to the limit and used primarily only where the bus is an extension of the car route. Where the same section can be reached either by car or bus, the bus fare should be higher as part compensation for the superior speed offered. The special factory-home services should be handled at special rates of fare in accordance with the distance traveled.
>
> It is not to be expected that even these special rates of fare will make the bus services self-sustaining, but if employees have voluntarily paid busmen 7½ cents a trip for better service they may be expected to do so where such service will be more reliable.
>
> Anywhere from 50 to 100 buses could be used at the beginning. It might prove good policy to purchase these from the better class of bus owners and give them the opportunity to continue at this work if they saw fit to do so. The experience of some of these men would also be invaluable for the development of these services and for the working up of opportunity to use buses for mid-day shopping travel, for handling pleasure parties, groups of school children, etc.
>
> While a 5-cent fare is theoretically possible for the entire city, the day of the blanket unit fare has gone. It is believed that the greater part of the public would be satisfied if the 5-cent (or other lowered) fare were granted for distances of 2½ to 3 miles, so that an increment of 2 cents per mile would be paid only by those taking the longest possible ride east-west or going beyond the city limits. There is no sound reason why Bridgeport should have to subsidize the back-country through lower fares when it has so much short-haul territory still to develop.

With reference to zone boundaries, it is suggested that equal length zones are not necessary, even though the public complains of discrimination.

> The answer to this is that a zone system is only a zone system if the lengths of the zone vary in accordance with traffic conditions, density of traffic, rate of return and the like. Equal-length zones are practically unknown on the hundreds of foreign electric railways, whose experience with zone fares is as old as the electric and street railway business.

The suggestions are summarized as follows:

1. Operate all off-peak mileage with one-man cars.
2. Use two-car trains to help handle the peak traffic.
3. Use direct-routed buses at special fares to give faster rush-hour service while avoiding congested area.
4. Install bus lines for isolated parts in or near the city.
5. Restore the 5-cent fare to the greater part of the city car service, retaining a more elastic zone system for extra long rides.

Double-Deck Cars for Cape Town

THE J. G. Brill Company has recently delivered twelve new double-deck cars to the Cape Electric Tramways, Ltd., for use in Cape Town. The new cars are interesting chiefly because of the window sash arrangements. The windows are in pairs, separated by posts with an overhead hinged transom above. One window of each pair slides across the face of the other, which is stationary. The sliding sash is hung on a metal runway at the top and is easily manipulated. The window arrangement is identical on both upper and lower decks. The car seats thirty-two on the lower deck and forty-eight on the upper and has a total passenger capacity of 120. The car weighs about 24,600 lb. and has an overall height of 16 ft. 8 in. and a length of 34 ft. 9 in. It is equipped with maximum traction trucks with 4-ft. wheelbase with 33-in. driving wheels and 20-in. pony wheels.

New Sizes of Small Pneumatic Tools

Light-Weight, High-Speed Machines Can Be Used to Advantage in Cramped Places Where Heavy Machines Cannot Be Operated

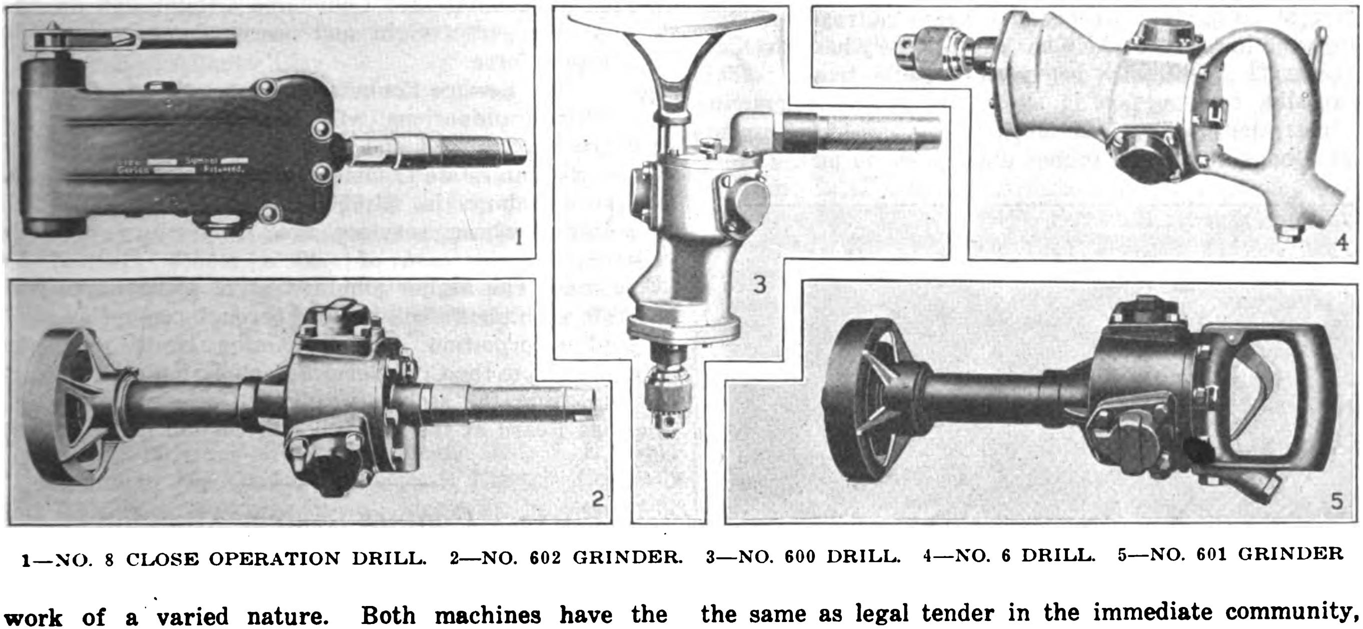
SEVERAL new sizes of small portable pneumatic tools have recently been added to the line of "Little David" pneumatic tools, manufactured by the Ingersoll-Rand Company, New York. The new tools include a small size of close quarter drill, to be known as No. 8; a small high-speed pneumatic grinder in two types, No. 601 and No. 602, and a light-weight drill furnished in two styles, No. 6 and No. 600.

These new tools have been developed to satisfy the demands for a light-weight, high-speed machine for certain classes of work, for which the heavier tools were not entirely adapted.

The No. 8 close quarter drill is a machine for use in certain classes of work where the ordinary machine is not suitable, as close to a wall or corner. This new machine has a fairly high speed, running at 250 r.p.m. without load, but will handle drilling, reaming or tapping up to 1¼ in. in diameter. The spindle which turns the drill, reamer or tap is operated by three rocking levers, connected directly to the pistons through connecting rods. The motor is of the three-cylinder type, with pistons acting at right angles to the levers. A very steady continuous movement of the spindle is obtained as one ratchet pawl is always in contact with a tooth of the spindle. The construction is very simple and sturdy, with least number of parts.

The No. 601 and No. 602 grinders are light-weight, high-speed tools running with a free speed of 4,200 r.p.m. and suitable for grinding, buffing or polishing work of a varied nature. Both machines have the same motor, but are equipped with different throttle and handle, the No. 601 having the closed type of inside trigger handle, while the No. 602 is fitted with the rolling type of throttle handle. A special feature of these tools is the three-cylinder motor, very different from that of the No. 8 drill, described above, which runs constantly in a bath of oil, insuring lubrication of all the parts. The valve is made integral with the crankshaft, and ball and roller bearings are used.

The No. 6 and No. 600 drills will handle twist drills from the smallest size up to ⅜ in. in diameter. The free speed at 90 lb. air pressure is about 2,000 r.p.m. The two machines differ essentially in the handle construction, the motors being the same. The No. 6 has the pistol grip type of handle, while the No. 600 is furnished with breastplate and rolling throttle handle. Aluminum, reinforced with steel bushings, is used wherever possible and results in a very light-weight machine, the No. 6 weighing only 9 lb. The motor is a three-cylinder type somewhat similar to that used in grinders above. The cylinders are separate iron castings, easily accessible, renewable and are interchangeable. A very sensitive throttle control has been obtained, which, with freedom from vibration, makes the tool ideal for drilling with small drills. The bearings are all either ball or roller type.



1—NO. 8 CLOSE OPERATION DRILL. 2—NO. 602 GRINDER. 3—NO. 600 DRILL. 4—NO. 6 DRILL. 5—NO. 601 GRINDER

What Shall We Do with the Other Fellow's Tokens?

THE problem of interchange of tokens of foreign lines, taken in fare boxes, is rising and must in the future become more of a problem than it is now, in all probability. The answer may be that the expense of interchange is greater than the loss; that, in the long run, the losses will equalize.

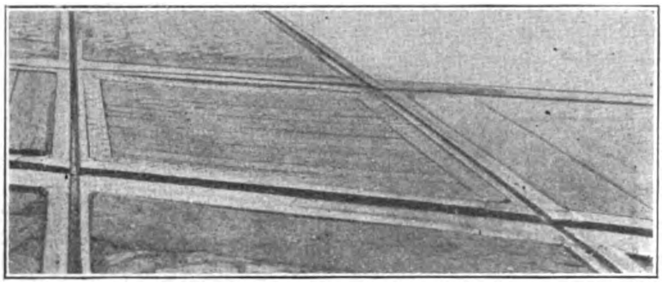
The Connecticut Company, for example, has something like 617,000 tokens out at its various sub-agencies and therefore largely in the hands of its patrons. The mere task of keeping track of all these and of checking the agencies is no small job. And, in the checking up of various returns to these agencies, tokens of other lines are appearing rather frequently. Tokens of this company, which, as is usual, soon become almost the same as legal tender in the immediate community, are doubtless carried away to other parts of the country and are used, unnoticed by the conductors, in the rush hours on other lines. Many of the tokens are so similar that they look alike in the fare box.

Shall the association establish a clearing house for tokens? They are worth all the way from 5 to 10 cents, and perhaps it would pay to clear them up annually, or even more frequently. It would be interesting to learn how important the question is; how many companies collect a noticeable number of foreign tokens.

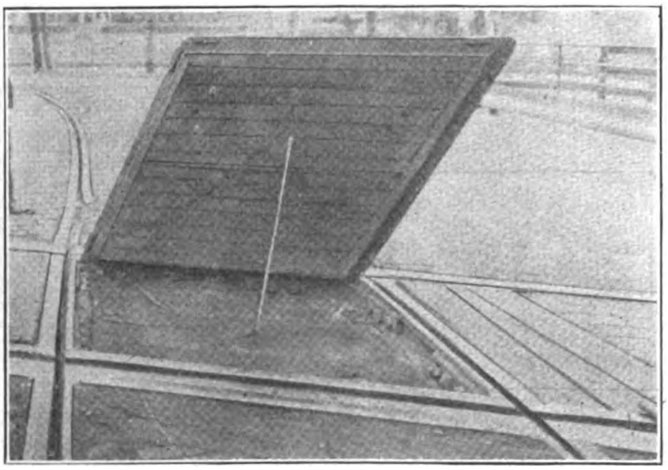
Convenient Surface for Crossings

The Wilkes-Barre Railway Has Satisfactory Construction, Which Provides Accessibility for Tightening of Joint Plates

MANY different types of paving surface for railway crossings have been tried out. Those which provide the best surface for vehicular traffic are of such construction that occasional access to the crossing itself for tightening bolts is impossible without the breaking up and relaying of the pavement. The ordinary plank crossing is unsatisfactory in many respects. It has a very short life, does not wear evenly, and, if placed loosely, individual planks may fly out of position following the passage of trucks or other vehicles. Finally, although such a cover provides a certain degree of accessibility, the ends of the planks are frequently broken in the process of removing, so that it is necessary to replace them with new planks.


UNIT CROSSING FLOORING IN POSITION AFTER SERVICE UNDER HEAVY TRAFFIC FOR FIVE YEARS

A type of construction which seems to have given excellent account of itself under service is that which has been in use for five years by the Wilkes-Barre Railway at an electric railway and steam railroad intersection and in a street which has exceptionally heavy vehicular traffic, especially heavy automobile trucks. This crossing construction is shown in two accompanying illustrations. The framework of the crossing is made of Z-bars, cut to the proper dimensions to fit the crossing after the measurements of the angle have been taken. In the particular case illustrated, angle irons were substituted for Z-bars on two sides of the crossing. It will be noted that a slight depression has resulted at the sides where the angle irons were used. This crossing has, however, been in service for five years under very heavy service, and had Z-bars been used during this period it would in all probability be in first-class condition.


CROSSING FLOORING RAISED TO SHOW Z-BAR AND PLANK CONSTRUCTION AND METHOD OF SUPPORT ON KNEE BRACES

The bars are ⅜ in. thick and of a depth sufficient to accommodate 3-in. planks sawed into strips 3 in. wide. When these strips are cut it is made certain that the wearing surface will come on the end of the grain. The 3-in. planks are nailed together and then a wedge is placed in the center. The swelling of the wood under service makes the crossing tight. The top surface of the Z-bar has been roughened by the use of an acetylene welder in order to prevent slipping of horses.

As shown in one of the illustrations, lugs have been welded to the under side of the Z-bars, and when the crossing surface is in position these lugs rest on the knee braces of the crossing. The corner joints of the Z-bars are welded together. The plank surface is brush treated with carbolineum. In this crossing 5-in. 85-lb. rail-bolted construction is used.

Such a crossing as this is handled in exactly the same manner as an ordinary manhole cover. Two men with picks remove the flooring as a unit, tighten up the bolts beneath and replace the flooring in a few minutes. There are no spikes to pull, and there is no necessity of breaking the end of the planking, which in the ordinary plank construction is gouged out to provide a bearing on the track joint knee braces.

I. C. C. Needs Rate Experts

IN A statement issued by the United States Civil Service Commission it is said that the recently authorized general increase in freight and passenger rates, following the wage increase of railway employees, requires the Interstate Commerce Commission to add scores of expert freight and passenger rate clerks to its present force.

The Civil Service Commission states that to fill these positions examinations will be held throughout the country on Sept. 22 and Oct. 20 for tariff examiners under the Interstate Commerce Commission. The usual entrance salary is $1,620 a year, besides which appointees whose services are satisfactory will be allowed the increase of $20 a month granted by Congress. The higher administrative positions in connection with tariffs will be filled through promotion.

Full information and application blanks may be obtained from the Civil Service Commission at Washington or from the secretary of the United States Civil Service Board at the post office or custom house in any city.

Surface Contact System Abandoned

THE tramway system in Wolverhampton, England, which has been operated by the Lorain surface contact system for eighteen years, will be changed to the overhead wire system. Wolverhampton has long been noted as having the most extended surface contact system in existence. The reports from England state that the reasons for the change are not due to mechanical or electrical failures. It is brought about by the desire of the Wolverhampton corporation to operate through cars onto or from adjacent tramways, all of which use the overhead system. The cost of conversion, including construction of new track (20 miles), is estimated at £375,000.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Fuel Service Order Extended

THE Interstate Commerce Commission has extended for thirty days Service Order No. 9, under which the electric railways, with other public utilities, can secure priority in the transportation of coal. This extends the period of the service order to ninety days from June 21. Further details of this order will be found on page 344 of this issue. A request for this extension was made by the American Electric Railway Association.

Executive Committee on T. & T. Meets

A MEETING of the executive committee of the Traffic & Transportation Association, the last to be held before the annual meeting except one just prior to the convention, was held in New York on Aug. 12. Those in attendance were W. H. Collins, president; R. P. Stevens, L. H. Palmer and T. C. Cherry. W. J. Harvie, representing the committee on collection and registration of fares, and Edward Dana, representing the committee on schedules, were also in attendance.

The purpose of the meeting was to consider the reports of the committees to be presented at the annual meeting. Drafts of the reports on schedules and on code of traffic principles were read, and Mr. Harvie outlined the report of the committee on collection and registration of fares, which is a joint committee with the Accountants' Association, and said that the report would be completed shortly. The secretary then gave information about the status of the other reports to be presented at Atlantic City.

It was decided to follow the same plan as last year of appointing a committee on subjects before the convention. This committee will canvass the live topics of interest to transportation men prior to and during the convention, so as to be prepared to submit a report for next year's work to the executive committee immediately after the convention. In this way association committees can be appointed promptly to take up the subjects selected, and more time will be allowed for a study of the various topics.

Attendance at Traffic Officers' Convention

MENTION has already been made that W. H. Maltbie of the United Railways & Electric Company of Baltimore is to present an address at the convention of the National Traffic Officers' Association in San Francisco on Aug. 23-27. This organization is an association of the traffic officers of the police departments in the different cities and one of the principal objects of the convention is to frame a model motor vehicle act to be placed before the various state legislatures and the provinces of Canada. It is understood that Mr. Maltbie, in his address, will argue in favor of the following:

Establishment of delivery (*i.e.*, congested) districts and one-way streets.

Licensing of all motor vehicle drivers.

Lights on all vehicles; horns or bells on all motor vehicles; compulsory signals before turns or stops.

Right of way as follows:

Emergency service, including public utility repair wagons.

Street cars.

Main thoroughfare traffic.

Except as above, right of way belongs to vehicles on the right.

Exclusion of pedestrians from streets except at crossings and safety zones.

Parking forbidden to block alleys, street intersections, fire plugs, entrances to private property, and street car loading berths. In delivery district parking limited to designated times and areas.

Parades limited to non-peak hours and excluded at all hours from delivery districts except by permit.

Blocking of car tracks by vehicles delivering or loading forbidden. End delivery forbidden in delivery districts. All delivery forbidden in delivery district during peak hours.

Slow-moving vehicles excluded from delivery districts during peak hours.

Left-hand turns forbidden in delivery district during peak hours.

Electric railway companies, which are especially interested in reducing street congestion and believe that the adoption of some such plans as those outlined would assist in relieving the traffic situations in their cities, might very well take these matters up with the police departments, chambers of commerce or other bodies in their cities which will be represented at San Francisco and acquaint them with these principles.

Standards Committee Holds Two-Day Meeting

THE Engineering Association committee on standards met in New York City on Aug. 5 and 6 to consider the reports of committees in so far as they contained recommendations relating to association standards. The members of the committee present were: H. H. Adams, Chicago, Ill., chairman; H. L. Andrews, Schenectady, N. Y.; C. H. Clark, Cleveland, Ohio; C. G. Keen, Philadelphia, Pa.; John Lindall, Boston, Mass.; H. H. Norris, ELECTRIC RAILWAY JOURNAL; Martin Schreiber, Newark, N. J.; W. C. Starkey, Mansfield, Ohio; N. B. Trist, Pittsburgh, Pa., and F. E. Wynne (representing N. W. Storer), Pittsburgh, Pa. During all or part of the meeting E. R. Hill, president of the association; J. W. Welsh, special engineer of the association; R. C. Cram, chairman committee on way matters; Daniel Durie, chairman committee on equipment; Charles R. Harte, chairman committee on power distribution; A. B. Stitzer, chairman committee on power generation, and F. W. Sargent, member committee on equipment, were in attendance. A summary of the actions on the recommendations of the several committees follows:

Committee on Way Matters—Report presented by Mr. Cram. On the adoption of a recommended uniform system of track spirals as presented, approved; on substitution of submitted designs of 7-in. and 9-in. girder grooved rails with curved heads for the corresponding present standards, approved; on revision of recommended specifications for plain bolted special trackwork, approved; on slight revision in wording in several sections of the Engineering Manual relating to way matters suggested to increase clarity, approved; on substitution of certain A. S. C. E. and A. R. A. rail sections for present standard sections, approved.

Committee on Buildings and Structures—On adoption as a "recommended practice" a set of suggestions regarding inspection and maintenance of buildings, approved. Mr. Schreiber explained the relation of these suggestions to the rules of the American Railway Engineering Association.

Committee on Power Generation—Report presented by Mr. Stitzer. On adoption as a "recommended practice" of a form of contract for the purchase or sale of power, referred to the convention for discussion before action by the committee.

Committee on Equipment—Report presented by Mr. Durie. On adoption as standards of submitted dimensions for steel wheels and wheel treads and flange contours, of submitted designs for limit-of-wear gages for flanges of ⅞-in. thickness and for several journal bearing and wedge gages, approved; on revision of standard specifications for solid wrought carbon-steel wheels for electric railway service, action postponed and matter referred back to committee pending receipt of information as to action on the same general subject by a joint committee of the A. R. A., mechanical section, and the A. S. T. M.; on adoption as standard of submitted gaging points and terms for wheels and tracks, approved; on revision of standards for brake-shoe heads and brake-shoe keys as submitted, approved.

Committee on Power Distribution—Report presented by Mr. Harte. On publication in the *Engineering Manual* under "Miscellaneous Methods and Practices" of a submitted revised specification and form of contract for electric conduit construction, approved.

In conclusion, the standards committee decided to include in this year's report the actions taken at the February, 1920, meeting, although these related to reports of standing committees which appeared in the 1919 proceedings.

Connecticut Company Section No. 7 Holds Annual Outing

THE annual summer outing of the Connecticut Company Section No. 7 was held at Momauguin on Aug. 5. Owing to the new fare rate effective Aug. 8 on the Connecticut Company's properties, many members were prevented from being present, therefore the attendance was not as great as in former years, there being ninety-nine dinner tickets sold.

The morning was given up to athletic events, consisting of a tug-of-war, the married men against the single men, same being won by the married men; 75-yard dash, sack race, fat man's race, relay race and baseball game, this last event being the principal feature of the day. The result of the score was Resolutes, 3; Shamrocks, 2. Special mention should be made of the home run by Henry Downs, superintendent of Westport, who came over the plate at a pace that would make "Maud S" blush.

Dinner was served at Theodore P. Swift's, Momauguin, at 1:30 p.m.

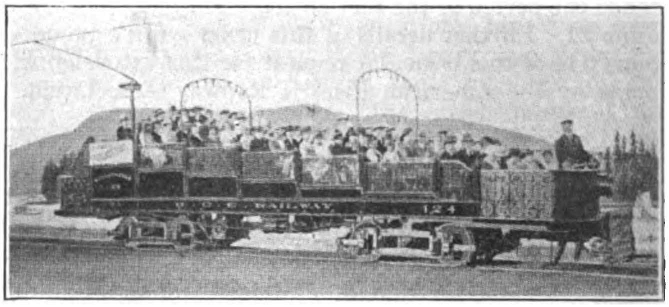
Safety Car in Europe

THE International Street & Interurban Railway Association has just issued a leaflet containing a digest of an article descriptive of the safety car, which appeared in a recent issue of the Dutch technical paper *Telegraaf*. The immediate cause of the bulletin was an accident which happened in Brussels owing to sudden illness of the motorman on a two-man car. The article describes the well known advantages of the safety car for city service and concludes: "In general it might be said that the operation of these cars has had a favorable influence on both the cost of operation and on the receipts."

Observation Car in Vancouver

THE British Columbia Electric Railway is now operating an observation car on its lines. The car is a double-truck flat car with cross seats, side rails and no top, attractively upholstered and lighted by arches extending across the car over the seats.

The car operates from May to October and makes about five daily trips in and about Vancouver. The twilight trip is said to be especially delightful. The route taken is through the industrial sections, residential suburbs, Japanese quarter and on out to Point Grey, Kerrisdale and Shaughnessy Heights. From the latter point a beautiful view of the Fraser Valley and Mount Baker, 90 miles away, is obtained. The fare is 50 cents for the trip.



VANCOUVER OBSERVATION CAR

This company also issues an attractive illustrated folder entitled "Electric Trips Around Vancouver," which is full of valuable information for the tourist. The folder suggests trips to the adjacent beaches, to the city parks, to Fraser Valley and to attractive cañons and scenic beauty spots in adjacent territory. In all a five-day tour is suggested, with definite daily schedules.

Spain to Develop Water Power

THE Spanish Electricity Commission, appointed by the government in 1918, has made a report to the Ministerio de Fomento advocating the development of the national water power and its use through a high tension network for industrial and railroad electrification.

A single network covering the whole country is favored, as in the north high water occurs in the spring and summer, while in the south it occurs in the fall and winter, thus allowing a better use of the flood waters. Considering only developments of more than 20,000 the commission estimates the national water power at 2,000,000 kw., of which 500,000 kw. is in the Pyrenees, 200,000 kw. from the Ebro River, 150,000 kw. in Galicia, Asturias and Leon, 300,000 kw. from the Tejo River and the remainder from the southern rivers.

The electrical network will form an irregular quadrangle, with corners at Oviedo, Barcelona, Valencia, Granada, Sevilla, Alcantara. Feeder lines will be run to other cities. The total length of main transmission lines will be 3,000 miles, using 120,000-volt, three-phase, fifty-cycle current. All the lines are to be in duplicate on the same tower and the wires are in three standard sizes, 3 mm. x 100 mm., 3 mm. x 75 mm. and 3 mm. x 50 mm. The estimated cost exceeds 130,000,000 francs.

The state will regulate the development and undertake the construction, maintenance and control of the power transmission network. Rates will be fixed by the state on a cost-of-service basis, using a flat rate based on investment and independent of energy used.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Construction Started

City of Detroit Going Ahead with Municipal Line Despite Opposition from Property Owners

Plans of the Street Railway Commission of Detroit, Mich., for the construction of the crosstown line provided for in the Couzens system of municipal railways are meeting with opposition from home-owners on Eliot Street, one of the aristocratic down-town streets which the Charlevoix-Buchanan crosstown line is to traverse. The residents on Eliot Street contend that there are other streets near by given up entirely to business which can be used to better advantage.

Owing to complaints against the construction of the proposed lines on Burlingame, Clairmount and Owen Avenues, the city decided that the protests warranted an investigation into the possibilities of determining upon a less objectionable route. The railway commission will make a field survey and report to the Council on the advisability of using alternative streets for the lines. The commission was to pass a resolution next calling for bids on this second crosstown line, the Clairmount-Owen line. . The complete system as planned to be carried out by the city is planned to include five crosstown lines.

WORK BEING PUSHED

The Clairmount-Owen line is to connect the proposed Petosky Avenue line on the west side with a proposed north and south line on Conant Avenue, and will run easterly from Grand River Avenue on Joy Road, Clairmount, Owen and Holbrook Avenues, crossing Woodward Avenue on Clairmount.

Work is to be pushed on the St. Jean line, the contracts for paving, grading and foundation work involved in the municipal line having been approved by the Council. In answer to Councilman Bradley's question as to why the Detroit United Railway had been prevented from completing the St. Jean line and at the same time allowed to complete the Twelfth Street line, Chairman Ellis for the commission replied that the Detroit United Railway would not be allowed to resume operations on St. Jean since that work had been started by the Detroit United Railway and left practically dormant for three years, while on the Twelfth Street line work was nearly completed when the city gave permission to finish it.

The Street Railway Commission expects to complete the St. Jean line as soon as the Detroit United Railway would have done it notwithstanding that the Detroit United Railway promised to have it in readiness by Sept. 30. It is not intended to tear up the street until the project can be carried straight through to completion. Councilman Bradley charged that since the Detroit United Railway's operations were stopped on the St. Jean line, the city has done nothing and he objected to tearing up the street until the commission was ready to lay rails. The Charlevoix line was referred to. A trench was started the day after election, some concrete poured in and some pictures taken and nothing done since the contractor completed excavations near Alter Road. Mr. Bradley branded this as grandstand play which might just as well have been deferred.

Municipal Railway Denies Wage Advance

The budget committee of the City Council of Seattle, Wash., by a vote of six to three, recently denied the request of the trainmen of the Seattle Municipal Railway for a 25-cent increase in wages. While the men had asked for no definite increase, in informal discussion with Councilmen they indicated that a general wage raise of 25 cents a day for employees who have been in the service for more than a year was desired. The present scale calls for a daily wage of $4.75 for new men and $5 after the first six months, and $5.25 after the first year.

Proposals to raise the wage of the men were opposed by taxpayers who appeared before the committee. They declared the recent fare increase from 5 cents to 6¼ and 10 cents was put into effect with the understanding that there would be no additional overhead expense against the railway. Representatives of the men declared that the increase would not be a charge against the tax levy, but would be borne out of the operating revenues of the railway.

When questioned as to the effect of the proposed fare increase on the earnings of the railway D. W. Henderson, general superintendent, stated that the wage advance would add between $120,000 and $130,000 to the payroll. He urged that if any increase was adopted only two wage rates be provided for, $5 and $5.50. Members of the Council indicated that if it is learned at a later date that the new fare will materially add to the revenues of the railway increases for the car men might be considered by the Council at that time.

The men in their appeal also referred to the possible effect of jitney regulation in increasing the railway revenue.

B. R. T. Men Talk Strike

Receiver Garrison Refuses Demands for Pay Rise and Eight-Hour Day —Closed Shop Asked

Employees of the Brooklyn (N. Y.) Rapid Transit Company have announced that they will go out on strike if their demands for a substantial increase in wages and changes in working conditions are refused. Announcement that the men would take this action followed rejection of their demands by Lindley M. Garrison, receiver for the B. R. T. lines. Obtaining no satisfaction from Mr. Garrison the union officials have appealed to Federal Judge Julius M. Mayer, who is in charge of the company's affairs, for a hearing.

The present contract under which the men are working will expire on Aug. 28. On July 28 they presented to William S. Menden, general manager of the company, a new contract providing for an eight-hour day with a limit of twelve hours for those on swing runs, and time and one-half for all overtime. They also asked for a six-day week and a twelve-hour rest period after each day's work.

The wage scale which has been demanded by the men as included in their formal request is as follows:

> For surface motormen and conductors, from 84 cents to 92 cents an hour, the present schedule being from 52 to 62 cents; for switchmen and car cleaners, 55 cents an hour; for Sunday and holiday work, 10 cents an hour extra.
>
> For elevated motormen, 87 cents to 90 cents an hour, the present scale being from 54 to 57 cents; for guards on rapid transit lines, from 82 to 85 cents, the present scale being from 49 to 52 cents an hour.

NEGOTIATIONS USELESS

In refusing these demands Mr. Garrison stated that their acceptance by the company would mean an increase in the system's payroll of at least $15,000,000 annually. He also declared that it would result in a closed shop, to which he could not consent. In his letter to the trainmen's representatives the receiver said in part:

> Under the circumstances there can be no point at this time in entering into any negotiations in regard to these proposed agreements. I have always refused to make a closed shop, I have always refused to enter into a contract with anybody other than a committee of employees. As you know I have taken this course under instructions from the court, whose representative I am.
>
> Until the court changes its instructions in this respect it is useless to have any negotiations because I could not under the circumstances enter into any such agreement.
>
> I recently, as you know, voluntarily offered an increase of wages which went to the limit of the financial means at my disposal. Even if you were asking me to modify merely the existing agreement with the employees, I could not possibly entertain the suggestions contained in the papers submitted. Under the most favorable construction of the different demands it would add a total of at least $15,000,000 to the existing wage payments.

Municipal Ownership Defeated at Toledo

People of Ohio City Unwilling to Sail the Uncharted Seas of City Ownership—Company Suit Still in Court

The twin bond ordinances authorizing the expenditure of $7,000,000 for a municipal railway and a bus system were decisively defeated by the voters of Toledo, Ohio, at the election on Aug. 10. The $3,000,000 ordinance to "acquire" a transportation system was lost by a vote of 8,535 in favor and 12,468 against. The $4,000,000 ordinance to "construct a transportation system" had a like fate. It received 7,901 votes in favor and 11,532 against. The first move to get the cost-of-service ordinance out of the Council committee on railroads and telegraph was made by Mayor Schreiber on Aug. 11 when he announced that he would ask Council to pass it at its next meeting on Aug. 23. This may insure the measure coming before the electors at the general election on Nov. 2 or at a special election before that time.

THE twin bond ordinances proposed by the municipal ownership commission for the settlement of Toledo's railway difficulties were in for a stormy career even if they had been ratified by the voters. This was evident the day before the election. The Toledo Traction, Light & Power Company, a holding corporation for the Toledo Railways & Light Company, the operators of the railway system, and several other electric and gas properties at Toledo, came into court after the suspension of the injunction against the twin ordinances had been granted by the Circuit Court of Appeals and asked leave in a motion to file an amendment and supplement to its bill of complaint.

COMPANY WANTED CITY ENJOINED

The amendment was deposited with the clerk for filing the day before the election. It brought the city of Toledo into the case as a joint defendant with the board of elections and offered much additional evidence seeking to make vague the validity of the bonds, should they be approved and issued.

The company held that the city had not complied with the state code regarding the publishing of ordinances in pamphlet form; that voters had been deprived of voting on the two ordinances between July 24 and Aug. 4 while the injunction of the District Court was in effect, and that already the action of the city had tended to depreciate value of company securities.

The company also asked the District Court to enjoin the board of elections from certifying the result of the vote on the twin bond ordinances, and sought to restrain the city from issuing any of the bonds the ordinances provide for and from levying any taxes under the measures.

LEGAL QUESTION BEFORE COURT

The Circuit Court of Appeals at Grand Rapids last week did not pass upon any of the legal questions involved in the case as brought out in Judge Killits' court at Toledo. The circuit judges merely suspended the effect of the injunction.

The company has announced that twelve lines are not paying their own way at the present fare rates. Only five are operated at a profit. These five bear the burden of supporting the system and the gross profit is cut down to a very low figure, company experts declare.

The plan of the city, if the ordinance had been successful, was to appoint a commission to lay out the new system for Toledo. Many of the members of the commission relied almost wholly on the bus end of the proposed double system, and counted on the railway to remove its tracks whenever any move was made to dismember the present railway system.

The members of the cost-of-service commission and two of the three daily papers supported the cost-of-service plan as the logical way to protect the interests of both municipal ownership enthusiasts and the traction company. As stated previously, this plan may now be submitted at the November presidential election.

Bridgeport Continues Trolleyless

Jitneys are still running in the city of Bridgeport, Conn., and the trolley cars are still off the streets, two weeks and a half after they were withdrawn by order of the company's trustees. Storekeepers in Bridgeport report a loss of patronage of from 25 to 50 per cent since the cars stopped running, most of it due to the fact that the jitney routes do not extend out beyond the thickly populated areas of the city. The fact that women shoppers cannot carry bulky packages in the jitneys is also a factor in the reduced volume of trading, it is said.

Out of the welter of the present more or less haphazard bus service in Bridgeport is likely to grow an organizd bus system which will be responsible for maintaining dependable service. At least this is the promise of J. B. Schwartz, president of the jitney men's association. He says that within a few days a jitney bus operating company will be incorporated which will provide for transfers at 2 cents each. Mr. Schwartz predicts that the new corporation will include in its membership a majority of the present bus owners. He says that the tentative plans so far made by the men who will enter the new company call for the purchase of twenty-five buses of modern type, equipped with cash boxes. It is possible that the uniforming of operators will follow later.

According to Mr. Schwartz it is the intention of the incorporated company to maintain the 5-cent fare. He feels that the absence of officials at large salaries and the purchase of oil, gasoline, spare parts and general supplies at wholesale by the corporation will enable the individual bus owners to operate at a profit at the present rate. According to Mr. Schwartz a flock of inspectors are working all over the city to see that the buses are in repair; that the drivers do their work properly, and that the public does not suffer any unnecessary inconvenience.

So far as the Connecticut Company is concerned it again reported on Aug. 10 that "there is nothing new in the situation in Bridgeport."

In the other cities of the State the anti-jitney feeling is getting stronger. The Waterbury Chamber of Commerce issued a report on Aug. 10 advocating the removal of jitneys from all streets on which the Connecticut Company has tracks. The Hartford Chamber of Commerce has appointed a committee to take up the matter, and from what members of the committee say, it is expected they will recommend action like that of the Waterbury Chamber. The Norwich city authorities are also considering ways and means of curbing the buses.

Legislative Sanction Necessary

The Supreme Court of Iowa has just ruled in the Ottumwa Railway & Light Company case that a permanent fare cannot be fixed in a franchise without legislative sanction and that City Councils can change fares.

Cincinnati Wages Being Arbitrated

The trainmen in the employ of the Cincinnati (Ohio) Traction Company who are members of the Amalgamated Association are demanding an increase of 80 per cent over present wages, double time for overtime and other conditions. The present wage scale in Cincinnati is 2 cents an hour over the rate allowed by the War Labor Board. That body, in an award effective on Nov. 21, 1918, allowed the men an increase of approximately 30 per cent over then existing wages. On July 1, 1919, when the scale was reopened for adjustment, the company settled by giving a 2-cent increase, making the scale for trainmen 45, 48 and 50 cents.

The present demands are being arbitrated by George Dent Crabbs, president of the Philip Carey Manufacturing Company, who represents the railway; James A. Wilson, president of the Pattern Makers' International Union, who represents the men, and Prof. Alonzo Tuttle, a teacher of law in the Ohio State University. Professor Tuttle was appointed by the Industrial Commission of Ohio, which named him pursuant to terms of the contract between the company and the men. The arbitrators named by the company and the men had been unable to agree upon the third arbitrator.

W. Kesley Schoepf, president of the company, declared in his letter to the union rejecting the demand that they are out of all proportion, and that under no circumstances would he approve expenditure on the part of the company that would add to the burdens of the car rider.

New Akron Franchise Drafted

A new franchise has been prepared by city officials of Akron, Ohio, for the city line of the Northern Ohio Traction & Light Company. It is said to contain in legal form all the points on which the city and company have agreed. Director of Law Hagelberger, City Manager Laub and E. E. Brownell, expert, prepared the draft.

The measure was submitted to the public utilities committee of the City Council on Aug. 7, and such changes as thought necessary will be made. Copies will be sent to the company. The franchise will be made public as soon as an agreement is reached by the city and the company.

It is reported that the franchise provides for an initial rate of fare of 5 cents. This will be increased or decreased at the end of stated periods to cover the cost of operation, make improvements and extensions, as the city may direct, and provide a return of 7 per cent on the company's stock.

At the end of each five years the city and company may agree upon a change in the return on the stock.

Pay Increases in Los Angeles

Effective on Aug. 16 the Pacific Electric Railway, Los Angeles, Cal., will increase the pay of all its employees, making an increased payroll of $900,000 a year. The increase is made by the company in recognition of good service on the part of the employees, and in the face of a growing deficit. Employees of the transportation, mechanical, electrical and maintenance-of-way departments will receive an increase of approximately 5 cents an hour. The new scale is as follows:

City service, 50 to 53 cents an hour.
Interurban single-track, 55 to 58 cents an hour.
Interurban double-track, 52½ to 55½ cents an hour.
Freight service, 62 cents an hour.

The Los Angeles Railway will also increase the pay of its trainmen and mechanical department employees on Aug. 16. The pay increases there total more than $500,000 a year. The Los Angeles Railway increases will be from 5 to 9 cents an hour and with the bonus system recently established employees who have been in the service two years or more may earn as much as 60 cents an hour. The new scale of that company for motormen and conductors will be as follows:

First three months, 50 cents an hour.
Remainder of first year, 51 cents.
Second year, 52 cents.
After second year, 54 cents.

Additional pay of 2 cents an hour will be added on shuttle lines, and 4 cents on downtown safety car runs.

Denver Union Men Defiant

Override Their Executive Committee and Indulge in an Orgy of Disorder—Federal Troops on Guard

The union employees of the Denver (Col.) Tramway were still on strike on Aug. 12 in defiance of their executive committee. This was in fact a reversal of a decision which had been made previously to return to work. On Aug. 7 the attorney for the union announced to Judge Whitford of the District Court that the strike had been called off by a vote of 973 to 3 in connection with the court's order. The union was given until Aug. 12 to "square its actions with its words." On Aug. 10 meetings of the union officials, other labor leaders, officers of the tramway and city and state officials were held. F. W. Hild, general manager of the company, announced that the company would take back those who had been on strike, except that certain individuals would not be re-employed, provided the men filed individual applications. The 58-cent scale will be paid pending the injunction proceedings in the Supreme Court. The men were given until midnight, Aug. 12, to file applications so as to maintain their seniority rights.

EFFORTS to have the union leaders negotiate with Mr. Hild were rebuffed by him. The company will not recognize or make any agreement with any labor union. On the afternoon of Aug. 11 a mass meeting of the union was held at which the executive committee recommended that the men go back to work and accept the terms offered by the tramway. The men refused to go back to work unless they were taken back in a body and the union was recognized. The vote on these matters stood at 771 to 36.

The tramway immediately issued a call to all other men who had applications for employment on file to report at once. It also began advertising for additional men.

VERY SERIOUS DISORDER

Unusual disorders have attended the attempts by the company to operate cars. On Aug. 5 the operation of twelve cars was stopped by a mob of 5,000 men and women from the city's steam railroad shops and other unions. The crews of two cars in the downtown district were taken off the cars and beaten up by the mob and the cars demolished. Later the mob stormed the plant of the Denver *Post* and wrecked it. It then surrounded four cars in the residence section, tipped them over and smashed them up, beat up the crews and attempted to burn the cars. The police were unable to cope with the rioters.

Later that night the mob attempted to storm and burn the South Division carhouse, occupied by 150 strikebreakers; two of the rioters were killed and twenty-four wounded. The following day 2,000 citizens were sworn in as special officers and armed. No cars were run during the day. A mob at the East Division carhouse after menacing the property all evening rushed the place with bricks, pieces of iron and revolvers. They were fired upon by the guards. Three rioters were killed and fourteen wounded. Another mob made elaborate preparations for an attack on the South Division carhouse of the company at the same time.

The power and light wires to the carhouses were cut and dynamite bombs thrown into the car yards. An attempt was made to fire the carhouses. Another mob threatened the Tramway Building, but was held back by the police.

TROOPS RUSHED TO CITY

Early on Aug. 7 250 troops from Fort Logan were rushed to the city by motor trucks and took over control. The following day 500 regular soldiers arrived from Camp Funston, Kan., to augment the forces from the local fort. Each car was escorted by an automobile load of soldiers. Major General Leonard Wood arrived from Chicago on Aug. 9 to make a personal investigation of the situation.

More than 160 cars were operated on Aug. 10, but no trailers. Two hundred cars were operated on Aug. 11, or forty more than normal. There has been no rush-hour service since Aug. 9. The cars have been heavily loaded with passengers.

The company has approximately 600 strikebreakers on the system and has received sufficient requests for employment from former employees and new men to enable it to operate the full system very shortly.

COURT SAYS MEN MUST RETURN

The District Court on Aug. 12 gave the executive committee of the union until Aug. 16 to persuade the men to return to work, or to resign as responsible heads of the union.

Full service was given on Aug. 13 on all lines, with the exception of one city route and one interurban.

No New Louisville Franchise Ready

W. H. Kaye, member of the executive committee of the Louisville (Ky.) Railway, announced to the Council during the week ended Aug. 7 that the company had no ordinance prepared at this time to offer as a substitute for the service-at-cost measure withdrawn by the company at the last Council meeting. William T. Baskett, assistant city attorney, said the city had no ordinance to submit.

Wage Increase in Richmond

Official notice of an increase in the wage scale of the trainmen of the Virginia Railway & Power Company has been made by C. B. Buchanan, vice-president and general manager, as follows:

> The City Council having granted the 6-cent fare, effective on Aug. 1, 1920, and thereafter so long as the 6-cent fare is in effect, the wage scale of motormen and conductors will be: For men in service for the first three months, 43 cents an hour; for men in service for the next nine months, 45 cents an hour, and for men in service thereafter, 47¼ cents an hour. "Safety car" operators will receive 5 cents an hour in addition to the above rates and scales.
>
> In view of the fact that the company has not as yet applied for a 6-cent fare in Petersburg, as anticipated, it is deemed just that the same rate and scale as applies in Richmond, Norfolk and Portsmouth, where the 6-cent fare has been asked for and granted, be also made effective in Petersburg as of Aug. 1.

It is understood that should the company apply for a 6-cent fare in Petersburg, and the same should be denied, the old rate and scale will apply. Certain conditions have prevented the company from making the 6-cent application in Petersburg to the present time, but such action in the near future is probable. In consideration of the employees, however, the company decided that its failure to make the application should not be reflected in their wages, and the Petersburg scale, consequently, has been raised to the Richmond level, with the provision that the application, when presented, is accepted.

A Mighty Poor Advertisement

The Los Angeles *Saturday Night* published an editorial "Squelch the Trouble Breeders" in a recent issue. That paper said:

> Recently, in the newspapers of this city, the Los Angeles Railway appealed to the public for fair play. The appeal had to do with the rerouting of cars in an effort to relieve congestion and to avoid the necessity of a fare increase. Those responsible for the rerouting of the cars, an action mainly due to the importunities of strap-hangers and the hostile attitude of certain newspapers, paid no attention to the prayer of the corporation. Instead, they redoubled their efforts to incite trouble and seemed to enjoy the experience of "eating their own word."
>
> That a corporation should deem it necessary to appeal to those it is trying to serve for fair play is a mighty poor advertisement for the city. There seems to be a fault-finding "brick-throwing" epidemic on. The people, incited by inflammatory and hysterical newspaper articles, are kept in a constant state of irritation, well-meant efforts on the part of those criticised to remedy conditions are met with abuse instead of a helping hand, and officials who sincerely are trying to do their duty are denounced in vitriolic terms.
>
> Something should be done to squelch the trouble breeders. It looks like another job for the Chamber of Commerce.

Wages Increased at Memphis

Judge McCall has authorized a new wage scale for employees of the Memphis Street Railway, previously agreed upon at a conference between the receivers of the company and representatives of the union. The order authorizing the increase was signed after a petition setting out the terms of the proposed contract was presented to Judge McCall by Lovick P. Miles, attorney for T. H. Tutwiler and F. S. Elgin, receivers of the company.

The increase is to remain in effect for one year from Aug. 1, 1919, to July 31, 1920, and will mean an increased expenditure on the part of the company of $150,000 a year. Under the new scale motormen and conductors who work nine hours a day are paid for the first year at the rate of 47 cents an hour, or $110 a month. Second year men get 52 cents an hour, or $131.68 a month. Third year men get 57 cents an hour, or $133.38 a month.

Under the old scale the monthly salaries were for first year men $101.79; for second year men, $105.30, and for third year men $112.32.

Similar increases for the men who work ten hours a day bring the first year men from the old rate of $113.10 to $122.20; the second year men from a rate of $117 to $135.20, and the third year men from $124.80 to $148.20.

Settlement Up to Mayor

Mayor J. E. Meyers of Minneapolis, Minn., has before him for action an emergency ordinance passed Aug. 6 by the City Council granting the Minneapolis Street Railway a 6-cent fare until Dec. 15 and a 7-cent fare with four tickets for 25 cents thereafter. The ordinance supersedes an ordinance granting a 7-cent fare at once, which was returned to the committee by the Council. The Mayor's position is problematical.

If the present ordinance becomes effective it is understood that the company will accept it and will grant the trainmen a wage increase as recently suggested by the board of arbitration. Possibility of the strike scheduled for July 1 unless the wage advance was granted still exists if the Mayor vetoes the ordinance.

In St. Paul the deadlock between city and company is still on. A physical valuation is under way and as matters now stand the City Council cannot grant the increase of fare voted by the people last spring until the company improves the service. The company reports that it cannot improve the service at the present trainmen's wage. The trainmen of the St. Paul City Railway are still waiting for the city to act on an increased fare so the company can pay the wage suggested by the arbitration board.

Democrats for Home Rule

The Democratic state platform in New York contains the following planks on public utilities and increased rate regulation:

> We favor the regulation of public utilities so that sufficient and safe service may be rendered the public at a cost which will yield not more than a fair return upon the capital actually and honestly invested.
>
> We favor investing the Public Service Commissions with sufficient power to enforce their own orders and suspend proposed increased rates during investigation by the commissions.
>
> We favor the enactment of legislation, defeated at the last session of the legislature by the Republican senate, placing upon a public utility corporation demanding increased rates the burden of proof to show the reasonableness of such proposed increases, and removing that burden which now rests upon the public.
>
> We are opposed to legislation permitting state commissions to impair or modify contracts made between cities of the state and railway companies fixing rates of fare. Measures violating this principle were strenuously advocated by Republican legislators and by a Republican speaker of the Assembly in 1919 and 1920. Any modification of such contracts should be made by the contracting parties in accordance with the majority sentiment of the community affected, and they should not be abrogated by the interference of state agencies.

Short Strike in Auburn

The demands of 161 striking motormen and conductors of the Auburn & Syracuse Railroad, Syracuse, N. Y., have been met by the company and service was restored on Aug. 8 in the city of Auburn and on the suburban line to Syracuse.

The men struck on Aug. 4 after notifying the company that if immediate action was not taken to increase their wages they would quit. The officials did nothing immediately and the men kept their word. On Sunday morning a conference was held between Patrick H. Downey, state mediator; City Manager John Jaeckel of Auburn and Attorney Frank M. Leary, representing the Amalgamated Association. Lawrence Lippitt represented the company.

Motormen and conductors on the city lines in Auburn will receive 60 cents an hour as maximum, starting at 56 cents, three months later 58 cents, to continue for nine months before reaching the maximum.

Men employed on the suburban lines will receive 62 cents an hour maximum. Freight and express men will get a rate 3 cents an hour higher. Freight warehouse men will receive 50 cents an hour and substation operators $5.20 a day. Shop men now receiving less than 50 cents an hour will be increased to that rate.

Court Decides Against Eighty-Cent Gas Law

The Consolidated Gas Company, New York, N. Y., won its long fight on Aug. 4 against the 80-cent law when a decree rendered by Judge Learned Hand, in the Federal District Court at New York, granted the company the right to charge $1.20 for every 1,000 cu.ft. until March 1, 1921.

The injunction restraining city, county and state officials from enforcing the old gas law of 1906, which has been in effect, lasts, however, for five years. After March 1, it is understood, unless the Supreme Court reverses Judge Hand's decision, he will set the price the company may charge from that time on. The new rate became effective at once. The excess over present rates paid by consumers will be placed in trust until a final decree is rendered by the Supreme Court if the defendants appeal.

Temporary injunctions restraining the state, county and city authorities from enforcing the law were granted by the Federal District Court on June 29, as noted in the ELECTRIC RAILWAY JOURNAL of July 3, page 36.

Seeks to Restrain Operation

The city of Martins Ferry, Ohio, filed a petition in the federal court at Columbus on Aug. 4 asking the court to enjoin the Wheeling (W. Va.) Traction Company from operating in the city of Martins Ferry.

The petition asks further that the company be required to remove its tracks, poles, wires and other equipment and property used in connection with its railway from the streets and to leave the streets in proper condition after so doing.

The petition sets forth that fares were increased in June, 1919, contrary to provisions of the franchise, from 5 cents to 10 cents between Martins Ferry and Wheeling and Martins Ferry and Bellaire, and that the company now proposes to increase rates again to 12 cents cash, with a 10-cent ticket fare, between Martins Ferry and Wheeling, and to 16 cents cash, with a 13⅓-cent ticket fare, between Martins Ferry and Bellaire.

The old franchise under which the company operated expired on Aug. 2. Federal Judge John E. Sater will return to Columbus on Aug. 15 to consider the case.

News Notes

Trackmen and Oilers Strike.—Trackmen and oilers employed by the Monongahela Valley Traction Company, Fairmont, W. Va., went on a strike on Aug. 2 for an increase in wages. The men are asking an increase of from 38 cents to 50 cents an hour.

Mr. Young on Engineering Council.—The American Society for Testing Materials has appointed C. D. Young as its representative on Engineering Council to succeed Albert Ladd Colby. Mr. Young is general supervisor of stores of the Pennsylvania System, and vice-president of the American Society for Testing Materials.

Fire Destroys Bay State Cars.—Twenty cars belonging to the Eastern Massachusetts Street Railway, Boston, Mass., were destroyed in a fire which burned the company's carhouse at North Abingdon, Mass., on July 26. The cars destroyed included nine of the double type, three short cars, five snow plows, a line wrecker, a sand car and a flat car.

More B. R. T. Tubes Open.—Two new subway tubes under the East River, New York, N. Y., one connecting Manhattan Island with Brooklyn and one connecting Manhattan Island with Queens, opened on Aug. 1. Both are to be operated by the Brooklyn Rapid Transit Company. The opening of these rapid transit lines will place in operation construction costing $36,000,000.

Chelsea Wants "L" Service.—A movement is under way among citizens of Chelsea and Revere, Mass., looking to the furnishing of electric railway service to these communities by the Boston Elevated Railway. The towns are now served by the Eastern Massachusetts Street Railway, which, under the proposed plan, would discontinue operation of the lines. The Chelsea division is said to be operated at a loss.

Delays Work in Radials.—The Ontario Hydro-Electric Power Commission has informed the Ontario Government that it will not make any further commitments on radial railways, pending the report of the royal commission appointed to investigate the radial projects. The commission claims to have misunderstood the Government's request at first, and to have gone ahead with some details of the radials in the District of St. Catharines. However, the possibility of friction has now been removed.

Work Started on New Terminal.—Work has begun on the Washington, D. C., terminal of the Washington, Baltimore & Annapolis Electric Railroad. It is the intention of the company ultimately to build a $2,000,000 station and hotel, but for the present the land recently acquired will be cleared of buildings and tracks laid so as to discontinue the practice of making the terminal stop in a public street. The new terminal is within a block of the heart of the business section of Washington.

Editorial Reprint Sheet Issued.—The Illinois Committee on Public Utility Information has published under date of July 15, 1920, Editorial Reprint Sheet No. 2, containing fifty-three editorials from various newspapers in Illinois. These comments express the viewpoint of the people in widely separated municipalities throughout the State on all phases of public service work. A cursory glance at some of the remarks contained in these editorials proves how anxious the public is for the growth of all modern utility even though the price paid for it must necessarily be high.

Chicago Officials Play Golf.—The officials of the Chicago (Ill.) Surface Lines recently enjoyed the first golf tournament of the season at the Harlem Golf Club. Practically all of the executives, from President Henry A. Blair down, joined in the contest. About three such outings in the summer have become one of the customs of the company. The winner of the first tournament this year was M. B. Orde, treasurer, who had the low gross score of 85, against par 71. Mr. Evenson, assistant to the superintendent of transportation, was also a prize winner, with the low net score of 72.

Improvised One-Man Cars Cause Strike.—Ashtabula, Ohio, is entirely without local railway service due to a strike of the employees of the Ashtabula Rapid Transit Company declared on Aug. 4. The men left their jobs because of an order posted on Aug. 3 putting into effect a one-man crew system. This was done as a retrenchment measure. The railway has been purchased by the city, but the transfer of the property to the city has not yet been completed. A statement from the men said they did not consider the cars adequately equipped for one-man operation.

To Fill Traffic Vacancy.—The United States Civil Service Commission announces for Sept. 7 an open competitive examination to fill the position of director of traffic. A vacancy at Curtis Bay General Ordnance Depot, Maryland, at $2,200 to $2,600 a year, and vacancies in positions requiring similar qualifications throughout the United States at these or higher or lower salaries will be filled from this examination. The duties of the appointee will consist of the organization and supervision of traffic details of outbound and inbound freight, movements by rail and water, and handling the railroad operating force in the depot.

Pay Rise for Queens Men.—William O. Wood, president and general manager of the New York & Queens County Railway, New York, N. Y., has announced an increase of approximately 10 per cent in the wages of the road's conductors, motormen and inspectors in the operating department and shopmen and linemen in the repair department. This will add in the neighborhood of $25,000 a month to the company's payroll. The increase was made voluntarily without any demand by the employees. In a recent communication to the Queens Borough officials Mr. Wood said the company was not making its operating expenses and that it was carrying passengers at a loss and for that reason it would be impossible to make repairs to its tracks and repave streets as ordered by the Borough President.

Electrical Workers Get 15 Per Cent Increase.—An increase in wages of 15 per cent to electrical workers employed by the Toronto (Ont.) Suburban Railway is recommended by a majority report of the board of conciliation which inquired into the dispute between the company and this class of its employees. The recommended increase is to all employees who are now paid upon an hourly basis. In regard to all employees who are paid by the month it is recommended that they should all receive an increase of $10 a month. When employees are called upon to do extra work they are to receive a minimum time allowance of not less than two hours, but only one minimum allowance shall be paid for in any one day. It is also recommended that seniority coupled with efficiency shall be the basis of promotion. The report is signed by Judge A. Barron, chairman, and George Kelley, the representative of the company. Louis Braithwaite, the representative of the men, in a minority report, objects to the findings and recommends a higher rate of wages for the electrical workers.

Financial and Corporate

Utility Securities Analyzed

Cost of Money Excessive—Confidence Must Be Restored to Avert a National Calamity

The First National Bank of St. Louis recently made an interesting analysis of public utility finances and rate of return. This analysis points out the fact that in economic history prices pass through periods extending over several years, in which the level is upward or downward. Custom is a strong force in controlling prices, and governmental regulation only adds another force to restrain any change in price. The combined condition of customary price and governmental regulation is found in the case of public utilities. What is the situation, then, of many of our public utilities under prevailing conditions of an increasing price level, a regulated rate of return, an unsympathetic public, a selfish capital, seeking, as always, the best possible investment, with an increasing number of bidders for the use of capital and a decreasing amount of capital for sale?

COST OF MONEY TO PUBLIC UTILITY CORPORATIONS

In the first place, there is a tendency toward a deterioration of the physical plant and force. In the second place, extensions cannot be made with accustomed and desirable regularity, due to the high prices and dearth of material and labor, the reduced earnings, and the lack of new capital. In the third place, the most significant of all of these effects is the refusal of new capital to flow into this field.

The credit of public utility corporations on the whole is at present more or less in disrepute so far as the general investor is concerned. The highest grade of American public utilities can be purchased in the open market at a basis that will yield the investor anywhere from 1 to 2 per cent per annum more than the same sum would yield were the investment in any other similar grade of corporation security. The published table shows the changes in bond yields since before the war.

The average yield on seventeen of the highest grade public utility securities between April, 1919, and December, 1919, was found to be 6.11 per cent. The average yield of seventeen utility securities from January, 1920, to May 1, 1920, was found to be 6.75 per cent. On the other hand, the average yield of 3 highest grade railroad bonds from April, 1919, to December, 1919, was found to be 5.52 per cent. The average yield from January, 1920, to May 1, 1920, was found to be 5.75 per cent, thus showing that even the highest grade first mortgage public utility securities have recently been selling at a price which would yield the investor a full per cent more income per annum than could be obtained from the same class of railroad securities. In addition to this, the new securities of a growing concern seldom rank as high in regard to the securities behind it as do the seasoned issues secured by first mortgage on the property. How seriously this is handicapping the development and maintenance of public utilities is evidenced by the following table:

COST OF MONEY TO PUBLIC UTILITY CORPORATIONS, EXCLUDING MARKETING PROFIT TO UNDERWRITERS—BOND YIELDS

Period—Jan. 1, 1919, to May 14, 1920

		Yield, per oent
(*a*)	Average yield on twenty-three representative issues of $1,000,000 and over, offered to the public between Jan. 1, 1919 and July 1, 1919	6.86
(*b*)	Average yield on twenty-four representative issues of $1,000,000 and over, offered to the public between July 1, 1919, and Dec. 1, 1919	6.90
(*c*)	Average yield on seven new representative issues of $1,000,000 and over, offered to the public in January, 1920	7.10
(*d*)	Average yield on eight new representative issues of $1,000,000 and over, offered to the public in February, 1920	7.11
(*e*)	Average yield on seven new representative issues of $1,000,000 and over, offered to the public in March, 1920	7.59
(*f*)	Average yield on seven new representative issues of $1,000,000 and over, offered to the public in April, 1920	7.62
(*g*)	Average yield on five new representative issues of $1,000,000 and over, offered to the public in May, 1920	7.83

Bond Yields	June, 1920	May, 1920	Jan., 1916	July, 1915	Before War
U. S. average 5 public utility	8.60	8.19	5.18	5.31	5.09
U. S. average 5 railroad	6.14	5.86	4.51	4.71	4.42
U. S. average 5 manufacturing	6.41	5.92	4.89	4.99	4.93

In conclusion the article states that public utilities can be punished only at the expense of the general public. Improvements in regard to the condition of public utilities cannot be expected until their properties afford as attractive a field for capital investments as that offered in other fields of business enterprise.

Receiver Pays 10 per Cent for Money

The petition of the Jacksonville (Fla.) Traction Company, granted by Judge R. M. Call of the United States District Court, Southern District of Florida, on July 27, to issue certificates of indebtedness amounting to $143,690, with interest not to exceed 8 per cent, was nullified on July 31 by order of Judge Call. A supplementary petition of E. J. Triay, receiver of the company, to issue certificates of indebtedness amounting to $65,000 and bearing interest at 10 per cent, was granted. The company found that it was impossible to sell the certificates of the company at an interest rate of 8 per cent and the additional petition was filed and granted. However, permission of the court is given only to issue certificates to the amount of $65,000, the estimated cost of paving. The sum of $78,690 which it was stated in the first petition was necessary for the payment of the State, county and city taxes is not provided for in the order granted on July 31.

American Railways Readjustment Plan Amended

Announcement has been made of an amendment to the plan submitted under date of July 31 for the acquisition by a committee of the holders of the 4-6 per cent bonds of the National Properties Company of all of the common stock of the American Railways, Philadelphia, Pa., now deposited as security for bonds of the National Properties Company for a cash subscription of 17½ per cent of the face value of the National Properties Company bonds, for which each subscriber will receive a like amount of 7 per cent income bonds of the American Railways. Upon the acquisition of common stock of the American Railways, and the distribution thereof, the bondholders will become common stock holders of the American Railways to the full amount of the stock now deposited as security for their bonds provided they pay the subscription. This subscription will provide the American Railways with cash to an amount estimated to be not less than $900,000. This amount is immediately required to take care of accounts payable by the American Railways and its subsidiaries.

In addition to these accounts the American Railways owes about $3,500,000 of notes payable to banks and bankers. The plans further provide that this amount shall be converted into five-year 8 per cent notes secured by bonds of a subsidiary company to the extent of about $4,550,000, thus funding the debt of the American Railways for five years.

It is announced that more than 90 per cent of the creditor institutions have accepted the plan of the committee subject to the American Railways being provided the $900,000 in cash under the plan of the bondholders' protective committee. The plan will not be operative, however, unless the additional working capital is paid in. Such depositing bondholders as are unable or unwilling to provide funds for additional working capital will receive 30 per cent of the face of their bonds in common stock of the American Railways, and their place will be taken and cash provided by an underwriting syndicate.

Good Middle West Report

Total Income for Fiscal Year of $2,463,567, While Expenditures Amount to $265,949

For the year ended April 30, 1920, the Middle West Utilities Company shows a total income of $2,463,567. The expenditures amounted to only $265,949. The balance was $2,197,618. Interest on notes, bonds, etc., makes a total of $1,126,975. The net income for the year was $1,070,643, to be carried to the surplus account. The proportion of the subsidiary companies' aggregate undistributed surplus accruing to the Middle West Utilities Company was $206,176. This made a total combined surplus of $1,276,819.

SUBSIDIARIES DO WELL

The gross earnings of the subsidiary companies show an increase over the previous year of $4,721,638, of which amount $197,202 was contributed by new properties. The earnings of the North West Utilities Company were included this year for twelve months, whereas that company was owned for only four months of the previous fiscal year. Increased earnings included from this company were $1,206,031 more than in April, 1919. Eliminating these two items, the increase in the gross earnings was $3,318,414, or 23.3 per cent.

The consolidated statement of subsidiary earnings for the year showed that gross earnings were $18,362,673. Operating expenses, including taxes, were $14,044,166. This makes the net earnings $5,318,507, from which the rentals on the leased properties of $305,193 were subtracted, leaving a balance of $5,013,314. This balance, in addition to some earnings from subsidiary construction companies, gives a total of $5,131,766. After bond debentures and other interest of $2,953,893 and $1,971,696 had been paid, the Middle West Utilities Company's proportion of surplus carried to the aggregate surplus of subsidiary companies was $206,176.

FISCAL YEAR CHANGED

The fiscal year of the company has been changed to end Dec. 31. The next annual meeting of the stockholders will be held March, 1921, when a report will be submitted covering the eight months' period from May 1 to Dec. 31, 1920. The balance sheet shows an item of indebtedness of the Middle West Utilities Company due to the Middle West Securities Company of $3,100,000. A merger and consolidation of the two companies was authorized June 15, 1920. As a result this item of indebtedness has been eliminated.

Local Control Planned

Holders of Buffalo Bonds Outline Proposal for Distributing Assets of International Railway

The bondholders' protective committee which is in control of the International Railway, Buffalo, N. Y., has submitted to the bondholders a plan for the distribution of the assets of the railway by which they may acquire its stock and bonds, aggregating about $20,000,000. The plan would place the control of the railway in the hands of a group of Buffalo bankers.

DETAILED PLAN SENT OUT

The apportionment of the assets, however, is contingent on the bondholders paying what will be practically equivalent to an assessment of $1,600,000. This sum represents money borrowed by the protective committee and additional funds which would be necessary to meet obligations of the company.

Bondholders who refuse to pay their assessment or the amount necessary to participate in the distribution of the company's assets will of course be penalized. The Marine Trust Company, the Bank of Buffalo and the Manufacturers' and Traders' National Bank of Buffalo stand ready to participate in the underwriting.

The protective committee decided upon the plan at a meeting in New York on Aug. 6. The detailed plan has been sent to all bondholders. It will go into effect unless 30 per cent of the holders of the bonds object. The debts of the protective committee, which has been looking after the interests of the bondholders for more than a year, must be paid and the additional fund made available for financing the road.

The bondholders hold about $18,000,000 of the bonds of the International Traction Company, which owned all of the stock of the railway. After the traction company defaulted in its interest on the bonds, foreclosure proceedings were started and they acquired the stock which was security for the bonds. The bondholders have been represented by a protective committee of which Elliott C. McDougal, president of the Bank of Buffalo, is chairman. Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, is a member of the committee.

MITTEN MANAGEMENT TO CONTINUE

The Buffalo bankers who propose to take over the control of the railway will retain the Mitten interests to operate the traction system. Herbert G. Tulley, one of Mr. Mitten's aides, is president of the International. He will be retained under the reorganization plans.

A Return of 4.58 per Cent

Six-Year Statement of Income of Chicago Elevated Railways Made Public Recently

The consolidated income statement of the Chicago Elevated Railways for the years ended June 30, 1915, to June 30, 1920, inclusive, but with the last year based on eleven months actual results and an estimate for the month of June, 1920, without taking into account the increased wage scale which became effective on June 1, 1920, is shown in the accompanying table. The items in this table are as accepted by the Illinois Public Utilities Commission in the rate case which the elevated railways have before that body at the present time, items of $586,017 for replacement reserve, $137,501 for valuation expenses, and $50,000 income taxes having been set aside by the Public Service Commission.

CONSOLIDATED INCOME STATEMENT OF CHICAGO ELEVATED RAILWAYS

	1915	1916	1917	1918	1919	1920*
Revenues:						
Passenger	$8,369,337	$8,861,360	$9,764,134	$10,263,349	$11,050,930	$14,451,605
Other transportation	519,610	444,915	464,068	463,569	553,423	639,109
Non-operating	53,663	74,667	86,507	81,814	72,663	88,900
Totals	$8,942,610	$9,382,942	$10,314,709	$10,808,732	$11,677,016	$15,179,614
Operating expenses:						
Ways and structures	$212,038	$268,543	$301,945	$391,710	$735,816	$1,377,101
Equipment	398,142	528,828	584,620	663,753	849,138	1,203,629
Power	1,088,103	1,171,464	1,340,294	1,312,027	1,323,385	1,468,196
Conducting transportation	2,422,434	2,668,076	2,881,132	3,187,212	4,361,239	5,942,209
Traffic	6,908	20,651	27,855	26,225	33,874	27,978
General and miscellaneous	356,150	345,706	388,790	419,867	517,438	640,334
Totals	$4,485,775	$5,004,565	$5,524,636	$6,000,794	$7,820,890	$10,659,447
Taxes, car licenses, etc	$773,800	$789,662	$934,552	$1,012,094	$1,103,858	$915,088
Rentals	258,992	268,252	302,130	309,385	312,035	341,916
Totals	$5,518,567	$6,062,479	$6,761,318	$7,322,273	$9,237,783	$11,916,451
Available for depreciation and return on investment	$3,424,043	$3,320,463	$3,553,391	$3,486,459	$2,439,233	$3,263,163
Return on $70,943,020*	4.83%	4.68%	5.01%	4.91%	3.44%	4.60%

* Value fixed by ordinance of the City of Chicago, Aug. 14, 1918.

STATEMENT OF CHICAGO ELEVATED RAILWAYS FOR MAY

Gross earnings	$1,306,685
Total expenses	1,122,940
Balance for interest	$183,744
Fixed interest charges	206,103
Net deficit for May, 1920	$22,364
Payroll for May, 1920	700,264
Passengers carried in May, 1920	16,056,716
Since Aug. 1, 1918, wages on the elevated railroads have increased as follows:	
Aug. 1, 1918, increase per year	$1,566,537
Aug. 6, 1919, increase per year	2,650,739
June 1, 1920 (estimated), per year	1,756,512
Total increase	$5,973,788
Increase in cost of materials per year	793,918
Increase in power, taxes, rentals, etc	357,323
Total increase in expenses per yeai since Aug. 1, 1918	$7,125,029

The accompanying statement for the month of May, 1920, shows that there continues to be a deficit under the 8-cent cash fare, with two tickets for 15 cents. This deficit for June and July will presumably be increased, owing to the large increases in wages which became effective on June 1, whereas the increase in the rate of fare to 10 cents cash and four tickets for 35 cents did not go into effect on the lines of the elevated until Aug. 4.

If the return for the five-year period is averaged it will be found to be 4.58 per cent.

Large Decrease in Net Income

Long Island Railroad Operating Ratio Now 85 per Cent, an Increase of 10 per Cent in One Year

The thirty-eighth annual report of the Long Island Railroad for the year ended Dec. 31, 1919, shows that the company is approaching a crisis very rapidly. Operating expenses are increasing twice as fast as the operating revenues, the percentage change for the former being 23 per cent and for the latter only 9.7 per cent. This allowed a net income transferred to profit and loss under government operation of $2,500,000, a decrease of $1,700,000, or approximately 40 per cent, from the income of 1918. This decrease is due to the great increase in cost of operation and because no increase in fares has been allowed.

THE accrued compensation payable by the government to the company for the possession, use and control of the property of the Long Island Railroad, together with its other corporate income, enabled the company to pay its fixed charges, taxes and expenses and carry forward more than $682,000 to the credit of profit and loss. The latter account was charged with $115,773 to cover the yearly charge of $150,000 on the Atlantic Avenue leasehold estate, less other credits, so that the amount to the debit of profit and loss account was, as a result of such credits and charges, reduced to $566,303. The net income to the company under government guarantees in comparison with 1918 decreased about $90,000, or 11.8 per cent. This was due to the fact that the gross income increased only about two-thirds as much as deductions from the gross income.

$1,700,000 Decrease in Net

Glancing at the income statement of the federal operation, the net income decreased by $1,700,000, or more than 40 per cent, over 1918. This decrease may be traced to the increase in the operating ratio from 75.2 per cent in 1918 to 85.3 per cent in 1919. Operating revenues increased only 9.7 per cent, or about $2,100,000, while operating expenses increased 23 per cent over 1918, or nearly $4,000,000.

The extraordinary increase in passenger traffic of 16.5 per cent from 55,004,086 passengers carried in 1918 to 64,067,541 in 1919, with an increase in business through western terminals varying from 15 to 27 per cent, necessitated the acquisition of additional equipment. An arrangement was made for the purchase of 100 steel passenger cars at a cost of $2,088,000. These cars are under construction and should be delivered by the autumn of 1920.

The trend of operating statistics of the Long Island Railroad between the years 1881 to 1919 may be obtained from the accompanying chart. Gross revenues started from the low figure of $1,899,973 in 1881 and increased very gradually until 1916, when the increase was rapid, changing from $14,971,839 in 1916 to $24,381,974 in 1919. The operating expenses followed closely the curve of the revenues, starting at $1,674,135 and ending in 1919 with $21,689,979. From these two curves another may be drawn showing the variation in the operating ratio. The trend of this curve has been upward almost from the start. The lowest percentage ever reached was 58.1 per cent in 1887. At present the ratio has increased to 89 per cent, and there are prospects of its increasing still higher. One reason for the increase in operating ratio during the last eleven years is due to the fact that taxes are included in the operating expenses commencing with the year 1908. Expenses shown for 1918 and 1919 include taxes of the federal administration and the war taxes paid by the corporation, heretofore charged to "Railway Tax Accruals."

INCOME STATEMENT OF THE FEDERAL OPERATION OF THE LONG ISLAND RAILROAD

Year ended Dec. 31:	1919	1918	Percentage, Change
Passenger revenue	$15,607,723	$14,246,016	9.5
Freight revenue	6,280,427	5,713,725	9.9
Revenue from other railway operations	2,493,824	2,281,415	9.3
Total railway revenue	$24,381,974	$22,241,156	9.7
Maintenance of way and structures	3,163,138	2,894,843	9.3
Maintenance of equipment	4,334,035	3,173,826	36.6
Traffic	156,876	134,773	16.4
Conducting transportation—rail and water	12,167,012	9,867,339	23.2
Miscellaneous operations	175,543	175,884	— 0.2
General	591,929	500,528	18.3
Transportation for investment—Credit	1,684	8,122	—79.2
Total railway operating expenses	$20,586,849	$16,739,071	23.0
Net operating revenue	$3,795,125	$5,502,085	—31.0
Taxes assignable to railway operations	1,063,277	1,069,859	— 0.6
Uncollectable railway revenue	5,314	3,314	60.5
Expenses assignable to railway operations	$1,068,591	$1,073,173	— 0.4
Operating income	$2,726,534	$4,428,912	—38.6
Deductions from gross income:			
Net hire of equipment—Dr. Balance	$171,450	$277,962	—38.4
Net joint facility rents—Dr. Balance	133,384	259,859	—48.7
Net miscellaneous income—Credit	86,873	338,013	—74.1
Total deductions from gross income	$217,961	$199,808	9.1
Net income transferred to profit and loss	$2,508.573	$4,229,104	—40.8

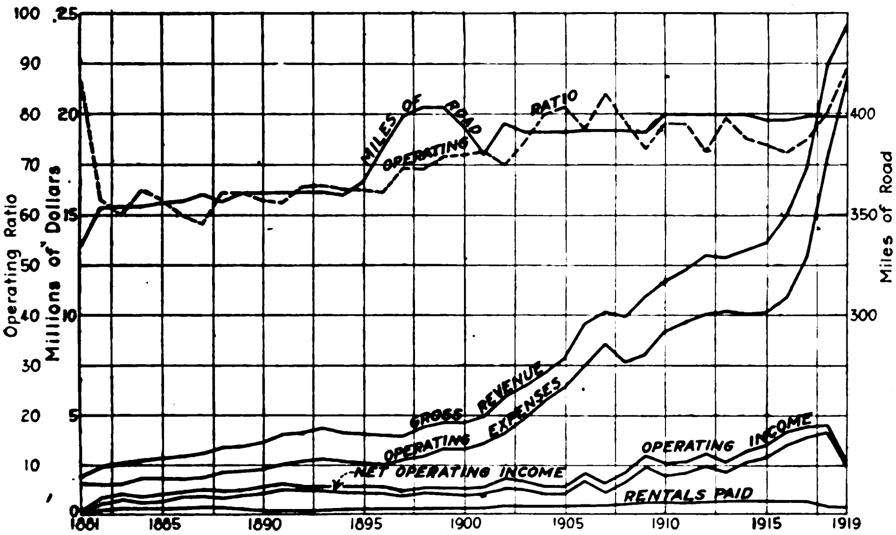
INCOME STATEMENT—LONG ISLAND RAILROAD

Year ended Dec. 31:	1919	1918	Percentage, Change
Compensation accrued under Federal control for possession, use and control of property of company	$3,221,949	$3,221,949	0.0
Other corporate income	719,276	562,299	27.9
Gross income	$3,941,225	$3,784,248	4.2
Deductions from gross income	3,258,719	3,010,273	8.3
Net income	$682,506	$773,975	—11.8
Disposition of net income	430	430	0.0
Balance transferred to profit and loss	$682,076	$773,545	—11.8
Amount to debit of profit and loss, at beginning of year	6,543,179	6,378,661	2.6
Sundry net debits during the year	115,773	938,063	—87.6
Amount to debit of profit and loss at end of year	$5,976,876	$6,543,179	— 8.7

STATISTICAL INFORMATION—LONG ISLAND RAILROAD

Year ended Dec. 31:	1919	1918	Percentage Change
Miles of single track	398.38	398.38	0.0
Train-miles:			
In passenger service	6,062,254	5,909,033	2.6
By freight service	433,074	481,077	—10.0
Total revenue train mileage	6,495,328	6,390,110	1.7
Car-miles:			
Passenger service	32,414,371	30,415,678	6.6
Freight and other service	9,433,192	9,684,003	— 2.6
Total car-miles	41,847,563	40,099,681	4.4
Revenue passengers carried	64,067,541	55,004,086	16.5
Passenger revenue	$15,623.417	$14,254,641	9.6
Passenger revenue per cent of total operating revenue	64.08	64.09	— 0.01
Passenger revenue per mile of line	$39,217	$35,782	9.6
Average revenue per passenger (cents)	24.39	25.92	— 5.9
Average miles each passenger was carried	15.97	15.99	— 0.1
Average number of passengers per car-mile	31.56	29.00	8.8
Statistics per train-mile:			
Passenger train revenue (cents)	278.2	257.7	8.0
Passenger train expenses (cents)	263.5	224.0	17.6
Net passenger train revenue (cents)	14.7	33.7	—56.8
Number of passengers	10.6	9.3	14.0
Train-miles per revenue passenger	0.094	0.1075	—12.6
Statistics per car-mile:			
Operating revenue (cents)	58.30	55.60	4.9
Operating expenses (cents)	49.20	41.80	17.7
Net income (cents)	5.98	10.55	—43.3
Number of passengers carried	1.52	1.37	10.9
Car-miles per revenue passenger	0.654	0.728	—10.2
Statistics per mile of road:			
Operating revenue	$61,203	$55,829	9.6
Operating expenses	$54,294	$44,764	21.3
Net operating revenue	$6,909	$11,065	—37.6
Number of passengers carried	160,820	138,000	16.5
Operating ratio per cent	85.3	75.2	10.1

The operating income is the difference between the gross revenue and operating expense curves. The figures for 1918 and 1919 represent the operation by the United States Railroad Administration, except those under "Rentals Paid," which represent the rental obligations of the Long Island Railroad. The amount shown under "Net Operating Income" is the difference between the result of the federal operation and the rental obligations of the corporation.



OPERATING STATISTICS OF THE LONG ISLAND RAILROAD

Graph of revenue, expenses, operating income and rentals from 1881 to 1919, inclusive

About 398 miles of road are operated by the Long Island at present. This represents about 880 miles of single track. About 70 per cent of this mileage is third rail. If traffic conditions are taken into account, the percentage of track which is electrified is very high, as the number of passengers carried on the unelectrified track is negligible compared with those carried on track supplied with a third rail.

The Long Island Railroad has applied to the Public Service Commission for an increase in passenger rates. Involved in the decision is the fate of another 100 passenger cars, which the company is contemplating purchasing in order to handle the growing passenger traffic. The financial ability of the company to pay for the cars, which are estimated to cost at present prices about $30,000 each, depends upon its ability to earn the interest on the money which must be borrowed to purchase this rolling stock.

Safety Cars as Security

The Virginia Railway & Power Company, Richmond, Va., through Cassatt & Company, Philadelphia, offers $250,000 car trust 8 per cent gold certificates at 100 and interest under the Philadelphia plan. The Philadelphia Trust Company is trustee and the certificates are dated July 1, 1920. They are of $1,000 denomination and are due serially $50,000 each July 1, 1921 to 1925. The security is fifty one-man safety cars built by the J. G. Brill Company at a total cost of $325,700.

Renewal Fund for New Cars

Commission Orders Chicago Company to Use Idle Funds to Purchase New Rolling Stock

The Illinois Public Utilities Commission on July 31 issued a supplemental order in which it directed the Chicago Surface Lines to continue to deduct from the gross receipts 8 per cent for the current renewals and accruing depreciation, but to deposit this sum from month to month in a special equipment fund instead of the renewal and depreciation fund as specified by the 1907 franchise, and to expend this sum, less actual expenditures for current renewals, in the purchase of additional equipment. Of the sum deposited in the equipment fund 60 per cent is to be deposited in the name of the Chicago Railways and 40 per cent in the name of the Chicago City Railway. From this special fund each of the companies is to pay its current renewals and expend the balance for the purchase of additional equipment.

The amount expended for such additional equipment is not to be made a charge against the capital investment of the companies, either in the amount upon which the commission will allow a fair rate of return or in the amount upon which computation is made under the city ordinances as the basis for fixing the compensation of the city of Chicago for the use of its streets, until the amounts thus expended have been repaid to the renewal and depreciation fund.

In an order dated Aug. 8, 1919, the commission said that the provision of the city ordinances for a reserve fund equal to 8 per cent of the gross receipts, for taking care of renewals and depreciation, was made on the basis of a 5-cent fare, and that in setting aside this money the company should not set aside more than 8 per cent of the amount of the gross receipts computed on the basis of a 5-cent fare instead of the higher rate of fare later authorized. In view of this opinion and the fact that the companies have been unable to comply with the order of the commission to purchase new equipment, by reason of financial difficulties and economic and financial conditions beyond their control, the commission sets forth the reason for its decision in the following words:

> It is the judgment of the commission that the public interests can best be served by requiring the active employment in the public service of the amount allowed by it for current renewals and accruing depreciation, and that this will be accomplished by ordering the investment of the amount thus allowed (less expenditures for current renewals) in necessary additional equipment, rather than by permitting such amounts to be deposited in an idle fund which draws only 3 per cent interest. The rights and interests of all parties can be protected by providing that the cost of additional equipment purchased under this order shall not be added to the petitioners' investment, or to the so-called capital account or purchase price provided in the city ordinances, unless and until they deposit in such renewal and depreciation funds the amounts which may be expended under this order for additional equipment.

To date more than $10,000,000 has been accumulated and is on deposit in the renewal and depreciation fund and is available for making renewals or replacements of principal parts upon certificates of the Board of Supervising Engineers. The 8 per cent allowance will amount to about $240,000 a month, of which $90,000 to $120,000 will be required for current renewals, leaving more than $120,000 a month available for new car purchases.

Under the duties imposed upon it by the Legislature the commission is required to determine the accruing depreciation, and under earlier order the sum was fixed at 8 per cent of the gross earnings, estimated on the basis of a 5-cent fare. Later the commission acknowledged that there was much force to the contention that this amount was entirely inadequate if provision is made for taking care of depreciation on the basis of labor and material costs at the time the depreciation is accruing.

B. & L. E. Bids Advertised

Bids are being advertised for the sale of the property of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., between the Buffalo city line and the New York State line except such parts of the line as were excluded by the provisions of the recent order of the Supreme Court of Erie county, referred to in the issue of July 17, page 147. The action for the foreclosure of the company's first and refunding mortgage is brought by the New York Trust Company, New York City. The property includes all the belongings of the company.

All bids must be delivered or mailed to George Bullock, receiver for the railway, at his office in Erie, Pa., before midnight of Sept. 15. Tenders must be accompanied by cash or a certified check to the amount of 5 per cent of the bid. The acceptance or rejection of the bids is subject to the approval of the court. A complete inventory of the property is on file in the office of the receiver at 61 Broadway, New York, N. Y., and his attorney, Daniel J. Kenefick, 1330 Marine Trust Building, Buffalo.

Boston Elevated Receipts Cover Costs

The expectations of the board of trustees of the Boston (Mass.) Elevated Railway have been fulfilled, according to a statement made by the bureau of audit of the company, as a result of the 10-cent fare established on the system a year ago. For the year ended June 30, 1920, there was a balance on the profit side of $17,079. This statement covers the second full year of public control. On July 10, 1919, the present 10-cent fare was inaugurated, but owing to the strike and other unfavorable conditions large deficits were sustained during the months of August and September of last year.

Commencing with the month of October, 1919, the operations of the road showed an actual profit each month over and above the cost of operation as defined by the act of the Legislature, until February, 1920, when abnormal snow expenses were encountered.

The month of February of this year showed an actual loss of $372,263. It is conservatively estimated that the snow expense of the company for the year just closed, taking into consideration the direct charges for removing snow, resulting loss of revenue, damage to equipment, etc., was at least $1,000,000.

The month of June, this year, showed a small loss due principally to a further increase in wages granted by the recent arbitration and to large expenditures for track work.

Month	Loss	Profit
1919		
July	$599,199	
August	227,029	
September	102,466	
October		$168,097
November		230,770
December		343,333
1920		
January		78,928
February	372,263	
March		91,076
April		150,190
May		98,584
June	5,776	
Invoice and other adjustments and profit and loss daily item		162,835
	$1,306,734	$1,323,814
Balance		$17,080

Foreclosure Sale Postponed

Holders of the first mortgage 5 per cent bonds of the Northampton (Pa.) Traction Company are again being urged to deposit their holdings. These bonds are due on Jan. 1, 1933. On Nov. 6, 1919, a bill of complaint was filed by the Northampton Trust Company, trustee for the bonds, against the company asking for the appointment of a receiver. Accordingly, Chester Snyder, Easton, Pa., was named to take charge of the property. A majority of the bonds has been deposited either with the Pennsylvania Company for Insurances on Lives and Granting Annuities or with the Northampton Trust Company. Foreclosure proceedings under the first mortgage were instituted and June 29, 1920, was set as the date for the sale of the property, but the sale was postponed.

Financial News Notes

New Chairman of Executive Committee. — Harrison Williams has been elected chairman of the executive committee of the board of the North American Company, New York, N. Y.

Receiver for Caldwell Traction Company.—C. D. Purkiser has been appointed receiver of the Caldwell (Idaho) Traction Company. Mr. Purkiser was formerly assistant general manager of the company.

Abandonment Authorized.—The Corporation Commission of Oklahoma under date of July 14 has permitted the Bartlesville Interurban Railway to abandon service of part of its line and also to remove poles, wires and tracks.

Colorado Line Abandoned. — The Durango Railway & Realty Company, Durango, Col., has ceased operation and will be dismantled. The city of Durango refused to take over the line for municipal operation. The road is 2½ miles long.

Sells $10,000,000 of Gold Notes.—It is announced that the Pacific Gas & Electric Company, Sacramento, Cal., has entirely disposed of an issue of $10,000,000 of five-year 7 per cent convertible gold notes. More than $7,000,000 of the issue was taken in California.

Extra Dividend Declared.—The board of directors of the J. G. White Engineering Corporation, New York, N. Y., has declared an extra dividend of 6 per cent in addition to the regular quarterly dividend of 1½ per cent on the common stock and the regular quarterly dividend of 1¾ per cent on the preferred stock, all payable Sept. 1 to stock of record Aug. 16.

Summer Resort Road Suspends.—The Point Pleasant (N. J.) Traction Company, which heretofore has operated 3.72 miles of line in summer at Point Pleasant, did not place the road in service this year. The company has failed for several years to earn its operating expenses and there were no funds available for carrying out improvements necessary to make the operation of the road safe.

Would Issue More Bonds. — Bond issues have been asked for in petitions filed with the Illinois Public Utilities Commission as follows: Decatur Railway & Light Company, Decatur, $354,000; Danville Street Railway & Light Company, Danville, $88,000; Urbana and Champaign Railway, Gas & Electric Company, Champaign, $88,000; and Urbana Light, Heat & Power Company, Urbana, $6,000.

Appraisal for Des Moines Lines.—As a preliminary to a settlement of the fare difficulties of the Des Moines (Iowa) City Railway the City Council of Des Moines has appointed three appraisers to determine the amount spent by the company for additions since 1915. A service-at-cost agreement was recently recommended as offering the best solution of the traction problems of the city.

United Railways Employs Power Experts.—The receiver for the United Railways, St. Louis, Mo., has employed two experts from Byllesby & Company, Chicago, to assemble data for his guidance in remaking the contract of the railway with the Union Electric Light & Power Company for steam-generated power at its expiration on Jan. 1, 1921, and also to devise a more perfect accounting system for the department of supplies and maintenance.

Towns May Purchase Line.—A committee representing Exeter, Hampton and other towns served by the Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., is reported to be negotiating through the State Public Service Commission with a view to the purchase of the company's property by the municipalities. The railway some time ago announced its intention to discontinue operation.

Receiver Sells Cape Cod Line.—The property of the Plymouth & Sandwich Street Railway has been sold at a receiver's sale to Louis Sovensky, Combridge, for $55,200. This sale included all the real estate and personal property of the road in Plymouth and Sagamore. The road covered 17.8 miles. The first 6 miles was constructed in 1899 and 1901 and in 1914 the Sagamore end was put in. In 1916 and 1917 9.25 miles was built. Operation of the entire road was begun on July 28, 1917. Operation ceased on April 1, 1918. There was much litigation between contractors and the road. It is thought that most of the trackage will be pulled up and sold for junk. Many people believe that a portion of the road, from Hotel Pilgrim to Fresh Pond, could be made profitable, and are ready to make an attempt to purchase this end of the line.

Mortgage for $15,000,000 Filed.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., has recently filed for record a general mortgage to the First Trust & Savings Bank, Chicago, and M. Traylor, Chicago, as trustee, to secure an issue of $15,000,000 of gold bonds dated May 1, 1920. The bonds will mature on May 1, 1950, but are subject to prior redemption. The issue was created for refunding purposes. Not to exceed $6,000,000 of the bonds may be issued from time to time and certified for refunding, redeeming or paying before maturity $6,000,000 of first mortgage sinking fund 5 per cent gold bonds of the company, issued on Jan. 1, 1910, of which there are $5,775,000 outstanding. Not to exceed $8,000,000 of the bonds will be used from time to time as the board may direct to care for extensions, improvements, additions, etc.

Traffic and Transportation

Councilmen After Jitneys

Guardians of Seattle Municipal Railway Insist that Unfair Competitors of Railway Shall Go.

An absolute ban on the operation of jitney buses in Seattle, Wash., is provided in an ordinance transmitted to the City Council by Corporation Counsel Walter F. Meier at the request of the City Councilmen. The ordinance, however, if passed by the City Council, could not become effective until approved by a vote of the people, Mr. Meier states.

Referendum Asked on Buses

The initiative petition presented by the jitney interests, calling upon the Council to submit to popular vote an ordinance in substitution of the present drastic regulations, is now in the hands of the Council. It contains the names of sufficient qualified voters to require an election on the subject at the next municipal election in March, 1921. According to Mr. Meier, any measures which the Council may pass before that election dealing with the elimination of the jitney must also be submitted to popular vote, as alternative propositions to the initiative ordinance, and cannot become laws upon being passed by the Council only.

The only hope of cutting off jitney competition at once now rests with the regulatory ordinance now in litigation, on which the courts are expected to pass on Aug. 20. The clause in the city charter which ties the Council's hands from enforcing a prohibitory ordinance without a vote of the people, according to Mr. Meier, is as follows:

> In case the City Council shall after rejection of the initiative measure have passed a different measure dealing with the same subject it shall be submitted at the same election with the initiative measure, and the vote of the qualified electors also taken for and against the same.

The ordinance introduced by Counsel Meier, after stating that the bill is based on the power of the city, provides as follows:

> It shall be unlawful to engage in or carry on the business of transporting passengers for, by, or in a jitney bus or to charge, demand, accept, or receive any fare, cash, ticket or other valuable thing in consideration of carrying or transporting any passenger by jitney bus within the limits of the city of Seattle.

Committee Defers Action

The public utilities committee of the City Council has laid over consideration of the ordinance for a period of two weeks.

In the meantime the outcome of the present regulations to come before the court on Aug. 20 is being eagerly awaited. In attempting to have vacated the temporary injunction under which the jitneys are now operating the city ran into an obstacle in the form of a writ of prohibition obtained by the jitney interests forbidding any judge of the Superior Court of King County from sitting to hear the city's motion to vacate the injunction until Aug. 20.

On that date the city is required to appear in the State Supreme Court at Olympia to show cause why the Superior Court should not be restrained from granting the motion to vacate the temporary injunction. It will be necessary for this writ of prohibition to be dissolved before the city can be heard on its motion to vacate the injunction.

If the city wins in Olympia on Aug. 20, and then wins out in the motion to vacate the injunction, the case will be dismissed from court and city officials would be free to enforce the existing regulations. If, however, the city loses the motion to vacate the injunction the case will be heard on its merits on Sept. 20.

Then if the jitney interests should win again a permanent injunction would be issued restraining the city from ever enforcing the regulations. If this permanent injunction is denied the jitney interests may appeal to the Supreme Court, and the temporary injunction would restrain the city from enforcing the regulations until the appeal is heard in Olympia some time next May. As the situation stands now, unless the city has the temporary injunction vacated, jitneys will be permitted to operate for at least another year.

Rochester Commissioner Takes Office

The new order of things in Rochester, N. Y., with regard to electric railway administration went into effect on Aug. 1. The 7-cent fare fixed in the cost-of-service contract will not become effective, however, until it is approved by the Public Service Commission for the Second District. It is expected that the new rate of fare will shortly be approved and in operation not later than Aug. 15.

Charles R. Barnes, the newly appointed commissioner of railways under the service-at-cost agreement, outlined his policy and immediate plans in a statement to a representative of the ELECTRIC RAILWAY JOURNAL. The features of the statement are the following:

1. Orders will be issued requiring the company to put into effect new schedules to increase the service on all lines, especially during the rush hours.
2. Relief from the present heavy congestion on Rochester's principal thoroughfares by ordering a new routing of the cars as soon as the increased fare is granted.
3. Reconstruction of a large amount of track and special work in the city for proper service.

Must Have 10 Cents

Kansas City Railways Applies to Commission for Immediate Increase—Rate Would Be Adjustable

The Kansas City (Mo.) Railways has filed an application with the Missouri Public Service Commission for an adjustable schedule of rates computed on the basis of the fluctuations in the price of fuel and labor, to become effective Aug. 20, the date of expiration of the present 8-cent fare. The effect of a favorable decision by the commission would be to raise the car fare immediately to a 10-cent cash fare with six tickets for 50 cents, or a ticket fare of 8⅓ cents.

Cost of Service Mounting

The present schedule of an 8-cent cash fare, two checks for 15 cents and five tickets for 35 cents, which has been in effect since Dec. 14, 1919, leaves an approximate deficit of $1,000,000 from operation during the calendar year ending Aug. 20, 1920. The fare is now averaging 7.42 cents a passenger and the approximate cost of furnishing service is 8.6 cents a person.

Wage increases Oct. 1, 1919, and June 1, 1920, have added $1,104,000 to the annual expenses of the company. Increased coal costs of $1 a ton, 60 cents of this increase being due to recent railroad freight hike and 40 cents due to the rise in the price at the mine, have increased the yearly expenditures $425,000. Based on the present price, the company's coal bill is now $350,000 more than in August, 1919.

Expenses Increase $2,000,000

Summing up these increases a total expenditure of more than $2,000,000 will be added to the company's expenses for the year. The company is asking for the 10-cent fare as one adequate to maintain the high standard of service which is being rendered, adequate wages to its employees and interest on the investment of stockholders.

The fare rate applied for is based on the present price of coal, about $4.43 a ton, and the average wage of trainmen of 53 cents an hour, which is now in effect. In case coal went to $4.93 and labor advanced as high as 58 cents an hour the 10-cent cash fare would still obtain, though only eleven tickets would be sold for $1. The present rate is figured on the basis of $3.43 as the cost for coal and 43 cents an hour for labor.

Jitneys Prove Burdensome

The company estimates that jitneys cost the street car riders of Kansas City a penalty of 1 cent a ride, taking as a basis the fact that the jitneys are hauling 40,000 people a day and thereby taking away at least $3,000 in revenue from the railway. The Kansas City Railway serves about 345,000 patrons and it would cost each patron about 1 cent to support the jitney service for the 40,000 people who use it.

Safety Cars Probed

Illinois Commission Holds Hearings to Determine Applicability of One-Man Equipment to Chicago Lines

Several hearings for the purpose of determining the applicability of one-man safety cars to operation by the Chicago Surface Lines were recently held by the Illinois Public Utilities Commission. The hearings were ordered by the commission as a means of deciding whether any substantial improvement of street railway service in Chicago could be secured through the use of this type of equipment.

Suited to Many Lines

R. F. Kelker, Jr., city transportation supervisor, appeared before the commission and testified that he would not be prepared to commit himself on the advisability of bringing one-man cars into the Loop district until he had given the matter further serious consideration. He said, however, that there are numerous lines in Chicago where three one-man cars could be operated in place of two double-truck cars with resulting improvement both in service and in operating cost.

He said that the cost of operating the safety car in Kansas City, where he had recently made an investigation, was about $2,000 a year less than for the double-truck type of car. His observations as to the results obtained in Kansas City were that the safety car worked very well except at heavy transfer points where many persons wish to board and leave the car at the same time. Under this condition he thought the one-man type was too slow in loading and unloading to be used with a high degree of efficiency. On lines where there was little congestion the "safeties" would work admirably.

In his testimony Mr. Kelker also referred to the loading platforms which have been installed in Kansas City at various points. He said that despite the fact that in some cases there is a space only 9 ft. wide for vehicles between the platform and the curb, the platforms expedite traffic and reduce accidents. Prospective passengers can wait for cars without danger of being run down by automobiles and vehicles can proceed at the sound of the traffic whistle without waiting for street cars to finish loading and get under way as they do at present.

Recommends Loading Platforms

The cars are loaded much more quickly and get out of the congested districts much sooner. He said that he was thoroughly convinced that the installation of such platforms in Chicago, with a collector there to take the fares before cars are boarded, would do much to speed up downtown traffic, particularly in rush hours.

The chief engineer of the Illinois commission also submitted a report at one of the hearings, but inasmuch as this had been hurriedly prepared he drew no conclusions. However, he stated that while there might be some outlying lines in Chicago where safety cars could be used, their application to main lines was of doubtful value. The commission has issued no order as the result of the hearing.

More "Safeties" for Los Angeles

One-man car service began in the business district of Los Angeles, Cal., on Aug. 1. Twelve cars were placed in service as against nine of the older type which were replaced. The seating capacity of the safety cars is just the same as that of the cars formerly furnished, so that a marked improvement was afforded. A one-minute faster headway was permitted where the "safeties" are used through use of the three additional cars.

Use of the safety cars was introduced to the public by numerous newspaper articles furnished by the publicity department of the Los Angeles Railway and by small folders placed on the cars before the change was made. Cards hung in the cars announced that an important change in service was to be made and that the folders contained the details.

The "safeties" are equipped with name plates introducing the operators to car riders. The feature of name plates was adopted by the operators when they assembled for final instruction. The vote in favor was practically unanimous and so each safety car will announce: "This car is operated by William F. Smith," or whatever the carman's name may be. It is the theory of executives of the company that the average car rider who meets the same operator each day likes to be able to address him by name.

Suburban Line Increase Approved

The Public Service Commission for the Second District of New York by order issued July 6 authorized the Syracuse & Suburban Railroad to charge for the balance of the year 3.6 cents a mile for cash fares, 3.1 cents for ticket fares, 2.4 cents for mileage book rates, with minimum fare of 7 cents for each class, and 1.8 cents for commutation rates.

The order further provides that after Jan. 1, 1921, fares shall be at the rate of 3.5 cents a mile for cash fares, 3 cents for ticket fares, 2.3 cents for mileage book rate, with a minimum fare of 7 cents for all classes, and 1.7 cents for commutation rates.

Application for the increased rates was due to a recently granted wage increase, retroactive to May 1, the company alleging that the increase could not be met from present revenues of the company. Village presidents of Manlius and Fayetteville testified at the hearing before Commissioner Frank Irvine that in their opinion the wages granted are reasonable and not higher than those prevailing generally in those villages. The new wage scale was reached in settlement of a strike, the conductors and motormen receiving from 52 to 56 cents an hour. Their original demands were much higher.

Transportation News Notes

Fare Rise in Wichita Falls.—The City Commission of Wichita Falls, Tex., has passed an ordinance authorizing the Wichita Falls Traction Company to raise its fare from 5 cents to 6 cents. The company will make a 2-cent charge for each transfer.

Fare Increase Approved.—An increase in the rate of fare from 5 cents to 6 cents on the Sandusky, Ohio, line of the Lake Shore Electric Railway, Cleveland, has been approved by the Sandusky City Commission. Five tickets for 25 cents may be purchased under the new ordinance.

Appeals Fare Increase.—The City of Milwaukee has filed an appeal in the Dana County Circuit Court from the recent order of the Wisconsin Railroad Commission granting the Milwaukee Electric Railway & Light Company an increase in fares. The order of the commission became effective June 27 and fixed the fare at 7 cents, or eight tickets for 50 cents.

Ten Cents in Elgin.—The Illinois Public Utilities Commission on July 30 authorized the Aurora, Elgin & Chicago Railroad, Aurora, Ill., to raise its cash fare in Aurora and Elgin from 8 cents to 10 cents. The company was directed to sell six tickets for 50 cents. The increase was made necessary by the wage advances recently granted the company's employees.

Ten Cents on Rainier Line—Ten-cent cash and 6⅔-cent token fares went into effect on the lines of the Seattle & Rainier Valley Railway, Seattle, Wash., on July 20. Fifteen metal tokens are sold for $1. A charge of 2 cents is made for transfers to and from the cars of the Seattle Municipal Street Railway, on the token fare, no charge being made for transfers on the cash fare.

Seven Cents in Lima.—Beginning Sept. 1 the Ohio Electric Railway, Springfield, Ohio, will be permitted to charge 7-cent fares on its lines in Lima, Ohio. It will sell nine tickets for 50 cents, with free transfers. The increase has been authorized by the Lima City Council. The company asked for an 8-cent fare. The company will be asked to resume service on the Grand Avenue line, abandoned last winter.

Use of "Movie" in Louisville.—The Louisville (Ky.) Railway is using a moving picture screen advertising in every moving picture house in Louisville to place before the public its position in regard to 5-cent fares and the need for an increase. Practically the same material which is appearing in its advertisements in the daily papers is being flashed on the moving-picture screens throughout the city.

Seven Cents on Evanston Lines.—The Evanston (Ill.) Railway was granted an increase in its rate of fare to 7 cents cash or five tickets for 30 cents by an order of the Illinois Public Utilities Commission, announced last week. The new rate supersedes the former straight 6-cent fare with no tickets, and became effective Aug. 7. The rate of fare was changed from 5 cents to 6 cents on May 1, 1920.

City-Owned Line Reduces Fare.—A 5-cent fare became effective Aug. 1, on the Tacoma (Wash.) Municipal Railway. An additional charge of 3 cents is made for a transfer to the lines of the Tacoma Railway & Power Company and the Pacific Traction Company. The fare has been 7 cents. Transfers from the privately owned lines will be accepted by the city under the new arrangements, the companies paying the city 2 cents on each transfer issued by them and accepted by the city on the municipal line.

Flat Fares in Connecticut.—Seven cents is now the basic fare on the lines of the Connecticut Company, New Haven, Conn. The order of the State Public Utilities Commission abrogating the zone system of fare collection and setting up in its place a flat rate of 7 cents, took effect on Aug. 8. Under the new regime the initial fare of 7 cents permits a passenger to travel to any point within the traffic centers of cities and two miles from the traffic centers of towns, with a cost of approximately 3 cents a mile for distances traveled thereafter. Transfers are free.

Seven Cents in Charleston.—Fares on the lines of the Charleston Interurban Railroad, Charleston, W. Va., were raised from 6 to 7 cents by a recent order of the State Public Service Commission. The order provides that four tickets may be bought for 25 cents, or ten tickets for 60 cents. The commission based its order upon the net earnings of the company for the four-month period ended June 30. The net earnings, according to the company's report, after operating expenses and taxes had been deducted, amounted to $8,313. The rate was increased from 5 to 6 cents on Feb. 25 last.

Fare Rise Opposed.—An ordinance giving the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, the right to put in effect a flat 10-cent fare for four months on its lines in Findlay, is meeting with serious opposition from business interests of that city. The measure, prepared by the company's attorneys, gives the railway the alternative of discontinuing city service at the end of the 10-cent fare period. The company's representatives told the City Council that the 10-cent fare would not solve its problems as decreased patronage would result with higher fare.

Audit Justifies Fare Rise.—A 7-cent fare is required by the Oklahoma Railway, Oklahoma City, Okla., if the company is to continue to operate, according to the report of auditors appointed by the City Commission to examine the company's books. The railway recently applied to the municipal authorities for an increase in fare from 5 cents to 7 cents. The audit showed a valuation of $3,400,000, and on this valuation it was shown that a 7-cent fare would barely take care of wage increases already promised by the company and provide an equitable return to the company.

Seeks Seven Cents in Victoria.—A. T. Goward, local manager of the British Columbia Electric Railway at Victoria, B. C., has formally notified the City Council by letter that his company will make application to the Board of Railway Commissioners for a 7-cent fare on the Victoria lines. Mr. Goward points out that when the company first applied for permission to charge a 6-cent fare it believed that such a charge would make it possible to operate the system on a satisfactory basis. Subsequent events, however, have proved that this could not be done, according to Mr. Goward, and an appeal to the Railway Board for a 7-cent fare appeared to be the only course left.

Eight Cents in East Chicago.—An 8-cent fare has been granted to the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., by the State Public Service Commission on its lines in East Chicago, without affecting the transfer of school children, the commission abolishing the previous zones and zone fares of the company. The Indiana Railways & Light Company, Kokomo, has been granted a straight fare of 3 cents per mile on passenger service, effective on one day's notice. The Indiana Union Traction Company of Anderson has been granted an increase on its rates on the transportation of crushed stone, sand and gravel in carloads between points on its lines to a graduated scale of 40 cents to 85 cents a ton, effective on one day's notice, until Jan. 11, 1921.

Ask More on Interstate Lines.—The Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., has filed an application with the Missouri Public Service Commission asking an increase in passenger and freight rates. The company sets forth that it transports freight and passengers between points in Missouri and other states and as a common carrier is subject to the transportation act of 1920, and should operate on the same basis as the steam lines. The date of the hearing has not been set. The Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kans., has filed a similar application with the Kansas Public Utilities Commission for freight and passenger rate increases. The Interstate Commerce Commission has granted the petitioned increase on rates to the Kansas City, Kaw Valley & Western Railway and the company is publishing its tariffs. The new rates will go into effect Aug. 26.

Seven Cents Asked in Ft. Wayne.—Paul Haynes, representing the Indiana Service Corporation, has just concluded a hearing in Fort Wayne, Ind., on the petition of the Indiana Service Corporation, for a 7-cent fare in that city. The company throughout pointed out that it based its petition for increased fare on the former or pre-war valuation and not the present valuation of its property. Robert L. Feustel, president of the company, said that with an increase in fare it would be able to grant its men an increase and to keep its equipment in much better condition than before. At the present time the trainmen are getting 40 to 45 cents an hour. Mr. Feustel explained that if the 7-cent fare were granted the company would issue four tokens for 25 cents. City officials and the City Council are against the proposed increase. An audit of the company's books showed that in January of this year 1,528,000 passengers were carried, while in April with the same car mileage only 1,395,000 were carried.

Sliding Scale for Syracuse.—Adoption of a service-at-cost plan for the Syracuse (N. Y.) lines of the New York State Railways will be recommended in the report of a citizens' committee appointed some time ago to inquire into transportation conditions in that city. A commissioner of transportation, under the plan to be recommended by the investigating committee, will be named to supervise electric railway affairs in Syracuse. The original fare probably will be 7 cents. The proposed agreement follows in many details the agreement which the city of Rochester has accepted. The study by the committee revealed the fact that the only hope the people of the city have of enjoying efficient, prompt railway service was by the adoption of some agreement that would give the local lines of the New York State Railways a financial return commensurate with the investment in Syracuse. Ford, Bacon & Davis, the engineers who were employed to investigate the whole subject of local transportation, have practically completed their survey.

Wants Track Payments Cancelled.—The City Council of Tacoma, Wash., has protested to the United States Shipping Board against paying any part of the claim held against the Tacoma Municipal Railway for double-tracking the line during the war period. Representatives of the Shipping Board recently came to a tentative agreement with the members of the Council that the city should pay to the board the sum of $42,000 and turn back ten cars purchased by the Emergency Fleet Corporation in settlement of the standing indebtedness. As a war measure the Council voted to double-track the line to accommodate shipyard workers. After the voters of the city turned down the proposition of putting added money into the lines the Council had to proceed without tax money. The Government therefore helped to finance the improvements and furnished ten cars, giving the city an option on their purchase. The city has already paid the Government $16,000 in interest on the account. The cars cost $74,000, with $35,000 added for new motors, making $109,000 for the cars.

Legal Notes

CALIFORNIA—*A Person Crossing Behind a Passing Train Must Use Powers of Observation.*

The general rule that one who attempts to cross a railroad track must reasonably use his own powers of observation to assure himself there is no danger from approaching trains applies to a person from whom a train approaching on a second track is hidden by a train which has just passed. [Griswold vs. Pacific Electric Railway, 187 Pacific Rep., 65.]

CALIFORNIA—*Time When Relationship of Passenger and Carrier Terminates.*

Where a street car passenger had alighted upon the street for the purpose of transferring to another car, but before she had reasonable opportunity of getting away was injured by the overhang of the car from which she had alighted when it turned on a curve, the relation of carrier and passenger had not terminated. [Boa vs. San Francisco-Oakland Terminal Railways., 187 Pacific Rep., 2.]

FEDERAL COURTS—*Requiring Repaving with Asphalt Instead of Macadam Not Unreasonable—Low Earnings Not Excuse for Failure to Repave.*

Where a street railway franchise imposed on the railroad the obligation of repaving a specified portion of the street when the street was to be repaved, it was not an inherently arbitrary or unreasonable requirement to provide that such portion of the street be paved, like the rest of the street, with asphalt upon a concrete foundation, instead of macadam, with which the street was originally paved. While the financial condition of a public service corporation is a fact properly to be considered, when the reasonableness of an order directing an unremunerative extension of facilities or forbidding their abandonment is determined, the mere fact that a street railway is not earning 6 per cent on the value of its property does not relieve it of the obligation voluntarily assumed by its franchise to keep a specified portion of the street in repair. [Milwaukee Electric Railway & Light Company vs. State of Wisconsin, 40 Supreme Court Rep., 307.]

ILLINOIS—*Benefits from Elevated Railroad Which May Be Considered Not Limited to Those Resulting from Operation in the Particular Block.*

In determining the damages to abutting property from an elevated railroad, the special benefits from increased traffic and travel facilities which may be considered are not limited to those resulting from the construction and operation of the road in the particular block in which the property is situated, and evidence of the passenger traffic at stations a few blocks from the property is admissible. [Geohegan, et al., vs. Union Elevated Railway, et al., 126 Northeastern Rep., 763.]

INDIANA—*Negligence of Parent Cannot Be Imputed to Infant Five Years of Age.*

The negligence of a mother who was struck at a railroad crossing by a car cannot be imputed to her infant daughter, only five years old, who accompanied her and was also injured. [Terre Haute I. & E. Traction Company vs. Stevenson, 126 Northeastern Rep., 34.]

MARYLAND—*Ordinary Care Required for Safety of Boy Permitted to Ride on Outside of Car.*

A conductor, who permitted a boy to jump on the outer side of the back platform of his car for the purpose of riding across a bridge, by holding on to the outside of the safety gate, was required to exercise ordinary care for the safety of the boy after he became aware of his dangerous situation, and when the car failed to stop on the other side of the bridge and started to increase its speed, the conductor should have stopped the car to let the boy off or have opened the safety gate and admitted him to the rear platform. [Carr, et al., vs. United Railways & Electric Co. of Baltimore, 108 Atlantic Rep., 872.]

NEW JERSEY—*Pedestrian, Who Cannot Cross Ahead of Car in Safety, Is Negligent Unless He Waits.*

The rule enunciated in the opinion for affirmance in Earle vs. Consolidated Traction Company, 64 N. J. Law, 573, 46 Atl. 613, viz., "The first to reach the crossing has the right to pass over first, but if it appears that the motorman does not intend to respect his right of priority and that the driver [or pedestrian] cannot, in the exercise of reasonable prudence, exercise his right, he is guilty of contributory negligence if he fails to wait or turn aside, if he can do so by the use of due care, and thus protect himself from injury," followed and approved. [Connolly vs. Public Service Railway, N. J., 109 Atlantic Rep., 507.]

NEW YORK—*Lighting Fire on Cold Day Deemed Incident to Employment—Section Hand Working in Gravel Pit Not Engaged in "Interstate Commerce."*

Where a laborer, shoveling gravel into wagons on a cold day, suffered injury to his eye from a flying spark while building a bonfire to warm himself and his fellow workers during the intervals between the loading of wagons, his act was fairly incidental to the work, so as to justify an award under the Workmen's Compensation Law for the injury. Where a section hand on a railroad primarily designed for intrastate carriage of passengers, and incidentally in interstate commerce, was hurt in a gravel pit, away from the railroad's premises, while loading gravel into wagons driven to a siding and dumped into a work train for carriage to points on the right-of-way requiring ballast, he was not engaged in "interstate commerce," within the federal law, and he was therefore within the protection of the state Workmen's Compensation Law. [Malandrino vs. Southern New York Power & Railway Corporation, 180 New York Supp., 735.]

NEW YORK—*Pedestrian Held Negligent in Failing to Heed Approaching Car Observed.*

A pedestrian, who, when she started to cross street railway tracks, observed an approaching car at a distance and in a position where there was manifest danger of colliding with it but paid no further attention to it, was chargeable with contributory negligence as a matter of law. [Salmirs vs. Union Railway of New York City, 181 New York Supp., 283.]

TENNESSEE—*Bond by Traction Company for Construction of Line Held Penal, Though Given to Municipality.*

Where a traction company, under a franchise to construct lines on particular streets, executed a bond for $200,000 to secure the municipality against loss, and also to procure the company's compliance with the regulation requiring stipulated expenditures within a fixed time, the bond must be treated as penal, notwithstanding the rule that the bond given to secure performance of public work for the benefit of a municipality will be treated as liquidated damages, because of the difficulty of ascertaining the damage. However, the city cannot recover damages from the company without proof of special injury. [City of Nashville vs. Nashville Traction Company, et al., 220 Southwestern Rep., 1087.]

WEST VIRGINIA—*Municipal Franchise Construed to Entitle City to Base Its Percentage on Gross Receipts Without Abatement for Lines Beyond Its Limits.*

A provision in a railway franchise provided for the payment of a certain percentage of the gross revenues from all of its lines operated wholly within the corporate limits and certain other specified lines which are partly within and partly without the corporate limits. Held, that this clause entitles the city to receive the percentage provided in the contract upon the entire gross receipts from such lines without any abatement therefrom because of that part of the specified lines which may lie without the corporate limits. [City of Parkersburg vs. Kanawha Traction & Electric Company, 102 Southeastern Rep., 116.]

Personal Mention

P. R. Taylor, office engineer of the power plant of the Kansas City (Mo.) Railways, has resigned to accept the position of city manager of Grand Haven, Mich.

E. E. Brownell has been engaged by the City Council of Akron, Ohio, to represent the city in the negotiations with the Northern Ohio Traction & Light Company looking to a settlement of the traction issues in Akron.

George I. Plummer, assistant general manager of the Dallas (Tex.) Railway, has returned to Dallas after an extended trip through the North, Middle West and South, where he studied transportation conditions in the principal cities.

Lewis Nixon, Public Service Commissioner for the First District of New York, sailed for Europe on the *Aquitania* on Aug 1. While abroad Mr. Nixon will study at first hand the operation of bus lines in London and other parts of England.

C. J. Sullivan, of Fairport, N. Y., has been appointed by Charles R. Barnes, commissioner of railways of Rochester, N. Y., accountant and auditor of the New York State Railways, Rochester lines. Mr. Sullivan has served for a number of years in different departments of public utility companies in various sections, acting in all capacities from master mechanic to general manager. For the past three years he has been the expert accountant for the capitalization department of the Public Service Commission for the Second District. While in that position he was assistant to Mr. Barnes in the investigation of the New York State Railways' finances.

Major Phillip Dawson has received the honor of knighthood at the hand of King George. Sir Phillip is a partner of the firm of Kincaid, Waller, Manville & Dawson, consulting engineers, London. He is also consulting electrical engineer of the London, Brighton & South Coast Railway. In the early days Dawson's "Electric Traction" was the standard book on electric railway engineering, and later his handbook was recognized as the authority on that subject. During the war Sir Phillip rendered valuable service as a member of the Disposal Board, Ministry of Munitions. He was also named a member of the commission appointed by the Belgian Government to investigate the future of the Belgian State Railways. He is now prominently associated with the scheme for the electrification of these railways. Sir Philip is a member of the Institute of Civil Engineers, the Royal Institute of Mechanical Engineers and the Institute of Electrical Engineers.

Railway Gets Editor

Mr. Clark Leaves Association Work to Join Public Service Railway—Authority on Fares

Harlow C. Clark has resigned his official connection with the American Electric Railway Association to accept a position with the Public Service Railway, Newark, N. J. Mr. Clark will enter at once on his new duties with the publicity department of the company. For this work he is admirably fitted by reason of his keen understanding of the problems of the industry, gained during his long service as editor of *Aera,* the Association's monthly magazine.

H. C. CLARK

Mr. Clark is a native of Syracuse, New York. He was educated in the public schools and high school of that city and in Blackhall School, in Connecticut. His first work was in the steam railroad field, serving in the freight and transportation departments of the New York Central and the Lehigh Valley Railroads. In 1892 he returned to Syracuse and entered the employ of the Syracuse *News* as a reporter, subsequently serving as Sunday editor and city editor on the Syracuse *Herald* and *Journal.*

In 1903 Mr. Clark was drafted from newspaper work to become secretary to the Mayor of Syracuse. Two years later he became secretary of the Syracuse Chamber of Commerce and in 1907 was appointed Commissioner of Public Safety under Mayor Forbes. At the expiration of his term of office he returned to the Chamber of Commerce as secretary. In 1911 he joined the staff of the Syracuse *Journal* as one of its editors. In the following year he was with the firm of Allen & Peck, Inc., his work being in the public relations field. Mr. Clark was appointed editor of *Aera* in 1913.

Mr. Clark has written extensively upon public utility matters, being the author of "Service at Cost Plans," a book recently published dealing with modern electric railway franchises. He was one of the witnesses before the Federal Electric Railways Commission and the Public Utilities Committee of the Chamber of Commerce, investigating electric railway affairs and has achieved a reputation as an authority on the subject of electric railway fares and the relations of electric railways to the public.

Obituary

Albert O. Brown, traffic director of the Peoria (Ill.) Railway, died on Aug. 1 at his home in that city from heart disease. He was fifty-four years of age.

Luther E. Guy, claim agent of the Southern Public Utilities Company, Charlotte, N. C., and the Piedmont & Northern Railway, Greenville, died recently.

Charles McGinley, formerly superintendent and roadmaster of the Kansas City (Mo.) Railways, died recently. Mr. McGinley was born in Canada in 1838. He entered the employ of the Kansas City lines in 1880.

Russell A. Griffin, general sales manager of the National Pole Company, died on July 14 from pneumonia. Mr. Griffin was formerly connected with the American Telephone & Telegraph Company and later with the Western Electric Company.

Daniel L. Prendergast, head of the real estate department of the Boston (Mass.) Elevated Railway, died on July 28 at his summer home in Nantasket, Mass. Mr. Prendergast had been ill about two months. He was born in Boston in 1857.

Melvin O. Adams, president of the Shirley Street Railway, Winthrop, Mass., a subsidiary of the Boston, Revere Beach & Lynn Railroad, died in Boston, Mass., on Aug. 9. Mr. Adams was also president of the Boston, Revere Beach & Lynn, a steam road. He was seventy years old.

Stiles P. Jones, active in electric railway franchise considerations in Minneapolis, is dead. He had been executive secretary of the Minneapolis general franchise committee, secretary of the Voters' League, examiner for the War Labor Board in Washington and member of the National Public Utility League and of the National Municipal League.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Embargoes Hindering Deliveries to Electric Railways

Need of I. C. C. Removing Restrictions —Purchasing Agents Working Hard to Overcome Delays

A crying necessity of the hour from the purchasing agent's standpoint is the removal of embargo restrictions upon the shipment by rail of many kinds of supplies destined for traction service. Recently the purchasing agent of one of the largest electric railway systems in the country informed a representative of the ELECTRIC RAILWAY JOURNAL that the public interest is closely concerned with the inability of traction companies to obtain shipments from manufacturers on as free a basis as is available to the steam railroads. It was strongly urged that the Interstate Commerce Commission be appealed to on behalf of removing embargo restrictions which if continued can have but one outcome in many cases—the stoppage of construction and repair work and the ultimate withdrawal of service on many railway lines.

DELAYED SHIPMENTS SERIOUSLY AFFECT NEW CONSTRUCTION WORK

One company, for example, has been unable to obtain a shipment of twenty-five carloads of ties from Jacksonville, Fla., since the early part of the year, and another tie shipment aggregating 100,000 cannot be moved out of a locality in West Virginia under present embargo restrictions. If the Interstate Commerce Commission would authorize the same freedom of movement on such material destined to electric railways that it approves in the case of the steam roads the situation would be greatly improved. Both are public utilities, this purchasing agent affirmed, and unless the above shipments of ties are made in part soon, he pointed out, it will be necessary to lay off 1,000 men engaged in pushing important track construction for the benefit of improved public service. In the case of steel rails and heavy supplies for car service the situation is likewise urgent. Machine tools, when needed, and smaller supplies available by express shipments can be obtained fairly satisfactorily, if an operating company is prepared to pay the cost of the higher-speed transportation.

It would be difficult to estimate the excess cost of operating companies this year, resulting from express shipments made necessary by the congestion of freight service. One of the leading purchasing agents stated recently that whereas many industrial companies can afford to maintain tracers in the field to expedite deliveries the traction companies as a rule cannot spare the funds required to follow up material in person. Such difficulties react upon the service rendered the public sooner or later, but the car passenger has little or no conception of the efforts which are being made at present to overcome the freight congestion as it affects local traction systems. It is maintained that electric railways as public utilities ought not be forced to spend time and money seeking special permits on individual freight shipments of embargoed commodities, but that a blanket order should be issued which will once and for all result in the freer flow of supplies.

Utilities Get Extension of Coal Priority

Confliction Regarding the Right to Both Purchase Coal in the Open Market and Secure Assigned Cars

Extension of orders Nos. 7 and 9 for ninety days from June 21 was made on Wednesday by the Interstate Commerce Commission, thereby assuring electric railways and other utilities priority of coal car assignments for coal for current use until Sept. 19. Order No. 9, which granted priority to utilities, was entered on July 13 and was to last until Aug. 19.

Under that order utilities could secure coal cars for coal for current use but not for storage. Certain interpretations of the order, however, were necessary. The rule did not make it plain whether or not utilities could store coal by purchasing in the open market and at the same time secure assigned cars for current use. The Interstate Commerce Commission assured different state utility commissions that the utilities could secure all of the coal they wished in the open market. This naturally implied that utilities which did so buy in the open market in order to assure the public of continuous service would not be penalized by being refused assigned cars.

NO CAR ASSIGNMENTS TO UTILITIES WITH SURPLUS SUPPLIES

It has developed, however, in a dozen or more cases that the railroads have refused to assign cars to utilities with a surplus supply on hand. The stand taken by the railroads in each case was upheld by the Interstate Commerce Commission. These conflicting points of view of the I. C. C. have been brought to the commission's attention and a clarifying interpretation is expected.

The commission, it is known, has been urged from a number of separate sources to broaden its order pertaining to utility car assignments so as to permit the utilities to begin to secure coal for winter storage. It was known, however, that the commission was not in favor of such action and consequently it was not surprising to find no mention thereof in the continuing order of last Wednesday.

It has also been learned that in some cases mines have been able to secure enough coal cars for their output so as to be able to refuse to load cars assigned to utilities.

Generally speaking, however, utilities are everywhere taking advantage of the priority order and as a result securing more coal on contract. As a result coal is costing the utilities less. There are also indications that spot coal may cost less.

Attorney-General Palmer has been investigating the prices charged for spot coal and the reports to the Federal Trade Commission showing what it costs to mine coal. Within a few days from this writing he is expected to name a fair profit for spot coal. Coal companies making a greater profit will be subject to prosecution for profiteering under the Lever act.

Fare Rate Increases Catch Railways Asleep

Traction Companies Do Not Always Anticipate Changes in Fare Box Mechanisms

Manufacturers of registering fare boxes have been embarrassed at times by their inability to meet the demand of companies who have been granted an increase in fare. These demands made upon the manufacturer are at times unreasonable and prove to be a source of complaint which it seems is hardly justified.

It has frequently happened that railways have not anticipated a change in fare, which necessitates the use of multiple coins and thereby an additional coin plate in the fare-box mechanism, by making adequate preparation. When the fare increase is granted, to become effective in the near future, the company often comes back to the fare-box manufacturer with the proposition of completely changing the fare-box coin-counting mechanism in an impossibly short period. The suddenness of such demands has made it physically impossible in many instances for the manufacturer to meet these requirements. It is believed that a little forehandedness in this respect will save traction companies from the possibility of not being able to install the new rate of fare as soon as it is authorized, and it certainly will make the problem of taking care of such customers a much more simple and businesslike one for the manufacturers. It is hardly fair to expect that a manufacturing plant shall be turned upside down and all regular work put aside and greatly delayed by the necessity of meeting the requirements in a fare-increase situation all in a minute.

ADVANTAGE OF METAL TOKENS FOR MULTIPLE COIN FARES

Incidentally, this frequent changing of the fare rate would seem to emphasize the advantage of using metal tokens for multiple coin fares, for in that case a change in the rate of fare will usually not involve the necessity of altering the fare box. The change necessary when metal tokens are used is a very simple one, and a new supply of the tickets can be secured upon rather short notice. This is an advantage which is appreciated only at the time of a change in fare rates, but the continuing advantages of the metal token are well known.

Unusual Demand for Controller Parts

Production Has Not Caught Up with Heavy Orders for Repair Parts Damaged Last Winter

Sales of controller fingers and segments have gone forward this year faster than ever before, according to several of the large manufacturers of this material, until at present the demand is far above normal and proceeding regularly. This is in spite of the fact that sales are usually spasmodic and extremely light during the summer months. One of the large producers stated that his sales for the first six months of 1920 had been greater than for the whole previous year. The basis of this extraordinary condition may be traced back to last winter, when traction companies were harder hit by storms than for many years. As a result excessive demands were made upon manufacturers to replace broken-down equipment, one of the large items being controller parts. Production has not yet fully recovered from the incubus of that overload, consequently orders in some cases are still far ahead of available output.

Reports on factory stocks reveal very uneven conditions as some manufacturers are reduced to bare shelves while others have acquired fairly good stocks. Delivery quotations also vary widely, the extreme length of time running to eight weeks; but several producers quote from two to four weeks, with one even shipping principally from stock. Deliveries on small sized orders can be made more quickly than those in larger quantities. Difficulties in obtaining metal are experienced in many cases, not that there is any actual shortage of raw material, with copper in its present condition, but merely that transportation troubles have been seriously holding up needed supplies.

Several companies report a volume of production that is not only normal but increasing and which bids fair to catch up soon with the number of unfilled orders. Many of the buyers are old customers and practically no orders have been canceled. Spasmodic labor troubles are felt in this field, but the general situation is good, especially since the close of the strike of brass workers in New England, which is expected to make further supplies of unfinished material available for the production of goods.

Prices have remained steady, and manufacturers hope to maintain the present price level, although in some quarters further increases are looked for. The majority, however, seem to anticipate no fluctuation. Collections are said to average about two months.

Strong Market Ruling for High-Tension Insulators

No Stocks of Finished Products Reported, While Shipments Run from Six to Ten Months

Although the production of high-tension insulators is said to be up to normal capacity, or nearly so, demand has increased to such an extent that it now far outstrips available supply. Not only is a good volume of domestic orders reported but the call coming from foreign countries since the war has been steadily increasing and export orders are now an important factor in the business. South American countries, France, Italy and the Scandinavian peninsula offer especially favorable markets for porcelain insulators, and replacements seem to be about an equal factor with new construction work in accounting for the demand.

FINISHED GOODS ARE NOT AVAILABLE

Manufacturers when questioned regarding stocks of finished goods throw up their hands in despair at the very suggestion of the existence of such a thing. Reports on the raw-material situation, however, are not so uniformly bad, for although this item is undoubtedly causing delay the use of personal tracers to locate shipments and careful attention to ordering supplies long ahead have guarded against an acute shortage. Little labor trouble has been experienced in this field, although in one or two quarters some shortage of skilled workmen is reported.

With the output of insulators unable to keep pace with demand delivery dates have been growing longer. Six months is about the very best figure quoted, and shipping dates run all the way up to ten months, depending upon the size and type. Medium-voltage sizes around 35,000 to 45,000 volts seem to be in the best shape as regards deliveries, while the highest voltage types are the worst off in that respect. Suspension insulators in several cases are reported a little easier than the pin type, and although in the former case the metal parts are a factor in production the metal is not holding up the program so much as porcelain. In spite of long deliveries an almost entire absence of cancellations is noted.

Prices at present are high, and opinions differ as to whether further increases may be expected. No price change is reported since the advances made a month and a half or more ago. Manufacturers in this line as a whole report their bills are being met fairly promptly and that little trouble is experienced with collections.

Foreign competition seems still to be a negligible quantity in affecting the American market for high-voltage insulators, as the industry abroad has not as yet sufficiently recovered from its period of war apathy.

Poor Impression Created by U. S. Made Street Cars

An unfortunate condition in respect to American trade propaganda exists on the street car lines of Buenos Aires. It happens that the oldest and most dilapidated trolley cars are of American make, of a type twenty years old. By comparison with the later models of British-built cars, thousands of the daily users of these cars, who have not seen more recent American designs, are led to believe that European mechanical equipment is superior to North American. The two street railway companies operating in Buenos Aires are the Compañia de Tranvias Anglo-Argentino, Ltd., and the Compañia La Croze.

Rolling Stock

The Kansas City Railways, Kansas City, Mo., advises that it purchased seventy safety cars the early part of this year.

Northern Ohio Traction & Light Company, Akron, Ohio, has just been granted authority by the Public Utilities Commission to purchase the twenty new interurban cars, fifty-six city cars and ten city trailers mentioned in the April 24 issue. Total cost of the cars will be $1,358,000. Officials of the company state that the price of cars on this one order has advanced $100,000 in four months.

Cheyenne (Wyo.) Electric Railway recently lost its carhouse, tools, repair parts and several cars in a fire which caused damage to the extent of $50,000. Included in the destroyed equipment were four new inclosed trailers without motors valued at $3,000 each, two motor cars valued at $10,000 each, one car of an older type, and one hand-brake car.

Recent Incorporations

Richmond & Fairfield Railway, Richmond, Va.—The Richmond & Fairfield Railway has been incorporated. This is a successor company to the Richmond & Seven Pines Railway, which has recently been sold. The officers are Oliver J. Sands, president; Arthur E. Parrish, vice-president and treasurer; J. A. Baird, general manager.

Track and Roadway

Sacramento Northern Railroad, Sacramento, Cal.—With the approval of the City Commission the Sacramento Northern Railroad will remove its tracks on Nineteenth Street from I to K and will vacate its franchise on that track.

Northwestern Pacific Railroad, San Francisco, Cal. — The Northwestern Pacific Railroad has applied to the Railroad Commission for permission to construct an undergrade crossing across the highway near Tyrone, Sonoma County. The new crossing is to take the place of a grade crossing to be abandoned.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md.—The land recently acquired by the Washington, Baltimore & Annapolis Electric Railroad for its new terminal building will be cleared of buildings and tracks will be laid.

Kansas City (Mo.) Railways.—The Kansas City Railways are completing the rebuilding of 2.045 miles of track in the downtown district, representing an expenditure of $101,256.

Northern Texas Traction Company, Fort Worth, Tex.—The Northern Texas Traction Company has begun work on the machine shop to be erected at 1600-1610 East Front Street, Fort Worth. The building is of reinforced concrete. It will cost about $60,000.

El Paso (Tex.) Electric Railway.—As soon as the money is available the Fort Bliss line of the El Paso Electric Railway will be double-tracked. This contemplated improvement will cost about $200,000.

Knoxville Railway & Light Company, Knoxville, Tenn.—Extensive new track construction is being planned by the Knoxville Railway & Light Company. This plan includes new lines on Wall Avenue from Gay Street to Asylum Avenue and double-track lines on Asylum Avenue from Walnut to South Broadway.

Ohio Valley Electric Railway, Huntington, W. Va.—The Ohio Valley Electric Railway expects this summer to lay a double-track in Ashland, Ky., from Twenty-second Street to Twenty-ninth Street; also a new track in Huntington, W. Va., from Twenty-fourth Street to Guyandotte.

Ohio Valley Electric Company, Huntington, W. Va.—Following the announcement that the Ohio Valley Electric Railway will abandon its local freight station because its funds are insufficient to defray the expenses of rebuilding it T. F. Bailey, general manager of the Banks Supply Company, announced local jobbers were willing to purchase a sufficient quantity of bonds of the company to enable it to rebuild the station. The freight shed was damaged by fire recently and the fire marshal ordered it razed.

Power Houses, Shops and Buildings

Los Angeles (Cal.) Railway.—An attractive and serviceable waiting station especially suitable for a terminal point has been established by the Los Angeles Railway at Manchester and Vermont Avenue with shuttle car continuation.

Interborough Rapid Transit Company, New York, N. Y.—Bids for the completion of the passenger station, electric lighting and heating systems for the Livonia Avenue (Brooklyn) line of the Interborough Rapid Transit Company will be received at the company's office, 165 Broadway, New York City, until Aug. 23, at which time the proposals will be publicly opened and read.

Central Texas Electric Railway, Waco, Tex.—The Central Texas Electric Railway, which is building an interurban line from Waco to Temple, has purchased a grading machine with which the grading on the line between Waco and Robinson, a station 6 miles out of Waco, is being done.

Monongahela Valley Traction Company, Mannington, W. Va.—The new terminal building of the Monongahela Valley Traction Company at Mannington, W. Va., was opened on Aug. 1. It is a one-story building, modern in every respect, and has been built to care for the increased business in the oil town.

Cheyenne (Wyo.) Electric Railway.—A fire believed to have been of incendiary origin has destroyed the carhouses, cars, tools and repair parts of the Cheyenne Electric Railway. The damage amounts to about $50,000 and the matter of repairs has not yet been decided by the company.

Trade Notes

The Brown Instrument Company, Wayne and Windrim Street, Philadelphia, is making arrangements for an extension to its plant, to cost about $20,000.

The Republic Flow Meters Company, Chicago, announces removal from 565 Washington Boulevard to its new factory at 2240 Diversey Boulevard.

The Locke Insulator Manufacturing Company, Victor, N. Y., has been granted permits to erect two factory buildings, one 66 ft. x 59 ft. and the other 62 ft. x 141 ft., at Charles and Cromwell Streets, Baltimore, Md., to cost about $44,000.

Westinghouse Changes.—The Westinghouse Electric & Manufacturing Company announces that L. D. Canfield, assistant district service manager at the New York office, has been appointed district service manager to L. G. Richards, who has been transferred to East Pittsburgh. G. O. Noble has been appointed special representative.

The Metal & Thermit Corporation, New York, N. Y., has made arrangements to insure all employees who have served the company for at least six months. The amount of protection is graded according to the length of service. The company bears the entire expense of the insurance, which is in addition to any compensation which might be granted employees under the present State compensation laws.

A. H. Grayburn, for the past four years assistant to the vice-president of the Norma Company of America, Long Island City, N. Y., has been made assistant secretary and assistant treasurer of the company. Norman Bell has been appointed sales manager of the company. This appointment follows a connection over three years with the company as sales engineer.

Titan Steel Corporation, Newark N. J., recently organized under the laws of Maryland, has acquired the plant of the Hewitt Steel Corporation, also of Newark. The company proposes to utilize the plant, which was used during the war for the manufacture of shells, in building railroad equipment and also for making its specialties, which are railway car trucks and body bolsters. The company has secured the manufacturing rights in the Hewitt car trucks and journal boxes. Sufficient orders are reported on hand to insure capacity operation for some time to come.

New Advertising Literature

Air Separator.—The Griscom-Russell Company, 90 West Street, New York City, has issued bulletin No. 1111, covering its Stratton air separator.

Time-Saving Accessories.—In the latest issue of the "Esterline Graphic," published by the Esterline Company, Indianapolis, Ind., the subject of time-saving accessories for use with graphic meters is taken up.

Electrically Driven Tools. — The James Clark, Jr., Electric Company, Louisville, Ky., has issued catalog No. 28, covering the "Willey" electrically driven tools, generators and motors.

The Yale & Towne Manufacturing Company, Stamford, Conn., has issued Volume 5, No. 3 of its bulletin "Hoisting Hints," an issue specially devoted to machine shop work.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Asst. News Editor

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Manufacturers Are Helping Establish "Good Will"

IN LAST week's issue and also in that of Feb. 7 we published short articles about the kind of publicity and public advertising that the Western Electric Company is doing and illustrated them with some of its posters or "advertising copy." We believe this kind of action is more important and has a greater significance than can be shown in the few descriptive remarks possible.

What we see in this is the recognition of a few of the facts and ideas which we tried to emphasize in our issue of July 10, the chief of which is that messages which are for the good of the electric railway are ultimately beneficial to all connected with that industry, and further that one's own self-interest, correctly analyzed, should lead him to a realization of his own dependence upon the success of the industry in which he lives and works. The Western Electric Company has no monopoly of the idea, but it is doing a wonderful piece of work along this line.

One important fact is that this sort of publicity is effective, if the surprisingly large number of commendatory letters received by the company is any indication. If this is so, is it not worth while for manufacturers and operators alike to study the methods and principles of this publicity with a view to extending their application?

Pushing Maintenance Work Through the Shop

WHAT a world of difference there is in the way in which maintenance and repair work is dispatched in different shops! In some it is quite evident that the shop force has the work well in hand, in others the work seems to be the master. The writer recently had occasion to visit many shops on properties that stretched across the continent. He noted illustrations of the above; in fact, his observations suggested the present line of thought.

In a recent editorial in this paper the suggestion was made that research work would be found profitable on the part of any electric railway company. Nowhere is this more true than in the shop. The term "research" has an academic, "high-brow" flavor, but really every master mechanic who is alive to the possibilities of his job is doing more or less investigation. But in most cases this activity is unsystematized and desultory. A little concentration of effort would make it much more effective. In some shops there are young fellows of ability who are not loaded up with executive work to whom could be delegated the task of studying the local procedure to determine whether improvements are not practicable. While the operating department of the railway is speeding up the running schedules of the cars, the equipment department might well put a little effort on speeding up the shop schedules. All workers will put more "pep" into their efforts when the work is going with snap and system. And a small percentage of time saving on each operation will bring far-reaching results. Some one individual, however, must make it his special business to study the proposition as a whole. If the master mechanic has time to do it, he is, or ought to be, well qualified for the task. But some competent person should do it.

Manufacturers frequently call in outside specialists, sometimes termed "efficiency experts," to show them wherein their factories are wasting labor and materials through lost motion. Competent advice in such cases is a paying investment. But in the railway shop there is usually enough talent already available to accomplish the same purpose. Is any one doing this work on your property? If so we should like, for the benefit of the industry, to know what results he has accomplished.

What About Substitute Ties?

ALL careful observers have noted that the price of timber has been advancing rapidly and the experts of the Department of Agriculture have declared that more timber is being cut than is replanted. Labor is high and freight rates are to be higher yet. Most of the tie timber used by electric railways comes to them by freight, because the local supplies have either been exhausted or else they are absorbed by the steam railroads. In 1916 one could buy a first-class sawn-heart pine tie laid down in New York for about 80 cents. Today the price is about $2.50, and the quality of the timber is doubtful while the certainty of delivery is a mooted question.

With such conditions in mind, the position of the engineer who has used wooden ties in track construction to his entire satisfaction becomes uncertain, and the mounting cost must lead him to serious consideration of substitutes for his timber. As to substitutes, there are several types of steel ties which have had more or less vogue, and in the steam road field there are a number of different types of reinforced concrete ties as well as some steel ties under experimental observation.

Heretofore one of the reasons for continued use of wood ties by electric railways has been their cheapness, as compared to steel or concrete ties. But the price disparity between steel and wood has now practically disappeared, although concrete has increased in cost owing to scarcity of cement and lack of shipping facilities for stone. With steel and wood more nearly upon a price parity the use of steel ties is very likely to increase.

As to the substitute ties themselves, there are opportunities for further development and adaptation to the needs of the track. Most of these ties are designed to serve first as a tie rod or gage holder, and the concrete in which they are usually embedded is supposed to carry the loads. We say "supposed" advisedly, because it is one of the most difficult tasks if not impossible, to get and maintain a good bearing contact between the concrete and the rail base. With some forms of steel tie the fastening devices are far from perfect and there has been a tendency in many cases to space ties too far apart in order to reduce the first cost. The reports of the board of supervising engineers, Chicago Traction, indicate the need for a spacing much closer than that of 4-ft. centers, which has prevailed. Experience elsewhere simply adds emphasis to the results of the Chicago study.

It seems to be clear that way engineers must begin to give thought to the subject of substitute-tie design, partly because the tie-timber shortage must be faced and partly because most ties now used as substitutes have been designed and promoted by manufacturing interests which may or may not have given sufficient thought to their design as engineering structures. The subject is one calling for a great deal of study. The results from existing installations, which have been sufficiently long in service, should be collected and compared.

The relation of the tie, of whatever type, to the track as a whole needs to be considered in the light of the information made available through the report of the committee on stresses in track of the American Railway Engineering Association. Tests along lines similar to those conducted by that committee and covering electric railway track conditions would furnish interesting data. It is to be hoped that the American Electric Railway Engineering Association may soon find time to give the subject of substitute ties the attention which its increasing importance seems to warrant.

Court Decision Improves Iowa Situation

IOWA electric railways in the absence of a state utilities commission have had a hard row to hoe. Things looked more gloomy than ever when in the Ottumwa case, in July, 1919, the State Supreme Court upheld the appealed decision of the Circuit Court that the contract provision as to rate of fare was legal and binding, but it left one ray of hope by stating that it would submit to a rehearing of the case. The Ottumwa company promptly petitioned for such rehearing and on Aug. 10, 1920, the court reversed its previous view and declared that portion of the franchise calling for a 5-cent fare to be invalid for the reason that the law does not give cities the power and authority to contract with street railways for a specified rate of fare.

Undoubtedly this favorable decision will be of far-reaching effect in all present and future fare controversies in Iowa, final determination of several cases having already been delayed pending the outcome of this Ottumwa case. We are glad to note this decision, for, like the companies of every other state, those of Iowa were not endowed with the foresight to realize that a fixed-fare franchise of immense present value might some day become a serious liability. And since this inequity of a fixed fare in a long-term contract has been established in most other states, it would have been unfortunate indeed for the railways of Iowa, almost alone, to be left longer in the predicament which the original Supreme Court decision caused. Perhaps the effect of this decision may even reach Florida, where, for example in Jacksonville, the only recourse from the referendum of the people disapproving an increase in fare is to appeal to the courts for similar adjudication of the fixed-fare clause of the franchise.

Is It Amortization at Last?

BY RECENT decision of the Illinois Public Utility Commission the Chicago surface traction system inaugurated July 1 a plan for using the current renewal fund accruals differing somewhat from the stipulation of the ordinance requiring 8 per cent of the gross receipts to be deposited monthly in the renewal and depreciation fund, bearing 3 per cent interest. This decision was reviewed on page 337 of this paper dated Aug. 14.

This decision seems to mark an important step in the actuarial treatment of this very involved subject, and it is to be noted particularly that it will likely inaugurate the beginning of amortization in the case of the Chicago surface lines out of direct revenue, which has long been recognized as the chief omission of the 1907 ordinance as viewed in the light of present accounting knowledge.

From the commission's findings it appears that a $10,000,000 fund (already on deposit) is big enough to constitute a safe "nest egg," earning only 3 per cent in a 7 per cent or 8 per cent market; that new equipment purchased direct from the renewal reserves will not increase the official capital account computed according to the formula of the 1907 ordinance, unless and until paid back; that this accounting expedient is authorized as an emergency measure, in view of the present money stringency; that a preceding temporary order establishing the renewal reserve as 8 per cent on the gross receipts, computed on a 5-cent fare basis, has been changed to 8 per cent of the total present recipts, in recognition of prevailing and continuing high cost of renewal material, and that the rate of expenditures for new equipment is automatically limited by the amount of unexpended balance remaining from the 8 per cent after normal renewals have been taken care of.

The accounting problem involved will be recognized as a simple expedient for anticipating the normal renewals of rolling stock, in order to avoid the necessity of buying new capital at excessive rates, and this seems to be eminently justifiable. Furthermore, it permits the property to turn over its current resources promptly, without banking or underwriting fee, by employing a liquid fund. To continue the present practice of placing all renewal reserve in the renewal and depreciation fund would be simply to increase by gradual steps a fund earning only 3 per cent interest. In other words, the whole process resolves itself into the familiar plan of "putting money back into the property."

As the "special equipment fund" authorized is directly under the eye of the commission and as it is the intent to expend the entire allotment on either normal renewals or equipment, there can be no criticism of abstracting part of the renewal and depreciation fund in contravention of the specific mandate of the contract ordinance, for there will be no balance left. Thus so long as the commission retains specific jurisdiction the situation is in safe hands.

Amortization has in late years been recognized as a fundamental necessity in securing ultimate stability in capital enterprises, subject to the unalterable law of decretion through wear, use and other causes. It was pre-eminently recognized by the courts in the Kansas City ordinance, and the precedent has been followed in other cases. It makes little difference how amortization is brought about. The Chicago Traction Subway Commission in its 1916 report definitely recommended the use of the $25,000,000 traction fund for the building of initial subways, the same to be uncapitalized, thus definitely recognizing the amortization principle in a commendable way. It seems idle to discuss arguments against such a plan, as there seems to be no other feasible plan that will tend to bring about a parity between property and capital account at the time when a resettlement will become the great public issue as in Chicago, and also the only plan which will equalize in the least harmful way the respective responsibilities of investor, operator and patron.

If, therefore, the action of the commission has rightly been construed as embodying this forward-looking expedient it must be regarded as eminently sound and just.

What Is Power Factor?

THIS question has been asked thousands of times from engine room to president. It has been answered unsatisfactorily as many times. Those of our readers who noted our emphasis of the importance of this little factor in our editorial columns of July 24 will think us facetious when we add, "There ain't no such animal!" Such is the bald truth, however. It is a case like the story of the blind man and the elephant, "They are both right." Neither side has grasped the entire perspective of the problem that is at hand.

Committees of our electrical societies have wrestled with the definition of power factor, particularly for a polyphase circuit, for years. At the recent convention of the A. I. E. E. at White Sulphur Springs eight very able papers by some of our best engineers were presented, setting forth both the practical and theoretical viewpoints. Yet the committee was continued and the problem is as yet unsolved.

We can measure kilowatt-hours of energy very accurately and charges are made accordingly for the energy used. Why bother, then, about power factor? Simply because the lower the power factor the greater the investment required to produce that energy, the greater the losses in its generation and transmission and the less the available capacity of the plant for delivering that energy. Hence the greater the costs *per kilowatt-hour*. Thus it touches the pocketbook and we must all "sit up and take notice."

Fortunately for the balanced three-phase loads usually generated or contracted for by the electric railways there is little question regarding definition and standardization of power factor. The difficulty arises only when the currents and voltages in the different phases are unbalanced or out of phase by different angles. That these conditions are serious with the present usage of the term "power factor" is very clearly and practically pointed out by Phillip Torchio in his paper presented at the annual convention of the A. I. E. E. *i.e.*, with different unbalanced three-phase loads of power factors varying from 100 to 50 per cent a delivered load of 1,000 kw. may require capacity of equipment ranging from 1,000 kva. to 2,175 kva., and with single-phase loads the variation may extend from 1,740 to 3,000 kva. All of these loads would be paid for upon a basis ranging from 1,000 kw. at 100 per cent power factor to 2,000 kva. at 50 per cent power factor with the present definition of power factor in common use. In cases of single-phase contracts, combined three-phase and single-phase loads or those polyphase loads which are unbalanced with respect to voltage, current or phase relations within one phase, the papers in question should be carefully studied and care exercised that the proper standards are determined. Evidently in such cases we must either change our definition of power factor or introduce an additional element into our rates involving a properly defined "unbalance factor."

Manufacturers of electrical equipment, central stations and consumers would be affected differently by the various definitions proposed. The situation was therefore very well stated by Prof. V. Karapetoff of Cornell University, who told the following parable at the convention:

> In a certain country, at a certain stage of its development, the circle used to be the only curve known, and any objects that could not be made square or rectangular were made of circular cross-section. It came to pass, however, that in the course of industrial development the advantages of a flattened circle or ellipse were gradually realized.
>
> At first the forms of the ellipse used departed but slightly from the circle, and every one was speaking about "the mean radius of the ellipse," without thinking of any exact definition of the term. By and by more oblong forms of the ellipse began to be used, and with them came ambiguities, controversies and even lawsuits, until it became necessary to appoint a joint committee for the definition of the "mean radius of the ellipse." The committee began its activities by holding a public hearing to consider the interests of those concerned. First came the representatives of makers of canned meats, who stated that the public preferred elliptical boxes of the same height and contents as the former round boxes. So these representatives wanted the mean radius of the ellipse defined as that of a circle of the same area. Next came the makers of labels to go around the sides of the same boxes. They complained that they could not figure out correctly the length of the paper strip for the new elliptical boxes and they wanted the mean radius of the ellipse defined as that of a circle of the same circumference and not of the same area. Finally came the representatives of elliptical pie makers, who wanted two separate definitions for the mean radius of the ellipse. According to them, for selling purposes the largest radius of an elliptical pie should be defined as its "equivalent mean arithmetical radius," irrespective of the other dimension. For purposes of taxation the shortest radius should be used and defined as the "equitable mean geometric radius."
>
> The committee was in great difficulty to decide among these proposals, when a shabby looking, underpaid college professor appeared and bashfully ventured the opinion that the thing really needed was not a fictitious definition of a mean radius of the ellipse, but a careful study of the actual properties of the ellipse. Then, he continued, the area as well as the circumference of the ellipse could be expressed in terms of its dimensions, and each industry could be provided with the needed data. Besides, such an investigation would open the way to further progress in the arts.

Although this parable created considerable amusement, it served well to direct the attention of those present toward the rational and fundamentally sound viewpoint advocated by the professor. This unique method involves the tangent of the angle between active power and total kilovolt-amperes in place of the cosine of this angle, which has commonly been known as power factor. Since the quantities involved in this new factor are readily measured on meters, the new ratio should have careful study as a possible factor in rates involving unbalanced loads. It may be found in the discussion of the papers on power factor in forthcoming issues of the journal of the A. I. E. E.

Safety Car Operation

Educational and Practical Methods Which Have Been Developed by the Kansas City Railways, Together with Complete Operating Rules for Safety Cars, Ninety-five of Which Are Now Being Operated by This Company

By

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AND

J. M. DAPRON
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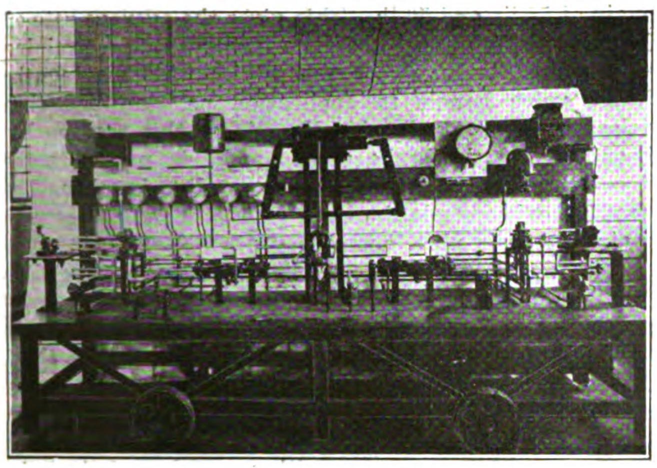
THE INSTRUCTION ROOM IS A BUSY PLACE DURING LUNCH HOUR

THE Kansas City Railways has had thirty safety cars in operation for a year, seventy for the last six months, and it is now operating ninety-five. All but thirty-four of these are operated from one carhouse, which now has a total of 210 cars, the balance being made up of double-truck cars weighing from 35,000 to 48,000 lb. each. All cars are inspected on a mileage basis, and operating costs are worked out on a ton-mile basis, the records for both inspection periods and costs being carefully checked. Recently certain changes were made in the records whereby maintenance costs of safety cars and other types are segregated, so that comparisons can be made. Operating conditions in Kansas City are very severe, due to many and steep grades, heavy passenger loads and fast schedules.

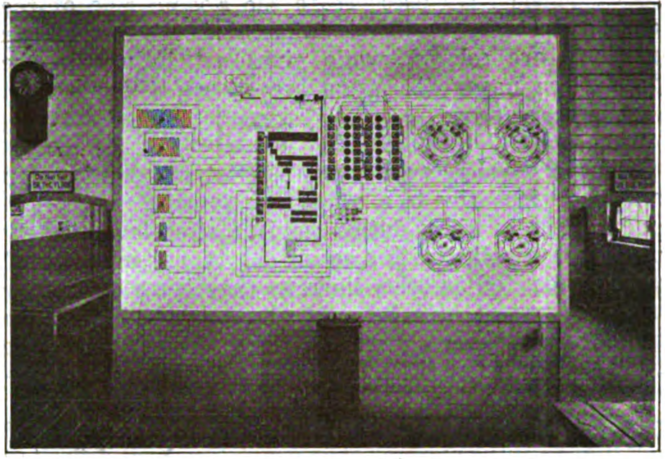
Safety car operation was begun on lines that looped through the heavy riding district, and so far this service has been maintained with few failures. It was, however, quickly discovered that successful operation depended largely on the efficient functioning of the air equipment of the cars, as while no great number of failures were experienced those that did occur were poorly handled by inspectors and repair men, while electrical failures were cleared up with little difficulty. It was apparent from the time that the first car was placed in the service that the personnel at the shops and carhouses was impressed with the idea that the equipment on the car was complicated and that this was particularly true of the air brakes and auxiliary air apparatus. As this company has not a single line on which there are not severe grades, one busy line having to negotiate 13.7 per cent, it was quickly realized that operators, inspectors and repair men must be taught thoroughly to understand the handling and maintenance of the air brake equipment, and with this in mind a definite program was prepared whereby repair men could be taught in detail the functions of every piece of apparatus and when and how it should be inspected and tested. The inspection of the safety car was, of course, taken care of from the outset by the same system as applied to other cars, but experience has shown that the car can, if anything, run on longer inspection periods, but that there is need of special instructions on the air devices.

TEST RACK VALUABLE

The first step taken toward carrying out this program was to build a test rack, comprising a single and double end safety car control equipment, with the addition of sand traps and such air-operating devices as are installed on the safety cars of this railway. The rack was designed in the form of a bench with posts in the back, extending about 4 ft. above the top. These posts were equipped with brake valves, controller handle, foot valves, door and step controllers, emergency valve, rear door unlatching device, register foot valves and register, mounted on brackets secured to the top of the bench and arranged in such a manner that the valves can be taken apart without disturbing the pipe connections. On the three posts at the back of the bench the respective pipe lines are run in a horizontal position. The brake cylinder, compressor switch, fuse, governor, sand reservoir, circuit breakers, register and gages are installed on the extended posts above the bench. The main reservoir and compressors are hung to the underside of the bench top; all pipes are provided with gages



DOUBLE-END SAFETY CAR AIR BRAKE TEST RACK

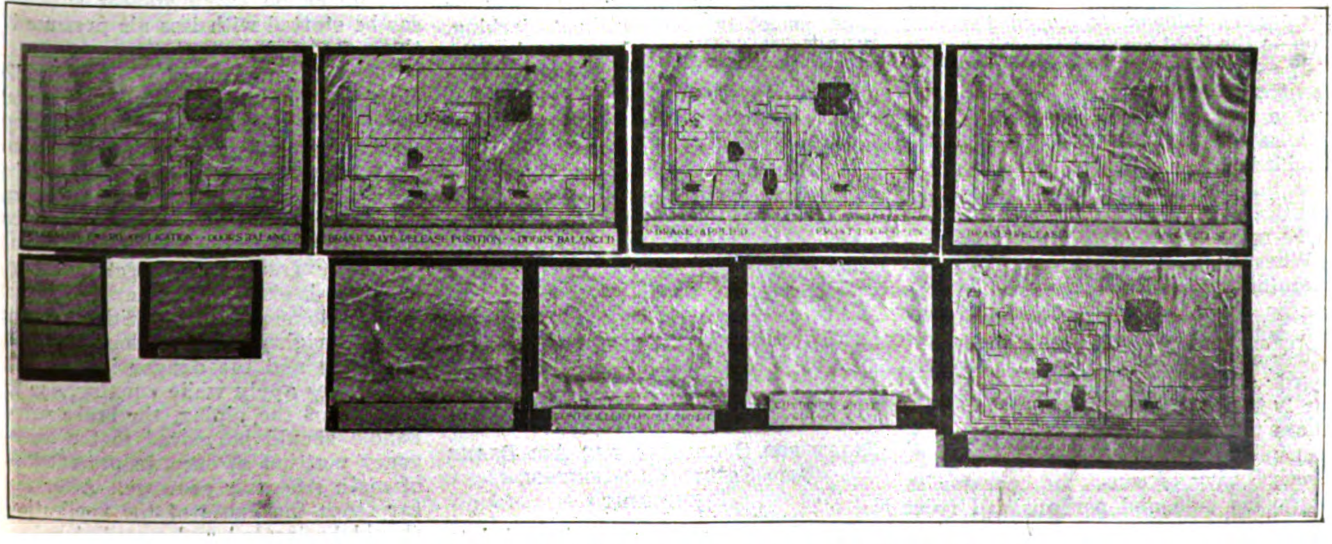


INSTRUCTION CHART FOR "K" CONTROL. COLORED LAMPS SHOW PATH OF CURRENT

and cutout cocks arranged in a manner which provides for the testing of each device. Each pipe line is represented and identified by a color, while the gage connected thereto is provided with a target of the same color with the name of the pipe and volume represented. When it becomes necessary to represent a single end equipment for demonstration the necessary cutout cocks are closed. The rack has also been mounted on wheel carriers which provide for quick and easy removal from one department to another and when not being used in the air brake department for testing the rack can be moved to the instruction room without disturbing any of the pipe connections or equipment. As will be seen from the foregoing, the rack is of unusual design and differs from the ordinary test rack found in most railway shops. It will be noted by referring to the accompanying illustrations that great care was exercised in the arrangement of each piece of apparatus and that by raising the various devices well above the bed of the bench all pipe lines and pipe connections to the base of valves are clearly exposed and easy to trace. The only equipment placed underneath the bench consists of the main reservoir and air compressor connections. The system of pipe connection, mentioned below, was made more easily understood by a color scheme which was used purely for educational purposes in connection with diagrammatic charts. Sets of five diagrammatic charts were secured from the Safety Car Device & Equipment Company, illustrating the apparatus and position of the respective valves for the various conditions as follows: (1) Release position—doors closed; (2) application position—doors closed; (3) application position—front door open; (4) brake valve emergency—doors balanced; (5) controller handle emergency—brake valve in release position, doors balanced.

COLORED CHARTS AID INSTRUCTION

A set of these charts were colored so that each pipe line with valve, ports, etc., corresponded in color with that on the test rack showing the five applications which are made in the operation of safety car control equipment. In the demonstration an application was made on the rack and the operation was illustrated by referring to the chart corresponding to the application made. For example, if the brake valve handle on the rack was placed in application position with the controller handle down, the chart corresponding to this position was used and its colored lines showed that the communicating ports in the brake valves provided air pressure through ports in the rotary, straight air pipe, cavity in the emergency valve, slide valve and into the brake cylinder. This same color showed the straight air pipe pressure with its communication to the combined foot and cutoff valves and that the emergency pipe was being charged while in this position through a feed port in the emergency valve and that the emergency



COLORED CHARTS ARE USED IN CONNECTION WITH TEST RACK line furnished air pressure to the closing side of the door and step controllers. Pipes and valves with air pressure are colored, while pipes not in use in the application under discussion are shown without color.

MEN COLOR THEIR OWN CHARTS

With a view of awakening interest among the men and as an incentive to study the equipment, repair men and inspectors whose duties required attention to safety cars were supplied with a set of charts, not colored, and were instructed to color them as they became familiar with the system. Master charts hung in the instruction room were always available, and these men were requested to bring their charts to the school of instruction which has been started and is held once a week. At this school the test rack and charts are used and questions answered in the usual manner following similar instructions. The response among the men has been very gratifying, and it is believed that in a short time there will be the necessary number of employees thoroughly instructed and competent to handle this equipment properly.

Thus far no very radical changes have been made in the system on inspection except that a definite leakage test has been put into effect. This test consists of charging up to 63 lb., holding controller handle down with brake valve handle in full release position and compressor switch open. When the gage shows that the air pressure has leaked down to 60 lb. time is taken, and again at 55 lb. and 50 lb. This gives the average rate of leakage per minute. The same method of determining the rate of leakage is employed by next moving the brake valve handle to application position and then releasing the controller handle. After this reading has been secured the brake valve handle is moved to the door-opening position and another reading is taken. The first test will include the main reservoir and accessories, main reservoir pipe, emergency pipe, door-closing side of the door and step controllers and the rear door unlatching device. The second test includes the above-mentioned fixtures with the addition of the straight air pipe and brake cylinder. The third test includes all of the second test with the exception that the door-opening side of the door and step controller is charged. When the average rate of leakage is 2 lb. per minute or over the equipment is gone over with soapsuds and the leaks are repaired until 1½ lb. per minute as a maximum rate of leakage is secured.

During the past winter considerable trouble was experienced from freezing of air equipment. To overcome this trouble the 1 in. pipe between compressor and main reservoir was replaced by a 2 in. pipe. On these cars no further trouble from freezing was experienced.

It may be interesting to other roads operating or contemplating the operation of safety cars to include the operating instructions prepared by the mechanical department of this property and approved and used by the transportation department.

Instructions for the Operation of Safety Cars by the Kansas City Railways

General: In handling the safety car it must be kept in mind at all times that the car is distinctly a different type from the ordinary trolley car; that it has certain limitations, and that these limitations must be favored by the operator. The total weight of the car, without passenger load, is about 15,000 lb. With an unloaded car or a small load there is always a possibility of the wheels sliding and a consequent flattening, unless the operator follows instructions under "Brakes."

A "full" load for a safety car is sixty passengers and this number should not be exceeded. When this number of passengers is reached, the "Car Full" signed should be displayed and no more passengers allowed to board the car. Due to the light construction of the car body and the horsepower of the motors, no attempt should be made to push or pull a car, other than a safety car. One safety car can handle one other disabled safety car, but *no more.* In case the car ahead is of a heavy type and disabled the disabled car will have to be removed by some other means.

Where it is found necessary for the operator to get onto the roof of the car he should never touch the trolley pole when it is against the trolley wire unless he is standing on the running board. Due to the construction of the car it is not possible to completely insulate the roof, and there is always a possibility of receiving a shock sufficiently heavy to cause the operator to let go his hold and perhaps fall from the car. In other words, it is possible to receive a shock if the roof and the trolley pole are touched at the same time by any part of the body. Also the roof is of light construction and not made to support the weight of a man off the running board.

Motors: The safety car is equipped with two motors, which are connected practically the same as the motors on the ordinary two-motor single-truck car. Owing to the horsepower of the motors and the light car body, it is possible to start a car rapidly and to feed up the controller much more rapidly than on the ordinary car without knocking out the circuit breaker or causing harm to the electrical equipment. It is of the greatest importance that the notching up of the controller be done smoothly and without jerking. With heavy loads and on grades the operator must use discretion, and the amount of time required on each resistance point is of course governed by the passenger load.

A safety car, like any other two-motor car, can be stopped by reversing, but the effect on the car and motors is much more severe, and a safety car *must never be reversed* except when the brakes are absolutely inoperative, and this rarely happens. It is a demonstrated fact that a car moving at a rate of 5 miles per hour or more can be stopped by a brake application in a less distance than it can by reversing.

RULES FOR OPERATING THE AIR BRAKE AND SAFETY CAR CONTROL EQUIPMENT

The following rules are intended to cover, in a condensed form, the important instructions to be observed in handling this equipment in service.

Charging: Before starting the air compressor the main reservoir drain cocks should be closed and the cocks in the door-closing pipes opened. All hand brakes should be fully released. The fuse in the compressor circuit must be in place and "alive." The handle on the brake valve should be moved to release running and door-closing positions and the compressor started by closing the snap switch in the compressor circuit. The controller handle in the handle base portion should be held down until the gage hand indicates at least 50 lb. pressure in main reservoirs, and under no circumstances should a car be started with less air pressure in these reservoirs.

Running: The brake valve handle should be kept in release, running and door closing position when not being used for a brake application. The controller handle or foot valve should be held down while the car is running, and in the event of sudden danger the hand or foot should be removed immediately from the respective valves, or the brake valve handle moved quickly to emergency position, at the extreme right, and kept there until the car stops and the danger is past. If the brakes apply while running, due to rupture of the piping, the brake valve handle should be moved to the emergency position at once, to prevent loss of main reservoir pressure. After the car stops the cause of the application should be located and remedied before proceeding.

Service Application: To apply the brakes for an ordinary stop the brake valve handle should be moved to service application position. When the desired brake cylinder pressure, depending on speed, condition of rail, grade and kind of stop desired, has been obtained the brake valve handle should be returned to lap position, where it should remain until it is desired either to release the brakes or to make a heavier application. In the latter case the handle is moved again to service application position, thus further applying the brakes until the desired result is obtained and then returned to the straight air lap position.

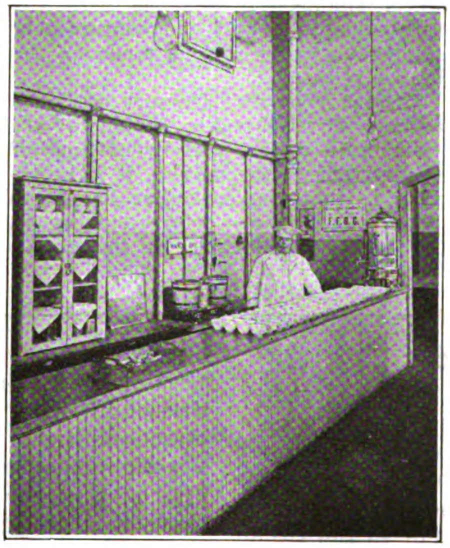
The controller handle or combined foot and cutoff valve must be held down until the stop is completed and the brake valve handle moved to service application position or door opening position. While a car is standing the brake valve handle must remain in service application position or door opening position, at which time the pressure on the controller handle or combined foot and cutoff valves, as the case may be, can be released, thus permitting the car operator to attend to any duties incident to the stop. The best possible stop will be made when the brakes are applied hard at the very start and then graduated off as the speed of the car is reduced, so that at the end of the stop little pressure will remain in the brake cylinder, unless on a grade. Since the retarding effect of any given application of the brakes is considerably greater at low than at high speed, a heavy application at low speed will result in an abrupt stop, with perhaps discomfort to the passengers or slid wheels. At high speeds a heavy initial application should be made, in order to obtain the most effective retardation possible when the momentum of the car is greatest. If the brake cylinder pressure is very light at first, and is increased as the speed of the car diminishes, it not only makes a longer stop, but the high cylinder pressure at the end will be liable to produce a rough stop, perhaps slide the wheels and result in loss of time, because of the necessity of waiting until this high cylinder pressure can exhaust before proceeding. With practice these correct methods of stopping can be readily acquired.

Holding Brakes Applied: When the desired brake cylinder pressure has been obtained the brake valve handle should be placed in straight air lap position, where it should remain until it is desired either to make a heavier application or to release the brakes. The brake valve handle should never remain in straight air lap position, except while bringing the car to a stop, and in any case it should not be allowed to remain in this position for a sufficient length of time to permit the brake cylinder leakage to diminish the braking power materially.

Release: To fully release the brakes after any application the brake valve handle is moved to release, running and door closed position. The handle must be left in this position at all times when the brakes are not in use, to keep the brake system charged and ready for operation, and to insure that the brakes will not be applied by leakage. Immediately before moving the brake valve handle to release, running and door closed position, which action usually precedes a movement of the car, the controller handle must be held down.

To graduate or partially release the brakes the brake valve handle is moved to release, running and door closed position for a moment, then back to straight air lap position: this operation may be repeated as often as necessary until the car is brought to rest, with only sufficient pressure retained in the brake cylinders to prevent rolling. During this manipulation of the brake valve handle the controller handle or combined foot and cutoff valve must be held down.

Opening Doors and Steps: When the car stops the brake valve handle should be moved to door opening position for the purpose of opening the doors and lowering the steps on the operating end of the car. After the brake valve handle has been in this position for approximately one second the pressure on the controller handle and combined foot and cutoff valve can be released. While the door and steps remain open the car cannot be moved, as the brakes are fully applied.



THE COMPANY SUPPLIES THE EQUIPMENT, WHILE EMPLOYEES PAY FOR COFFEE AND SELL IT AT 2½ CENTS PER CUP

Closing Door and Steps: All brake valve handle positions to the left of door opening position are, in addition, door closing positions. Should it be desired to close the doors and raise the steps without releasing the brakes, the handle must be returned to service position. Where it is desired to close the doors and steps and release the brakes at the same time, such as preliminary to a movement of the car, the brake valve handle is returned to release, running and door closing position on the extreme left. Immediately before this last operation of the brake valve handle the controller handle must be held down.

Emergency: Emergency situations may be found to exist either because of conditions outside the car, such as the movement of pedestrians and vehicles, or because of conditions originating within the car, such as inadvertence or inattention on the part of the car operator to his duties. With respect to the class of emergency situations first mentioned above it is assumed that the car operator is alert, in which case should it become imperative to stop in the shortest possible time and distance; to save life or avoid accident, the brake valve handle must be moved quickly, from whatever position it may be in, to emergency position, which is at the extreme right, and left there until the car has stopped and the danger is past. While the brake valve handle is in emergency position it is not necessary to hold down the controller handle or the combined foot and cutoff valve. This movement of the brake valve handle, in addition to providing maximum brake cylinder pressure, provides a supply of air through the emergency valve, for the purpose of sanding rails. Also, by exhausting emergency pipe pressure, air pressure is released from the closing side of the door and step controller, so that the doors and steps on both ends of the car can be easily moved by hand. It is intended that the rear door and step be used as an emergency exit.

Concerning the second class of emergency situations, it should be remembered that the operator is required to either hold the controller handle down by hand or press the combined foot and cutoff valve downward at all times with the car in motion; that is, without the brake applied to such an extent that the application would in itself stop the car. Should the operator, for any reason, unintentionally or otherwise, release the controller handle and combined foot and cutoff valve while the brakes are not applied, as before mentioned, this may properly be termed an emergency situation which calls for emergency action, and the result will be the same as described under "Emergency" as initiated from the brake valve, with the additional feature of opening the motor circuit by actuating the circuit-breaker cylinder.

Release After Emergency: To release the brakes and restore normal conditions after emergency action the brake valve handle is placed in release, running and door closed position and the controller handle held down until 50 lb. pressure is reached in the main reservoir, as indicated by the gage.

Changing Ends: Preliminary to changing ends, the brakes must be fully applied, when the brake valve handle and the controller handle can be removed. This brake application is required to prevent emergency, which would otherwise occur upon removal of the controller handle, and it insures that the car will stand still during the time required to change ends. If the handles are not replaced in their proper positions within a reasonable time to guard against excessive brake cylinder leakage, emergency action will automatically occur. Upon reaching the end of the car from which it is intended to operate, the brake valve handle should be placed in service application or door open position, as may be required. Before attempting to move the brake valve handle to release, running and door closing position the controller handle must be in place and held down.

Sanding: A feature of great importance in obtaining the most effective operation of any brake is that of properly sanding the track when making the stop, since the maximum retarding force is developed when the adhesion between the wheels and the rail is the highest possible. Whether this be realized or not necessarily depends very largely upon the condition of the rail. Various independent sanding devices have heretofore been used for sanding, but in these cars, by incorporating the sanding device in the brake valve, sand may be applied to the rails with the minimum amount of effort on the part of the motorman and with greater safety and efficiency.

The brake valve is provided with a hinged handle, the downward movement of which operates a poppet valve, through the medium of a bail, and air may thus be admitted from the main reservoir pipe to the sand box for sanding the rail for service operations. This manipulation is possible in any position of the brake valve and without requiring the operator to remove his hand from the handle. To insure that sand will be applied to the rails in all emergency applications of the brake, no matter how initiated, air is admitted from a sanding reservoir (normally kept charged from the main reservoir) to the sand pipe through the medium of the emergency valve when it is placed in emergency position.

Whenever it is desired to sand the rails in making a stop this should be done, if practicable, before the brakes are applied, for the reason that if the brakes are set and the wheels begin to slide the application of sand will not, in all probability, cause them to revolve again, and flat spots may result.

In such event, the best practice is to release the brakes slightly at the moment of applying the sand, after which a much higher brake cylinder pressure can be used without causing wheel sliding. If sand is used the rails should be well and continuously sanded until the stop is made or the brakes released.

Circuit Breakers: On such occasions as the circuit-breaker cylinders are called into action, thereby cutting off the current to the motors, it is necessary to turn the controller handle to power-off position before cutting in the power again through the circuit breakers.

Correct Brake Operation: To gain time in the use of power for propelling the car the brake application should be adapted to the speed of the car—for example: At a high rate of speed a full brake cylinder application should be made and graduated off by partial release as the car is coming to a stop. This is accomplished by moving the brake valve handle from service to lap position and then quickly to release position and back to lap. During the stop the point at which these graduations should be begun and the amount of the graduations will be readily acquired through experience. The initial application should be heavy enough and made at such a distance from the stopping point that the car will stop before reaching the stopping point, unless the graduations are made. When the actual stop is made there should be just sufficient brake cylinder pressure to insure that the car will remain in a standing position.

It should be remembered that in making these graduated releases, if a mistake in judgment has been made and the car is not likely to stop until it is past the stopping point, the cylinder pressure should be increased by making a reapplication. With a small amount of practice the required degree of skill in making correct stops can be very readily obtained. The condition of the rail is to be considered at all times when making brake applications, so as to avoid wheel sliding, which greatly lengthens stops and may cause flat stops.

Hogging the Load

AN INTERURBAN railroad in the middle West had considerable trouble with a few of its cars, in that some of the motor's armatures had to be changed quite frequently on account of insulation failures resulting in a breakdown to ground. When this occurred a new or repaired armature would be put in the frame and the car replaced in service, with the result that after making a comparatively low mileage the car was again turned in for trouble, which was found to be the motor with the replaced armature. In repairing these defective armatures it was observed that in all cases the insulation on windings was badly roasted, indicating overheating. As there was nothing found wrong with the method of winding and connecting these armatures and as the fact was that several different armatures had failed in the same field it was suggested to check carefully the winding of the field.

A temporary circuit was arranged in the repair barn and current passed through the field coils connected in series. By checking the polarity of the coils with a small compass needle it was discovered that one of the fieldcoils was reversed. This was remedied and a new armature placed in the frame. After this had been done no further trouble developed. The other cars afflicted with the same ailment were given similar treatment, which cured the trouble.

The following explanation is given as the source of this equipment ailment. Several months prior to this trouble, on account of snow and water conditions, a number of main field coils had failed and were replaced by new ones. On account of the markings on the coil terminals not being clearly understood by the workmen these coils were wrongly placed on the poles. Under these conditions the windings on this motor produced a weaker magnetic field, resulting in its armature running at a higher speed. When this motor was put on the car it tended to "hog the load," resulting in an increased current that overheated the windings, roasted the insulation and finally caused it to break down and cause a ground or short.

Troubles with reversed polarity of fields and wrong connection of field coils with additional methods of testing and locating such troubles were described in the ELECTRIC RAILWAY JOURNAL issues of May 17, 1919, and June 21, 1919. Some shops have reported difficulty in locating reversed polarity by a compass, as the polarity of the compass needle itself is easily reversed if care is not used to keep the magnetizing current used through the fields as small as possible. The other methods referred to use special shop made equipment which is easily constructed.

F. W. Mitchell, supervisor of safety and examination of the New York, New Haven & Hartford Railroad, reports through the *National Safety News* a reduction of 48 per cent in number of employees killed during 1919 as compared with the previous year, with a reduction of 16 per cent in number injured. There has been a heavy reduction in number of accidents since the safety department was organized.

Bonding in Special Locations

Cross Bonding and Special Connections to Structures, Bridges and Poles Constitute a Class of Bonding Universally Used and One Requiring Care in Installation

BY G. H. McKELWAY
Engineer of Distribution Brooklyn Rapid Transit Company

WHILE in most cases the bonding of the joints between the abutting ends of rails comprises by far the greatest amount of work that the bonders of a railway company are called upon to do, yet there are several other kinds of bonds to be applied on practically all roads, except the very smallest.

These bonds are for cross bonding between the rails of the track or between tracks and supplementary copper-returns run in multiple with the track rails, for bonding cross pieces of special trackwork, special connections between the track rails in carhouses, shops or yards, the connection of track rails to elevated structures or bridges, the crossing of streams and the attachment of ground wires leading from the negative buses of power or sub-stations to the tracks or other ground returns in streets or rights-of-way.

The most common of these special forms of bonding is cross bonding the rails of the tracks together. There is no standard distance apart for such cross bonds and the answers to questions which were sent to more than forty railroads by the United States Bureau of Standards regarding such distances proved that the lengths of track between the cross bonds varied from 100 ft. to 3,000 ft., the usual distance being every 500 ft. As a matter of fact, on a single-track line cross bonds should not be needed if both rails of the track are well bonded and could be kept in that condition, and their use is merely the confession of the inability of the company to keep its bonding up to 100 per cent efficiency. With perfect bonding and only a single track the current naturally would divide equally between the two rails so that there would be no need for cross bonds. Where there are two or more tracks, however, they would be needed, as it is unlikely that the loads on the various tracks would be equal and they must therefore be equalized through the cross bonds.

Not only is there no standard distance apart for the cross bonds to be installed but, when they are installed there is no standard size of wire used, although the most common size for cross-bonds as well as for rail bonds, is No. 0000. In most cases the cross bonds are merely bonds similar to those used at the joints, with the exception that the length of strand between the terminals is much longer, the additional length being required to reach across from one rail to the next. As with all other long bonds that are more or less exposed, there is always considerable danger of their being stolen, even where they are buried in the ground, unless the track is in paved streets where the bonds cannot be disturbed after they are installed. To prevent their theft, where they are installed in open track, they are sometimes run between the ties and covered with dirt, and in addition to that pieces of tin or short pieces of wood are nailed to the ties to enclose the wires. Such precautions are often of no value, as the tin or wood will be torn off or broken and then the wires stolen. A much surer way, and a more expensive one, is to encase the cross bonds in concrete, and where enough concrete is used the job can be considered a permanent one. On one road where the standard cross bond for a four-track line had been a 500,000 circ.-mil wire, so much trouble was experienced from theft that the wires were all replaced with old rails connected to the track rails above with short bonds compressed into both the cross-bonding rail and each of the rails above it.

SUPPLEMENTARY WIRES NO LONGER COMMON

A practice much more common in the earlier days of street railway construction than now was to run supplementary copper, consisting of a wire or wires, in multiple with the rails. These supplementary wires were sometimes run on the arms of the trolley poles with the positive feeders, but more often were buried in the earth between or alongside the tracks.

When the negative wires are carried on the poles taps have to be run down to the rails every few hundred feet, and this not only requires additional wire to make these taps but there is danger of the portion running up the pole being stolen unless it is well protected by being encased in either pipe or molding of some kind. Merely fastening the wire to wooden poles with staples will not answer satisfactorily unless a great many are used in the portion that can be reached from the ground. It is generally sufficient to extend the pipe or molding only 7 or 8 ft. from the ground, but sometimes the thieves will be found willing to climb the pole in order to get the wire and they will even cut down sections of the wire that have been run on the poles.

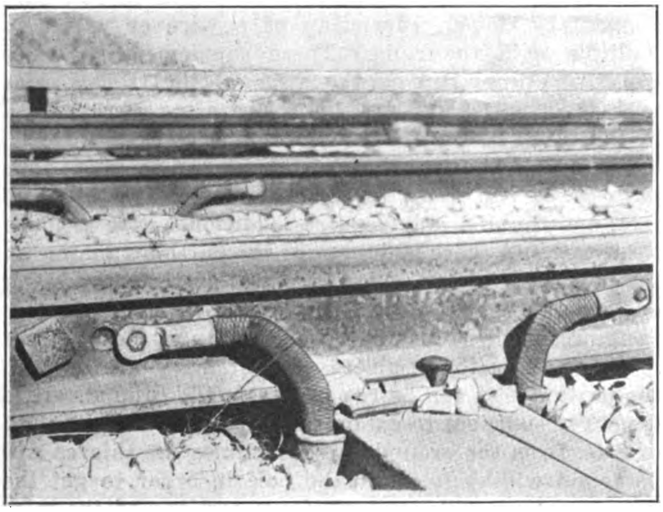
When wire installed on the poles is stolen the thieves naturally prefer to take the negative wire on account of there being less danger to themselves and less chance of the theft being discovered as soon as would be the case if they removed the positive wire. The writer knows of one case where a mistake was made by some copper thieves who cut down a wire that had previously been used as a ground wire, but which a short time before had been cut over to the positive side. Believing that there was no danger they were careless in their handling of the wire and permitted it to ground on an iron gas lamppost. The resulting fireworks frightened them away, and although they were not caught there was no further attempt to steal copper in that neighborhood.

Where iron or steel trolley poles are used for carrying the feeders it is sometimes the custom to drill a hole in the pole near or below the ground line and bring the tap from the tracks up inside the pole, making another hole near the arm so that the wire can be run out and connected to the supplementary wire. Such holes, and especially those under or just at the ground line, weaken the poles and shorten their lives as they permit the entrance of moisture to a portion which cannot be protected by periodic painting.

Another objection to the use of overhead ground wires is that by having both positive and negative wires close to each other there is more danger to the men working on them, as there is always the chance of their touching both wires at the same time and also, when there are several wires on the same pole, there is danger of making a mistake and trying to connect wires of opposite polarity.

So long as the pole line parallels the tracks there is but little if any reason why the supplementary wires should be carried overhead unless it is desired to use them as an insulated return. Of course wires buried in the ground are not so well insulated as those carried on poles, but if they are tapped frequently to the uninsulated rails there is no reason for attempting to insulate them. When the negative wires on the poles are part of an insulated return system these conditions do not apply and they cannot then be considered as supplementary wires.

Supplementary wires, except for comparatively short runs near the power or substations, are of very little value, as the current density in them must be kept low if the return drop is to be held at a reasonable figure, and much better results can ordinarily be obtained by spending only a fraction of their cost in maintaining the bonding rather than in installing the additional copper. A pair of well-bonded track rails of only the ordinary weight will have a conductance equal to copper wires of at least 1,500,000 or 2,000,000 circ.mil cross-section, so it is easy to see that unless a great deal of copper is run and at great expense, but little reduction in the return drop can be expected.



PIN-EXPANDED TERMINALS FOR HEAVY BOND WIRE

It is not, however, considered good practice to rely merely upon rail bonding at points where there is special trackwork. In such places there is liable to be more movement of the track than where it is composed only of long pieces of rail, and that movement is certain to cause the bonding to deteriorate rapidly.

Still another reason for abandoning the use of the ordinary type of bonds at each of the joints is that there are comparatively a large number of such joints in a short length of track, so that the cost both of bonding material and the labor to install the bonds would be high. Again, the special work will not last nearly as long as will the straight track, so that the former may be renewed several times before the latter is worn out. Then, if the special work has been bonded at the joints with short bonds, new bonds will have to be installed in the special work perhaps three or four times as often as in the straight rail, and as there is very little salvage from the old bonds—in fact, unless close watch is kept on the labbrers making the track changes there will be none, as the rail bonds will be kept by them and sold to junk dealers instead of being turned back into the storeroom—the cost of bonding will each time be approximately the same as for the first installation.

BONDING OF SPECIAL TRACKWORK

A better way, and the one that is now standard on almost all of the large properties, is to "jump" the special work with long bonds made up from pieces of wire, these cables being attached to the ends of the pieces of straight rail and running to the straight rail on the other side of the special work. These cables can be considered as a permanent investment which ought never to require renewal, the only portions of such bonding that have to be changed, under usual conditions of soil, being bonds of small capacity running from the cables to a few points in the special work to which the bonds are connected so that there will be no large differences of potential between the various pieces of metal making up the track special work. As the heavy cable bonds will keep the potential of the ends of the straight rail on each side of the special work practically the same, all of the special work between those points will be of the same potential except when there is a car on the special work taking current from the positive side of the circuit. To prevent the resistance of the unbonded joints in the special work from causing a large difference of potential between the adjoining pieces when current is flowing from the car into the castings is the reason for bonding some of them to the wires and so insuring that there will be but little drop between any piece of the trackwork and the long pieces of rail in the straight track.

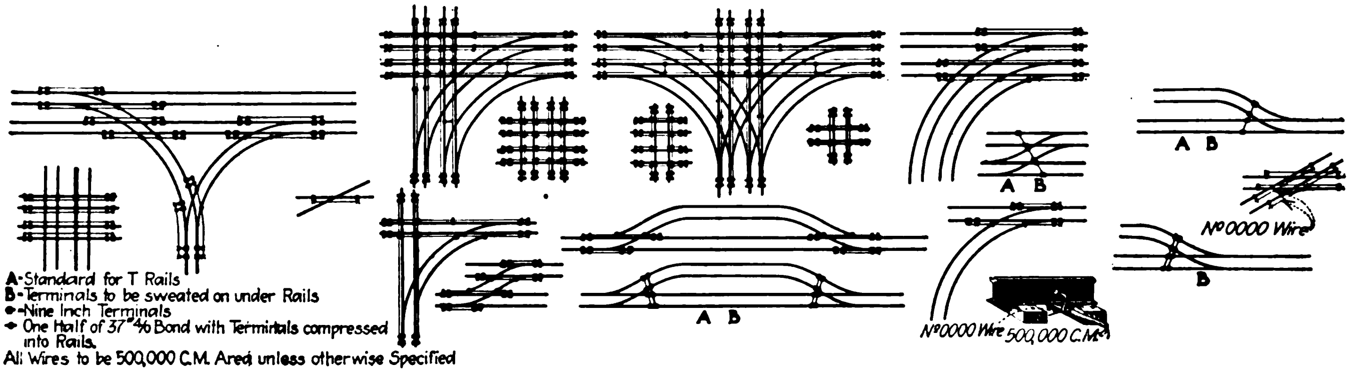
Not only will it be unnecessary to renew the bond wires when the special work is renewed but they can also remain in place even if the rails in the rest of the line are renewed. All that will have to be done will be to disconnect the terminals at the ends of the wire from the rails and then to reconnect them to the new rails when those are laid.

If for any reason the special work is abandoned and taken up the bond wires, too, can be removed and either sold as scrap or, if they are of the right length, used to bond another similar piece of special work somewhere else on the system.

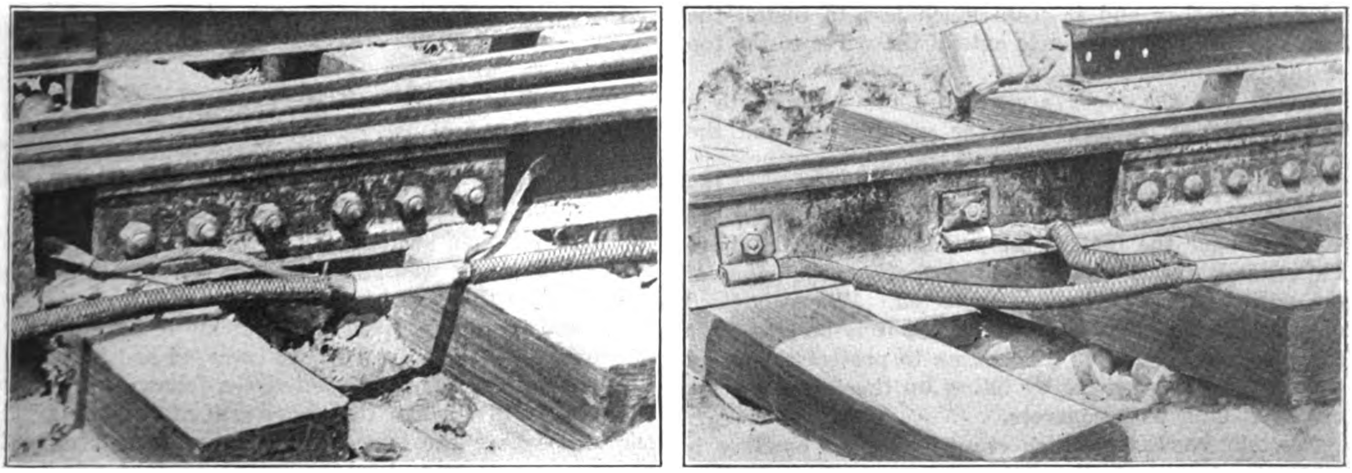
In order that the wires can be removed or changed to conform to a new special work layout, in case the type of layout should be altered, it is best to run the wires over the ties rather than underneath them in all places where the track is installed with a concrete foundation over which paving is placed. For special work layouts in open track it is best to bury the wires and place them under the ties so as to prevent their being stolen, but where the wires are protected by the pavement that arrangement is neither necessary nor desirable, because if it is made when the special work is taken out it will be necessary to break out more of the concrete foundation and then dig down to get wires out. Another reason for keeping the wires above the ties is that in case of any excavation by other companies or contractors under the tracks the wires are not exposed to the employees of the contractor while hidden from those of the railroad company. When bonding is exposed to the sight of the ordinary contractor's laborer and to no one else, experience shows that the temptation to cut them off and dispose of them at some nearby junk shop is nearly always too strong to resist.

The wire used for such special work bonding may be made up of any wire on hand, insulated or uninsulated. Comparatively short lengths, too short to be advantageously used on pole lines, can be used up in this way instead of being sold as scrap.

Often weatherproof wire is taken down from a pole line after having been in service for many years, and the insulation on it will be found to be in such poor condition as to preclude its use overhead unless it is first reinsulated. At the same time the conductor will be in as good condition as when new, so that for bonding purposes the wire is as good as any other. The rails to which the bonding wires are attached are uninsulated and so are the joint bonds, so that the insulation is not needed at the special work if used nowhere else on the line.


A·Standard for T Rails
B·Terminals to be sweated on under Rails
●-Nine Inch Terminals
◆ One Half of 37" 4/0 Bond with Terminals compressed into Rails.
All Wires to be 500,000 C.M. Area unless otherwise Specified
A B
A B
A B
A B
B
No 0000 Wire
No 0000 Wire
500,000 C.M.

DIAGRAMS OF SPECIAL TRACKWORK BONDING



AT LEFT, CONNECTING RAIL AND BONDING CABLE WITH HALVES OF BONDS. AT RIGHT, BOLTED AND SOLDERED TERMINALS

For attaching the wires to the rails many companies use compressed or pin-expanded terminals, either special terminals supplied by the manufacturers or ends of cable bonds which have been cut in two so that each bond supplies two terminals. Still others weld the bond to the rail, but this requires special equipment and is expensive.

BOLTED AND SOLDERED TERMINALS FAVORED

The best comparatively cheap method of attachment that has come under the observation of the writer is by means of the use of a bolted and soldered terminal of the type shown in an accompanying illustration. These can be used only on girder rails or high T-rails, as they cover too much surface to be installed on the T-rails with comparatively low webs. There a terminal like those used on switchboards can be applied with better results.

To install the larger terminal a hole is first drilled of the proper size, and then that portion of the rail which will be covered by the terminal is brightened, either with a grinder or by means of chipping away the dull surface with a chisel, using only light hammer blows. Of the two methods of polishing the rail the latter, though requiring more time and labor, will give the better surface, as the solder will adhere better to the roughened surface than to the smooth one. The terminal is tinned and the back next to the rail has grooves cut into it so that the solder will flow down behind the terminal. The rail is heated with a blow torch and the terminal sweated on and drawn up tight to the rail by means of the bolt.

In large carhouses or storage yards and at terminals, there is, at times, so much special work that to bond each piece separately would be a very expensive proceeding and at such points heavy cross bonds bonding all of the tracks together and other leads from these cross bonds or from portions of the trackage in the yard or terminal are run out to the main line tracks beyond the last of the special work.

While it is necessary to use such special construction at some few places, yet whenever possible standard methods of bonding should be adopted for each type of special work and these standards adhered to. Accompanying diagrams show the way in which most of the standard types of special work can be bonded. In these diagrams, although but a single wire is shown attached to each of the rails, yet it will be noticed that two terminals are used to make this connection. This is just a safety precaution to insure that the circuit will be continuous even if one terminal should by some means become loosened from the rail or the conductor.

In some cities it is the practice to bond across the special work with wires having the same total conductance as that of the rails on each side, but this should not be necessary, as the increased drop across infrequently used pieces of special work should lower the potential of the line by such a negligible amount as to make the difference unnoticeable and there should never be enough current returning through the rails to heat up the wires or connections enough to endanger them.

BOND TO ELEVATED STRUCTURE WHERE POSSIBLE

Where there are steel elevated structures running toward the power or substations it is nearly always well to take advantage of the high conductance of the large mass of metal composing them and therefore all lines crossing underneath them should be bonded to them. One of the illustrations shows a good method of doing this. The connections to both the rails and the column of the elevated structure are usually made with bolted and soldered terminals, although sometimes the method of using halves of bonds with the terminals compressed into the rails, as shown in the drawing, is used. Occasionally the leads to the metal structure have been continued in the pipes up the columns to the girders, but this is unnecessary if the columns and girders are bonded together and it costs much less to install the bonds between them than to extend the wires to the top of the columns.

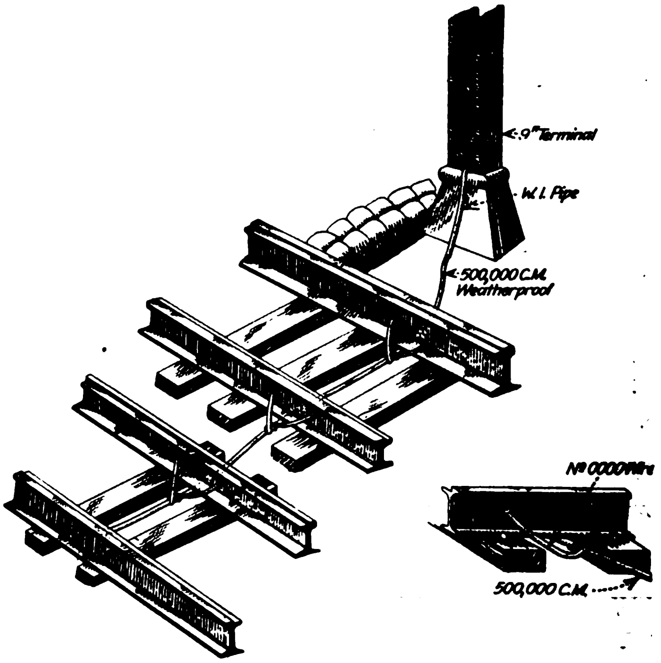
Sometimes the pipes are run up the columns to a height of 8 or 10 ft. above the ground line and the wires connected to the column there, the pipes protecting the wires from injury or theft. However, the method shown in the drawing, where the wires are attached near the foot of the column but a little above the ground line, is cheaper and perfectly satisfactory if the wire and terminals are protected. Where latticed or similar types of columns are used it is best to place the terminals inside of the column to protect them and then to seal them there by filling up the lower portion of the column with concrete.

Another condition which requires special bonding is where the tracks or other returns cross a river or other navigable body of water on a bridge the height of which is not great enough to permit of vessels passing underneath and where a draw must be opened to allow them to go through.

This condition may be treated in either one of two ways, depending upon whether the tracks across the river from the source of power are completely separated from the station, or whether, through cross bonding with other tracks, there is another path or other paths by which the current may return to the negative bus. In the latter case the opening of the draw, although it may increase the return drop a little, but only for a short time, will not interfere with the service or produce any situation which may be dangerous to any pipes or cables on account of electrolysis. All that is necessary then is so to arrange the bonding that as soon as the draw is closed the return circuit will also be closed.

This can generally be done in a satisfactory manner by installing on the draw spring contacts which will touch each other when the draw is closed, these contacts coming together with a rubbing motion so ~~as to~~ insure clean surfaces when they touch.

For rolling-lift bridges there is no difficulty in making such contacts, which, of course, should be bonded to all of the rails on the bridge. Nor is there any difficulty in the case of swing bridges if the two arms of the draw are both of the same length. Where one arm is a few inches longer than the other, as sometimes happens, the making up of spring contacts that will work satisfactorily is almost an impossibility if the bridge is handled as such bridges generally are.



CONNECTING SURFACE TRACKS TO STEEL COLUMN

If the bridge is swung open to allow a vessel to pass through and then swung back in the opposite direction to close the draw, well and good; the contacts will touch properly and there will be no trouble. But time can be saved and the draw closed more quickly if the direction of movement of the draw is not reversed and instead if it is swung in a complete semi-circle, following the boat through. This brings the short arm of the bridge on the side where the long one had previously been and opens a gap there unless the spring on that side is so abnormally long as to make almost certain that it will be broken when the long arm shall swing around again.

Where contacts on the bridge cannot be used it is necessary to install conductors of some sort all of the way across the channel, either overhead on extra long poles, something which is seldom done, or under water by sinking the wires or other conductors to the bottom of the stream. It is not necessary that regular submarine cables be used in this service, for bare copper conductors will be almost as satisfactory, although they will deteriorate more quickly, especially if the water is at all salt. In such locations the electrolytic action of the current leaving the wire at the surface of the water can very easily be noticed, and after the wire has been in service for a time the copper strands will show signs of having been eaten away at the point where the current leaves them. Where there is much of a rise and fall to the tide this point of weakness may be spread over a distance of several feet, so that the destruction of the wire will take place much more slowly than when the corrosion is confined to a smaller area.

Except in very deep waters it is well to make sure that the wires will sink well into the mud at the bottom, either by their own weight or by being put into position by divers. If this is not done there is danger of the wires being carried away by either the hulls or anchors of passing boats. The writer knows of one case where, to protect the return circuit and insure that the conductors in the stream would not be destroyed by passing boats, electrolysis or thieves, they were made of a number of old rails cast welded end to end and sunk in the stream. They were welded together on the shore and drawn into the water by means of a flat car crossing the bridge, their weight causing them to bend at the ends enough for the center to rest on the bottom of the creek, while the ends projected above the water on the banks and were there connected to the track rails by means of short pieces of wire buried in the roadbed.

Principles to Be Followed in Tie Plate Design

Tie Plates Used Under Rails Reduce the Fiber Stresses in the Ties—When Plates Are Purchased Under Specifications the Cost of Inspection Is Small

BY HOWARD H. GEORGE
Assistant Engineer Public Service Railway of New Jersey

THE question of tie-plate design and its effect on the tie is one of the important problems that confronts the track maintenance engineer. It has received a great deal of attention and study through the efforts of the various committees of the American Railway Engineering Association, under whose direction a number of tests and experiments have been made.

The committee that was responsible for the development of the standard specifications of the A.R.E.A. evolved, among others, the following principles that should be followed in the design of tie-plates which are equally applicable to electric railway practice. (See Proceedings, Vol. 14, p. 93):

> The plates shall not be less than six inches in width and as much wider as is consistent with the class of ties on which they are to be used.
>
> The length of the plates shall not be less than the safe bearing area of the ties divided by the width of the plate, and, when made for screw spikes, shall be so shaped as to provide proper support for the screw spike.
>
> The thickness of the plate shall be properly proportioned to its length.
>
> The distance from the edge of the rail base to the end of the tie-plate on the outer side must be uniform, and in excess of the projection inside of the rail base.
>
> Where treated ties are used or where the plates are for screw spikes, a flat bottom plate is preferable. Where ribs of any kind are used on base of plate, these shall be few in number.
>
> The punching must correspond to the slotting in the splice bars and, where advisable, may be so arranged that the plates may be used at joints. Spike holes may be punched for varying widths of rail base where the slotting will permit such punching without the holes interfering with each other and when the plate is of such design that the additional holes will not impair its strength.

There has been much discussion among steam railroad engineers as to the minimum thickness of plates required at the edge of the rail base. Some have argued for a minimum of ⅝ in. while others have maintained that a thickness of ½ in. gives more satisfactory results. Of course it is entirely a matter of respective loading and the kind of timber in the tie on which the plate is used. In the case of electric railways it is not felt that the load requirements would ever justify specifying a thickness in excess of ½ in. and a thickness of $\frac{7}{16}$ in. will generally be found to be ample, regardless of the kind of timber in the tie.

Some railroads are using an inclined tie-plate, the maximum thickness of which is ¾ in. and the minimum less than ⅜ in. In addition the plate is cambered lengthwise of the rail, this giving a line contact instead of a surface contact between the rail base and the tie-plate, which line of contact is always at some point between the two edges as the rail flexes under moving loads. It eliminates the concentration of the load on the near and far edges of the tie plate as the loads approach and recede. One large railroad has adopted a tie-plate of this design as its standard. The inclination tilts the rail inwards and is designed to make the resultant force due to a wheel load on the rail and the wedging action due to the coning of the wheels, which are at right angles to each other, coincide with the center of the rail. Some few engineers have at various times argued to eliminate coning, but they evidently were not very well informed as to the reason for its use. As a matter of fact, it is absolutely necessary for the safe operation of a railroad. Wheels were first made with flat treads, but they soon tore to pieces the metal strips used for rails and the wheel flanges as well, so that it early became necessary to introduce coning as a matter of safety. It eliminates excessive rubbing of the flanges against the side of the rail head. When the flange approaches the rail that wheel is turning on a larger diameter than the other wheel on the same axle, and because they are rigidly fixed on the axle the wheels are caused to swerve in the other direction slightly until a corresponding action takes place on the other rail.

Tests have been made at Purdue University to determine the relation of the crushing strength of different ties with and without tie-plates. (See Proceedings A.R.E.A., Vol. II, p. 844). It was found that the fiber stresses per unit of area of the wood under the tie-plate at the elastic limit in the case of the oak tie were less than those under the rail alone, with the exception of one type of tie-plate that was tested. Of course, the total load was greater. This was accounted for by the perceptible springing of the tie-plates, thus producing a non-uniform pressure on the wood under the plates. Therefore, the loads carried with the aid of the tie-plate, while larger, were not increased in the same ratio as the increase of the bearing surface. In the loblolly pines and in the case of one type of tie-plate tested on red-oak ties, no perceptible springing of the tie-plates was observed within the elastic limit of the timber, the load being increased in practically the same ratio as the surface. These facts must be given careful consideration in designing tie-plates for use with any particular kind of timber. The primary purpose or function of a tie-plate is to protect the tie from mechanical wear, and all other functions should be subordinated to this. Of course, the brace tie-plate also must act as a brace and care must be taken in its design to obtain a good fit and in the specifications to see that the permissible variation in the dimensions shown does not defeat this object. Assuming, however, that the tie-plate will be of sufficient area properly to distribute the loads imposed, and that it is of sufficient thickness to prevent buckling, it is necessary that the movement between the plate and the tie be reduced to a minimum or eliminated if possible. Otherwise, due to impact, the force of the blow delivered soon crushes the tie and renders the tie-plate ineffective, the crushed wood fibers permitting the retention of moisture and hastening decay. Also care should be taken to see that there is no chance for lateral movement of the rail across the plate and that the distance between the inside faces of the spike holes is not greater than the width of the rail base. Excessive rail movement causes excessive wear on the spike itself and should be prevented as far as possible.

It is recognized that it is the best practice to require that all holes be punched from the top of the plate. This insures a smooth surface for the rail bearing. However, there may be special cases where holes will have to be punched from the bottom, where it is not practical to punch from the top.

Probably no other track fixture deteriorates so rapidly from rust as the tie-plate. Many engineers favor coating all plates with oil before shipping from the mill to retard this corrosive action as much as possible. However, opinion as to the value of such an oil coating is divided. The New York Central Railroad made some tests a few years ago of some steel plates coated with linseed oil and found that they began to rust within

Steel Tie Plates

1. Material:

The plates shall be made of bessemer or open-hearth steel.

2. Physical Tests and Properties:

The steel in the tie-plates shall conform to the following requirements:

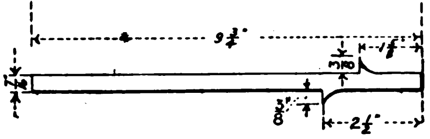
(*a*) Ultimate strength, not less than 55,000 lb. per square inch.

(*b*) Elastic limit, not less than 50 per cent of the ultimate strength.

(*c*) Elongation, not less than 20 per cent in two inches.

(*d*) Reduction of area, not less than 40 per cent.

(*e*) Plates shall bend cold for 90 deg. without showing any sign of fracture.



STANDARD SHOULDER TIE PLATE

A sufficient number of tests will be made to satisfy the railway company's inspector that the material meets the specifications in every respect, and he shall have the privilege of selecting the specimens to be tested.

3. Workmanship and Finish:

Subject to the following allowances, the form and dimensions of the plates shall conform to the drawings submitted to the manufacturer:

(*a*) The length and width of the bearing surfaces of both plain tie-plates for T-rail and brace tie-plates for girder rails shall not vary more than ⅛ in. from the dimension shown.

(*b*) The thickness of the metal in the plates shall not vary more than 1/32 in. from the dimensions shown.

(*c*) All variations in length shall be left on the inside end of the plate.

(*d*) In the case of shoulder tie-plates, the distance from the shoulder to the outside end of the plate must be made uniform.

(*e*) In the case of brace tie-plates, the height of the brace above the top of the bearing plates shall not vary more than 1/32 in. from the dimension shown on the drawing.

(*f*) The spike holes must be punched from the top, clean cut, without burrs, and the plates must not be cracked or bent out of shape in punching the holes.

(*g*) All plates must be stamped on the top side, outside of the base of rail, with the section and weight of rail.

(*h*) The plates shall be free from burrs and imperfections.

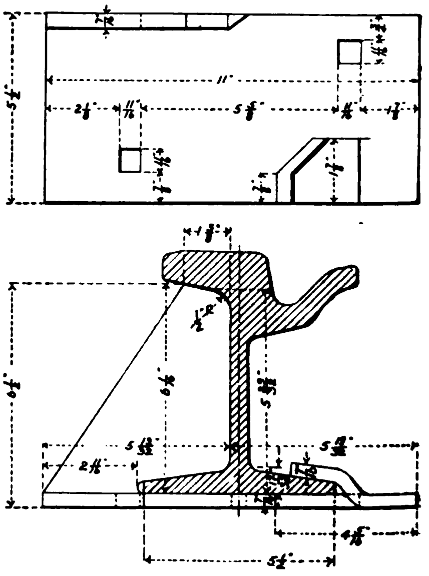
4. Inspection:

When required, the manufacturer shall furnish samples of tie-plates from a preliminary rolling before proceeding with the filling of the order, and shall give sufficient notice in advance of the date when they will be ready for inspection.

The railway company's inspector shall have free entry at all times, while the work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the material ordered.

The inspection shall be made at the mill and the manufacturer shall afford the railway company's inspector, free of cost, all reasonable facilities to satisfy himself that the plates are being furnished in accordance with these specifications. The tests and inspection shall be so conducted as not to interfere unnecessarily with the operation of the works.

Tests shall be made of samples of the finished product selected by the railway company's inspector from each lot of fifty bundles. Two (2) pieces shall be selected for each test and if both meet the requirements of the specifications the lot will be accepted, but if both fail the lot will be rejected. If one of the test pieces fails a third test piece shall be selected from the same lot and tested. If it meets the requirements the lot will be accepted, but if it fails the lot will be rejected.



RAIL BRACE FOR 116-LB. RAIL

If, after shipment, any tie-plates are found to be defective, due to material or manufacture, they may be rejected.

5. Shipping:

Tie-plates shall be wired together in bundles, the weight of which is not to exceed 100 lb., and shipped with a uniform number in each bundle.

two or three months when exposed to ordinary weather conditions. Since storage of such fixtures as tie-plates is generally made in the open or under open sheds, they are more or less exposed to the weather and corrosion is apt to be very rapid, especially where they are exposed to salt air. On our own property, it has been the practice to require the manufacturer to coat all tie-plates with red lead before shipping, and this has been found to give excellent results. If not protected in some way steel tie-plates are very apt to go to pieces very rapidly before they get into the track.

The inspection cost of the plates is very small. It amounts to only about 20 cents per net ton at the present time. The brace tie-plate shown with the accompanying specifications, for example, weighs approximately 10 lb., so that the cost of inspection would only be about one-tenth of a cent each.

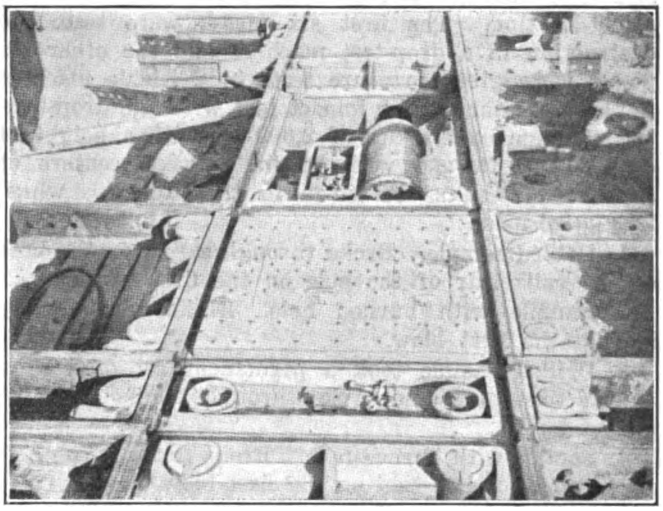
Shockless Crossing on Pacific Electric

Special Type of Crossing Placed in Test at Heavy Traffic Center in 1917 Is Giving Good Satisfaction

BY CLIFFORD A. ELLIOTT
Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

IN AN article in the ELECTRIC RAILWAY JOURNAL for Feb. 21, 1920, I mentioned, in a table of various crossings, that the Pacific Electric Railway had installed a Cobb shockless crossing* for a test. This was installed during the year 1917 and in order to give the crossing as severe a test as possible it was placed at the intersection of Fourth and Main Streets, Los Angeles, which is a heavy traffic center where the narrow-gage Los Angeles Railway's double tracks cross the double-track combination gage jointly operated by the Pacific Electric and Los Angeles Railways. Since installation over 4,000 movements per day have been successfully handled.

This type of crossing is automatic and the mechanical parts are electrically operated. The track intersections, as shown in an accompanying illustration, are composed of movable rails mounted on eccentrics or cams that are keyed to shafting directly under the rails. One set of the rails is in "down" position, while the other is elevated to a level with the corresponding tracks. This makes a continuous rail over the crossing. The detached rails are lowered about 1½ in. to allow the flanges of the car wheels to pass over them without striking. The shafting upon which the cams are mounted is turned by means of a cylinder and piston operated by compressed air. This cylinder is similar to the brake cylinders used in connection with air brake equipment. Compressed air is supplied by an automatically controlled compressor which is installed in the basement of an adjoining building. A conduit line extends underground from the crossing to the air plant. The average monthly consumption for the operation of this plant has been 8 kw.-hr. and the maintenance expense of the crossing has been comparatively small. The illustration shows the manner in which manhole covers may be removed for any attention necessary to the mechanism of the crossing. When cars approach the crossing they pass onto an insulated section of track. Relays are thus energized, which in turn control electrically operated air valves. These air valves supply air to the cylinder for operating the crossing rails. Each approach has a separate set of relays so the crossing is automatically set for the car or train that has the right of way over the crossing. Powerful interlocking devices preclude any possibility of failure, but as an additional safeguard cams, shafting, mountings and bearings are made of strong construction so that they will elevate the heaviest locomotive in operation on any road at the present time. The Pacific Electric Railway now operates three-car interurban trains, which consist of some of its heaviest types of equipment, over the crossing daily. The weight of these cars is 107,000 lb.



SHOCKLESS RAILWAY CROSSING WITH ONE MANHOLE COVER REMOVED

More Information on Burning Holes in Rails

Tests Made by Great Northern Railway with Burned Holes in Web of Rails Indicate This Practice Is Not Safe

BY JULIUS H. GOOD
Inspecting Engineer Great Northern Railway, St. Paul, Minn.

IN THE issues of the ELECTRIC RAILWAY JOURNAL for May 1 and July 24, 1920, reference was made to the use of burned holes in the web of rails. The Great Northern Railway has carried on some quite extensive experiments in this direction, the results of which may be of interest to electric railway men.

In August, 1919, we started welding frogs and cutting track material on quite an extensive scale with the oxyacetylene flame. A considerable amount of cutting and perforating of rails was done, principally on sidetracks and in yard work. This method proved economical and quite a labor saver. However, during the following winter several rails with perforated holes in the web broke in service. This naturally led to an investigation regarding the safety of this practice, especially where rails were used under high-speed main-line traffic. Instructions were immediately issued limiting the practice to use on side tracks and yard work and some extensive laboratory tests were instituted at the Gary mills, in conjunction with the Illinois Steel Company, to determine the relative safety of drilled and burned holes in rails. These tests were made while the plant was rolling 3,200 tons of 90-lb. section rail for our company.

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*Details of the Cobb crossing will be found in the issues of this paper for May 22, 1915, and Oct. 7, 1916.

For making the tests we cut up two G. N. 9036 rails into 4-ft. lengths and numbered them consecutively from one to twelve inclusive. The odd numbered pieces were drilled with a $1\frac{1}{16}$-in. hole through the web at the center and the even numbered pieces had the same size hole burned by the oxyacetylene process in the same location. The first six pieces were tested to destruction in a drop-test machine and the other six pieces were given pressure tests in a Riehle machine in the laboratory. The impact test with the drop-testing machine used a tup of 2,000 lb. with a height of drop of 13 ft. and with 36 in. between centers of supports. Results are given in the order in which they were made:

1. Drilled sample. Broke through a flaw in the base of the rail clear of the hole on the first blow.
2. Sample with burned hole. Broke through the hole at the first blow.
3. Drilled sample took a permanent set of 1.1 in. on the first blow and broke through the hole on the second blow.
4. Sample with burned hole. Broke through the hole in an angular direction on the first blow.
5. Drilled sample. Took a permanent set of 1.1 in. on the first blow, 1.8 in. on the second blow, and then broke square on the third blow.
6. Sample with burned hole. Broke angular through the hole on the first blow.

The results of these tests were not entirely satisfactory, so it was decided to finish the remaining tests by the static method in the Riehle testing machine. so that a unit of measurement could be secured, and therefore a better comparison made. The capacity of this machine is 300,000 lb. Rails were placed in the machine with the same centers as used in the drop tests, that is, 36 in. Tests were made on three samples with drilled holes and three with burned holes. The results are given in tests No. 7 to 12 inclusive.

7. Sample with drill hole stood a load of 162,000 lb., then broke squarely through the hole. The break indicated some segregation in the web.
8. Sample with burned hole stood a load of 117,000 lb., then broke squarely through the hole.
9. Sample with drilled hole stood a load of 189,000 lb., then broke through hole.
10. Sample with burned hole stood 102,000 lb. and then broke irregularly through the hole.
11. Sample with drilled hole stood a load of 117,000 lb. and then broke squarely through the hole.
12. Sample with burned hole stood load of 116,000 lb. and then broke squarely through the hole.

From the above it will be seen that the pieces of rail with drilled holes took an average of 174,000 lb. to break through the section, and the ones with burned holes an average of about 110,000 lb., or a difference of about 64,000 lb. in favor of rails with drilled holes.

Further tests were made by taking 4-ft. pieces of sound section rail with no holes in the web and testing these to destruction in the Riehle machine. These stood an average of 226,400 lb. load and then broke squarely through the section at the center.

Further drop tests were made on a number of rails from six different heats after the regular tests for the inspection had been made. In this special test the height of drop was 17 ft. and the weight of the tup was 2,000 lb. The results of this test are given in the accompanying table.

RESULTS OF DROP TEST
HEIGHT OF DROP 17 FT. WEIGHT OF TUP 2,000 LB.

Heat Number	Ingot No.	No. of Blows	Permt. Set	Remarks
50126	2	1	1.30	Twisted out of shape.
	2	2	2.25	
	..	3	3.00	
	..	4	....	
	23	1	1.30	Broke through flange account of slight segregation.
	..	2	....	
53101	2	1	1.45	Broke through section.
	..	2	2.50	
	..	3	3.30	
	..	4	....	
	..	1	1.45	Broke through section.
	..	2	2.45	
	..	3	3.35	
	..	4	....	
52115	13	1	1.30	Broke through section.
	..	2	2.10	
	..	3	3.05	
	..	4	....	
	23	1	1.50	Broke angular through section.
	..	2	....	
39093	23	1	1.40	Broke through section.
	..	2	2.55	
	..	3	3.40	
	..	4	....	
	2	1	1.45	Broke through section.
	..	2	2.50	
	..	3	3.45	
	..	4	....	
30123	2	1	1.55	Broke through section.
	..	2	2.65	
	..	3	3.80	
	..	4	....	
	13	1	1.60	Broke through section.
	..	2	2.70	
	..	3	3.90	
	..	4	....	
48100	13	1	1.60	Broke through section.
	..	2	2.70	
	..	3	3.55	
	..	4	4.10	
	..	5	....	
	23	1	1.55	Twisted out of shape—head and web broke.
	..	2	2.65	
	..	3	3.65	
	..	4	4.10	
	..	5	....	

Our conclusion from these tests was that the practice of burning holes in the web of rails is unsafe, since the rails were weakened more than with drilled holes, and that the use of this method should be limited to yards and sidings.

Civil Service Vacancies

THE Civil Service Commission announces an examination on Sept. 22 to fill a vacancy as purchase agent at the Watertown Arsenal, Mass., at $2,400 per year and other vacancies requiring similar qualifications. After six months' satisfactory service appointees may receive a $20 per month increase. The highest eligibles nearest the vicinity at which the appointee is to be employed will be certified. All citizens over twenty-one are eligible to qualify.

Applicants must have had at least two years' experience as purchasing agent or assistant in the buying of machine, electrical, foundry, woodworking and forge shop supplies.

On Sept. 28 examinations will be held to fill vacancies in the Bureau of Public Roads at an entrance salary of $1,500 and grade of junior civil engineer. No formal examination will be held, but competitors will be rated on experience, training, education and physical ability.

Applicants should apply for Form 1,312 to the Civil Service Commission, Washington, D. C.

Carbon Brush Testing

The Several Materials Which Enter Into the Composition of Carbon Brushes Are Discussed, Together with Methods Used for Testing Brush Quality

By JOHN S. DEAN
Railway Motor Engineering Department Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

BEFORE going into the details of testing carbon brushes it seems logical that some general information regarding the raw materials, various types, method of manufacturing and general characteristics of brushes be reviewed in order to lay a broad, well-grounded foundation for a more intelligent understanding of this subject. The materials used consist of carbon and pitch. Carbon is a non-metallic element found in both crystalline and amorphous (non-crystalline) forms. Amorphous carbon may be obtained in the form of coke or lampblack. Natural graphite is carbon in crystalline form which is mined in many localities, and artificial graphite is obtained by heating amorphous carbon, such as coke, in an electric furnace to change its structure to a crystalline state. Pitch, commonly used as a binder, is obtained as a residue in distilling coal tars.

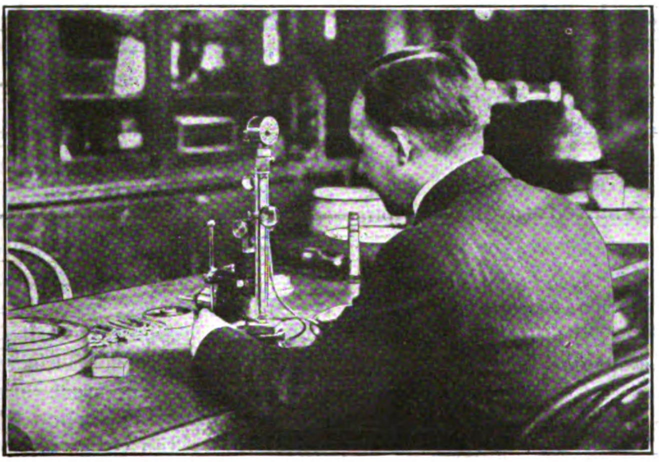
Depending upon their composition, brushes may be divided into seven classes:

1. *Carbon graphite*—Known as the ordinary carbon brush and consisting of amorphous carbon in the form of coke, with a small percentage of graphite and binder.
2. *Graphite carbon*—With either a mixture of a large percentage of artificial graphite, some coke and binder, or with a mixture of a large percentage of natural graphite, some coke and binder.
3. *Electro-graphitic*—Consisting of (1) and (2) graphitized by special electrical treatment.
4. *Graphite*—Made of natural graphite and binder.
5. *Impregnated*—Consisting of carbon graphite brush treated with a lubricating material.
6. *Metal graphite*—Made of a mixture of graphite, powdered metal and binder.
7. *Compound brush*—Consisting of alternate layers of carbon and metal.

The following four types are most suitable for railway work. They are listed in the order of their value with reference to the best all-around results obtained in service: (1) Electro-graphite and (2) graphite carbon, both used with commutators having mica undercut; (3) impregnated, used with commutators where it is impracticable to undercut the mica, and (4) carbon graphite, used with commutators having mica undercut.

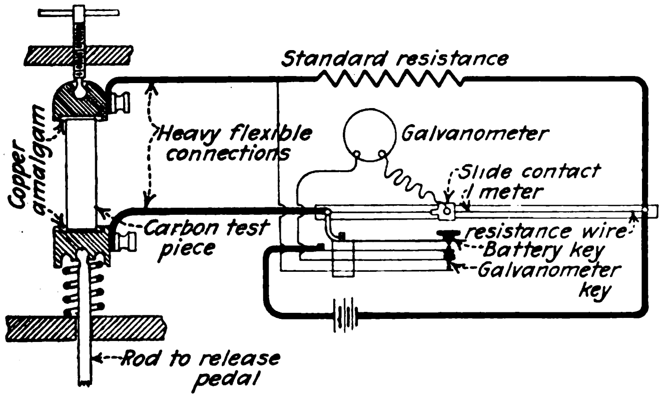
TWO COMMON METHODS OF MANUFACTURE

The most common two methods of manufacturing carbon brushes are termed the extruded or squirted method and the molded or machined method. In the former of these the material in the form of pulp is forced through a metal die under pressure and then cut off to the desired length and baked at a high temperature to carbonize the bond and permanently set the material. This method is used in making the cheaper grade of carbons, which do not have the strength to resist the breaking and chipping in service. The "molded or machined" method consists in molding the material into blocks



AT TOP, HARDNESS TEST APPARATUS. AT LEFT, STRENGTH TESTING MACHINE. AT RIGHT, CHECKING CARBONS FOR THICKNESS under heavy pressure and then baking it. Carbons are cut from these blocks and machined to exact size. This method is used in making high-grade carbons and gives a brush of uniform texture and strength that is best suited for railway work.

For railway work it is the most common and considered the best practice to use graphitized unplated carbons, without shunts or pigtails. In general this type of brush requires the following shop operations to produce the finished carbon from the raw material.

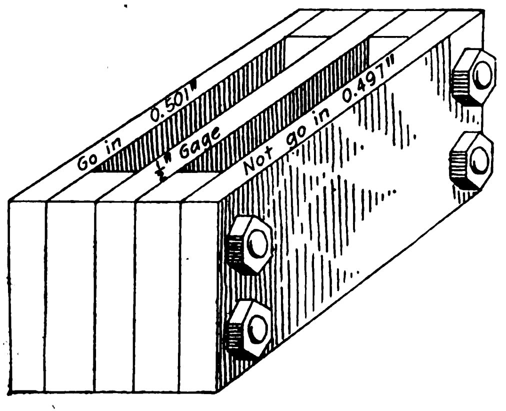


SCHEMATIC DIAGRAM OF SPECIFIC-RESISTANCE TEST APPARATUS

Starting with the raw material, it is crushed, calcined or carbonized, cooled, milled, mixed, again cooled, remilled, molded, packed in furnace, gas baked and electrically baked or graphitized.

The preceding operations produce the unfinished rough carbon blocks, which are then sawed to approximate size, side planed, edge planed, end planed, washed and dried, when the wet process of grinding is used, then cooled, stamped, when not marked during the molding process, chamfered on the corners and finally inspected, which produces the finished brush ready for shipment.

In connection with the manufacture of the many grades of carbon brushes best suited to the various requirements of different service conditions the physical properties of the brush shown in Table I must be considered:



MAXIMUM AND MINIMUM GAGE BOX

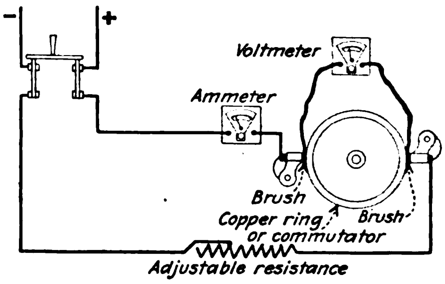
TABLE I—PHYSICAL CHARACTERISTIC OF BRUSHES

Characteristics...	Electrical......	Specific resistance Contact drop Current-carrying capacity
	Mechanical....	Coefficient of friction Hardness Toughness or strength Abrasivness Density Thermal conductivity Dimensions

One of the most important factors associated with carbon brushes, in which both the consumer and manufacturer are vitally concerned, is the uniformity of the product. This is of the utmost importance from the operator's standpoint. He, after deciding to use a certain grade of carbon, which best meets his operating conditions as determined by a long series of service tests on sample carbons, depends entirely upon the reliability of the manufacturer to continue to supply this grade of carbon with similar characteristics on all future shipments. If for any reason this is not done and some of the carbons in service do not measure up to the samples furnished there is a strong inclination on the part of the operator to discontinue using this brush.

TESTS NECESSARY TO ASSURE UNIFORM PRODUCT

The manufacturer, realizing the above condition, takes all precautions to insure a uniform product in the various grades of carbons manufactured. To accomplish this a careful inspection and test must be made of the raw material as it is received and during the processes of manufacture, as well as of the finished carbons. These tests are made on samples taken from approximately 10 per cent of the materials and finished carbons. They are outlined here to show the user of railway motor carbons to what extent precautions are taken to produce a uniform and reliable carbon brush best suited to meet the requirements of railway operating conditions.



SCHEMATIC DIAGRAM OF CONTACT-DROP APPARATUS

Specific Resistance—The specific resistance of a brush is the electrical resistance of a unit[*] cube of the material measured between opposite surfaces, expressed in ohms. For measuring this a testing outfit, consisting of the well-known Wheatstone bridge, with the carbon test piece as one leg and the standard resistance as a second leg, and the adjustable divisions of a one-meter resistance wire as the other two legs in the bridge is used. This is shown in an accompanying illustration. The test specimen consists of a ½-in.-square section of carbon 2½ in. long, having, therefore, a resistance ten times that of an inch cube.

The test piece is clamped between two heads, one of them adjustable and the other spring supported. The contact between the carbon and these two heads is reduced to a minimum by the use of copper amalgam paste or copper gauze. A setting of the sliding contacts on the wire is obtained where there is no deflection on the galvanometer when the circuit is closed by pressing the double key. This balance gives a relative resistance of the carbon test piece and the standard resistance unit. By reference to a computed table the resistance can then be obtained without the necessity of calculating the values in each individual case. Another method quite generally used is the voltage-drop method, where a known current is passed through the carbon test piece and the voltage drop across a known length of the carbon is determined. The resistance is then calculated by Ohm's law.

The specific resistance depends on the composition of the brush and varies from 0.0025 ohm to 0.0001 ohm. The specific resistance of a good grade of electro-graphitic railway motor brush should be about 0.0015 ohm.

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[*] Here taken as 1 in.

Contact Drop—The electrical contact drop of a brush is the sum of the differences in potential between the positive brush and the commutator surface, and the commutator surface and the negative brush. This contact drop is determined by means of special apparatus consisting of a motor-driven flat copper disk and two brushes in contact with the vertical face of the rim. The current passes through the positive brush to the wheel and out at the negative brush. The voltmeter leads are connected one to each brush as near to the brush face as possible. The voltmeter then reads the drop between the brushes.

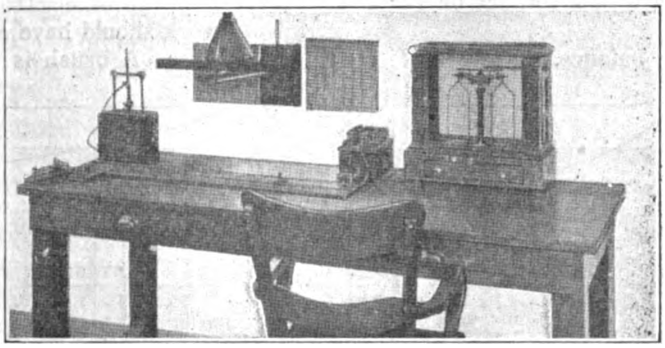
The size of the test piece will vary in accordance with the general design of the holder. The use of a piece of brush with one square inch cross sectional area will simplify the computation to a considerable extent. Special brushes are required for this test, each of which must have two pigtails, for connection in the ammeter and the voltmeter circuits respectively.

The test specimens are inserted in the holders and the apparatus is operated for some time with the current flowing until a characteristic surface has been formed. The brush pressure, current density and peripheral speeds are then adjusted and readings are taken, giving the contact drop from brush to brush at the current density brush pressure and peripheral speed used.

The value obtained for the contact drop is determined largely by the material in the brush, the pressure between brush and commutator, the current density and the condition of the surface of the commutator and the brush face, and will vary from 1.25 to 2.75 volts. Accompanying graphs show the variation of contact drop due to change in brush pressure and current density. The contact drop of a good grade of electro-graphitic brush suitable for railway work should be about 2.1 volts.

The current-carrying capacity of a brush is the density of the current that the brush can carry continuously without serious heating, expressed in amperes per square inch of contact surface. Not only the actual load current of the machine is considered in this connection but also the short-circuit current that the brush must carry.

There is no laboratory method of testing a brush for this characteristic. It is dependent on so many factors that a test other than operation under service conditions would have but little meaning. Fundamentally the carrying capacity of a brush is limited by the temperature reached at the contact face and all conditions having influence on this temperature affect the carrying capacity in a given instance. It is the practice of carbon manufacturers to rate brushes in this respect in accordance with what they have observed the brush will carry in service without distress. Ratings given are for continuous service, so that intermittent service such as is encountered on railway motors will permit the use of higher current density than the standard rating of the brush would indicate.



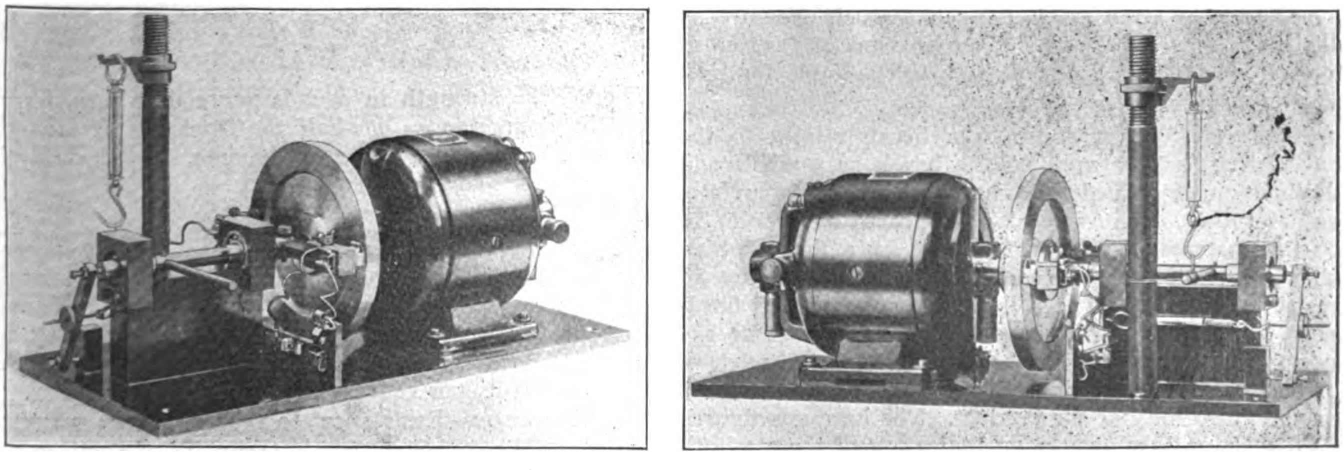
SPECIFIC-RESISTANCE TEST APPARATUS

The current-carrying capacity depends on the composition of the brush, specific resistance, contact drop, coefficient of friction, thermal conductivity of the brush itself and the radiation factor of the machine in operation. It will vary from 35 to 70 amp. per square inch, the value for a good grade of electro-graphite brush suitable for railway work being about 50 amp.

Coefficient of Friction—The coefficient of friction of a brush is the ratio of the force preventing rotation (the tangential pull exerted by the commutator upon which the brushes bear) due to friction of the brushes, to the force pressing the brushes (radial pressure applied at the brush face) down upon the commutators, that is, to the total pressure on the brushes.

The machine used for measuring contact drop is also used in measuring the coefficient of friction. In this machine the brushholders are placed on a counterbalanced arm to which is attached a vertically hung spring balance which registers the pull due to the brush friction.

The test specimen used for the contact drop test is utilized for this also, preferably with 1 sq. in. cross sectional area. In this test pigtails are not necessary.



TWO VIEWS OF CONTACT-DROP AND COEFFICIENT-OF-FRICTION TEST APPARATUS

In making the test, brushes are placed in the holder and the motor is operated until the brushes are well seated. It is advantageous to run this test immediately after the contact drop test, as it is then unnecessary to remove the brushes from the holder. With the above apparatus it is possible to hold the current density and brush pressure constant, while data for a curve between coefficient of friction and peripheral speed are made, or by holding the speed constant data for a friction pressure curve may be obtained. From the readings on the springs balance the dragging force is calculated by the law of moments as follows:

$$F = \frac{R \times P}{r}$$

where

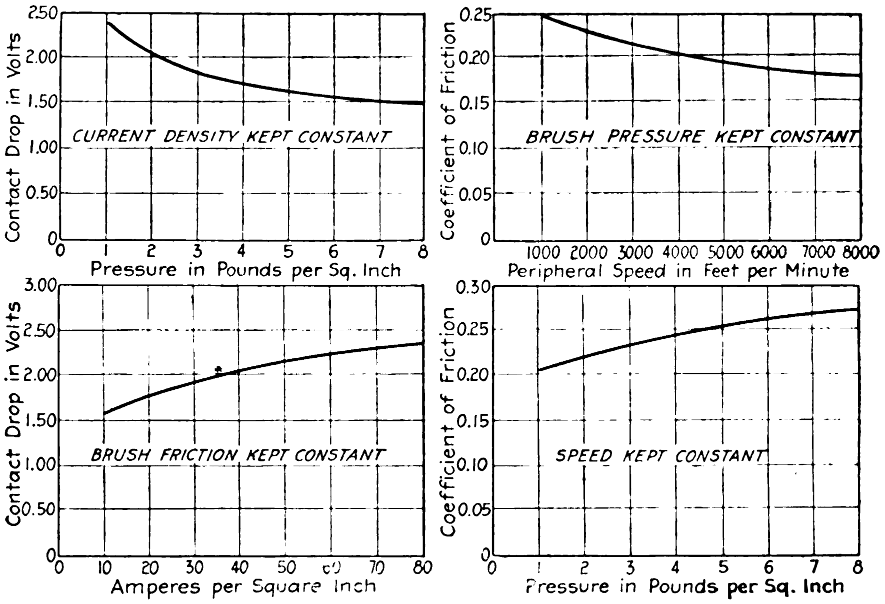
F = dragging force.

R = radius at which dragging pressure on vertical spring balance is measured.

r = radius at which brush makes contact on revolving disk.

P = pull on vertical spring balance.

By using this value of F and the brush pressure on horizontal spring balance $F1$ the coefficient of friction is readily calculated by the same principle. The coefficient of friction is subject to a wide variation due to the peripheral speed of the commutator, brush pressure and composition of the brush, as well as the process of manufacture. This value will vary from a little above zero to 0.75. On account of this wide variation, brush engineers have, for convenience, classified brushes as "high," "medium" and "low," depending on the coefficient of friction. Accompanying graphs show the variation of the coefficient of friction due to a change in peripheral speed and the effect of a change in brush pressure on the coefficient of friction. The coefficient of friction of a good grade of electrographite brush suitable for railway work should measure about 0.22.



DIAGRAMS SHOWING EFFECT OF BRUSH PRESSURE ON CONTACT DROP, EFFECT OF PERIPHERAL SPEED ON COEFFICIENT OF FRICTION, EFFECT OF CURRENT DENSITY ON CONTACT DROP AND EFFECT OF BRUSH PRESSURE ON COEFFICIENT OF FRICTION

Hardness—The hardness of a brush relates to the compactness of the mass of the brush as a whole and depends on the cohesion of the particles on its surface, as determined by its capacity to scratch another or to be itself scratched. It is expressed by a figure which shows a relative measure of ability of its surface to resist penetration. There is no absolute unit of hardness, and the readings obtained on the scleroscope are relative figures, which are useful only for the purpose of comparison, but which are very essential as a check on the uniformity of the product. The hardness figures as determined are usually an indication of the strength of the brush. A scleroscope is shown in an accompanying illustration. For the scleroscope test the finished carbons or any small piece of carbon with a smooth polished surface can be used. The sample carbons are placed on the heavy base plate of the instrument directly under the graduated glass tube which contains a diamond-point hammer. The hammer is made to drop from a fixed height upon the test piece of carbon. The rebound of the hammer is measured by means of a fixed scale graduated from 0 to 100.

Results obtained vary from 10 to 75 for brushes, depending upon the material and methods of manufacture. Brushes are graded according to their scleroscope readings as follows:

Scleroscope Readings	Degress of Hardness
0-15	Very soft
16-30	Soft
31-45	Medium
46-60	Hard
61-75	Very hard

A good grade of electro-graphitic brush suitable for railway work should have a hardness figure of about 60.

Toughness—A brush is tough or strong when it will endure the application of force without breaking or yielding, possessing the quality of flexibility without brittleness. The strength of a brush determines its ability to withstand chattering in the carbon box without chipping or breaking. It is expressed in pounds per square inch.

A special testing machine is used for making this test and test carbons are cut ½ in. square and 6 in. long. The test piece is placed on two knife-edge supports, 4 in. apart, and the load is gradually applied at the center until the piece breaks. The strength is computed in pounds per square inch by means of the following formula:

$$S = \frac{WcL}{4I}$$

where S = strength in pounds per square inch, W = load in pounds, c = one-half the thickness of the test piece, L = distance between supports, I = moment of inertia, $\frac{1}{192}$ in this case.

Typical test results vary over a considerable range from 1,000 to 8,000 lb., depending upon the material entering into the mixture as well as the method of manufacture. The strength of a good grade of electrographite brush suitable for railway work should be about 5,500 lb. per square inch.

Abrasiveness—Resistance to abrasion or scouring action of the carbon brush is the ability to withstand the wear due to friction. This term should not be confused with hardness. Hardness relates to compactness of the mass as a whole, while abrasiveness relates to the cutting action of the brush due to the presence of gritty particles in the brush mixture.

There are no reliable tests for abrasiveness. Efforts have been made to develop an apparatus to test this characteristic, but these have failed to produce results that check with actual experience with the different grades of carbons under service conditions. This is attributed to the influence of the commutating currents on disintegration at the brush face, which cannot be reproduced on the testing machine. Brushes which show decided abrasive characteristics in operation will sometimes glaze over on the test machine and run for a long period of time without wear.

The abrasiveness of a brush depends on the composition and the amount of the ash which forms a part of the brush. It can be controlled by varying the mixture that enters into the various grades of brushes. Silica, mica and carborundum form the larger part of the abrasive material found in the ash of carbon brushes. The best modern practice among railway operators is to keep the mica of all commutators undercut, hence an abrasive brush is not required; in fact, it is objectionable, as it tends to wear the copper more rapidly. In this connection, it might be added that in the case of a motor which commutates poorly an abrasive brush may be required to keep the commutator surface well polished. A good grade of electro-graphitic brush suitable for railway work should be non-abrasive.

Density—The density of a brush is the quality or state of having the constituent parts massed or crowded together. The real density of a brush is the weight of the carbon, exclusive of pores compared to the weight of an equal volume of water, while the apparent density is the weight of the carbon with the pores compared to the weight of an equal volume of water.

The equipment necessary for determining density is a micrometer reading to 0.001 mm. and of a size adaptable to the test specimen and an analytical balance weighing to 0.0001 of a gram. For the test specimen 2½ in. x ½ in. x ½ in. is a convenient size.

The test specimen is carefully measured for length, width and thickness and the volume is computed in cubic centimeters. This piece is then weighed and the apparent density computed by comparing it to the weight of an equal volume of water. The real density requires a more elaborate test as it is necessary to take into account the porosity of the material. To do this a sample of known volume is saturated with a liquid of known density and the weight of the saturated piece is determined, the apparent density of the sample having been previously calculated. It is then possible to make a correction for the liquid used to saturate the sample and to determine the real density of the test carbon exclusive of the pores by comparing this correct weight to the weight of an equal volume of water.

As the average real density of carbon brushes is 2, the apparent density will vary below this value, depending on the porosity of the finished carbon, which is determined by the material of the mixture and the process of manufacture. The apparent density of a good grade of electro-graphitic brush suitable for railway work should be approximately 1.5.

Thermal Conductivity—The thermal conductivity of a carbon brush is the property of receiving and transmitting heat through its homogeneous mass from particle to particle and from one body to another when in contact. There has been no practical laboratory method developed for testing this characteristic of carbon brushes. This property depends upon the material in the brush as well as the method of manufacture. There is no practical unit of measurement of this characteristic. Graphite has a higher thermal conductivity than most forms of carbon. A good grade of electro-graphitic brush suitable for railway work should have the maximum thermal conductivity allowable.

Checking Dimensions—A caliper rule is used to check the length and width of brushes and a special gage to check the thickness. The type of gage shown in an accompanying illustration has proven very satisfactory, inasmuch as it can be adjusted when worn. When the plates forming the side of the gage become worn it is only necessary to dismantle the gage and regrind these plates to a true surface. When it is again assembled the gage will be restored to its original accuracy.

The finished carbons are checked for length and width, using the caliper rule, and then they must pass through the slot in the gage marked "go in" and not enter slot marked "not go in."

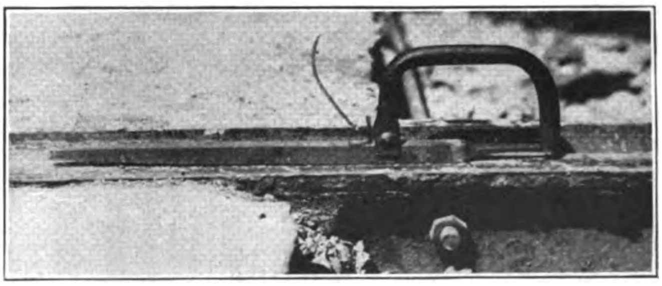
Of the three dimensions of a carbon brush the accuracy of the thickness is most important as it is essential that brushes have a snug fit in the carbon box to allow easy movement and at the same time prevent chattering. For unplated carbons, such as used in railway work, brushes should come within the following "tolerances": Thickness, 0.001* in. over to 0.003* in. under; width, nothing* over to 0.016† in. under; length, 1/32 in. over to 1/32 in. under.

The above allowances are in accordance with the specification as adopted by the Power Club and tentatively adopted by the A. E. R. A. committee on standards.

In the preparation of this article the writer has been indebted to H. A. Humiston of the National Carbon Company and W. C. Kalb of the Corliss Carbon Company for very valuable suggestions and assistance.

Hand Filing of Rail Joints Facilitated

THE United Railroads of San Francisco has facilitated the work of filing down rail joints by hand, presumably on isolated small jobs where the amount of metal to be removed is small, by providing a handle for the large files used. This handle consists simply of a piece of iron rod bent into U-shape, with a hole at one end, into which the tail of the file is inserted, and a clamp at the other end which fits over the file and is tightened by means of a thumbscrew. The handle can be removed in an instant by simply loosening the thumbscrew. Its use permits the workman to file longitudinally along the head of the rail as well as across it.



HAND FILE EQUIPPED WITH DETACHABLE HANDLE FOR USE ON RAIL JOINTS

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*Each brush shall pass by its own weight through a gage of these dimensions.

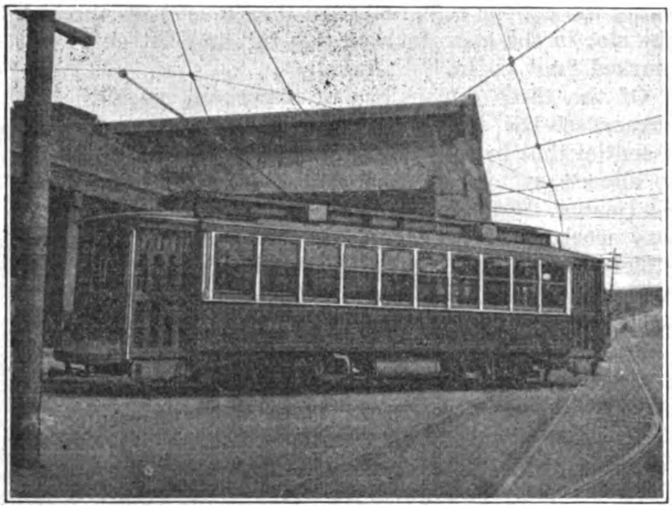
†The brush shall not enter a gage of these dimensions.

Rebuilding Old Rolling Stock

Scranton Railway Bringing Fifteen Old Cars Up to Date by Installing Modern Equipment for City Service

THE Scranton (Pa.) Railway is rebuilding fifteen of its older type of closed cars. This work was started some time ago and at present the reconstruction of twelve cars has been completed. The old cars, one of which is shown in accompanying illustrations, had full longitudinal seats and sloping sides, stationary sash and bulkheads.

The first steps in the reconstruction were to remove all sash, seats and control equipment, take off the sheathing and take out the bulkheads. The posts were spliced, new side sills added and ⅛-in. steel sheathing applied. The new sash have the upper half stationary and the lower half raises. New pantasote curtains were installed. The new seating arrangement includes twelve Hale & Kilburn transverse seats, while the end seats, built in the shop, are longitudinal. New floors have also been laid.



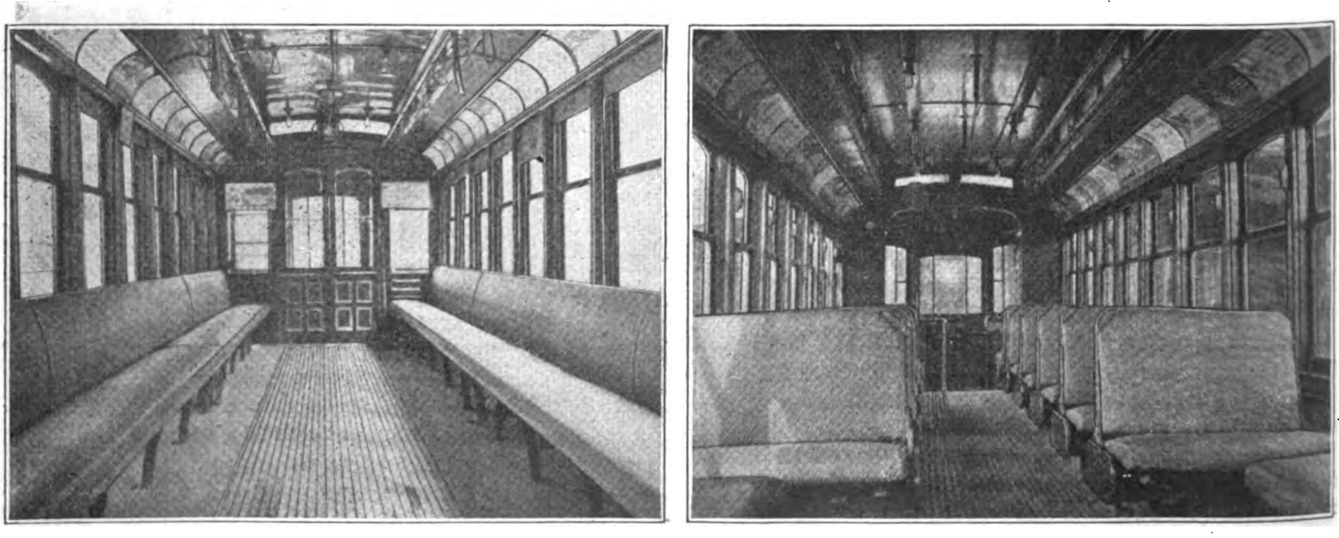
A DIFFERENT LOOKING CAR AFTER GOING THROUGH THE SHOP

Four ventilators have been installed in the monitor roof of each car. Some of these are the Utility Honeycomb, while others are Garland type E. Keystone signs have been installed, also the Consolidated buzzer system and twelve cross-seat, four panel and two vestibule Consolidated heaters. The Consolidated door signal system is also used. Other new equipment includes National pneumatic air-operated doors and steps, Golden Glow headlights and Economy meters. The cars are equipped with General Electric No. 70 motors. The new lighting arrangement includes four five-light series of 23-volt lamps, two rows of five down the ceiling of the car, one light outside over each door and one on each platform.

Flashing of Railway Motors Caused by Light Loads

A SOUTHERN railway company bought three second-hand cars equipped with four motors of the non-commutating pole type, which gave considerable trouble due to the motors flashing. Upon investigation it was found that the original owners operated these cars on a belt line where they ran in one direction only and the brushes on these motors had been given a back lead for this single-end operation. However, after the brush holder rigging had been changed and the location of the brushes had been adjusted to the neutral position for double-end operation it was noted that when the cars reached a certain speed the motors would tend to flash over and give some trouble. By accident it was learned that by cutting out one motor on the car—it made no difference which one—and operating with the other three motors, under no condition could they produce a flashover. This condition existed on all three cars and was a mystery for some time to all those in charge of the equipments. Many special tests and investigations were made none of which led to any definite remedies, until the phenomenon was finally explained as follows:

Under the most favorable conditions the motors concerned were fundamentally very sensitive to flashing and very much more so on light loads and the consequent higher speeds that occur when the motors were taking a small amount of current. For this reason flashing resulted when the critical speed was reached. With one motor cut out, the other three motors were obliged to do the work of four, and the load per motor was increased; also there was a corresponding reduction in the speed at which the motor operated to a value below the critical point, so that the motors then operated satisfactorily without flashing.



AT LEFT, INTERIOR OF CAR BEFORE REBUILDING. AT RIGHT, MODERN INTERIOR OF CAR AFTER REBUILDING

Why Use Fuel Oil in Power Plants?

The Advantages Claimed for Fuel Oil Are Set Forth and the Changes Necessary in the Furnaces for Burning Crude Oil Are Described

WITH the present coal shortage the manager of the railway utility generating its own power naturally wishes to know the possibilities of using crude oil.

The advantages claimed for oil burning under stationary boilers may be listed as follows:

1. Oil fuel is cheaper than coal in most parts of the United States.
2. Boiler room labor can be decreased.
3. Ash handling expense is eliminated.
4. Fires need not be banked and each fire is working at high efficiency.
5. Although both oil and coal may be purchased upon a B.t.u. basis, the tests involved in checking oil values are more easily and cheaply applied by the smaller companies.
6. Oil fuel can be burned more efficiently than coal.
7. Boiler rooms and surroundings can be kept neat and clean.

OTHER CLAIMS AS TO FUEL OIL

It is claimed further by those interested in promulgating the use of oil in boiler plants that one fireman can take care of ten oil-fired boilers, so that in large plants the decrease in labor required would be considerable. The cost of unloading coal, usually greater than that for oil, and the handling of ashes are eliminated. In the case of banked fires coal is being burned wastefully, whereas with oil-burning apparatus as soon as the load begins to decrease burners can be shut down or cut off entirely in any desired boiler or boilers and only enough fuel burned to maintain the load. By opening the proper valves at the burner more heat can be quickly obtained when needed. Longitudinal walls, placed in the fire box, confine the desired air supply to each burner, so that all those in use are operated at maximum efficiency. This is particularly important for boilers used on "stand-by" service. However, it is best to equip a boiler so that under ordinary conditions, with its changing load, all the burners may be operated with a corresponding intensity of fire, rather than to shut off entirely any number of burners when the load is reduced.

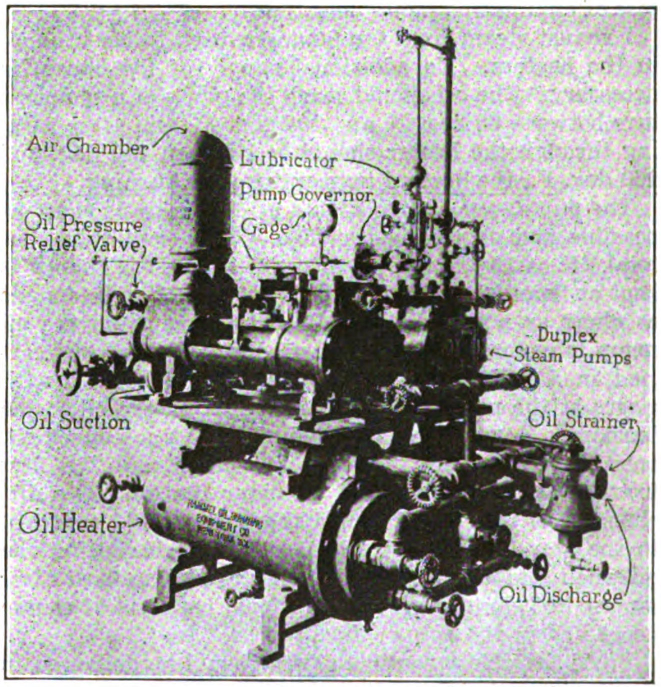
Assuming that fuel oil with 18,500 B.t.u. per pound is available in competition with a high grade coal testing 14,500 B.t.u. per pound, that the efficiency of the coal furnace is considered to be 60 per cent and that of the oil furnace 70 per cent, the theoretical equivalent for each long ton of coal would be 4.5 barrels of oil. Higher oil efficiencies than that assumed are, however, quoted which, if attainable in the average plant, would materially reduce the relation indicated. Managers in different sections of the country may readily determine cost comparisons for fuel if their boiler efficiency is known.

Among the manufacturers of apparatus for burning fuel oil is the Hammel Oil Burning Equipment Company, Providence, R. I. To the engineers of this company the ELECTRIC RAILWAY JOURNAL is indebted for technical information regarding the problems which are met in their work, the ways in which these have been met, etc. The accompanying halftone shows details of an oil-burning equipment as manufactured by this company and much of the following information relates to the application of this equipment.

NEW EQUIPMENT REQUIRED

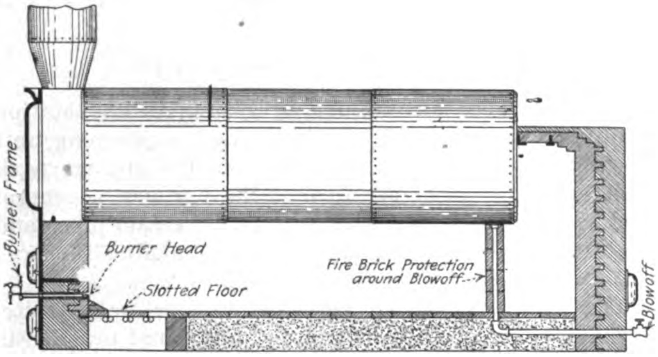
Application of an oil-burning system to any station requires a storage tank for the fuel oil, a pumping unit for drawing the oil by suction from the storage tank and forcing it under pressure to the burners, a general piping system for the necessary oil and steam pipes and the furnace changes whereby the coal-burning furnaces can be transformed for the use of oil.

The storage tank may be either of steel or concrete, depending upon local conditions. The usual practice is to make the storage large enough for at least a two weeks' supply of fuel if the plant is located near an abundant source. From the relation of oil to coal necessary it is possible to determine the oil supply required. The reservoir should be as near the boiler room as possible to obtain the shortest pipe lines, although this location must necessarily conform to insurance and local fire regulations. Usually the reservoir is placed below ground, and adjacent to a railroad siding if oil is to be received in tank cars. Mexican oil, which is used very largely in the East, is extremely sluggish when cold, so that the tank cars are equipped with a steam coil for heating the oil to a temperature high enough to permit it to flow freely. In order to serve the largest tank car, the filling pipe should be at least 6 in. in diameter. A larger diameter may be preferable if the slope to the reservoir is not great.



COMBINED PUMPING AND HEATING UNIT FOR OIL SUPPLY

A steam-driven pump is installed with its suction connected to the main reservoir in order to force the oil under pressure to the burners. The Hammel unit consists of two standard duplex type steam pumps, furnished in several sizes, depending upon boiler capacity, specially fitted for fuel oil and including one or two heaters for heating the oil to the desired temperature for the burners. Only one pump is required at any time, the second unit being for use as spare equipment. The unit is conveniently piped so that either one or both heaters may be used with either or both pumps. It should be equipped with automatic governor to maintain constant pressure of the oil discharge, a pressure gage, automatic relief valve, suction and discharge thermometers, strainer, pump lubricator and air chamber for the purpose of eliminating pump pulsation.



FURNACE CHANGES FOR RETURN TUBULAR BOILER

Exhaust steam from the pumps is used to heat the oil in the heaters. No additional supply of live steam is necessary. The oil should reach the pump at a temperature between 80 deg. F. and 100 deg. F., and after passing through the heater should be between 140 deg. and 160 deg. F., the desired temperature for burning.

The pump suction line should of course be as short as possible and should be provided with a foot valve. A total lift of 18 ft. may be successfully used if the oil is kept at from 80 to 100 deg. F. and the suction line made as short as possible. The discharge line from the oil pump is generally dropped below the floor level and carried in a trench along the front of the boilers, with risers at the proper places for conducting the oil to the burners. A meter should be placed at a convenient position on the line between the pump and the first branch tee, if it is desired to meter the oil. The discharge line is carried beyond the burners and returned to the storage tank for the purpose of circulating the oil when cold and when the boilers are being fired after a period of shutdown. An additional meter is of course necessary in the return line.

Since the driest possible steam should be delivered to the burners, the steam line should have a gradual slope toward the boilers and discharge into a trap at its lowest point. Steam lines may also be required for heating coils in the storage reservoir and for connection to steam coils upon the tank cars.

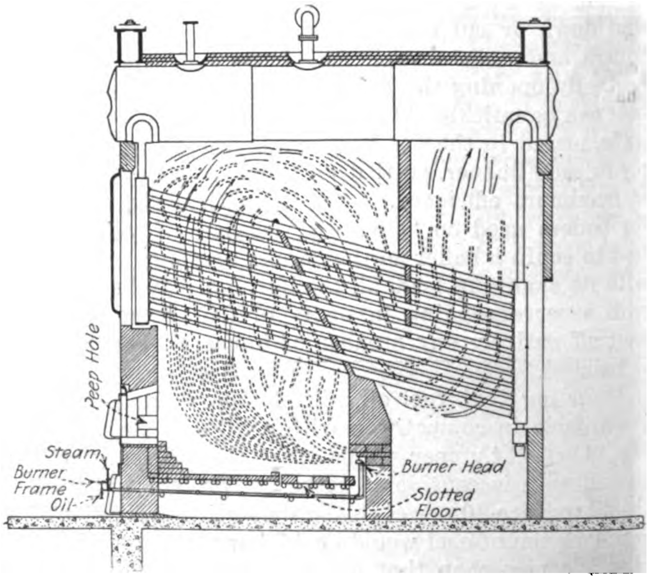
The burner in most common use for high pressure work is of the steam atomizing type. This has separate inlets for receiving the oil and high pressure steam. The oil is forced to the burner under a pump pressure, while the steam is generally under full boiler pressure at the burner throttling valve. The action of the steam inside the burner, and as it expands out of the burner into the combustion chamber, is to atomize the oil thoroughly into minute particles. When these particles are ignited a fan-shaped flame is produced which extends from the burner mouth over the full width of the combustion chamber.

FURNACE CHANGES NECESSARY

In order to change the furnace for the use of oil fuel, the grates are removed and the bridge wall torn down to approximately the level of the top of the ashpit door. A new floor of fire brick is then laid upon pipe supports. Slots between the bricks are left for admitting the necessary air for combustion, the air entering through the ashpit doors. The rear portion of the floor is laid upon an earth fill. All the walls of the furnace above the level of the new floor should be lined with firebrick. As an oil fire develops a more intense heat than coal, it is advisable to use the very best grade of firebrick, with a fusing point at least 3,000 deg. F. These should be laid with a very thin fire-clay joint, the brick being rubbed into place without the use of a trowel. In order to avoid burning the blow-off pipe, it should be encased in fire brick or wrapped with asbestos.

In the usual setting the new bridge wall is placed as far in the rear of the boiler as possible, but in the Babcock & Wilcox boiler the area of the second gas pass should not be decreased an abnormal amount. To insure good combustion there should be a distance of from 8 to 10 ft. between the front wall and bridge wall. Within certain limits, the higher the boiler setting, the better the efficiency, especially at high overloads.

The burners for return tubular boilers are located in a small hole cut as low as possible in the cast-iron front of the boiler without interfering with the free paassage of air through the ashpit door. In the Babcock & Wilcox, Stirling and Aultman & Taylor boilers the burner heads are located in notches in the bridge wall, the latter protecting them from the intense heat of the furnace.



APPLICATION OF OIL BURNERS TO WATER-TUBE BOILER

The number of burners for each boiler depends upon the width of the latter, the boiler design and local conditions. Average practice provides from one to four burners per boiler, *i.e.*, approximately six tubes, or a width of from 46 to 53 in. per burner. The whole burner frame can be easily and quickly detached by breaking two unions, when it is necessary to clean the burner. Then, by turning the frame sideways, both burner and frame can be slipped out of the ashpit door.

Electric Locomotives in Two Wrecks

Man Failure and Act of Providence Are Causes of Two Accidents on C., M. & St. P. Mountain Division—Electrical Equipment in No Way at Fault

ELECTRIC locomotives featured in two serious accidents which occurred in the spring in the Pacific Coast section of the Chicago, Milwaukee & St. Paul Railroad. All of the evidence has been taken and it is now possible to look back calmly upon the two accidents and to cite the circumstances on which B. B. Greer, vice-president, based his statement that one of the accidents was purely a case of man failure, while the other was the result of an act of providence, and in neither case was the electrical equipment or electrical operation of the road in any sense responsible.

One of these accidents is intensely interesting and informative as to the difficulties of mountain railroading. At 4:20 a.m. on June 16 train No. 74, with helper electric locomotive No. 10,239 on the front and a Mallet road engine on the rear end and fifty-eight loaded freight cars and one water car in the train, left Boylston, Wash., after the usual inspection of brakes.* A short distance east from this point the train began its descent of the long 2.2 per cent grade known as Beverly Hill

The engineer, who was an experienced man, allowed his train to gather momentum up to a point where regenerative braking in parallel could be cut in. The permissible speed for cutting in the motors for regenerative braking is from 15 to 20 m.p.h. Apparently this engineer waited for the speed to exceed 15 m.p.h., but failed to cut in his regenerative switches until the speed had reached at least 20 m.p.h., and the breakers would not hold. The confusion in his mind resulting from the operation of the overload relays caused a loss of action on his part for perhaps a fatal half minute, during which time the speed of the train kept rapidly increasing. The engineer then made a service application of his automatic air brakes, but this did not check the train. He tried to cut in the regenerative system a time or two, but the speed was too high and the breakers would not stay in. The service application of air was then released and an emergency application made, but the speed must have reached 35 m.p.h. by this time and the brakes had no effect in checking the train.

Running away, the train proceeded down the grade for a distance of 12 miles at a speed which is estimated was not in excess of 35 m.p.h., since it was held back to a certain extent by the independent driver and tank brakes on the Mallet engine on the rear, the retainers and the thirty-five hand brakes set up by the train crew. The train remained intact from the top of the hill to a switch at Doris, 12 miles, where the Mallet engine broke off the train on account of the tank becoming derailed. Presently this engine also left the rails, but was only slightly damaged.

Released from the holding power of the rear locomotive, the train gathered speed rapidly, and a little farther on twenty-eight cars of lumber and shingles piled up in a short space and were all consumed by fire. The remainder of the train proceeded eastward about 2½ miles, when thirteen more cars were derailed. Of these cars seven, carrying lumber and shingles, were badly damaged, but six cars carrying oil were practically unhurt. The remaining seventeen cars attached to the electric locomotive ran 1,000 ft. east of this point, where they were badly derailed in a short space and burned.

The electric locomotive, completely released from the train, proceeded 7 miles farther to a point 3 miles east of Beverly and stopped. The speed tape in this motor indicated that it ran at a maximum of 50 m.p.h. at some point, presumably after the Mallet broke off. There are several 10-deg. curves on this steep grade, and even with the excessive speed of the motor it did not leave the tracks nor did it cause any damage to the track. The total damage to the electric locomotive consisted of one motor-generator winding badly burned, one set of tires badly flattened and some minor damage to electrical connections. The entire damage, however, was slight.

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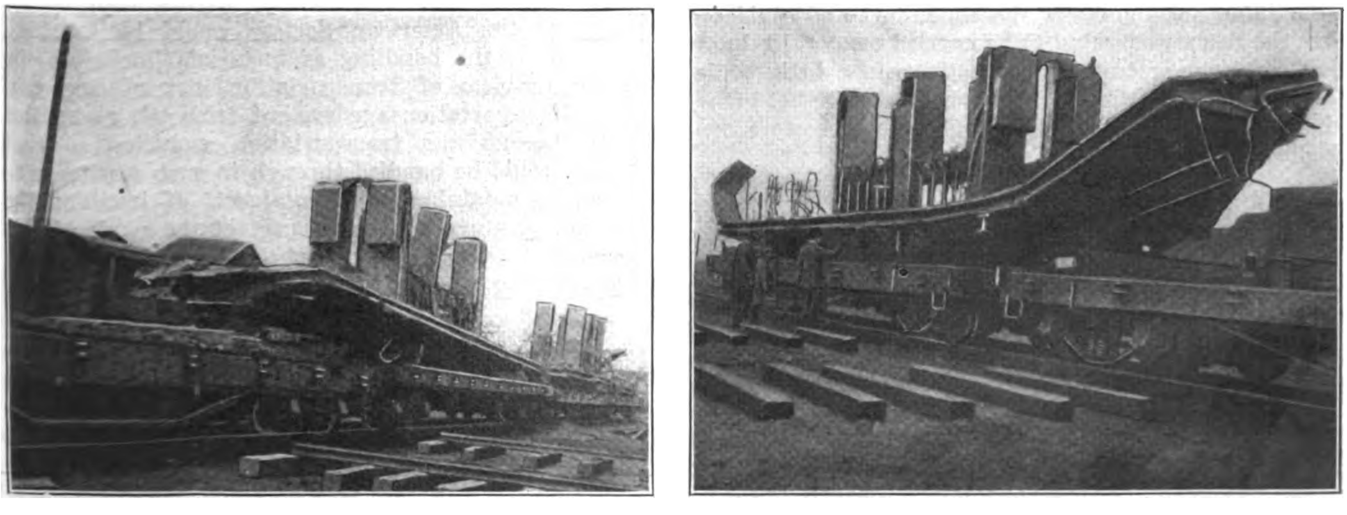
*A map and profile of this section of the railroad will be found in the issues of this paper for Nov. 3, 1917, pages 819 and 820; Nov. 1, 1919, page 830; March 6, 1920, page 481.



PARTS OF WRECKED MILWAUKEE LOCOMOTIVES AS RETURNED TO THE WEST TACOMA SHOPS

These underframes are being straightened and the rehabilitated locomotives will soon be in regular service.

The first recorded indication of trouble was when the breakers at the Kittitas substation blew out, indicating the operation of the overload relays on a locomotive on the line. This occurred at 4:26 o'clock and records the time when the engineer first cut in his regenerative braking. At 4:45 o'clock the trolley line and feeder line at Doris substation went out, and at 4:48 the high-tension line went out on account of being broken with the derailment of the first lot of cars.

So far as the braking power of the train is concerned, the company has always considered the regenerative system as entirely supplementary to the air brake system and has drilled its engineers to place primary dependence on the air brakes. In this particular case, the tonnage of the train was 2,480, while the air brakes would hold 4,000 tons on this grade, providing the speed is kept below 15 m.p.h. The regenerative features in addition should hold 1,500 tons. This points to the fact that there was no question of braking capacity involved in this wreck. The fact that 15 m.p.h. was the maximum speed of freight trains permitted before electrification, while this is the minimum speed at which the regenerative features may be placed in operation, makes the opportunity for man failure particularly critical. The men are instructed to test the holding power of their brakes before attempting to cut in the regenerative system, but there is a possibility that this may not have been done on this particular train owing to the general desire to take advantage of the regenerative features for saving energy at the earliest possible moment upon descending a grade. Full examination has determined that the electrical condition of both the locomotive and the substations was absolutely normal and that each part of the equipment was functioning normally. The entire responsibility is placed upon the engineer, who failed to cut in his regenerative braking until the speed had become excessive.

BIG SLIDE WRECKS TWO LOCOMOTIVES

The other accident referred to occurred at 11:30 a.m. on Sunday, May 23, at a point 3 miles east of Ragnar, Wash. In this case two electric locomotives running light, with only a caboose attached, were just in time to reap the full result of an enormous slide on the side of a mountain which took away a considerable section of track.

A watchman patrolling the track happened to be in this vicinity at the time the slide occurred. He heard a rumbling noise and saw the slide start and could see that the track was going to be carried away. He knew that a passenger train was due there in a little while, and he hurried up the track to flag this train, not knowing about the two electric locomotives which were proceeding from the opposite direction.

These locomotives, Nos. 10,208 and 10,240, rounded a curve at 15 or 16 miles per hour and entered the sunken track, rolling and sliding down the slope to a point about 400 ft. below. The two engineers and two firemen carried down with them were practically uninjured. An instructor and brakeman had to be taken to a hospital, but they recovered. The cabs of both locomotives were almost completely wrecked. The underframes were badly bent and twisted and the sheeting on the sides and roof was stove in by hitting against rocks and trees as the engines slid down the embankment so that it was practically beyond reclamation. Inside the cabs the motor-generator sets, rheostats, control equipment, air compressors, wiring, etc., were practically all torn from their fastenings and damaged more or less. The engine trucks, short and long main trucks, driving wheels and motors of both locomotives were very little damaged. The brake rigging on one engine was little damaged, while that on the other was damaged to some extent.

With the two wrecked locomotives some 400 ft. below grade, it was some problem to salvage them. This work was finally accomplished by loading the engines by pieces on wagons and carting them to North Bend on the Everett line, a distance of 7 miles, where they were loaded on cars and sent to the Tacoma shop.

Chicago Employees Support Commission

IN ITS current issue (Aug. 14), the *Union Leader*, official organ for Chicago of the Amalgamated Association of Street and Electric Railway Employees, has a strong editorial commendatory of the Illinois Public Utilities Commission.

Emphasizing the difficulty of the problem of the utilities with rising costs and fixed rates, the editorial says the commission members have attacked it fearlessly, honestly and in a practical way. These men of technical training and high ability, the "least understood, hardest worked and most abused" of all persons serving the Illinois public, are honorable men, and because they have done their duty have been "unreasonably criticised and abused by newspapers and politicians" who selfishly play the political game rather than work for the public welfare. The editorial concludes as follows:

> We hold no brief for this commission, but have had occasion to observe its work and realize some of the difficulties it has labored under. We know that by using good judgment the members of the commission have saved the people of various communities in Illinois much inconvenience. For the valuable service they have given they are entitled to credit and a deeper appreciation by the press and people of this state.

Materials Handling Association

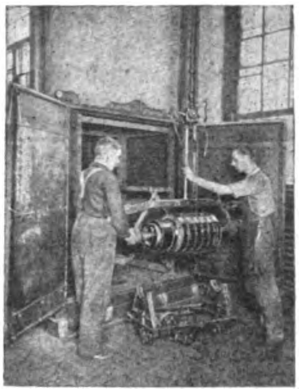
THE American Society of Mechanical Engineers has authorized the formation of a Materials Handling Section, the first and organizing meeting of which was held on Friday, Aug. 13, at the Engineering Societies' Building, New York.

It was indicated in this meeting that the work of this section of the American Society would be to study principles of the handling of materials, including the general problem of transportation, not of any particular transportation agency, but from the standpoint of linking up the transportation agencies so that material could be handled through in such a manner as to keep to a minimum the total cost of handling the material. Naturally, a large part of the work of this section will have to do with the handling of materials in manufacturing establishments.

In the article in last week's issue on "Training Platform Men" in Los Angeles, by J. G. Jeffrey, Director of Public Relations Los Angeles Railway, two titles were given to the author. That just mentioned with the Los Angeles Railway is correct. The title also given to him as an officer of the East St. Louis & Suburban Railway was due to a misplaced line, which was not caught by the proofreader.

Shop, Track, Power and Line

These Articles and Ideas Are From Men on the Job Who Find Special Applications and New Methods an Incentive for Greater Effort — If You Have Something Good Pass It Along



Interurban Car Stop Signal

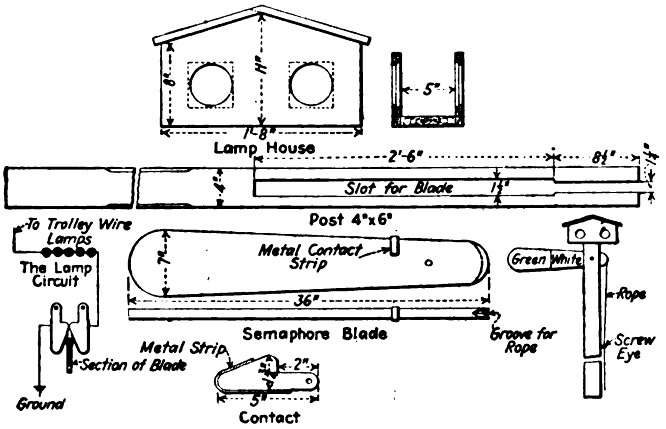
Semaphore with Signal Light Connection Operated by Waiting Passengers Substituted for Hand Signal System Commonly Used by Texas Railway

VERY few interurban railways have provided any special means for the convenience of passengers who wish to stop cars. In towns and cities and on lines where there are stations with ticket agents interurban cars make regular stops and this problem does not arise, but in country districts where stops are ordinarily not made between terminals, unless the cars are flagged, the usual method for stopping a car is for the passenger to wave his hand, hat or handkerchief as the car approaches in the daytime and to wave some sort of a light at night. As lanterns are not usually available, passengers resort to burning matches, pieces of paper or any other inflammable material which will produce a light. In windy or rainy weather the producing of such a light is quite a problem for the passenger, and it frequently happens that a car passes, leaving a dissatisfied customer and causes inconvenience, especially where the cars run at infrequent intervals.

In addition to this method being unsatisfactory, it is often quite dangerous, as was found by the Galveston-Houston Electric Railway, which lost a station at Dickinson by fire, started from a burning wisp of paper thrown hastily aside by a passenger as the car approached.

This experience led the railway company to install a type of semaphore and light signal, details of which are shown in the accompanying illustration. The essential parts of the device are a lamphouse and a semaphore blade, together with posts and contactors. The lamphouse is provided with green and white lenses on each side. Openings for these lenses are cut square half way through the sides and round the remainder of the way. This allows square pieces of glass to be used. Five lamps are installed inside the house connected in series to provide for the use of line voltage for lighting. The ends of the lamphouse are left open, so as to allow the heat from the lamps to escape.

The lamp sockets are installed against the roof bottom side up, so as to avoid any trouble that might result from rain. The lamps project downward from the socket. As shown in the sketch of the assembled signal, it will be seen that the lamphouse sets on top of the post. This post is slotted directly underneath the house to provide for the semaphore arm. The slot is made to fit the semaphore arm at the fulcrum, but below this point it is widened so as to provide clearance for the blade and prevent rubbing against the sides of the slot. The short end of the blade has a groove into which a rope fits for operating the signal. A contact device is provided just above the blade for closing the circuit and lighting the lamps. The contacts consist of two pivoted arms with metal strips around the lower end. These contact arms are held together by means of a spiral spring, which runs across from one to the other. The contact parts are ⅛ in. thick. A contact is also provided on the upper part of the semaphore arm in such a location that when the blade is raised by pulling the rope this metal contact will close the circuit between the two contact arms. A stop made of a small angle iron is placed at the bottom of the post under the blade. This prevents the blade from being raised above the horizontal position when the rope is pulled. Half of the blade is painted white and the other half green to correspond to the colors of the lenses used. Of course any colors can be used to suit conditions. On this road it has been found that where two bullseye lenses are used a coat of white paint applied to the surface of the white lens dims this light sufficiently so that the green light is more readily discernible.



DETAILS OF STOP SIGNAL

At locations where there are station agents and where trains do not ordinarily stop except on signal the signals are arranged to be operated from the agent's station and an additional lamp compartment with red lenses is provided. This latter serves as a train order stop signal. An additional blade is provided which is painted red and has contacts for closing the circuit through the lamps in the house having the red lens. This blade is controlled only by the agent and dropped from the top instead of being raised, as is done with the passenger's stop blade.

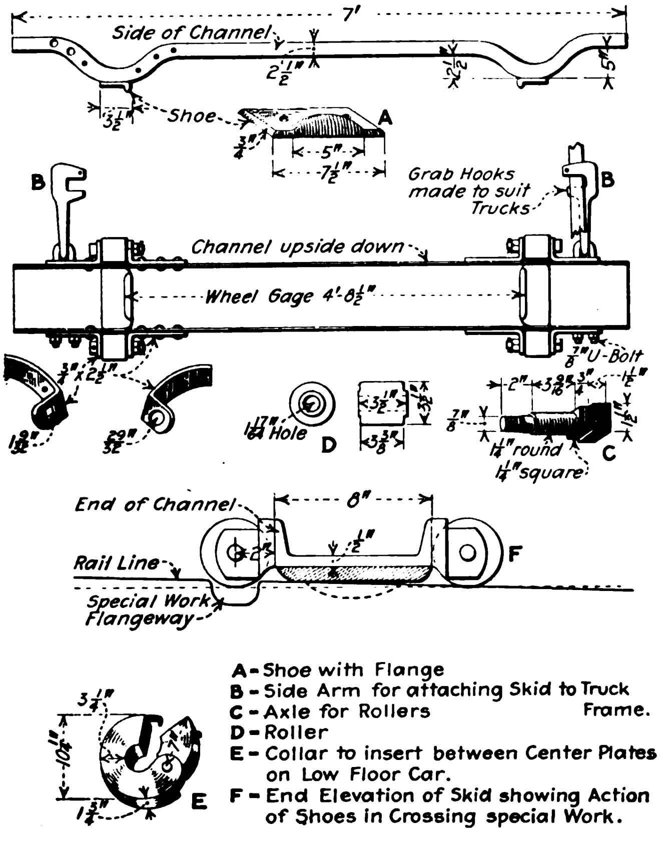
This type of signal has now been in operation for two years on our lines, has given marked satisfaction and has been enthusiastically received by the public.

Kinks from the Des Moines Shops

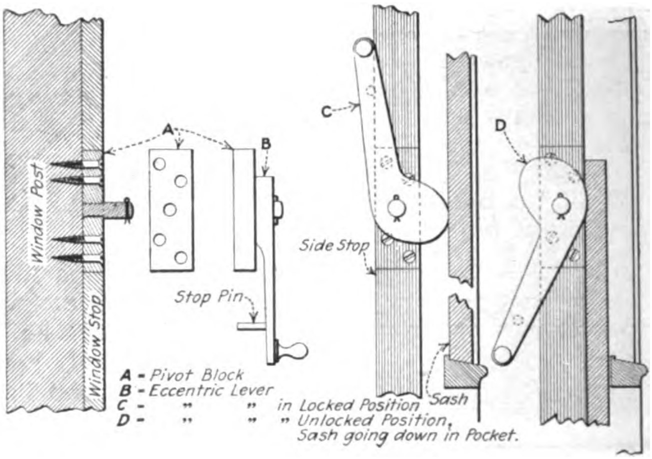
Sketches Show How to Make Vestibule Window Latch, Holder for Turning Trolley Wheels and Skid for Broken Axles

By C. R. McMahon
Master Mechanic Des Moines (Iowa) City Railway

THE center front vestibule window on many cars is a source of trouble and annoyance to trainmen in bad weather, as wind and rain often blow in around the edges. Any permanent fastening of this window which would make it tight is undesirable, since it must be arranged for ready lowering when it is necessary to throw a switch. Most of this trouble can be avoided by making use of home-made latches of the design shown in the accompanying sketch. One of these latches may be installed at the top of the sash or a latch on either side. The sash should be reinforced with a piece of brass or iron where the latch comes in contact with it. The accompanying sketch shows only the idea without dimensions. All parts should be made of the proper size and shape to fit the particular type of sash and car.


7'
Side of Channel
2½"
2½"
5"
3½"
Shoe
A
¾"
5"
7½"
B
Grab Hooks made to suit Trucks
B
Channel upside down
Wheel Gage 4'-8½"
¾" x 2½"
⅞" U-Bolt
1 9/32"
29/32"
17/64" Hole
D
3½"
3½"
3⅜"
2"
3 9/16"
¾"
1½"
⅞"
1½"
1¼" round
1¼" square
C
End of Channel
8"
½"
F
Rail Line
Special Work Flangeway
3½"
E
A - Shoe with Flange
B - Side Arm for attaching Skid to Truck Frame.
C - Axle for Rollers
D - Roller
E - Collar to insert between Center Plates on Low Floor Car.
F - End Elevation of Skid showing Action of Shoes in Crossing special Work.

SKID FOR HANDLING CARS WITH BROKEN AXLES


A
B
C
D
Window Post
Window Stop
Side Stop
Stop Pin
Sash
A - Pivot Block
B - Eccentric Lever
C - " " in Locked Position
D - " " Unlocked Position, Sash going down in Pocket.

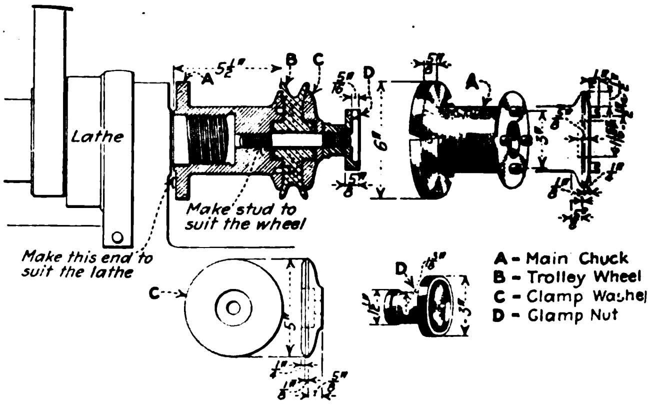
STORM LOCKS FOR MOTORMAN'S WINDOW

A Handy Scheme for Truing Trolley Wheels

Another sketch herewith shows a holder for truing up old trolley wheels. This device was made from a piece of old car axle and it serves the purpose very well. By using a stud of the right size to fit the wheel closely, bushing the wheel is made self-centering in the special chuck which is made to fit the spindle of the lathe on which it is to be used. Four pins screwed into the face of this chuck project through the spokes of the wheel and prevent it from turning on the stud. The wheel is held in position against the face of the main chuck by a special washer and a knurled thumb nut which screws on the end of the stud. The turning tool used should be ground to the contour of a new wheel, making it a very simple matter to get a perfect job. After a wheel has been finished it is necessary only to loosen the knurled thumb nut, slip off the finished wheel, put another in its place and tighten up the thumb nut again.

A Skid for Handling Broken Axles

The third sketch reproduced herewith shows a home-made skid for the purpose of bringing a car into the shop in case of a broken axle, locked wheels, etc. This skid may be operated successfully around curves and through switches, and, while it works better going ahead, a car can also be backed when the skid is in use. The device consists of an 8-in. channel supported by four 3½-in. rollers. The wheels of the broken axle are jacked up and the skid placed underneath them and attached to the truck frame by two side arms, the shape and length of which must be made suitable for the different types of trucks. A shoe mounted on the bottom of the channel between the rollers on either end is of such thickness that when the rollers are bearing on the rail this shoe clears the rail by ½-in. In passing over special work, however, as the rollers drop into a flangeway, the shoe comes in contact with the rail, carrying the load and preventing the rollars from catching. These shoes also have a flange which keeps the


Lathe
A
5½"
B
C
5/16"
D
6"
5/16"
Make stud to suit the wheel
Make this end to suit the lathe
C
5"
A
A - Main Chuck
B - Trolley Wheel
C - Clamp Washer
D - Clamp Nut

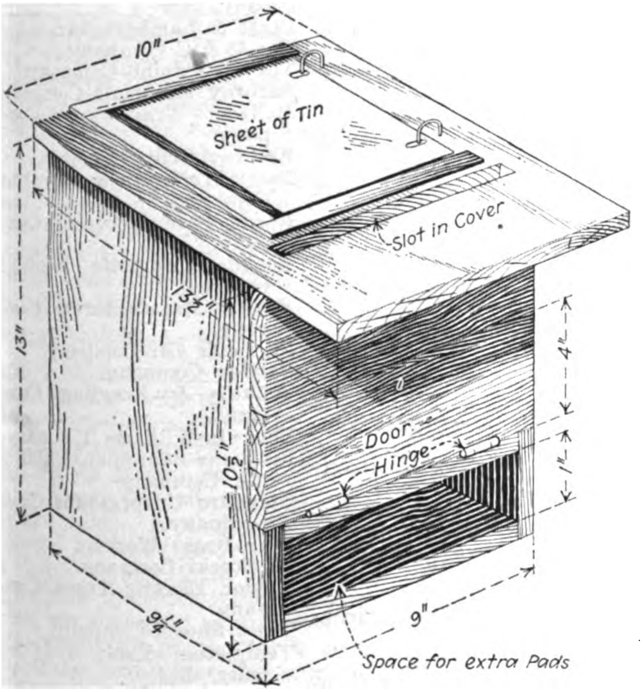
SELF-CENTERING HOLDER FOR TRUING OLD TROLLEY WHEELS rollers on the track. When the skid is used with low-floor cars it is necessary to place an iron ring or hinged collar, as shown at *E*, between the body and truck center plates to prevent the motors from striking the car floor in going around curves. The axles for the rollers are made hollow and fitted with grease cups for lubrication.

The detail construction of the skid is quite completely shown in the accompanying sketch.

Train Order Desk Boxes

Galveston-Houston Electric Railway Has Replaced Train Order Machines by Home-Made Train Order Desk Boxes

WHEN the Galveston-Houston Electric Railway began operation all train order blanks for giving orders to trainmen by dispatches were printed in rolls. These rolls were placed in machines located in telephone booths and when an order was written two copies were run out of the machine by turning a crank, while a third copy was wound upon a roll that remained inside the machine. These machines gave considerable trouble and required considerable attention to keep them in good working order. The principal source of trouble was from the paper hanging up and becoming uneven while it was being run out.



TRAIN ORDER DESK BOX

In 1915 a hurricane passed through the section and every telephone booth along the line was upset and the order machines were wrecked in nearly every case. The cost of these machines was about $20 each at that time, so that their replacement represented a considerable sum. To reduce this expense C. L. Greer of the company suggested a train order desk box as being more simple and easier to maintain. After experimenting with several different modifications, a desk of the type illustrated herewith was adopted and has been in use ever since.

This desk box is made of poplar ½ in. thick and of dimensions as shown. A sheet of tin is loosely hinged on top of the cover by two staples, which pass through slots in the tin and into the cover. Each order blank has a carbon back and the sheet of tin is used to furnish the hard surface necessary for copying. As many orders as are needed can be made, while with the previous type of machines it was possible to make but three.

The cover of the desk is provided with a slot into which one copy of the order is placed for filing. A space underneath is provided for the storage of extra blank pads. All boxes are equipped with duplicate locks, which make it convenient to remove the orders for filing as only one key is necessary. The conductors on express and baggage cars keep the desk boxes supplied with extra pads and so far no maintenance expense has been necessary.

The cost of constructing these desk boxes was $3.60 each.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Western Transportation Committee Appointed

A COMMITTEE of men from the Middle West and West has been appointed to handle transportation arrangements for the Western territory, particularly with reference to the special train which will leave Chicago on Oct. 9. The personnel of the committee is as listed below:

H. J. Kenfield, Chicago, Ill., general chairman.

Chicago: Williston Fish, Britton I. Budd, L. E. Gould, H. L. Monroe, C. W. Register, Frank Johnson, Harold Rudd, William Anderson, E. J. Magerstadt, R. R. Holden, Charles Knickerbocker, W. P. Butler, John Benham, Herbert Van Dorn, Arthur S. Merrill, William Simpson, M. A. Berg, E. H. Noyes, W. C. Burdick.

Illinois: A. D. Mackie, Springfield; H. E. Chubbuck, Peoria; J. R. Blackhall, Joliet.

Wisconsin: S. B. Way, Milwaukee; B. W. Arnold, Oshkosh.

Minnesota, North Dakota and South Dakota: Foster Hannaford, Minneapolis, Minn.; M. L. Hibbard, Fargo, N. D.; F. M. Mills, Sioux Falls, S. D.

Iowa, Nebraska and Kansas: B. J. Denman, Davenport, Iowa; R. A. Leussler, Omaha, Neb.; A. M. Patten, Topeka, Kan.

Montana, Idaho, Wyoming, Utah and Colorado: F. W. Hild, Denver, Colo.; J. R. Wharton, Butte, Mont.

Washington, Oregon and California: R. T. Sullivan, Tacoma, Wash.; Burton R. Stare, Seattle, Wash.; W. P. Strandborg, Portland, Ore.; J. A. Cranston, Portland, Ore.; G. J. Kuhrts, Los Angeles, Cal.; William Von Phul, San Francisco, Cal.; C. E. Heise, San Francisco, Cal.

Committee on Publicity Meets

THE American Association committee on publicity met at Association headquarters in New York on Monday, Aug. 16. Members of the committee present were B. G. Collier, chairman; C. B. Buchanan, W. A. Draper and C. D. Emmons; there were also in attendance J. H. Pardee, president; E. B. Burritt, secretary, and E. C. Faber.

Progress was made in deciding upon means and methods of accomplishing proper publicity, and plans for a specific working program discussed. Report was made of a meeting of the committee of publicity men held at the Association office last week.

Coal Supply for Electric Railways

UNDER date of Aug. 17 the American Association addressed to the Interstate Commerce Commission two letters relative to coal supply. One urged the importance of the enlargement of Service Order No. 9 or of the issuing of an additional order to provide for the storage coal requirements of electric railways. Exhibits were attached to show that much inconvenience and suffering will arise in the communities served by the electric railways unless some such provision is made.

In the second letter information is asked on the following points:

First—Can an electric railway owning coal cars of its own ship them directly to a coal mine with which it has a contract for coal and then have them shipped directly by the coal company to the electric railway's power station? If so, will the electric railway be charged for freight both on the coal cars returned to it loaded and also on the coal cars by it sent back to the mines empty?

Second—If such a procedure is followed, will the railroad company or companies over whose road or roads the empty cars and loaded cars, respectively, travel be permitted to use the cars for any other purpose or to divert them to any other use?

Third—If such a course is followed, will the railroad be permitted to confiscate the coal either presumably, or in fact, for its own use? If so, what would be the measure of damage the electric railway would be entitled to from the railroad company?

Illustrations were given to show why the answers to these questions are important to the electric railways, and the letter concludes with the statement that many of the companies are willing to go to the expense of owning their own coal cars if by so doing they can make sure of a steady and dependable supply of coal at their power stations.

The first of these letters was signed by Secretary E. B. Burritt and Charles L. Henry, chairman committee on national relations. The second letter was signed by Mr. Henry.

Exhibit Space Going Well

GEORGE W. WELLS, director of exhibits for the Atlantic City convention, to be held Oct. 11 to 15 inclusive, reports the names of 109 concerns which have been assigned space to date. A number of these are new exhibitors. Already 80 per cent of the space used last year has been engaged. Machine tool manufacturers, who have hesitated about exhibiting at the American Association conventions in the past, will show an interesting collection of machines in operation this year. One of the important features will be the large group of welding exhibits.

A sub-committee, appointed to investigate shipping conditions, especially for the benefit of Western exhibitors, has interviewed the chief freight officials of the Pennsylvania Railroad, who will actively facilitate the movement of freight to Atlantic City. Special representatives of this road will be appointed in Chicago and Pittsburgh to this end.

Reasonable haulage rates have been secured from the Eldridge Express Company of Atlantic City, which will make the same charges as at the June exhibit of the Railway Supply Manufacturers' Association, as follows: Consignments weighing over 300 lb. round trip, per net ton, $15; consignments weighing over 300 lb. one way, per net ton, $7.50; consignments weighing less than 300 lb. round trip, per case, $2.25; consignments weighing less than 300 lb. one way, per case, $1.50.

Following are the concerns which have engaged space to date:

American Association of Manufacturers of Chilled Car Wheels.
Ackley Brake and Supply Corporation.
Air Reduction Sales Company.
American Abrasive Metals Company.
American Crucible Products Company.
American Brake Shoe & Foundry Company.
American Steel & Wire Company.
Arthur Power-Saving Recorder Company.
Albert & J. M. Anderson Manufacturing Company.
Automatic Reclosing Circuit Breaker Company.
American Car & Foundry Company.
Bethlehem Steel Company.
Bridgeport Brass Company.
J. G. Brill Company.
The Buda Company.
Cheatham Electric Switching Devices Company.
Chicago Pneumatic Tool Company.
Chipman Chemical Engineering Company.
Cleveland Fare Box Company.
Barron G. Collier, Inc.
Columbia Machine Works & Malleable Iron Company.
Consolidated Car Fender Company.
Consolidated Car-Heating Company.
Curtain Supply Company.
Cleveland Frog & Crossing Company.
Dayton Mechanical Tie Company.
Drew Electric & Mfg. Company.
Dunbar Manufacturing Company.
Electric Railway Improvement Company.
O. M. Edwards Company, Inc.
Electric Railway Journal.
Electric Service Supplies Company.
Ellcon Company.
Fire Gun Manufacturing Company, Inc.
J. B. Ford Company.
Gurney Ball Bearing Company.
Galena Signal Oil Company.
General Electric Company.
Globe Ticket Company.
Gold Car Heating & Lighting Company.
Griffin Wheel Company.
Gould Coupler Company.
Hale & Kilburn Corporation.
Heywood Brothers & Wakefield Company.
Horrocks Desk Company.
Hubbard & Company.
Ingersoll-Rand Company.
Indianapolis Switch & Frog Company.
International Register Company.
International Steel Tie Company.
Irving Iron Works Company.
Jennison-Wright Company.
Kenfield-Davis Publishing Company.
Lorain Steel Company.
J. J. McCabe Lathe & Machinery Corporation.
Metal & Thermit Corporation.
Midvale Steel & Ordnance Company.
Nachod Signal Company.
National Brake Company, Inc.
National Car Wheel Company.
National Lock Washer Company.
National Railway Appliance Company.
National Pneumatic Company, Inc.
National Tube Company.
Niles-Bement-Pond Company.
R. D. Nuttall Company.
Ohio Brass Company.
Ohmer Fare Register Company.
Okonite Company.
Oxweld-Acetylene Company.
Pantasote Company.
Peter Smith Heater Company.
Perey Manufacturing Company, Inc.
Pratt & Lambert, Inc.
The Q & C Company.
The Rail Joint Company.
Railway Materials Company.
Railway Track-work Company.
Railway Utility Company.
Rail Welding & Bonding Company.
Reade Manufacturing Company.
Rooke Automatic Register Company.
Russell Manufacturing Company.
St. Louis Car Company.
Sattley Company.
Schutte & Koerting Company.
Sherwin-Williams Company.
Simmons-Boardman Publishing Company.
Standard Underground Cable Company.
Star Brass Works.
A. Stucki Company.
Taylor Electric Truck Company.
Thew Shovel Company.
Templeton, Kenly & Company, Ltd.
Texas Company.
Transit Equipment Company.
Thayer & Company, Inc.
Trolley Supply Company.
Tubular Woven Fabric Company.
United States Graphite Company.
Universal Lubricating Company.
Van Dorn Coupler Company.
Western Electric Company.
Westinghouse Electric & Manufacturing Company.
William Wharton Jr. & Company.
Wheel Truing Brake Shoe Company.
Wilson-Imperial Company.
Wilson Welder & Metals Company.
Alan Wood Iron & Steel Company.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Open Shop the Issue

Union Unable to Secure a Hearing from Court on B. R. T. Agreement—Walkout Threatened

Recognition by the company of the Amalgamated Association has come to the fore as the chief point at issue between Lindley M. Garrison, receiver for the Brooklyn (N. Y.) Rapid Transit Company, and the system's employees. Both Mr. Garrison and Federal Judge Julius M. Mayer have flatly refused to have any dealings with the association's representatives in the company's employ. The union leaders, for their part, have announced that unless their demands for a closed shop are met a complete tie-up of the B. R. T. lines will take place soon.

Prospects of a strike became more imminent on Aug. 16, when Judge Mayer refused to confer with union representatives on the question of the acceptance by the company of a new working agreement. The men intimated that they might walk out at any time after Aug. 28, when the present agreement will expire. Judge Mayer warned the union on Aug. 17 that under the terms of the agreement no strike could be called without thirty days' notice from the union.

WILL NOT TREAT WITH UNION

Mr. Garrison has announced his willingness to deal with the men as employees of the company. The receiver takes the stand that as the representative of the federal court he is not free to enter into an understanding with the union. In this course he is supported by Judge Mayer.

A letter setting forth his reasons for refusing to confer with the union officials was presented by Judge Mayer to the committee of the three presidents of the locals embracing a majority of the B. R. T. employees. In this letter Judge Mayer incorporated seven articles taken verbatim from the proposed agreement. They provide that all employees of the company eligible to membership shall be "sent by the company to join this association"; that employees in arrears of dues, fines or assessments shall be suspended, on the request of the officers of the association; that collectors for the association shall be permitted at all times to enter the property of the company, and that the company shall not enter into any agreement, verbal or written, with any newly formed labor or fraternal association. This clause was inserted for the evident purpose of shutting out of the company's employ members of the Brotherhood of Surface Employees of the Brooklyn Rapid Transit, an organization following the pattern of the Interborough Brotherhood, which the Amalgamated has been fighting for many months.

Other provisions contained in the proposed agreement are that any of the company's employees needed in the service of the association shall receive a leave of absence; that the association shall be permitted to distribute circulars and the like in any part of the company's property, and that no employee shall be discharged until after a hearing before a board composed of the officers of the company and of the association.

WOULD MEAN CLOSED SHOP

Concerning the extracts from the proposed agreement contained in his letter, Judge Mayer wrote:

> Obviously the federal court cannot permit its receiver to agree to provisions of this character. Without going into further detail, it is definitely plain that the three proposed amendments in effect demand of the federal court that the receiver must operate a closed shop. • • •
>
> If, as I assume from your letter, you desire to have a conference with me to ascertain my attitude in respect of a closed shop, I can only say that such a conference would not be of service, as the receiver has correctly stated my position. If, however, there are other matters which you wish to bring to my attention, I shall be pleased to consider any communication from you in respect thereof.

Pay Rise for Montreal Men

Reconsidering their action in threatening to strike unless their demands for higher pay were fully met, the employees of the Montreal (Que.) Tramways voted on Aug. 15 to accept the report of the board of conciliation granting them an increase in wages of from 25 to 30 per cent. Under the terms of the award the men will be paid at the rate of 45 cents, 50 cents and 55 cents an hour for first, second and third year men respectively. The wage increase will cost the company approximately $800,000 annually.

The agreement is to be effective until June 30, 1921. The men will receive back pay from July 1 last.

The men originally demanded an increase in pay amounting to 75 per cent, an eight-hour day and time and one-half for overtime. The case was presented to a board of conciliation, which made public its award on Aug. 5. The men at first voted to reject the board's report and gave the company twenty-four hours in which to grant their full demands. This action by the men called forth a sharp answer from the Tramways management. For several days a strike appeared imminent. The union later decided to reconsider the matter, and the acceptance of the award followed.

Tacoma Wages Adjusted

Small Increase in Pay and Some Concessions in Working Conditions Included in New Agreement

The question of wages and working conditions in Tacoma, Wash., during the year beginning Aug. 1, 1920, has been settled by representatives of the Tacoma Railway & Power Company and the union entering into an agreement granting a small increase in wages and some advantages in working conditions. The increase was ratified by the men by vote with a majority of nearly six to one.

The union attempted to get a closed shop agreement, but failed. The agreement, however, provides for no discrimination against any employee on account of his membership in a union, as well as no discrimination among union men against those who may not wish to belong to the union. There is to be arbitration of matters which cannot be settled amicably by a meeting of representatives of the company and men.

Motormen and conductors for their first six months of service, are raised from 50 cents to 55 cents an hour. Men in the second class, from six months to eighteen months in the service, will receive 59 cents instead of 55 cents an hour. Men of service more than eighteen months will receive 63 instead of 60 cents an hour. Gripmen on cable cars get 5 cents an hour extra, as formerly, but one-man car operators will get 5 cents instead of 4 cents an hour extra. The additional pay for breaking in students is raised from 2½ cents to 5 cents.

SHOP WORKERS GET MORE

Shop employees get an increase of from 20 cents to 40 cents a day, except women inside carwashers, who are raised from $3 to $3.65 a day. When women wash the outside of cars, they are to get $4.40, the same as men. Wages for men in the shops range from $4.40 for unskilled to $6.20 for skilled labor. In the track department, workers get a raise of 5 cents an hour, to 55 cents. Those on a monthly basis get a flat $10 increase.

A concession to extra men guarantees them $100 a month, as a minimum, against $90 in the former argeement. Employees in train service working on regular runs are guaranteed not less than eight hours pay for each day's work, except Sundays, and runs totaling 7½ hours or more are to be considered regular runs. Time and one-half applies to overtime work, computed after eight hours work. Eight hours constitutes the day. Operators of one-man cars get a concession of ten minutes straight time for the preparation of their daily reports.

Wages Increased in Cincinnati

Men There Awarded Increase of Nine Cents After Very Careful Study of Economic Conditions

Motormen and conductors in the employ of the Cincinnati (Ohio) Traction Company have been awarded an increase of 9 cents an hour in wages by the arbitration board on a contract which runs for a year from July 1, 1920. They had asked an advance of 40 cents an hour. Nine hours is to constitute a day for the rank and file of employees, but the nine-hour day does not apply to the trainmen. The average run on regular trips on the system is 9.3 hours and this remains. The finding and the opinion of the arbitrators are of unusual importance because of the very thorough effort that was made to dispose of the question in the light of the actual needs of the employees under the present conditions of inflated prices. There was absent any tendency to arrive at a conclusion by compromising between the demands of the men and some offer by the company, the chief underlying principle adopted being to get at the facts and make a decision on the merits of the case in Cincinnati.

THE arbitrators were George Dent Crabbs, president of the Philip Carey Manufacturing Company, a large local industrial plant producing asbestos products, who represented the company; James A. Wilson, president of the Pattern Makers' International Union, who represented the men, and Prof. Alonzo Tuttle, a teacher of law in the Ohio State University. The appointment of Professor Tuttle was made by the Industrial Commission of Ohio, pursuant to terms of the contract between the company and the men, as the arbitrators named by the company and the men were unable to agree upon the third arbitrator.

The award of the board follows:

Section 5 of the agreement to be changed to read as follows:

Section 5—The wage scale of motormen and conductors from midnight June 30, 1920, to midnight June 30, 1921, shall be as follows:

First three months, 54 cents an hour.

Next nine months, 57 cents an hour.

Thereafter, 59 cents an hour.

Overtime for motormen and conductors shall be paid for at the rate of time and one-half time.

Crews of snow sweepers and salt cars shall be paid at the rate of time and one-half time for all time put in, including time spent in barns before taking out same.

Crews operating sand cars, pay cars, special cars, sprinkling cars, work cars, coal cars and supply cars, shall receive the regular rate of wage scale for conductors and motormen, nine hours to constitute a day's work. All platform work in all departments is to be performed by transportation men.

Electric shovel operators shall be paid 65 cents an hour, with time and one-half time for overtime, nine hours to constitute a day's work.

Barn men, members of the association, except car tenders and watchmen, shall be paid an advance of 18 per cent over the present rates. When this figure is less than one-half cent over the cent per hour, a half cent shall be added. When it figures over the half cent per hour, a cent shall be added. For illustration, if the advance is 8⅛ cents, it shall be 8½ cents; if it is 8⅝ cents it shall be 9 cents.

The company reserves the right to determine the number and class of men to be placed at each barn, and these men shall not be discriminated against because of their being members of the association.

In case of vacancies that may arise men are to be promoted from a lower to a higher rate of pay or from a night to a day shift, provided, in the opinion of the company, they are capable of filling the position paying a higher rate or the more desirable position.

Nine hours shall constitute a day's work. Overtime shall be paid for at the rate of time and one-half time.

All men working day shifts shall complete their day's work by 6 p.m. each day.

Barn men shall perform such duties as shall be regularly assigned to them or do such other work as the company may prescribe when necessary to facilitate the work.

Car tenders shall be paid at the rate of 45 cents an hour, nine hours to constitute a day's work, and time and one-half for overtime; and they may be promoted to fill vacancies in carhouses, provided, in the opinion of the company, they are capable of performing the higher class of work.

Watchmen shall be paid at the rate of 45 cents an hour, nine hours to constitute a day's work.

Incline gatemen, members of the association, shall be paid at the rate of 48 cents an hour, ten hours to constitute a day's work.

Curve cleaners shall be paid 45 cents an hour, nine hours to constitute a day's work. Overtime shall be paid for at the rate of time and one-half.

Section 20 to be amended to read as follows:

Section 20—All substitutes shall be guaranteed a minimum wage of $100 a month, to be divided $50 each pay day in the month, provided, however, that any man missing shall forfeit one day's proportion of said monthly guarantee for the day on which the miss shall occur, and any man absent on account of sickness, leave of absence or under suspension, shall lose one day's proportion of said monthly guarantee for each day of such absence or suspension. Men earning more than the guaranteed minimum of $100 a month or $50 per pay, shall receive in full the amount they earn.

The board recommends that all crane cars, work cars and dump cars be equipped with air brakes.

ASKED 80 PER CENT RISE

The men demanded an increase of 80 per cent over the old wages, double time for overtime and other conditions. The following table shows the old wages and conditions contrasted with the demands:

	Previous Scale (Per Hour)					Demands (Per Hour)				
	First 3 Mos.	Next 6 Mos.	Thereafter	Overtime	Work-Day	First 3 Mos.	Next 6 Mos.	Thereafter	Overtime	Work-Day
Conductors and motormen	.45	.48	.50	1½	9.1 hour	.85	.88	.90	double	9 hours
Sweepers	.675	.72	.75	...	......	1.70	1.76	1.80	....	......
Salt car	.675	.72	.75	...	......	1.70	1.76	1.80	....	......
Elec. shovel operators	.55	....	....	1½	10 hours	1.00	....	...	double	9 hours
Car tender	.37	....	....	1½	10 hours	.665	....	...	double	9 hours
Curve cleaner	.37	....	....	1½	10 hours	.665	....	...	double	9 hours
Watchman	.37	....	....	...	10 hours	.665	....	...	....	9 hours
Incline gateman	.40	....	....	...	10 hours	.72	....	...	....	10 hours
Barn men (general)	.425 to .58			1½	10 hours	.765 to $1.04			double	9 hours
Substitutes (guaranteed pay)	$85 per month					$153 per month				
Crane car	2 men (motorman and conductor)					3 men (2 conductors)				
Work train	2 men to 1 motor car and two dump cars — extra man for 2 additional dump cars (4 dump cars limit hauled).					Conductor to each dump car				

Professor Tuttle, chairman, in giving reasons for the award said:

The board in making the award was actuated by a desire to do justice to the three parties vitally concerned; namely, the men, the company and car riders of Cincinnati. Though prices entering into the cost of living in Cincinnati are, according to figures given us, about 12 per cent below the average city in the country, in respect to street-car service the cost in Cincinnati, as compared with most American cities is, and must be on account of its hills and extended service, unusually high. In considering, however, the rate of fare in Cincinnati, it must be remembered that there are several cities in the United States where the fare is much higher. These facts, however, do not blind us to the further fact that Cincinnati is already paying a high rate of fare, and seems destined to pay a higher rate still. In considering, therefore, any increase in wage to employees the board was confronted with the fact that any large increase meant an additional burden on an already burdened body of our riders.

The company, as is known, operates under a service-at-cost plan—to our mind an eminently fair and sound system and greatly to the credit of Cincinnati. In spite, however, of the guarantee of $416,000 to the company as a fair return to the stockholders, no dividends have been paid to these stockholders for the past five years, and as a result the stock has sold in the market at the low price of $21 per share on a par value of $100, with 23⅜ per cent unpaid accumulated dividends. While, therefore, the company may not seem to be concerned in this award under its service-at-cost franchise, it in reality is, for it is essential to the future financial prosperity that its return be such that it can finance its operation at other than ruinous rates, a thing apparently impossible. Could the company today borrow money to make needed improvements it could effect material economies in operation. It must be borne in mind also that there comes a time somewhere that increased rates do not produce corresponding increased revenues, because when fares get too high people will walk rather than ride wherever possible. There seems to be some slight evidence of this principle already working in Cincinnati. How much higher, if at all, the rate can go without this recession setting in cannot be said, though it is believed the limit is not far off.

The men, naturally, are vitally affected by this award. An increase of 40 cents an hour was asked, which, if granted, would have increased the cost of operation, according to figures by Mr. Culkins, street railway commissioner, over $2,500,000. This would have caused a very marked increase in the cost of fare—probably, according to the same figures, about 2½ cents a ride, unless economies in other directions could have been practiced to offset this large increase in expense. The board did not feel that any such burden could be put upon the car riders in Cincinnati.

On the other hand the board felt that the car riders of Cincinnati should not and would not object to having the men paid enough to keep even with the increased cost of living. Already the community is paying 2½ cents more than the pre-war rate of 5 cents to meet the increased cost of coal, labor and other materials, and it was felt that it was only reasonable that the further increased cost of living of the men should be paid for.

Figures given by both sides agreed that the increased cost of living in Cincinnati since Nov. 1, 1918, is about 18.3 per cent. Starting, therefore, with the award at that date by the War Labor Board to the employees of a maximum rate of 48 cents, which award we are compelled to assume was fair and just, and adding to that award the increased cost of living to July 1, 1920, of 18.3 per cent, we find that the present wage would be a little less than 57 cents an hour.

This would in itself seem to have been a sufficient increase, in view of the existing rate of fare in Cincinnati, were it not that the board was confronted with the further fact that since the War Labor Board has given its award in 1918 of 48 cents to Cincinnati, along with other cities, in many of these same cities a marked increase of wage has been allowed, as in Cleveland, where the wage is now 75 cents an hour. It is true there are many cities in the country where the wage is still considerably lower than the wage awarded in Cincinnati. It is also true that in some of these cities where the wage has been greatly increased the cost of living is much higher than in Cincinnati, but the outstanding fact was that, whereas Cincinnati started in 1918 with the War Labor Board award of 48 cents, along with Cleveland and other cities, in Cincinnati there has been only a 2-cent increase since that time, while in many of those other cities the increase has been very much greater. This, to our mind, gave the men the right to expect something more than the mere increase to meet the increased cost of living.

In view of the fact, however, that many cities in the country as large as Cincinnati are paying considerably less than the amount here awarded, and also in view of the fact that the car riders in this city are already paying a high rate of fare, it did not seem to the board that at this time it was possible to give more than was given in the award above. It is further to be hoped that the company will introduce every possible economy consistent with good service to keep down operating costs, and in this way protect the car rider from mounting fares. It is believed by the board that, all things considered, the increase in the award given is manifestly fair to all parties concerned.

One of the features of the arbitration hearing was the absolute lack of public interest in the proceedings, although under the "service-at-cost" franchise held by the company the increase would pass to the car rider in the shape of an advance in fare. The rate has been 7½ cents (ticket) and 8 cents cash.

COMPANY SHOWS DEFICIT

It developed during the hearing that the company had a deficit in June, and that preliminary estimate indicated a deficit in July. This means that the fare will automatically advance to 8 cents on Sept. 1. Vice-president Walter A. Draper of the company stated that to meet the demands of the men in full would require 3½ cents additional fare, making the fare 11½ cents.

W. Kesley Schoepf, president of the company, declared in his letter to the union that the men's demands were out of all proportion, and that he would under no circumstances approve expenditures on the part of the company that would add to the burden that the car rider is already carrying. This attitude on the part of the company was in contrast to criticism made when the "service-at-cost" franchise was under consideration by the City Council and to the effect that a franchise which passed expenditures on to the car rider would throw the door open for the company to become careless and extravagant.

The arbitration hearing was completed on Aug. 10. In the final argument the attorney representing the company brought out the fact that in the present contract with the men it was provided that, in connection with employees of a certain kind, they shall be promoted, etc., "provided, in the opinion of the company, they are capable of filling the position—". The insertion of the three words "and the association," after the word "company," was asked. These three words, argued the company's attorney, practically transferred control of the men from the company to the union—a dangerous and unwholesome condition. He said:

> If the labor situation had reached a point in this country where committees from the union would oversee the work of the men and recommend their promotion from one position to another conditions would be different. But as it is we contend that the company should have absolute veto power on promotion, and we most earnestly request that the arbitrators in this dispute will not put a change in the contract which will put the question of promotion into the hands of the men.

Both the company and the men submitted figures on the cost of living, and, by coincidence, it was shown that the increase since November, 1918, was approximately 18 per cent. The men, however, were continually pointing to Cleveland, where a higher wage prevails, and in the closing hours of the argument statistics were introduced to show the difference in the cost of living between Cincinnati and Cleveland. It required six and one-half days to submit and argue the case.

The company submitted data showing that 102 of the employees own automobiles. This is a ratio of approximately one auto to each fourteen employees, compared with one auto to each fifteen in the entire population of the city and county.

On the other hand, the men submitted a statement showing the result of a canvass made by them. The following figures are based on 1,511 replies received to the questionnaire:

Homes owned (unincumbered)...	108	
Homes owned (mortgaged)......	315	423
Married men............................		1,272
Average dependents....................		2.9
Single men..............................		239

On the question of saving through economies in operation Vice-President Draper, of the company, stated that $200,000 a year could be saved by faster schedules, and if the company were permitted to organize its service on the split-run basis a saving of approximately 1 cent per passenger could be achieved. The company was unable to speed up schedules because of traffic congestion and parking in the down town section of the city.

The regular force of trainmen worked an average of 305 days during the past year. The actual earnings of these regular men, during the year, were:

No. Men	Range Yearly Wage
226	Earned under $1,500
203	Earned from $1,500 to $1,600
249	Earned from $1,600 to $1,700
180	Earned from $1,700 to $1,800
83	Earned from $1,800 to $1,900
50	Earned from $1,900 to $2,000
27	Earned over $2.00

(The maximum paid to one man was $2,167.65)

According to Mr. Draper the maximum possible earning for a regular man, working every possible day on regular runs, and the fifteen extra runs (allowed by the union contract) of 1½ hours each, would be $1,898 for the regular runs and $467.29 for the "extras," or a total of $2,366 a year.

The company has 1,176 regular motormen and conductors, and there are 1,302 regular runs.

The above earnings were made by the men on the scale of 45, 48 and 50 cents for platform service.

Des Moines Prospects Better

Means Appear to Have Been Found for Granting Company Fare Increase and Raising Wages

Movements looking toward the settlement of the railway problems of Des Moines, Ia., have developed with kaleidoscopic rapidity during the past week. As this article was written it appeared that a way had been found to grant at least a temporary 7-cent fare. This would permit better service and prevent a strike of the railway men called for Aug. 25, unless satisfactory arrangements between the Des Moines City Railway and its employees are made before that time.

THE first step was the appointment of a valuation board of three men by the City Council to value the property of the railway. The Council named Frank E. Lyman, chairman of the United Improvement Leagues, which had made a move toward a settlement; E. D. Perry, a Des Moines lawyer, and James King, of Toltz, Day & King, an engineering firm at St. Paul.

The appointment of this board, however, proved later to be a purely perfunctory action as the Council shortly afterward entered into a contract with Toltz, King & Day for the actual work of placing a valuation upon the railway plant. While the valuation board mentioned above has not been discharged the two Des Moines members are expecting to take only a nominal part in the work and leave the technical work all up to the engineering firm. Toltz, King & Day are to receive $14,000 from the city for arriving at the valuation of the plant at the present time and $2,000 for determining a valuation as of 1915, when the new franchise was granted the railway.

Almost immediately upon the heels of the Council's action in hiring the engineers came a strike vote upon the part of the union of railway employees. The men are demanding payment for the difference between the rate granted them by the arbitration board and that which was allowed by Judge Martin J. Wade of the federal court. The arbitration board awarded the men a maximum of 70 cents an hour dating from March 1 this year, but Judge Wade held that the revenues of the company were not sufficient to meet this increase and ordered that the 60-cent rate be maintained.

The next development was the decision by Judge Ben. I. Salinger of the Iowa Supreme Court, in the Ottumwa Railway & Light case that as the Iowa Legislature has not sanctioned the fixing of a permanent fare, rates named in contracts between Iowa cities and their utilities can be changed. This decision was immediately seized upon by all parties in the Des Moines controversy as the way toward a settlement.

INTERVENTION BEING SOUGHT

Petitions of intervention were then filed in the federal court, one by the railway union and one by Frank K. Mathis, a Des Moines property owner, looking toward relief of the city railway. At the time these petitions of intervention were filed the Des Moines City Railway petitioned the court for an increase in fare to 7 cents in order that it might meet the wage demands of the union.

Judge Wade set the hearings for Friday afternoon, but upon motion of the city attorneys ruled out the petition filed by Mr. Mathis. The city also resisted the petition by the employees, but Judge Wade held that as they were already before the court their petition would be made a part of the regular proceedings.

Special Counsel Byers, acting for the city, resisted the application of the ruling in the Ottumwa Railway & Light Company case to the Des Moines case as he claimed that Justice Salinger had made his ruling upon the basis that the Iowa Legislature and never expressly given to cities such as Ottumwa the right to make such contracts with city railways. Mr. Byers claimed that Des Moines is governed by commission plan law which expressly gives the city a right to enter into such contracts upon the approval of the voters.

IMMEDIATE INCREASE REFUSED

After hearing the case for the railway, the employees and the city Judge Wade gave practically an unqualified concurrence to the decision of Justice Salinger and suggested that the three parties to the case get together and try to work out a settlement. Then he tersely advised that unless they had arrived at an agreement before Aug. 20 he would take steps to end the controversy. The case is to be called for further hearing upon Aug. 20.

Judge Wade refused, however, to grant an immediate increase fare replying that the city had a right to take steps for temporary relief for the company.

SEVEN-CENT FARE RESOLUTION COMING

Members of the City Council of Des Moines seemed ready to base a movement for increased fare on Judge Wade's ruling and Commissioner Budd announced that early in the coming week he would introduce a resolution in Council increasing the rate to 7 cents contingent upon the company increasing service and making satisfactory wage arrangements with the men.

The difficulties which have beset the Des Moines Company have been the subject of comment previously in these pages. The court decision on the wage arbitration some time ago attracted especial attention.

City Lends Aid

Co-operating with Rail-Light in Perfecting Toledo Service-at-Cost Grant—Company Encouraged

Attorneys for the Toledo Railways & Light Company and for the city of Toledo are now joining efforts to make the Milner cost-of-service ordinance error-proof before it goes to the City Council for passage before submission to the people of the city. When it was definitely known that municipal ownership, as planned by the commission appointed by Judge Killits, had been defeated the city administration prepared to submit to the electorate the measure which has been agreed to by Henry L. Doherty on behalf of the company.

ULTIMATE CITY OWNERSHIP

The cost-of-service ordinance for Toledo was drawn by a commission of five business men and is said to be one of the most modern of its type. It provides virtually for city ownership of the lines in the course of several years. The life of the grant is twenty-five years with a privilege of extensions at the end of the first ten years of its operation. Whenever the property has been amortized through the working of either the sinking fund provisions for retirement of bonds or the amortization fund on its last fifteen years, the property comes into the possession of the city.

The valuation agreed to in the ordinance is $8,000,000. This was reached after months of negotiation and finally agreed to by Mr. Doherty when it looked as though the municipal ownership enthusiasts might endanger the property by a poorly constructed and ill-planned effort toward public ownership of a transportation system.

The ordinance will probably be submitted to Council for passage on Aug. 25. It is now in committee and it is thought will be reported out favorably. The city law director and the Mayor have asked the traction attorneys to work with them in making the attempt to pass the ordinance and to make its adoption absolutely legal in every step. It will probably be submitted to the people at the general election on Nov. 2.

If Council fails to pass the ordinance it may be submitted to the people on an initiative petition signed by approximately 9,000 Toledo voters.

HEAVY VOTE ON MEASURES

The vote on the twin bond ordinances was the most decisive registered in any election on local street railway questions. The $3,000,000 bond ordinance received only 8,534 favorable votes while it had 12,463 registered against it. The $4,000,000 twin ordinance received 7,901 favorable votes and 11,543 against it. Foreign wards brought in a slight majority for the measure while wards represented in Council by socialists voted against the public ownership propositions by large majorities. The "silk stocking" seventh ward voted almost 6 to 1 against the two ordinances. Only four of sixteen wards turned in small favorable majorities.

The vote was fairly typical of many other communities. The people of Toledo have voted several times in favor of municipal ownership of the street railway system when public ownership was merely a general principle and not hitched up to a specific and concrete plan for spending money. The vote itself was the first one favorable to traction interests since the Toledo railway problem has been before the electorate in one form or another for the last fifteen years.

The company immediately felt encouraged to go forward in improving many of its properties and orders were given to paint the cars and rush track repairs.

LOWER FARE POSSIBLE

It is thought that a campaign of popular education on the cost-of-service plan may be able to secure its adoption at the election in November. All civic agencies have united in favor of it during the negotiations with Mr. Doherty over the matter of valuation. Coupled with the fact that it is drawn by citizens and provides for ultimate municipal ownership, is will also introduce a lower fare than the rate now in force and this feature may have vote-getting possibilities.

Strike on New York City Suburban Line

Service on the Manhattan & Queens Traction Company's lines between Manhattan and Jamaica was suspended entirely on Aug. 14 after the eighty-five employees of the company had voted unanimously to strike for wage increases of from 11 to 13 cents an hour. The company offered an increase of 5 cents an hour in an ineffectual effort to avert the walkout.

Unless a petition now before the Public Service Commission asking for a fare increase to 13 cents is allowed the company will be unable to meet the demands, officials of the line declared. The petition is for a zone system, the fare from Fifty-ninth Street, Manhattan, to Grand Street, Corona, to be 5 cents, and from there to the Jamaica terminus 8 cents. The fare for the entire distance is now 5 cents.

The company is in the hands of receivers. It has been striving for more than a year to obtain permission to increase fares. The company operates a line between Second Avenue and Fifty-ninth Street in Manhattan and the Long Island Railroad Station in Jamaica, a distance of about 11 miles. Its average daily traffic is about 14,000 passengers. An application by the company to the Public Service Commission for permission to raise the fare was nullified by the city, which obtained an injunction preventing the commission from considering it. Later the Court of Appeals reversed this action and the company has now pending before the commission an application for permission to increase fares.

All Lines Operating

Denver Tramway Restores Service on All Routes with Aid of Strikebreakers—Men Still Out

Although the employees of the Denver (Col.) Tramway are still on strike, every line in the city including the Interurban Lines to Golden, Arvada and Leyden have been in operation since Wednesday morning, Aug. 18. More than four hundred new men have been hired permanently to replace the strikers. G. H. Harry, representing the Department of Labor, arrived in Denver on Wednesday. After conferences with union leaders and later with General Manager Hild, Mr. Harry informed the newspapermen that he would stay in Denver until a settlement had been reached but that he had arrived after both parties to the controversy had fought each other to a standstill and that "about all he could do was to bury the corpse."

A MASS meeting of striking car men was called for Friday morning. They were to be addressed by Mr. Harry, who in company with Gov. Oliver Shoup held a conference with General Manager Hild on Thursday afternoon.

Strikers Lose Seniority Rights

Return-to-work applications signed by 900 of the strikers are reposing at strike headquarters until the strike leaders make up their minds whether to present them to the company. President Silberg and other members of the union executive committee are still in jail. Their four lawyers have announced that they will get them out of jail "if it takes them ninety days."

The radical section of the Denver Trades and Labor Assembly voted to demand a general one-day strike of all unions on Aug. 23 in sympathy with the tramway workers. Conservative union men oppose the movement.

At midnight on Thursday, Aug. 12, all tramway employees who had not filed applications for re-employment lost their seniority rights, pension privileges, and standings in the wage scale. On Friday it was reported that more than 100 former employees in the train service, shops and engineering department had applied for reinstatement. The remainder of the strikers refused to return to work upon assurances of the union leaders that their trump card was yet to be played. Men whose seniority dates back fifteen, twenty and twenty-five years are among those who have lost their rights by their refusal to file applications.

Leaders Won't Resign

The broad hints of Judge Greeley Whitford of the Federal District Court that the executive committee of the union should resign were met by declarations on the part of the committee members that they would not resign and that jail had no terrors for them.

Operation of the cars by strikebreakers unfamiliar with switches and curves has resulted in one runaway down a grade and four or five collisions and two derailments at high speed. There were no serious injuries.

Most of the jitney buses had gone out of business by Saturday, Aug. 14, upon the operation of as high as 215 motor cars by the tramway on all city lines except one, which was blockaded by sewer construction.

The annual convention of the Colorado State Federation of Labor at Pueblo on Aug. 13 requested Governor Oliver Shoup to have the strikebreakers discharged and former employees reinstated in their position. Governor Shoup replied as follows:

> I would be more than pleased to have the former employees of the Denver Tramway restored to their positions and I have used my best efforts to that end. But, as Governor, I cannot dictate to a private corporation whom it shall employ any more than I can dictate to an employee whether or not he shall work.
>
> The men have refused to return to work and I am unable to demand, or reasonably request, the company to discharge any men who are willing to provide the public with service. My first duty is to the people, whose interest in this controversy is paramount to either company or strikers.

The "trump card" of the union came to light Saturday, Aug. 14, when it was announced that, at the request of Vice-President Fitzgerald of the Amalgamated Association, G. Y. Harry, a Government mediator, was enroute from Portland, Ore., to attempt a settlement of the controversy in accordance with instructions from the United States Department of Labor. General Manager Hild said that he would be glad to talk to Mr. Harry, but that the settlement of the tramway controversy was rapidly progressing through the building up of an entirely new organiation of employees and that the company's position was unchanged.

Early Sunday morning 150 strikebreakers were shipped out of Denver by the tramway from its South Division carhouse. After the exodus of strikebreakers 150 new employees, together with all former employees who have been re-instated, were placed in charge at the South Division and took over the operation of all lines operating from this carhouse.

Free Jitneys a Union Weapon

The Amalgamated brandished a new weapon beginning Monday in the form of free jitney service, in an effort to force the tramway to accept the strikers' terms of settlement. These jitneys are attempting to duplicate service on all tramway lines. About 100 automobiles of all sorts are being employed in the service. The union is paying $4.50 a day to the strikers driving the cars and providing free oil and gas. No fares are charged, but gratuities are accepted.

Reports were circulated Monday that labor leaders had made a deal with the City Council whereby the company was to receive a 7-cent fare providing the strikers were taken back as a body and given a 62½-cent wage scale. When told of the 7-cent fare settlement plan, General Manager Hild said that he "did not see how the tramway could change its position, and that he and other officials had been so absorbed with the speedy restoration of service that the matter of a higher fare had been given no thought at all."

Seven-Cent Fare Not Enough

The company had previously announced that even with a 7-cent fare it could not grant a wage increase above 58 cents an hour, since all surplus revenue from increased fare would be needed for improvements and extensions of service.

An unexpected blow to union hopes came Monday afternoon when Judge Whitford sentenced the seven members of the union's executive committee to serve ninety days in the county jail and to pay the cost of court proceedings occasioned by the strikers' action. The union heads were taken immediately to the county jail.

Union Chiefs Go to Jail

In a last-minute attempt to stave off jail sentences the union attorneys entered as evidence of good faith 847 applications from members of the union signifying their intention of returning to work. These were individual applications, and according to the attorneys, had "no strings on them." The court declared that the applications could not be considered, especially since they had not been presented to the company.

Judge Whitford, in passing sentence, said:

> There are mitigating circumstances in connection with this action which the court cannot and will not overlook. To impose a small fine, however, would not be in keeping with the dignified administration of the law; a few days in jail would not, either, command respect. The court must administer the laws of the people without fear or favor, and must see that every infraction of same is adequately punished. The court, on hearings, has found that your action has been in violation of the laws of the majority of the people. It cannot do aught but impose a penalty.

Men Accept Winnipeg Award

Acting under protest, representatives of the union employees of the Winnipeg (Man.) Electric Railway have signed an agreement with the company providing for an increase in pay of approximately 10 per cent. The pay increase was recommended by the Myers board of arbitration, which heard the demands of the men for an advance amounting to 50 per cent.

The award as rendered was accepted by the company although it will mean an additional expenditure of about $300,000 annually, but was rejected by the men on the ground that they were entitled to at least 20 per cent more.

The agreement is effective from May 1, and the back pay to date under the conditions of the award will amount to approximately $70,000.

Financial and Corporate

I. R. T. Deficit Cut

New York's Commissioner Reports Surplus from Subway Operation for Last Six Months

A statement of the financial condition of the Interborough Rapid Transit Company, New York, N. Y., prepared by Transit Construction Commissioner John H. Delaney and made public on Aug. 14, showed that the earnings of the company on the city-owned subways during the last six months of the fiscal year ended June 30 last were sufficient to meet fixed charges and pay $5,330,005 of the company's annual preferential of $6,335,000.

The jump from a monthly deficit to a monthly surplus began in December, 1919, when there was a surplus of $100,973, compared with a deficit of $67,045 in the preceding month. Thereafter there was a surplus every month except that there was a deficit of $16,607 in January and $199,703 in June.

The following table shows the gross revenue per month and surplus or deficit:

Month.	Gross Revenue.	Deficit.
July, 1919	$2,149,087	$299,212
August, 1919	2,052,741	408,917
September, 1919	2,286,301	325,264
October, 1919	2,586,303	145,945
November, 1919	2,614,894	67,045
December, 1919	2,948,520	*100,973
January, 1920	2,810,709	16,607
February, 1920	2,799,402	*86,597
March, 1920	3,039,540	*171,452
April, 1920	2,871,271	*53,319
May, 1920	2,850,011	*46,258
June, 1920	2,614,189	199,703
Total	$31,622,973	1,004,095

*Surplus.

SUBWAY DEFICIT $3,370,879

The total deficit of the subway division, including interest on previous deficits, amounted to $3,370,879. Deficits are cumulative and they must be paid, with interest, before any interest is paid on the city's investment. The operating expenses for the subways during the year totaled $12,785,581. The other principal expenses were: Maintenance, $3,794,756; rent paid the city under the original subway contract, $2,428,487; interest on the company's contribution for construction, $2,938,944; interest on equipment, $1,320,000; company's preferential, $6,335,000. The total charges for the year amounted to $32,627,068.

During the first six months of the year the earnings fell $1,145,412 below costs, and during the last six months they exceeded the costs by $141,316, after all of the company's obligations, including the preferential, were met. The large earnings in March were explained by Mr. Delaney, who said that during that month the surface car traffic was crippled because of weather conditions. He also said that during June of the current year the gross revenues were $326,427 more than in the same month in 1919, when the deficit amounted to $233,059.

The Manhattan elevated division of the Interborough system, which costs the company rent of 7 per cent on a valuation of $60,000,000, was the company's most serious liability. Prior to the last fiscal year the deficit grew from $8,231,994.31 to $15,320,158.62. Gross operating revenues for the year amounted to $19,829,482, and expenditures, including operating costs, rent, maintenance, depreciation, interest charges and the preferential of $1,589,348, reached $26,214,269.91, leaving a deficit for the year of $6,384,786.

FIGURES FROM BROOKLYN

Figures filed by the Brooklyn Rapid Transit Company showed that the rapid transit lines of the company earned $19,562,212.80 during the fiscal year and that the preferential of $3,500,000, operating expenses, taxes, depreciation, etc., amounted to $22,386,406, which left a deficit of $2,824,193, exclusive of the interest charges on the city's investment.

Passenger revenues for the year were $18,842,994, against $15,255,720 for the fiscal year ended June 30, 1919. There was an increase in receipts from advertising and station privileges. Mr. Delaney gave these additional particulars concerning the financial condition of the company:

> Operating expenses for the last fiscal year were $11,274,127, an increase over the preceding year of $3,165,974. Maintenance expenses were $2,629,219, an increase of $586,511 over the preceding year. The maintenance account for the year exceeded the contract allowance of 12 per cent of gross revenue by $775,336. The total revenues of the company since the signing of the contract between the city and the company on Aug. 4, 1913, have amounted to $85,996,084 and the total operating expenses have been $39,855,239. Allowances to the company under the preferential of $3,500,000 have been $24,180,107.

Municipal Railway Budget Decreased

Operation of the Municipal Street Railway in Seattle, Wash., for the year 1921 will cost $706,902 less than in 1920, according to the estimates completed by the City Council budget committee. The total cost of operation for the year has been placed at $6,186,910, the Council having cut off only $8,400 from the estimate as prepared by the department. The reduction was effected by eliminating a number of positions which had been asked for. The total sum includes an item of $2,400,000 for wages for trainmen; $394,546 for ways and structures; $618,644 for shops and car houses; $858,744 for interest on bonds, and $660,000 for power.

Gain in Net Income

Surplus Earnings Increase Over $115,000 with a Percentage Change of Nearly 24 Per cent

In a report issued for the year ended March 31, 1920, the United Light & Railways Company, Grand Rapids, Mich., showed a gross earning from all sources of $10,534,834. This was an increase over 1918 of $96,310 or 10.1 per cent. The operating expenses, which also included maintenance and income taxes, were $7,504,084 for 1920. Compared with $6,737,721 in 1919 the increase was $766,363, or 11.4 per cent. Net earnings for 1920 was $3,030,750. This was an increase of $199,946, or 7.1 per cent over 1919.

BALANCE FOR SURPLUS $611,792

After paying all the interest on bonds and notes and dividends of the subsidiary companies' stock, and paying the interest on its own bonds and notes, and dividends on preferred stock, the balance for surplus in 1920 was $611,792. Compared with $495,070 in 1919 the increase was $116,722, or 23.6 per cent.

From the surplus accounts of subsidiary companies $71,490 was transferred to their depreciation reserve. In addition the subsidiary companies expended, or set aside for maintenance, $730,945. This was charged directly to operating expenses. This made the total amount expended, or set aside for maintenance and depreciation of property, $802,435, or more than 9.8 per cent of the gross earnings. The operating expenses also include $509,539 accrued for payment of general and federal taxes, an increase of $123,779 for the fiscal year.

The statement of earnings contained in the report of the United Light & Railways Company follows:

	1920	1919
Gross earnings, all sources	$10,534,834	$9,568,525
Operating expenses (including maintenance, general, and income taxes)	7,504,084	6,737,721
Net earnings	$3,030,750	$2,830,804
Interest on bonds and notes, subsidiary cos.' due public	$721,274	$720,958
Dividends and earnings on preferred stocks, subsidiary companies due public	170,427	170,824
Profit due minority stockholders	11,299	7,972
Balance	$2,127,751	$1,931,050
Interest on first and refunding 5% bonds, United Light & Railways Company	453,287	435,896
Balance	$1,674,464	$1,495,154
Interest on 6% five-year bond secured gold notes United Light & Railways Company	67,033	90,000
Interest on 6% two and one-half year bond secured gold notes, U. Lt. & Rys. Co., Series "A"	90,000	90,000
Interest on 7% five-year bond secured gold notes United Lt. & Rys. Co., Series "B"	105,000	50,654
Interest on 7% one-year bond secured gold notes United Lt. & Rys. Co., Series "C"	31,556	
Interest on ten-year 6% convertible gold debentures U. Lt. & Rys. Co	120,000	120,000
Interest on commercial loans, United Lt. & Rys. Co	44,798	42,316
Balance	$1,216,076	$1,102,184
Dividends on first preferred stock 6%	604,284	607,114
Surplus earnings	$611,792	$495,070

Buffalo Reorganization Details Made Public

Company Needs Funds to Make Good Its Operating Deficit and Provide for Renewals and New Construction

Formal notice of the reorganization details agreed upon by the bondholders' protective committee have been mailed to bondholders of the International Railway, Buffalo, N. Y., by Elliott C. McDougal, chairman of the committee and president of the Bank of Buffalo. Chairman McDougal warns that the company has an operating deficit of $2,000,000 and that it is imperative at this time to make immediate provision for funds to meet maturing obligations and for rehabilitation purposes.

IF THE bondholders' committee is obliged to abandon the plan which has been agreed upon, there is danger that the securities of the company will be sold at public auction to satisfy the loans for which they stand, according to Mr. McDougal. In this event, he says, there will be nothing left for distribution among the bondholders.

CAN ISSUE NO MORE BONDS

Chairman McDougal points out to the bondholders that because of the provisions of the supplemental indenture of its refunding and improvement 5 per cent gold mortgage the railway will not be able to issue any additional bonds under the mortgage until its earnings for a period of twelve consecutive months shall have equalled or exceeded approximately $800,000 over all charges ahead of the stock.

It is accordingly imperative to make provision at this time for more than the immediate needs of the railway. In order to make the financial position of the company reasonably safe, Chairman McDougal and the committee estimate that it will be necessary to sell securities sufficient to raise about $3,800,000 and to hold some securities in reserve for possible future needs. Out of a total of $18,325,000 in principal amount, there have been deposited under the protective agreement about $8,100,000 in principal amount of the 4 per cent bonds of the International Traction Company. The committee has decided it will not receive any more bonds for deposit under this agreement.

WILL INCREASE STOCK

The committee in its recommendations to the security holders proposes to cause the stock of the railway to be increased from $16,707,500 par value to an amount equal to 95 per cent of the principal amount of the 4 per cent bonds of the International Traction Company which have been deposited under the protective agreement and to exchange all of this stock for voting trust certificates issued under an appropriate voting trust agreement.

The committee proposes to offer to each depositor of a $1,000 4 per cent bond of the International Traction Company, the opportunity to purchase $200 in principal amount of refunding and improvement 5 per cent bonds of the railway for $100 plus accrued interest on such bonds, and also the opportunity to purchase voting trust certificates for nine and one-half shares of stock of the railway for $100.

The committee proposes to sell to underwriters and others at these prices the portions of the refunding and improvement 5 per cent bonds and the voting trust certificates for stock of the railway company which the depositors do not elect to purchase in accordance with the offers to be made to them.

The depositors will be allowed such time after the offers as it shall deem to be reasonable for making elections to purchase the 5 per cent bonds or the voting trust certificates for stock of the price for the bonds will be payable at the time of making the election to purchase. Fifty per cent of the purchase price for the voting trust certificates will be payable at the time of making the election to purchase and the balance thereof at such time or times in 1921 as the committee shall determine. The committee may reserve to sell for account of the purchaser any voting trust certificates upon which any installment of the purchase price is not paid when due, holding such purchaser liable for any such deficiency. The bonds and voting trust certificates are to be delivered upon payment of the purchase price in full.

PROPERTY TRANSFER PLANNED

After paying and discharging its obligations and expenses, including the compensation of its members, the committee proposes to pay and transfer to the International Railway, or to trustees for its benefit, all cash, securities and other property which may remain in the hands of the committee, including $640,000 in principal amount of underlying first mortgage 6 per cent bonds.

Through the co-operation of a group of Buffalo bankers associated with the Marine Trust Company, the Bank of Buffalo and the Manufacturers & Traders' National Bank, the committee is enabled to make underwriting arrangements at moderate expense which will enable it to sell at the prices above mentioned all of the refunding and improvement 5 per cent bonds and voting trust certificates for stock of the railway, which the depositors do not elect to purchase.

If this plan of readjustment is carried out, it will, in substance, provide each depositor the opportunity to acquire his pro rata interest in the collateral by which the 5 per cent bonds of the International Traction Company were formerly secured, upon his paying his pro rata share of the cost protecting the collateral and rehabilitating the International. In the judgment of the committee, it is the most desirable and equitable plan that is feasible under the circumstances. The financial provisions are no more extensive or burdensome to the depositors than are said to be necessary for the proper protection of their interests.

The railway has been in serious danger of incurring a default under its refunding and improvement gold mortgage, but with the financial provisions and the improvement in management which are now proposed by the committee, it is felt that the future of the railway is reasonably safe.

OPERATING DEFICIT $2,000,000

The committee points out that owing to the great increases which have taken place in the cost of operation and the failure of the former management to make adequate reserves the railway has created an operating deficit of $2,000,000. It is recited that the wage advance granted the company's employees absorbed the fare increase and the company now is in need of funds to make good its operating deficit and provide for necessary renewals and new construction.

The committee, Chairman McDougal says, deems it essential to provide for stability of management under the direction of Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, who is a member of the bondholders' protective committee.

Claims of $777,571 Disallowed

The Quebec Public Service Commission has decided against the company in the appeal of the Montreal Tramways from the decision of the Montreal Tramways Commission in the matter of allowing $534,055 to be added to the company's working capital. On Aug. 25, 1919, the Tramways Commission deducted the sum of $534,055 from the amount of the company's working capital. The judgment of the commission read:

> It was resolved that of the amounts of working capital for which interest at the rate of 6 per cent per annum is claimed by the Montreal Tramways from Feb. 10, 1918, to June 30, 1919, the amount of $534,055, representing the reproduction cost of stores in hand, included in the valuation schedule "A," of the contract, be deducted.

It was from this ruling that the company appealed.

Colonel Hibbard, chairman of the Quebec Public Service Commission, who writes the judgment, believes it to be clear that the $534,055 was included at the book value of stores in hand as per the inventory of June, 1917, and that this sum is entered in the total sum of $36,286,295, the allowed capital value of the company's system. The company contended that the sum of $534,055 should have been allowed it as working capital.

The Quebec Public Service Commission has also rendered judgment in another appeal of the tramway against a judgment of the Montreal Tramways Commission, which had disallowed a claim of the company to have accounts totalling $243,516 credited for the 6 per cent.

Lessee and Lessor at Odds in Philadelphia

Mr. Mitten's Plan for Simplification of Corporate Structure and Economies Opposed by Underlying Holders

Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, has resigned as a director of the Union Traction Company, operated under lease by the P. R. T. Lessee and lessor company appear to be at odds, with Mr. Mitten of the opinion that the leased company seeks to impose burdens on the operating company that are far too exacting. On the other hand, officials of the Union Traction Company have thought that Mr. Mitten was aiding the effort to reduce the rentals paid by the company to the underlying corporations, of which the Union Traction is the largest.

JEREMIAH J. SULLIVAN, president of the Union Traction Company, has sent the following letter to Mr. Mitten:

> In view of the persistent rumors that the Philadelphia Rapid Transit Company is aiding or at least in sympathy with the attacks on the rentals of its underlying companies, we write to ask you if you will not contradict these rumors.
>
> We would like to know also if the Philadelphia Rapid Transit Company has any intention of trying in any way to cut down the rentals payable to the Union Traction Company under the lease of July 1, 1902, or would in any way aid or sympathize with any such attempt to reduce the rentals so payable to this company.

Under the terms of the agreement of 1902 the Union Traction Company must give its assent to any financial measures advanced by the operating company. In pursuance of the agreement the Philadelphia Rapid Transit Company sought the consent of the Union directorate to the floating of $6,000,000 car trust certificates. The Union Traction, in replying, stated that it would consent only if the P. R. T. would transfer the ownership of every available security that it has or ever will get. Among the demands of the underlying company were:

> That a new contract be entered into which would safeguard every right the Union Traction possessed. In that agreement it wished to obtain ownership of all the near-side cars that still remain in the possession of the P. R. T.
>
> That all the interest the P. R. T. has in the Motor Real Estate Company, amounting to $4,000,000, should be transferred to the Union Traction and that every interest the company now holds should be handed over to the Union Traction Company before it agrees to the necessary car-trust certificate issue.

Among the assignments mentioned are those of all the company holdings in the Willow Grove Park Company, the Chester & Philadelphia Railway Company, the Continental Passenger Railway and others.

In addition the Union directors sought to have the P. R. T. sign over all its real estate holdings and all that it might acquire. On none of the assets thus turned over was the P. R. T. to secure a loan without an approving resolution by the underlying body of directors.

Mr. Mitten in return submitted a proposal for the consolidation of the four principal underlying companies with the P. R. T. into one compact body. Under the plan of consolidation drawn up by Mr. Mitten the fixed charges of the company would be reduced from $11,000,000 approximately to $6,000,000. However, that plan entailed an assessment of $10 on every Union Traction stockholder for every share he held. That proposition was voted down and Mr. Mitten, after scrutinizing the terms under which the Union Traction would give its consent to the loan, submitted a counter proposition.

Mr. Mitten later wrote a letter in which he offered to make over to the Union Traction the real estate and stocks of the underlying companies that the P. R. T. owned, and also agreed to sign over the 500 cars that the P. R. T. had bought since 1902 when the lease was promulgated. He, however, refused to hand over the ownership of the Chester & Philadelphia Railway or the holdings in Willow Grove Park. The ownership of the bonds of the underlying companies Mr. Mitten desired to keep for use in future financing of the company. In conclusion, Mr. Mitten wrote that he had not joined in the attack on the underlying company rentals, nor would he do so as long as he had the co-operation of the Union Traction Company.

The Union Traction directors flatly rejected the counter-proposal on the ground that it did not conform with their requests.

In withdrawing from the Union Traction Company Mr. Mitten wrote to Mr. Sullivan in part as follows:

> I am not, and never have been, in sympathy with Union's policy of exacting P. R. T.'s equities as the price of Union's consent when required to secure additional capital to be spent upon the leased property; but, on the contrary, have repeatedly stated to your board my belief that Union's stability depended largely upon Union's strengthening its lease.
>
> Union's latest demand that, as the price of its consent to the proposed $6,000,000 car trust, P R. T. shall give to Union every equity that P. R. T. now possesses, and in addition agree to make over to Union all property which P. R. T. may hereafter acquire, is both unreasonable and destructive.
>
> I do not relinquish the hope that Union may yet see that its own, as well as the interests of the public and of P. R. T., will be best served by the adoption of a different spirit toward the transit problem—a spirit to which the accompanying plan is a tentative effort to give formulated expression. Nevertheless, my now continuing to act as a director of Union would be embarrassing, and I therefore desire to make my resignation, herewith tendered, effective forthwith.

In the full text of his proposal Mr. Mitten points out that under his plan the fixed charges of the new company would at the outset be $5,000,000 a year, as against the present charge of nearly $10,000,000. He says that credit is at once established by this change and the way opened to a further consolidation and the issuance of a general first and refunding mortgage by which securities of underlying companies could be retired and the capital needs of the operating company provided for. On the matter of leases and their value, Mr. Mitten says:

> All the lease-holding companies would do well to bear in mind that, as their existence is dependent on leases, so the value of those leases is dependent on the ability of the company operating the physical properties to make them profitable. This applies with equal force to all of the five companies, and, in fact, unless an individual property is such that the real owner of that particular property can see clearly that he can operate his own property on a paying basis, in case it were returned to him, it is equally to his interest to see that the operating lessee is successful and to assist his lessee by every means in his power.

PROPOSED NEW UNDERLYING TRACTION COMPANY UNDER MITTEN CONSOLIDATION PLAN—CAPITALIZATION AND RETURN

		Stock of New Company	Rate	Dividends, Amount	Capital Paid In	Surplus
People's Traction Electric Traction	1st pf.	*$14,865,057	8%	$1,189,204.56	$6,000,000 8,297,920	....
Philadelphia Traction	1st pf.	20,000,000	8%	1,600,000.00	20,000,000	$486,220
Total first preferred stock.		$34,865,057		$2,789,204.56		
Union Traction	2d pf.	30,000,000	7%	2,100,000.00	10,500,000	3,753,141
$10 per share assessment	......	....	.....	....	6,000,000	....
Philadelphia Rapid Transit com. 600,000 shares	......	No par value	$2.50 a share	1,500,000.00	30,000,000	4,482,120
		$64,865,057		$6,389,204.56	$80,797,920	$8,721,481

Total paid in capital and surplus	$89,519,401
Preferred stock of new company	64,865,057
Equity of common stock (for P. R. T. equals $41.09 per share)	$25,654,344

Note—

8% on $89,519,401 capital and surplus allowed before Federal tax is	$7,161,552.08
Dividends on stocks of all five companies would only be	6,389,204.56
Leaving additional earnings permitted before Federal tax applies of	$772,347.52

* Takes the place of $29,730,114 E. and P. 4s.

Permission of the Public Service Commission to withdraw the fare-increase petition now before it will be sought at once by the Philadelphia Rapid Transit Company. That was announced on Aug. 17 by Mr. Mitten. From the offices of the railway the following statement was made:

> Mr. Mitten today announced that the P. R. T. will at once petition the Public Service Commission to withdraw the application for fare increase now before the commission, and that he would notify the Mayor and city solicitor accordingly.

Earlier in the day Mayor Moore had said:

> It is a question of reducing the underlying rentals or increasing the fares.
>
> In view of the handicap under which the Rapid Transit Company is laboring, I do not see how it can get along without higher fares. The people want better service, better cars and better equipment generally.
>
> In addition to the problem of satisfying these wants, the company is greatly handicapped by the excessive underlying rentals. Therefore something very definite will have to be done to increase the company's income.

Financial News Notes

$85,000 of Bonds Authorized.—The Public Utilities Department of Massachusetts on Aug. 10 authorized the Holyoke Street Railway to issue bonds to the extent of $85,000 to mature in April, 1935. They will bear interest at 6 per cent. The new issue is put out to retire another which matures this year.

Southern Road Decreases Capital.—Notice of a decrease in the capitalization of the Alabama City, Gadsden & Attalla Railway Company, Gadsden, Ala., has been filed with the Secretary of State. In this notice the company stated that its authorized capital stock had been cut from $330,000 to $6,600.

Resort Line to Reopen.—Service will be resumed by the Southwestern Gas & Electric Company, operating the electric railway system in Texarkana, Tex., and Texarkana, Ark., on its line to Spring Lake Park. The park, formerly owned by the company, has been sold to the city. Operation of the line was discontinued several years ago.

Refunding Operation Approved.—An order by the California Railroad Commission authorizes the Pacific Electric Railway, Los Angeles, to issue bonds to the amount of $200,000 to refund bonds of the Riverside & Arlington Railway, which is now part of the Pacific Electric system. The bonds are owned by the Southern Pacific Company, which is willing to accept Pacific Electric bonds in payment therefor.

Texas Road Ordered Sold. — The Bryan-College Interurban Railway, operating from Bryan, Tex., to College Station, where the Texas Agricultural & Mechanical College is located, a distance of about 6 miles, has been ordered sold at public auction by Judge J. C. Hutcheson of the Southern District of Texas at Houston. The line has been in receivership for some months. The sale will be made by Guy Graham, Houston, on Sept. 8.

San Francisco May Vote on Railway Purchase.—The people of San Francisco, Cal., are to be asked to vote next November on the proposal that the city purchase the United Railroads, if the decision reached by the public utilities committee of the Board of Supervisors on Aug. 11 is carried out. The appraisal of the properties is yet to be made. The city attorney has been asked to draw up the charter amendment which would be a prerequisite to the proposed purchase.

Purchase Plan Promoted. — The Chamber of Commerce of Bloomfield, W. Va., has agreed to promote a plan of the Princeton Power Company to take over the electric railway system of the Appalachian Power Company in Bluefield and Graham, Va., and own and operate it in the future. The Princeton company will put the deal through providing the people of the city subscribe for $50,000 of preferred stock. This money would be utilized at once in the rehabilitation of the present system by providing immediately better cars and improving the roadbed.

Birmingham Plans Railway Survey.—A preliminary survey of properties of the Birmingham Railway Light & Power Company, Birmingham, Ala., as a basis of negotiations for a re-organization of the company has been authorized by the City Commission. The work will be done by I. W. Ross, consulting engineer for the city. At this time no attempt will be made at an actual appraisal of the properties. The commission instructed the engineer to make a survey of the properties and present a report to serve as a basis on which the city may start negotiations looking toward the working out of its plan.

May Seek to Stop Operation.—Announcement has been made by City Solicitor H. G. Pratt of Martin's Ferry, Ohio, that the city will not attempt to stop cars of the Wheeling Traction Company following the expiration of the company's ordinance, as the ordinance which repealed the franchise under which the company is operating contains a provision that the company may have twenty days in which to remove all equipment from the city. After the expiration of twenty days the city, it is expected, will file a petition for injunction proceedings in the courts, if the company has not complied with the provisions of the ordinance by that time.

Bids Asked for Bonds for Sinking Fund.—Holders of the first and refunding sinking fund mortgage twenty-five year 5 per cent gold bonds of the Denver (Col.) City Tramway have been notified that, on Nov. 1, the company will pay 1 per cent of the principal of the bonds issued and outstanding and the annual interest on all bonds purchased for the sinking fund, amounting to not less than $154,365 to be used for the redemption of bonds for the sinking fund. Sealed proposals for the sale of the needed bonds to exhaust the sinking fund will be received by the Bankers Trust Company, New York, on or before Aug. 24 and those offered at the lowest price, not exceeding par and accrued interest with a 5 per cent premium, will be paid.

Massachusetts Road to Be Sold.—The Board of Trade of Canton, Mass., has declined to entertain a plan to buy the property of the Blue Hill Street Railway in that town and operate it by public subscription. The Board of Trade felt that it would cost too much to buy the line, rehabilitate it and purchase new cars. It is understood to be the intention of the Canton citizens to organize a motor bus line. The Selectmen of Milton have been notified of the intention of the receiver of the Blue Hill company to sell it for junk. It is said that the buyers of the property are to pay about $59,000 for the Blue Hill Street Railway rails in Milton, Canton, Stoughton, Sharon, Norwood and Readville, about 18 miles in all. Perry, Buxton & Doane are the prospective purchasers.

Wages Increased in Asheville.—Arbiters in the wage controversy between the Asheville Power & Light Company, Asheville, N. C., and its trainmen have granted the men wage increases amounting to approximately 29½ per cent. The award was accepted mutually, owing to a previous agreement to leave the decision entirely in the hands of a board of arbiters composed of W. O. Wolfe, Jr., appointed by the men; W. C. Hopson, New York City, appointed by the company, and W. G. Fortune, an attorney of Asheville, appointed by both factions as umpire. The new scale is as follows: First six months' service, 48 cents an hour; second six months, 49 cents an hour; third six months, 50 cents an hour; fourth six months and thereafter, 56 cents.

Valuation Preparatory to Purchase by City.—A hearing was held on Aug. 4 before the Public Service Commission of New Hampshire involving the making of an appraisal of the Exeter, Hampton & Amesbury Street Railway to determine the fair value of the railway with a view to its acquisition by the town of Hampton. The railway about two years ago was authorized by the commission to abandon a certain portion of its lines provided the towns did not, prior to a date set by the commission, agree to the purchase of the railway or decide to enter into a contract with the railway under which service could be continued without loss. The Town of Hampton and the railway have since been in negotiation, with a view to the sale of the property to the town, but the negotiations were terminated upon the failure to reach an agreement.

Car Trust Certificates Offered.—Cassatt & Company, New York and Philadelphia, are offering for subscription at 100 accrued dividend to yield 8 per cent $1,000,000 of Northern Ohio Traction & Light Company car trust 8 per cent gold certificates. These certificates are issued under the Philadelphia plan with the Fidelity Trust Company, Philadelphia, as trustee. They are dated Aug. 1, 1920, and mature serially to 1925 on the rate of $100,000 every February and August. The equipment under the trust will be leased by the trustee to the Northern Ohio Traction & Light Company, Akron, Ohio. It will consist of twenty steel interurban passenger cars, fifty-six Peter Witt city passenger cars, and ten Cleveland type passenger trail cars, fully equipped being built by the G. C. Kuhlman Car Company, Cleveland, Ohio, at a total cost of more than $1,340,000. The total cost of the equipment will, therefore, be more than 33 per cent in excess of the face value of the car trust certificates to be issued.

Traffic and Transportation

Rates May Be Changed

Supreme Court of Iowa Holds That Rates Fixed by City with Local Utility Are Not Binding

The Supreme Court of Iowa has ruled that a contract between a city and a railway which fixes a permanent fare has never been sanctioned by the Legislature of Iowa and that therefore rates fixed in such a contract may be changed.

The decision was rendered in the case of the appeal of the Ottumwa Railway & Light Company from the ruling of the lower court which denied the company an injunction restraining the city of Ottumwa from reducing the fare from 6 cents to 5 cents, the higher figure having been granted as an emergency measure during the war period.

Ends Long Court Fight

In April, 1919, the City Council of Ottumwa, which previously had allowed the higher fare, passed a resolution ordering the Ottumwa Railway & Light Company to return to its former rate of 5 cents, declaring that the ending of the war had made unnecessary the continuance of a 6-cent fare. The railway then secured a temporary injunction from the District Court at Ottumwa restraining the city from interfering with the collection of the 6-cent fare. When the case came up for hearing on the permanent injunction Judge Cornell sustained the motion of the city to dissolve the injunction. The case was then appealed to the Supreme Court of Iowa.

The opinion in the higher court was written by Justice Ben I. Salinger. It has the added strength of receiving the unanimous concurrence of all members of the Supreme bench. Justice Salinger held that the case proceeds on the general theory that it is against public policy to contract for unchanging rates, that there must be no such contract because its enforcement might on the one hand fasten what proves to be an exhorbitant charge upon the patrons, or on the other prove a rate that will confiscate the property of the service corporation. The decision runs on the broad ground that public policy forbids such contracts unless the Legislature, the ultimate judge of what is public policy, declares unmistakably that such contracts do not offend that policy.

State's Power Sovereign

Later in the week weight was lent the decision of the Supreme Court by a ruling of Judge Martin J. Wade of the Federal Court in his hearing upon the petition of intervention brought by the railway union of Des Moines. Judge Wade discussed the Ottumwa case and stated that it was fundamental that a State has the power to enact constitutional laws and that the State has the power through the courts to construe these laws. United States courts, he added, always yield their views to the highest tribunal of the State when statutes of that State are construed.

Can Fix Emergency Rates

Judge Wade did not state definitely wherein lies the power to fix rates, but throughout the opinion there was an implication that the City Council could and should order a temporary change when such an emergency as the Des Moines case was concerned. While he held that it is without the province of a judge to determine fares he also stated that a judge could prohibit the enforcement of a rate which did not provide for the payment of the interest on the investment.

Court Orders Memphis Rise

As the result of an order issued by Federal Judge Andrew M. J. Cochran on Aug. 16, a 7-cent cash fare was scheduled to go into effect on the lines of the Memphis (Tenn.) Street Railway on Aug. 18. The company was directed to sell ten tickets for 65 cents. Judge Cochran refused to hear further arguments in support of the continuance of the 6-cent fare, holding that the matter had been decided by Federal Judge John E. McCall, since deceased. Judge McCall had ruled shortly before his death that the 7-cent fare should become effective on Aug. 15.

The abandonment of the 6-cent fare followed the report of the receivers of the company on the results of operation during the three-months trial period proposed by Judge McCall to determine the extent of the company's needs. Under an order issued by the State Railroad and Public Utilities Commission the company was to have begun charging a 7-cent fare on April 1. The court secured a postponment of the rate increase in the hope that a 6-cent fare would prove adequate.

The report of the receivers for the trial period of three months showed that the company was running behind and could not continue to operate at the 6-cent fare. Judge McCall, before authorizing the rate increase, signed an order under which wages of the company's employees were raised to a maximum of 57 cents an hour. The wage rise will entail an additional expenditure on the part of the company of $150,000 annually. The report of the receivers showed expenditures for the three months of $831,854, with revenues of $823,918.

Key Route Needs More

Oakland Company Asks California Commission for Another Increase to Meet Wage Rise

The San Francisco-Oakland Terminal Railways, Oakland, Cal., has applied to the Railroad Commission for an order readjusting its passenger fares between San Francisco and Alameda County points. Application is directed exclusively to the interurban trans-bay service in what is known as the "Key Division." It does not involve the "Traction Division" which operates between points in Alameda County and Contra Costa County. The company asks the commission to grant a rate substantially in excess of the amounts granted by the Interstate Commerce Commission. It declares that a one-way fare of 18 cents, such as is provided by the Interstate Commerce Commission in its recent order, would be cumbersome and impracticable to the Key Route and to the public.

Deficit of $710,550

In a statement accompanying the application, the company contends that for the thirty months ending June 30, 1920, there has been a deficit of $710,550. The deficit for the six months ending June 30, 1920, is given as $64,928. The results of the two rate increases granted the company by the Commission, one in June, 1918, and the other in September, 1919, are outlined as follows:

Six months ending December 31, 1918, as compared with the same six months of 1917, gross operating revenue increased $76.588; actual operating expenses increased $118,442.

Six months ending June 30, 1919, compared with the same six months of 1918, gross operating revenue increased $106,196; actual operating expenses increased $147,688.

Six months ending December 31, 1919 (which included the second rate increase) compared with same months for the year 1918, gross operating revenue increased $130,918; actual operating expenses increased $67,212.

Six months period ending June 30, 1920, compared with the same six months of the year 1919, gross operating revenue increased $135,407; actual operating expenses increased $109,381.

Gross Operating Revenue Raised

The company asserts that during the twenty-four-month period in which the higher rates have been collected, the increase in gross operating revenue totaled $499,111. The total increase in actual operating expenses was $443,325. To the total expenses the company contends should be added a State tax of 5½ per cent on the increased gross operating revenue amounting to $26,203, and actual cash set aside in depreciation fund in accordance with the commission's orders aggregating $75,262. According to these figures there has been a net decrease, therefore, of $45,580. It is estimated by the company that increased wages of train men will amount to $1,835 a month, in addition to the figures given above because of increases effective June 30. The men are now receiving a maximum of 59 cents an hour as against the former maximum of 54 cents.

Jitneys Still Hold Sway

Bridgeport Situation Unchanged Except for Growing Realization That Jitneys Do Not Meet Transportation Demand

Trolleyless Bridgeport, the second largest city in Connecticut, is going about its daily work as usual. More than 170,000 people are dependent for transportation on the jitneys and on private autos. But public opinion is not a unit as to how well the jitneys are functioning. Not by any means. The jitney men and an individual here and there will tell you that all is well, but the merchants and others declare that the salvation of Bridgeport lies in the return of the trolleys.

WITH Bridgeport thus divided against itself, the Connecticut Company remains silent. It is content to wait, as it said at the beginning it would. The Council also appears to be content to wait. The court in its recent decision suspending the jitney regulatory order pointed out wherein the measure was defective. That was its only province. The Council, however, has done nothing since toward amending the measure so as to meet the court's idea. The members apparently have their ears to the ground, and as soon as indications take on a permanent hue it is expected they will act.

MERCHANTS CHANGE THEIR TUNE

At the start the merchants in Bridgeport appeared to be indifferent to the passing of the trolley. They were, however, among the first to protest against the present arrangement and the no-parking rule. Their trade which came by trolley soon began to fall off considerably and the no-parking rule killed much of the patronage which drove downtown in its own autos. Protests about the latter were so loud that on Aug. 16 the Aldermen fixed a twenty-minute parking limit on eleven business streets. The Mayor in recommending the measure said that the business men had appealed to him for greater leeway in the matter of parking. The passage of this measure, however, solves only half the problem of the merchants. It doesn't bring back to the business man the patron who formerly used the trolley and now apparently refuses to shop via the bus. Where this man or woman is now shopping is a conundrum. Some say the trade has gone to the shops in the local community where the individual lives. Others say it has been lost to Bridgeport entirely.

JITNEY MEN PLEASED

As for the jitney men they appear well pleased. Their own opinion is that they are serving the city well, but that there is still some room for improvement. In consequence, rumors are heard of plans to incorporate a bus company for unified service. As a fancy this is a bright idea, but it doesn't appear to appeal very strongly to the itinerant operator who skims the cream of the traffic during the rush hours, night and morning. Nor does the proposal have much compelling power in the face of the fact that the Council may act at any time in line with the court's suggestions and in deference to public demand curb the jitneys.

The average number of jitneys in service is about 425. It is true that the withdrawal of the trolley cars has relieved congestion by making it possible for jitneys to operate two abreast, but it is hardly true that the average rider in Bridgeport enjoys the degree of comfort that he did when both jitneys and trolleys were in use or that he would enjoy under a combined system of trolleys and jitneys properly regulated and articulated.

These statements are general. They are intended to be general. They do, however, present the case as it rests at present. Business men and merchants to whom they were submitted by a representative of this paper who was in Bridgeport on Aug. 19 agree that the conditions were set forth correctly. The merchants generally were very willing to talk, but they were unwilling that their identity should be disclosed. Manufacturers were also inclined to adopt a similar attitude, although some of them did consent to having their names mentioned.

JITNEYS HAVE INJURED TRADE

The merchants are sure that the jitneys have hurt their trade. It had been suggested from an outside source that perhaps the buying movement in Bridgeport had fallen off on account of a general slump in trade, but the quietus was given to this by a merchant who proved that some of his charge customers were opening accounts elsewhere, notably in New Haven, and in some instances in New York. Here is how a merchant employing 500 people summarized the situation:

The jitneys are not desirable for the shopper. They are not as commodious as the trolley and the drivers object to bundles. Factory people seem satisfied with the quick service which the jitney renders. Customers complained by letter of their inability to shop conveniently. Finally the company agreed to take telephone orders. This is a practice it had steadily sought to discourage because telephone orders run up delivery costs. There has been no appreciable increase in lateness. Jitney service in the morning seems to be adequate. Employees have complained, however, about difficulty in getting home at night. People on the outskirts find transit difficult. The attitude of the trolley company is wrong.

A merchant with 100 employees said in substance:

The loss of the trolleys has certainly hurt trade. The present nondescript bus service doesn't appeal to the better class. The buses move faster, but the annoyances to which one is subjected in traveling in them more than outweighs the advantage of speed. Factory men have agreed in a straw vote that the jitney was the thing, but sentiment is changing, due to the pressure of the women members of families who object to riding in the public autos. The jitneys have done better than I expected they would. The city has undoubtedly suffered in the past because of inadequate transportation. The bus and the trolley services should be co-ordinated. If the matter had been put to a vote when the trolleys were withdrawn 90 per cent of the people would have favored the jitneys. Sentiment, however, is gradually changing.

Another merchant with 450 employees said he was sure the all-jitney service had hurt trade. He cited the credit instances referred to previously. In substance he said:

MID-DAY JITNEY SERVICE POOR

Jitney service is poor in the middle of the day. Both the jitneys and trolleys are needed. There should be trolley service from each end of the city with a loop in the central district, and a charge should be made by the railway for a transfer that will carry passengers from one end of the city to the other. Lateness is "a state of mind." Those who have been late on and off for years still come in late. The jitneys have made few recruits in this respect. The trolley had reached a low estate. It had not met the local needs. Since the trolleys were withdrawn this house has advertised the fact that telephone orders will be accepted. Mail order business has been solicited recently.

By careful study this man was able to estimate probable sales within 5 per cent. For reasons of his own his July and August budgets had this year been bunched, but receipts were running 25 per cent behind the estimate. The big falling off had occurred since the trolleys were withdrawn.

Another merchant employing sixty-five people had recently had two very big weeks. He said substantially:

Our good record was due to large advertising of our anniversary sale. The best trade will not ride in the jitneys. The trolleys are needed. There is no doubt about that. They have not, however, fully met the transportation needs of the community.

A plant in the outlying section employing 2,500 to 3,000 people, mostly women, was visited. The trip out there was made by jitney just after the noon hour. Bus after bus passed fully loaded. Finally one was boarded on which it was possible to obtain standing room. The ride was made at great personal discomfort to the writer. Standing in a trolley car is one thing. Standing in a jitney is something entirely different. The speaker at the plant visited was the supervisor of employment. He was suggested by the head of the company as being better informed, perhaps, than anybody else. He said:

NEITHER SERVICE ALONE SUFFICIENT

Two jitney lines run near the plant. There has been no noticeable increase in lateness on the part of the employees since the jitney has been the only means of service. The workers took "pot" luck in getting home. In this respect neither the jitneys nor the trolley has met the demand of the employees for adequate transportation. We should have the trolleys back but the trolley and the jitney service ought to be co-ordinated. A more intelligent attitude on the part of the trolley management is needed. The trolley company was certainly behind the times in the accommodations it offered.

E. Norton, manager of the Connecticut Clasp Company, did not object to the use of his name. The plant of which he is the head employs only seventy-five people, but he had given considerable thought to the matter of transportation. His sympathies were decidedly with the trolley company. Mr. Norton knew costs. His brief talk showed this. His help was getting

twice as much as before the war. Practically all commodities had doubled in price and he thought that the trolley was entitled to the advance in fare which had been put into effect. He also thought the present jitney service was doomed. He said, however, that he would like to see a well regulated jitney service installed to supplement the railway. Bridgeport was a workingman's town and the traffic peaks were unusually severe. He did say, however, that his help appeared to be handled just as expeditiously as before the trolleys were withdrawn.

Nondescript Service Unsatisfactory

The employment head of another plant with 2,500 persons said that there had been no general complaint of lateness on the part of employees since the trolleys had been withdrawn. He patronized the jitneys himself. Women at the plant had complained of crowding. He regarded most of the drivers as not qualified for their jobs and said they were not the type of men whose appearance inspired confidence. Weather conditions had favored the jitneys. He doubted whether they would be able to keep up the present pace under conditions of climate less favorable.

The welfare superintendent of a plant employing 1,500 said the proportion of those arriving late had increased slightly since the trolleys had been withdrawn. The service to the west end where this plant is located had not been satisfactory and it had been necessary to jack up the jitney association in the matter of service. The speaker used his own auto in travelling to and from work.

In the case of a plant employing about 2,000 the welfare superintendent said that most of the employees lived within walking distance. He was not optimistic as to the future of the bus service as at present managed.

Personal observation on the part of the writer established, so far as a limited survey could, the fact that service by jitney in the morning was fairly reliable and satisfactory. Conditions in the middle of the day, in so far as they come to the attention of the writer, were intolerable. In this regard they substantiate the claims of the merchants that women shoppers of the class upon whom the merchants are mainly dependent for their sales are conspicuous by their absence. Conditions in the evening are deplorable. Mr. Schwartz, the head of the jitney men, ascribes this to the fact that the general hour for closing in Bridgeport is 5 o'clock and that transportation must be furnished at one and the same time for shop help, employees of the stores and for the bulk of the traders who do their shopping down-town.

Police Reticent

The superintendent of police refused absolutely to discuss the jitney problem. Personal observation established the fact, however, that a very efficient traffic system has been worked out, five policemen being used at each of several of the important crossings during the rush hours. The system reflects great credit on Traffic Superintendent Walker.

Mr. Schwartz, who heads the jitney men, has lived in Bridgeport many years. He was formerly a mechanic in one of the shops there. He is now in the auto business with his brother. Literally and metaphorically he is the hardest man in Bridgeport to find. Interviewed after the rush hour peak on Aug. 19 he said there were 425 jitneys, each seating from twelve to sixteen persons. This is about the same number as before the trolleys were withdrawn.

With the trolley cars out of the way, however, the service had been speeded up greatly so that in the matter of accommodations conditions were improved considerably. Few buses run all night. Regular service commences at 5:30 a.m., and continues until 1 a.m., with a decreasing number of cars during the middle of the day and in the evening. Runs are assigned with the mutual consent of the bus drivers. Mr. Schwartz looked upon the withdrawal of the trolley service as an attempt on the part of the Connecticut Company to discredit the buses by proving their inability to cope with the traffic situation which the withdrawal of the trolleys created. He was sure that in this the Connecticut Company had failed. The bus men have plans of their own for organizing service or services with autos more commodious than those now in use, but funds for carrying out such plans can not be raised until the rights of the jitney have been properly established by suitable ordinances and at law.

Brief Notes on Other Cities

In the other cities in the state the jitney menace has taken on other and varied aspects. If a proposal made by Thomas F. Moore, secretary of the Chamber of Commerce of Waterbury, is adopted, the city will rely solely upon the trolley. That body, through its transportation committee, has just filed an elaborate survey of the local situation with the Board of Aldermen, who have adopted the recommendations and passed an ordinance restricting the jitneys from operating on streets now served by the electric railway.

As far as the city of New Haven is concerned representatives of the Connecticut Company and of the jitney operators were heard there recently by the Board of Aldermen. The committee of that body will consider the facts brought out at the hearing and then draw up a report for presentation to the full body.

Two reports on the jitney have been made to the aldermen of Hartford. Both have been referred back to the committee of that body for further consideration.

The statement was made in one of the New Haven papers a few days ago that the Connecticut Company proposed to engage extensively in the jitney business, but this President Storrs of the company denied.

Traffic Moving Faster

Anti-Parking Legislation Has Marked Effect on Electric Railway Service in Kansas City

Beneficial results have followed the enactment by the City Council of Kansas City, Mo., of an ordinance regulating the parking of vehicles within the downtown business district. The measure was passed late in May. Patrons of the Kansas City Railways now find that their daily rush-hour trips are shorter by from ten to fifteen minutes than formerly. More time is saved owing to the shorter headway under which the cars are run.

Rush-Hour Parking Barred

The parking ordinance provides that vehicles shall not be permitted to stand on any of the main streets in the business section between the hours of 7 a.m. and 7 p.m., except for such time as is necessary for the reception and discharge of passengers and freight. This section, in general, includes the territory bounded by Seventh Street, Thirteenth Street, Baltimore Avenue and McGee Street, making the district approximately six blocks north and south and five blocks east and west.

The parking law partially eliminated the causes for delay and congestion, but affected the situation very little during the morning and evening rushes. The great number of jitneys stopping every block to take on and unload passengers caused much more inconvenience and jam than all of the other steadily moving traffic put together. In an effort to remedy the situation the City Council recently passed an ordinance routing the jitneys so as to circle the congested district. All jitneys are now moving north on McGee Street to Seventh, west on Seventh to Baltimore Avenue, south on Baltimore Avenue to Thirteenth Street and east on Thirteenth. It has been estimated that this relieves from 35 to 50 per cent of the congestion.

Mr. Buffe Pleased

In commenting on the effects of the new legislation, F. G. Buffe, general manager of the Kansas City Railways, said:

More Car Riders

> The combined effect of the parking and loop ordinances has made a marked difference in the quality of service which we are able to give. We find that all cars are running on schedule and that we are maintaining our headways on time, where it was almost impossible before to get a car through. Our speed has increased more than 100 per cent, and although it is too early to estimate with a very great degree of accuracy, it looks as though our receipts were going to give favorable indication of the change.
>
> There is not as much use of the private automobile as formerly, as many are leaving them at home rather than go to the trouble of observing the parking regulations, and the jitneys have felt the effect of the "loop" in a falling off in the number of patrons. People are unwilling to walk farther to take a jitney or a street car when operating under normal conditions.

Efforts are being made by the Kansas City Jitney Association to have the "loop" ordinance repealed and a substitute measure introduced.

Minneapolis Fares Up

Ordinance Granting Company a Six Cent Fare Becomes Effective—St. Paul Men Plan Strike

An ordinance granting a 6-cent fare to the Minneapolis Street Railway took effect on Aug. 16. The measure was passed by the City Council on Aug. 6 and became a law without the signature of Mayor Meyers. The company accepted the ordinance on Aug. 13. Tickets are to be sold at convenient places, such as drug stores, but not on the cars. On Dec. 15 the fare will advance to 7 cents with six tickets for 25 cents.

The trainmen of the St. Paul City Railway served notice on the City Council that unless the Council took immediate action to increase fares they would strike at 5 a.m. on Aug. 21. E. W. Bemis has been wired to come from Chicago to make some sort of a report on the progress in the physical valuation of the company's property to determine whether an advanced rate of fare is warranted. The company will endeavor, in case of a strike, to operate the cars through voluntary service.

MINNEAPOLIS WALKOUT AVERTED

Had the Mayor vetoed the bill the trainmen's strike set for July 1, but postponed through formation of an arbitration board, would have been effective on Aug. 14. As it is employees of the company are to receive back pay from July 15 on the basis provided by the arbitrators. This means that about 2,000 men will get about $65,000.

Horace Lowry, president of the company, said:

> We expect to fulfill every promise to the arbitration board, the Council, city officials and the public. The time required to restore the 1917 service, in accordance with the provisions of the arbitration board's report, will depend entirely upon how soon we are able to fill up the ranks of our employees. We are beginning under a handicap because we are already short of the required number. We are hopeful however, that the new wage schedule will promptly furnish more employees, and these will be put to work re-establishing the service.

Under the new schedule the men instead of working on a ten-hour basis will work nine hours. They will receive 60 cents instead of 50 cents as maximum hourly pay, will obtain back pay for thirty days, will be allowed twelve holidays with pay each year and will be paid 70 cents an hour for overtime. Forty per cent of the shifts will be completed in eleven hours, 20 per cent in twelve hours and 40 per cent in thirteen and one-half hours. The men will be paid $5.60 a day for nine hours hereafter, while heretofore they received only $5.17 for ten hours.

Bus Franchise Sought in Tacoma

Representatives of a new company of bus drivers have asked the City Council of Tacoma, Wash., for a franchise to operate over the city streets. Four men plan to form a concern, capitalized at $40,000 to $50,000, to operate a number of twelve to twenty passenger buses on from two to four main arteries of the city.

In return for a franchise which will free them from cut-throat competition, the new company will guarantee fixed service in heated, pay-as-you-enter cars. Cash fare will be set at 10 cents with tickets at a lesser figure. To enable them to finance the proposition the City Council will be asked to give a franchise for a number of years.

Mayor Riddel and Commissioner Shoemaker state that no wild-cat jitney system will be tolerated. Bus drivers will be required to be bonded. A definite system of operation will be outlined before the cars are allowed on the city streets.

Transportation News Notes

Ask Ten Cents in Berlin.—The Berlin (N. H.) Street Railway has applied to the New Hampshire Public Service Commission for authority to charge a 10 cent fare. The company proposes to sell twelve tickets for $1.

Fare Raised in Augusta.—The Maine Public Utilities Commission on July 29 granted authority for a 9-cent cash fare or six tickets for 50 cents to the Androscoggin & Kennebec Railway, Augusta. The company had petitioned for a 10-cent fare.

Fare Advance Brings Revenue Rise.—The revenue of the Shawnee-Tecumseh Traction Company, Shawnee, Okla., has increased 25 per cent since the company began charging a 7-cent fare on June 1. The fare was formerly 5 cents.

Will Protect Carmen from Weather.—A bill has been introduced in the lower house of the Georgia Legislature requiring electric railways operating within the State to close in the ends of cars in winter to protect carmen from inclement weather. The proposed measure has been reported favorably by the committee on railroads.

Tokens on Georgia Line.—Metal tokens are now being used on the lines of the Augusta-Aiken Railway & Electric Corporation of South Carolina, Augusta, Ga. Fifteen tokens are sold for $1.05 and thirty for $2.10. The State Railroad Commission some time ago authorized the company to raise its cash fare from 6 cents to 7 cents.

Open Cars in Connecticut.—Open cars are again being operated on the lines of the Connecticut Company, New Haven, Conn. These cars were temporarily abandoned a year ago when the zone plan of fare collection was installed. Under the 7-cent flat fare regime now in force the use of this type of equipment is made possible once more.

Crosstown Fare 10 Cents.—The Massachusetts Department of Public Utilities has authorized the Union Street Railway, New Bedford, to discontinue the charge of 2 cents for each transfer. The company was given permission to charge a 5-cent fare to the center of the city and a 10-cent fare from one side of the city to the other.

Ten Cents in Regina.—Seattle is not the only city whose municipally-owned traction system has had to raise its fare to 10 cents to continue operation. The Regina (Sask.) Municipal Railway has been authorized by the Regina City Council to raise its cash fare to 10 cents and to sell two tickets for 15 cents, four for 25 cents and seventeen for $1.

Six-Cent Fare Extended.—The Wisconsin Railroad Commission on July 31 issued an order extending the present fare charged by the Wisconsin Gas & Electric Company, Kenosha, until further notice. The present fare is 6 cents cash or nine tickets for 50 cents. The extension was granted after the company had showed operating deficits for April, May and June.

Asks Rise in Lake Charles.—The Lake Charles Railway, Light & Water Works Company, Lake Charles, La., has petitioned the Lake Charles City Commission for authority to increase its rates from 6 cents to 8 cents. Action by the commission has been deferred pending investigation of the company's earnings and valuation upon which such earnings are based.

Ten Cents in Findlay.—The City Council of Findlay, Ohio, on Aug. 10 authorized the Toledo, Bowling Green & Southern Traction Company, Findlay, to raise the fare on its local lines from 5 cents to 10 cents. The company had applied to the council for permission to abandon operation. This request was refused. The new rate will continue in effect for a period of two years.

Mayor's Absence Halts Fare Action.—The departure of Mayor Smith of Louisville, Ky., on a vacation trip to Colorado Springs has brought negotiations looking to a solution of Louisville's electric railway problem to a standstill. Members of the City Council say that the Council will take no action of its own accord and that the next step must come from the Louisville railway.

Bringing Home the Cost.—A new plan of publicity intended to show people how much it costs to operate and make repairs to physical property of an electric railway was recently tried out by the Toledo Railways & Light Company, Toledo, Ohio. A new section of curve construction at the corner of Summit Street and Jefferson Avenue, in the heart of the downtown district, bears a huge sign with the legend, "This cost the company $35,000."

Regulate Davenport Buses.—The Board of Aldermen of Davenport, Iowa, has adopted a new jitney bus ordinance fixing license fees at from $10 to $30 each vehicle and fares at 5 cents during the rush hours and 7 cents during other hours. The ordinance was drafted by the socialist administration as a weapon to fight higher street car fares, but the measure was unanimously adopted by the Council. A bond of $1,000 must be filed for each car.

May Regulate Texas Utilities.—Governor Hobby of Texas recently appointed a committee to draft a public utilities bill for presentation to the State Legislature which meets in January, 1921. The proposed measure would create a State Public Utilities Commission with power to regulate the affairs of electric railways, gas companies and other public utilities. The committee consists of representatives of the Legislature, the utility companies and the state bar.

Quick Service to Beach.—As the result of persistant efforts which began early in 1912, the people of metropolitan Boston, comprising twenty-six cities and towns, have succeeded in procuring a rapid transit service to Revere Beach, the "Playground of New England." It is now possible to reach this famous seashore resort in nineteen minutes from Scollay Square, Boston, via the East Boston tunnel. Over this line the Boston Elevated Railway will operate cars direct to a loop on Ocean Avenue, Revere.

Wants More on Charleston Line.—Application was filed on July 30 with the Public Service Commission of West Virginia by the Charleston-Dunbar Traction Company, Charleston, asking increased rates on its city and interurban lines. The company would install a city rate of 6 cents and a zone rate on its interurban line of 7 cents. Its application states that it is unable to make operating expenses at present rates and that it has no funds for necessary improvements. The interurban line is divided into two zones.

Live-Stock Haulage Sanctioned. — With small-town and rural representatives voting against the larger cities, the Indiana House of Representatives has passed the Douglas bill authorizing interurban companies to haul live stock through the streets of incorporated cities. The bill is of particular interest to Indianapolis, where large shipments of hogs and cattle to the stock yards probably will result, the stock trains passing over the regular passenger lines and adding to the congestion, which already has proved a serious problem.

More Brooklyn Lines To Open.—Service will begin on Aug. 23 on two new extensions of the lines of the Interborough Rapid Transit Company, New York, N. Y., in the borough of Brooklyn. The new tubes are the Eastern Parkway Line extending from Atlantic Avenue to Flatbush Avenue and Prospect Park Plaza and then easterly through Eastern Parkway to Utica Avenue; and the Nostrand Avenue extension beginning at Nostrand Avenue and running to Flatbush Avenue. During the rush hours trains will run every two and one-half minutes.

Want More in Everett.—George Newell, superintendent of the Pacific Northwest Traction & Power Company, Everett, Wash., appearing recently before the Everett City Commission in connection with a street paving project, stated that it soon would be necessary to ask for an increase of the 5-cent fare now charged on the city lines. He declared Everett was the only city in the State that had not raised its fare. Just what would be asked was not stated, but it was intimated that a rate similar to the 10-cent fare charged in Seattle is desired.

Interurbans Ask More.—The Louisville & Southern Indiana Traction Company, the Louisville & Northern Railway & Lighting Company, New Albany, Ind., the Indianapolis & Louisville Traction Company, Scottsburg, Ind., and the Interstate Public Service Company, Indianapolis, Ind. have presented petitions to the Indiana Public Service Commission asking for authority to increase passenger rates to a maximum rate of 3.6 cents a mile. The companies ask an increase of 20 per cent in baggage and milk charges. The basic rates now in force are 2⅜ cents a mile.

Ten Cents in Muskegon.—Muskegon, Mich., is now paying a 10-cent cash fare. The Michigan Public Utilities Commission recently issued an order authorizing the Muskegon Traction & Lighting Company to increase its fare from 7 cents to 10 cents for a period of sixty days beginning Aug. 1. Four tickets are being sold for 30 cents and children under five years of age are carried for 5 cents each. The commission held that it had no power to order jitney buses off the streets on which the company operates. Substantial increases in wages of employees were agreed upon by the company before the commission consented to the increased fares.

Will Abandon Freight Service.—Freight haulage in less than car load lots between Birmingham and Bessemer, Ala., and Birmingham and Ensley will be discontinued by the Birmingham Railway, Light & Power Company. Permission for the discontinuance of this service was granted by the Alabama Public Service Commission on Aug. 11. At a hearing early in the spring the commission denied the company the right to discontinue the service. The company showed that motor truck competition had so seriously curtailed its service that it was no longer profitable and was resulting in a heavy deficit.

Rerouting Plan Attacked.—Declaring that their business is being ruined as a result of the rerouting of the lines of the Los Angeles (Cal.) Railway, a petition signed by approximately 1,000 business men and property owners was recently presented to the Board of Public Utilities of Los Angeles. In the petition the business men declare that property values along Broadway, Hill, Spring and intermediate streets north of Sixth Street have depreciated in value about $40,000,000 during the past five years, and that the taking away of the customers who use the Western Avenue line is just one more move that will cause a further depreciation in property values.

Wants More on Auburn Lines.—To meet additional expenditures resulting from a recent increase in wages to its carmen, the Auburn & Syracuse Electric Railroad, Auburn, N. Y., has applied to the Auburn City Council to waive its franchise provisions limiting the rate of fare, so as to permit the company to petition the Public Service Commission for an increase in fare from 7 cents to 10 cents. The increased wages recently granted the employees of the system by a board of arbitration will add to the operating expenses of the railway the sum of $90,000 annually. The company's income for the six-month period ending June 30, 1920, was less than the fixed charges and operating costs.

Eight Cents in San Antonio.—W. B. Tuttle, vice-president of the San Antonio (Tex.) Public Service Company, recently notified Mayor Bell of San Antonio that the company would raise its cash fare from 7 cents to 8 cents on Aug. 16. The company proposed to sell four tickets for 30 cents. In his letter to the Mayor, Mr. Tuttle stated that during the months of May, June and July the railway department operated at an actual loss. The deficit for May amounted to $827, for June to $3,085, and for July to $247. On Aug. 1 the company installed one-man cars on its Tobin Hill—Prospect Hill line, which showed a deficit of $1,500 for July. The company has thirty cars suitable for one-man use, twenty-eight of which are in regular service.

Five Cents a Mile Authorized.—The Charleston-Isle of Palms Traction Company, Charleston, S. C., has been authorized by the South Carolina Railroad Commission to charge a fare of 5 cents a mile on its lines. Under the new system many of the stations heretofore maintained are abolished, the company making stops each quarter mile. The company some time ago took action to raise its fare above the previous 3-cent limit, but was restrained by court order from doing so on the ground that a fare in excess of 3 cents a mile was prohibited under the State law. The company recently applied to the Federal District Court for permission to discontinue all service. It later asked the court to permit it to operate during a trial period of one year before rendering a decision.

May Ask Tulsa Rise.—To meet a demand of its employees for an increase in wages of 5 cents an hour, officials of the Tulsa (Okla.) Street Railway have announced that they may be forced to ask the Tulsa city authorities for an increase in fare from 5 cents to 7 cents. The company entered into an agreement with its carmen in April, 1919, that it would increase their wages commensurately with the increase in the cost of living. Shortly thereafter wages were raised from 45 cents to 50 cents an hour. The men recently informed the management that the prices of necessities had advanced in a greater proportion than wages. The men produced figures showing an increase in the cost of staple groceries ranging from 20 per cent in the case of coffee, to 200 per cent in the case of sugar. Clothing for men and women has increased from 25 to 75 per cent.

Probing California Stage Lines.—A lengthy controversy of rights of the United Stages, Inc., to operate its auto stage service on lines extending over wide territory in Southern California is under investigation of the State Railroad Commission. A hearing was held by the commission on Aug. 9 following the receipt of many formal and informal objections to the operation, rules and certain practices of the auto stage lines and regulation for transfer of certain franchises. It is the contention of interests representing both competing auto stage and rail lines that the United Stages, Inc., and the Morgan Motor Company, which it later absorbed, were not operating as common carriers over certain portions of their present routes on or prior to May 1, 1917, when the present law governing operation of auto stages became effective and that it should accordingly be required to show the public necessity for its service.

Strike Threat Forces Fare Plea.—The receivers of the Manhattan & Queens Traction Corporation, New York, N. Y., have filed a petition with the Public Service Commission asking for permission to increase to 13 cents the fare from Manhattan via the Queensboro Bridge to Jamaica. The receivers notified the commission that the employees of the road had threatened to strike unless they received a 25 per cent increase in wages. The men have since walked out to enforce these demands. The original application for a hearing on the increased fare petition was filed by Walter B. Robinson, attorney for the receivers of the corporation, in September of last year. The Public Service Commission set the hearing for Sept. 9, when the city obtained an injunction preventing the commission from holding it. Justice Finch of the Supreme Court last October in a decision upheld the injunction, whereupon the company appealed. The Appellate Division of the Supreme Court affirmed Judge Finch's decision and the case was taken to the Court of Appeals. The latter court reversed the previous findings and the injunction was dissolved July 7 of this year. The men demand a wage increase of 11 cents to 13 cents an hour. The company has announced its willingness to grant an increase of 5 cents an hour.

Personal Mention

Toronto Transportation Commission Named

P. W. Ellis, George Wright and Fred R. Miller have been appointed by the City Council of Toronto, Ont., as a Transportation Commission to manage and operate the railway system of Toronto on the expiration of the franchise of the Toronto Railway in September, 1921.

In presenting the report of the Board of Control, Mayor Church made a strong plea for generous consideration of the recommendation. He said the Traffic Commission was to be a permanent body, and would start work at once. It was the most important appointment that had been before the members of Council in a long time. Toronto had embarked upon a public ownership policy, and it was therefore necessary that the men chosen to manage the railway system should be avowed public ownership advocates. Many names had been before the Board of Control, but he felt that he was voicing the sentiment of his colleagues on the board in stating that no three men could have been named who would have commanded more widespread support from the public and the press.

P. P. Crafts, until recently manager, of the freight department of the Eastern Massachusetts Street Railway, has been appointed purchasing agent, succeeding W. C. Boldt.

W. C. Boldt, formerly purchasing agent and investigating engineer of the Eastern Massachusetts Street Railway, has been appointed superintendent of rolling-stock and shops, succeeding F. D. Ward.

George F. Williams, general superintendent of the Central Maine Power Company, Augusta, Maine, has been appointed general manager of the Androscoggin Electric Company, Lewiston, Maine, to succeed Frederick E. Gordon, resigned.

F. D. Ward, superintendent of rolling-stock and shops of Eastern Massachusetts Street Railway, Boston, has resigned to enter commercial work in China. Forty of his friends in the company gave him a send-off dinner at the Boston City Club on Aug. 11.

H. H. Norris, managing editor of ELECTRIC RAILWAY JOURNAL, has during the present summer made an extended tour through the Northwestern States and western Canada. He made a special study of electric operation on the Chicago, Milwaukee & St. Paul system, and investigated street and interurban railway conditions in Butte, Spokane, Seattle, Tacoma, Portland, Vancouver, Calgary, Winnipeg, Port Arthur and Fort William. He reports a spirit of optimism regarding the prospects of the future of the industry and much activity in bringing rolling stock, track and buildings back to the pre-war standard.

Frederick E. Gordon, general manager of the Androscoggin Electric Company, Lewiston, Maine, has resigned his connection with that company to accept a position with the Cumberland County Power & Light Company, Portland, Maine. Mr. Gordon will be succeeded as manager of the Lewiston property, which comprises thirty miles of electric railway line in addition to a lighting and power system, by George F. Williams, who has been serving as general superintendent of the Central Maine Power Company, Augusta. Mr. Gordon has been connected with the Androscoggin system for a number of years and is regarded as one of the most efficient railway operators of New England.

Obituary

Russell A. Griffin, general sales manager of the National Pole Company, died of pneumonia July 14 at his home. He was for many years connected with the American Telephone & Telegraph Company, and later with the Western Electric Company before going into the pole business.

H. L. Gordon, superintendent of the northern district of the Philadelphia (Pa.) Rapid Transit Company, died on July 14. Mr. Gordon had been in the service of the company since 1893. In 1898 he was made a division superintendent. He assumed his duties as superintendent of the northern district on July 1, 1919.

Roscoe D. Smith, formerly general manager of the Illinois Traction System, Peoria, Ill., died recently. Mr. Smith was in charge of the affairs of the company during the construction period from 1905 to 1910. He later went into business as a railroad construction engineer with offices in St. Louis, Mo. He was fifty-four years old.

Jeremiah E. Reeves, seventy-five years of age, who owned a controlling interest in the Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, died suddenly of apoplexy at his home in Dover, Ohio, on July 11. Mr. Reeves founded a sheet and tin mill at Dover which has developed into one of the largest in the country. He left a considerable estate in Toledo.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Commutator Segments in Normal Demand

Raw Material in Good Supply, but Transportation Is Delaying Deliveries

Manufacturers of commutator segments for railway motors report that sales are proceeding at about a normal pace but that demand is not extraordinarily heavy. These segments have probably been in a little heavier demand than usual as the result of necessary repairs to the many motors which were damaged by the severe storms last winter.

With the supply of copper in as easy a position as at present, raw material is not a question to worry producers especially, but considerable complaint is heard against transportation as a factor in lengthening deliveries, which are quoted by several representative manufacturers at from six to twelve weeks. These same companies report a normal volume of production that is gradually catching up with those orders which in some cases have fallen behind as a result of long deliveries. No orders have been canceled, however.

Labor troubles are here and there experienced, but as a whole the situation in that respect is considered good. Prices at present are steady, and while some companies look for further increases, those that think the market will remain firm seem to be in the majority.

Collections are rather slow and accomplished with difficulty according to the credit manager of one of the largest manufacturers of this material. Public utilities appear to be the worst delinquents in this respect, but with financial relief being more and more accorded in the form of rate increases improvement is looked for.

Railways Buying More Waste at Present

Closing of Textile Mills Is Seriously Cutting the Supply and Stocks Are Running Low

Waste manufacturers who sell direct to large consumers, such as railways, are meeting a very good demand for their product at present, although some producers who deal with jobbers say they are not finding a strong market in that quarter, due probably to uncertainties in the cotton and woolen market that may be causing distributers to hold off from purchasing.

As a matter of fact it is said that both steam and electric railways are using more waste now than for some time past, about 60 per cent of the output of one of the large producers going to this market alone. It is also stated that the increase in freight rates has already considerably swelled the volume of orders, as steam railroads are anticipating their requirements by ordering ahead to insure an adequate supply of material for the additions they will make to their rolling stock. It seems reasonable to suppose therefore that purchasing agents of electric railways must reckon on this increased market competition in providing a sufficient supply for their own needs.

Even if demand increased to a much greater extent, however, this would not be a circumstance to cause any alarm under normal conditions. But just now the situation is far from normal with a severe shortage threatening if no relief appears in sight, and the question of relief will largely depend upon the action of the textile mills, upon whose output the manufacturers of waste are dependent for their production. In spite of the fact that raw cotton has been dropping in price under the pressure of plentiful supplies and lessened demand, the situation with regard to cotton waste has been growing worse. This is because the production of waste bears no direct relation to the supply of cotton fiber, but is dependent instead upon the textile mills, which, as a by-product, turn out the material from which waste is made. There is an even greater dearth of woolen waste, as not only are many of the cloth manufacturers in that line closed down too, but the wool industry is in a condition approaching demoralization in the wool growing states of the Intermountain section.

Transportation delays have been adding their quota to the foreboding outlook, although some slight relief in that respect is reported now. Deliveries are an uncertain quantity, however, as no promises are made, but textile mills simply turn over raw material to the waste manufacturers as it becomes available and the latter in turn pass the goods on to their customers. In general, there are no stocks of the finished material, although in isolated cases producers report a fairly good stock through having supplies of material that were previously held at the mills unloaded on them. Prices have not increased materially, cotton waste being quoted at about 13 to 18 cents a pound and wool waste 13 to 22 cents a pound, according to grade. In some quarters, however, it is stated that an increase of about a cent per pound is expected.

Iron Wheel Market Shows Slight Improvement

Factory Stocks Low, but Deliveries Are Better—Transportation Is Chief Factor in Impeding Production

Electric railway buying of chilled-iron wheels exhibits a present tendency on the part of purchasing agents to place orders farther ahead than hitherto, although the amount of new business being handled runs along on an even keel. The greater part of the present business is renewal in character, and on representative orders a differential of about 3.75 cents per pound was recently quoted on 500-pound wheels. Factory stocks are pretty well cleaned out, except in cases where the contract between the railway company and the manufacturer provides for the continuous maintenance of a stated number of wheels in reserve stock subject to prompt shipment. Deliveries, however, are being quoted on a three to four weeks' basis, which is a great improvement over recent conditions.

In one particular case a large road recently ordered 5,000 wheels for replacement service, compared with a usual contract for 3,000. It is believed in some purchasing circles that no immediate changes in price are to be expected in wheels. One large manufacturer states that at present prices are about 50 per cent above the pre-war level. This concern put a 25 per cent increase into effect last winter, thereby advancing wheel quotations from an approximate 25 per cent sur-charge above the pre-war level. Following the signing of the armistice, wheel prices dropped off materially, but recent difficulties in securing raw material forced an advance. Labor is now in easier supply and doing somewhat better work than earlier in the year, so that if the transportation situation should be materially improved, raw material would flow into the factories in better volume and with greater punctuality, thus opening the way to increased production. The chances of early improvement in freight conditions, however, are not very bright. Fortunately, wheel factories are well distributed over the country, and the effect of local embargoes is thus minimized. A few days ago one factory had its outgoing shipments curtailed 50 per cent by the railroad system serving it, but it is not believed that this condition will last long. Gradually the resumption of rolling stock orders by the steam railroads is having its effect, and is expected to relieve the present uncertainties. Little night work is being done in the wheel factories, so far as can be learned. The price per pound of material represented by chilled-iron wheel quotations today compares very favorably with prices of other materials entering into car construction, and the present seems a particularly favorable time in which to order supplies of this kind.

No Favoritism in Allocating Supplies

Freight Embargoes Account for Some Sections Receiving More Material than Others

There is a feeling among some Pacific Coast buyers that manufacturers have been neglecting them in favor of Eastern firms, but an investigation shows that buyers in the East think it is they who are being discriminated against. During the switchmen's strike the East had some cause for complaint because the Far West received more than its share of electrical apparatus from Middle Western manufacturers for the reason that railroads would not accept shipments consigned to the East. Local buyers in cities where the factories are established also complain that others are getting more goods than they. However, no one in the field seems to have been able to obtain all the supplies that were needed, and this appears to have been at the root of the trouble rather than any discrimination in favor of or against any geographical group of buyers. Furthermore, there is every indication that deliveries in most lines are improving and that they will continue to grow better for some time to come.

Almost all the principal manufacturers of electrical apparatus allot a certain percentage of their output to each section of the country, and this allotment is based on the records of previous requirements. Every effort seems to have been made to treat all customers alike, and there has apparently been no idea of diverting shipments from representatives or customers on the Pacific Coast. During railroad embargoes, however, it is a case of making shipments according to the dictates of the transportation companies.

Electrification of German Railways Near Cities

According to the Bureau of Foreign and Domestic Commerce, coal as a power producer will be replaced so far as possible by the use of peat and the electrification of railroads in the vicinity of the large German cities. Great hopes are being placed on the new Theissen 10,000-hp. vertical gas turbine, two of which have been ordered for use on the German railways.

In regard to the electrification of the German railways near large cities, it is planned to install large central power houses, which will be equipped with peat-burning furnaces. The peat bogs in the vicinity of Osnabruck will furnish this fuel. Machinery for the working of this peat has been installed, and it is hoped that the first deliveries will take place by Sept. 1, 1920.

Orders for Fiber Conduit Booked Ahead

Output Inadequate to Meet Demand—Labor and Material Costs Increasing Prices

Buying of fiber conduit in the larger sizes has been very noticeable of late. Much of the material now going through and on order is of the 4-in. size, and some is going to 4½ in. In line with this there has been good buying of the larger sizes of lead-covered cable. At the same time it is known that as much duct ventilation as possible is desired.

Manufacturing output as a whole is booked up well into the last quarter of this year, October being well covered and much running into November. Here and there, however, a few small amounts may be taken care of late in September. At the same time, a good bit of business has been placed for 1921 delivery, and from the nature of the cable buying which has been going on this summer, it is rather expected that within the next few months fiber-conduit production will be well cared for for delivery running several months into the next year.

Demand is good all over the East and the Middle West, but there is not enough capacity to supply it quickly. The raw-material situation is in fair shape, but prices on pulp and compounds have advanced, along with the rates paid to mill workers all along the line to the finished conduit. Consequently, advances in price were made on the finished pipe during June and July, amounting to about 15 per cent. Labor is still unsteady and hard to obtain, and turnover is all too frequent. Because of this, considerably more attention is being paid to the inspection of the product in its various stages of manufacture, with a consequent higher cost of production. Extra night shifts are particularly difficult to get and to keep.

Export demand is good, but shipping rates are almost prohibitive. There is not enough fiber conduit made to supply both foreign and domestic trades, so the foreign allotments are liable to suffer.

Western Red Cedar Association Holds Annual Meeting

At the fifteenth annual meeting of the Western Red Cedar Association, held at Spokane, Wash., on July 30, nine companies were represented, including E. T. Chapin Company, Metropolitan Cedar Company, National Pole Company, Northern Cedar Company, Sandpoint Lumber & Pole Company, Searl-Waterman Company, Valentine Clark Company and Western Lumber & Pole Company.

Reports of various committees were heard, and the advertising program of the association was discussed. The officers elected were: Morton Macartney, president, and E. A. Lindsley, vice-president, while L. L. Hill, H. J. Searl and E. L. Clark were renominated as directors to serve for one year with the president and vice-president.

Rolling Stock

Recent announcement that the Pacific Electric Railway was to spend $1,400,000 for new equipment has been followed by orders placed during July for equipment which included forty-nine Birney type safety cars ordered from the American Car Company of St. Louis, Mo., and twenty all-steel multiple-unit cars for interurban service, equipped with motors for 600-1,200 volts automatic changeover. These new cars will be similar in design to twenty-four cars of the same type now in interurban service on the Pacific Electric Lines. The length of these is 58 ft. 1 in., the width 9 ft. 2 in., and the average weight of each car is 107,000 lb. without passenger load. Some of these new cars will contain compartments for smoking. This type of equipment is entirely a closed car and has no open section like some of the company's other interurban equipment. The order has been placed with the Pullman Company. This order also included ten all-steel cars of the same type as above but without motors, as they will be used as trailers in the operation of two, three or four-car interurban trains. The order for non-motor cars was also placed with the Pullman Company. Cars of this class contain thirty-two seats, thus accommodating sixty-four passengers.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway has begun relaying the tracks of its East Seventh Street line, Long Beach.

Humboldt Transit Company, Eureka, Cal.—The Humboldt Transit Company is rebuilding 2,300 ft. of track on the route of a new highway. The construction is concrete with Warrenite top.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway has been granted an extension of forty-five days in which to complete its track laying on East Colorado Street between the Santa Fé track and Los Robles Avenue. Under the provisions of the ordinance the company has 180 days from April 1 last in which to lay its new tracks on East Colorado Street from Los Robles Avenue to a point 200 ft. east of Mentor Avenue. The company is considering a plan for a subway from the Hill Street station to Figueroa Street and then to Vineyard Junction.

Interstate Public Service Company, Indianapolis, Ind.—High-tension electric current from Jeffersonville to Indianapolis was turned on a few days ago by the Interstate Public Service Company, which operates the lines of the Louisville & Northern Railway & Lighting Company as far north as Sellersburg, Ind., and the lines of the Indianapolis & Louisville Traction Company from that point to Indianapolis. All the current will be supplied from Louisville and Indianapolis. There will be a standard voltage, 600, from Jeffersonville to Indianapolis, instead of 1,200 volts from Sellersburg north.

Middlesex & Boston Street Railway, Newtonville, Mass.—The Middlesex & Boston Street Railway has refused to change the grade of tracks on Crescent Street, and as a result the city is forced to suspend the rebuilding of Crescent Street.

Springfield (Mass.) Street Railway.—The Board of Aldermen of Springfield has received five petitions from the Springfield Street Railway asking the right to locate and relocate tracks for proposed improvements in the East Springfield district.

New York & Queens County Railway New York, N. Y.—The Public Service Commission of the First District has notified W. O. Wood, president of the New York & Queens County Railway, that it must rebuild its tracks in Main Street, Flushing.

Public Service Railway, Newark, N. J.—The State Board of Public Utility Commissioners has issued an order granting permission to the Public Service Railway to change the Sixth and Eighth Street line in Camden and the Borough of Woodlynne. The company will divert the route from Ferry Avenue to follow the line to Haddon Heights, N. J., and will install a crossover to provide for turning cars on the outskirts of the town.

Muskogee (Okla.) Electric Traction Company.—Officials of the Muskogee Electric Traction Company announce that, when the viaduct over the Missouri, Kansas & Texas tracks has been repaired, double car tracks will be laid across the viaduct.

Dallas (Texas) Railway.—The Dallas Railway will be asked to extend the tracks of the State Street line from State Street to Haskell Avenue and along Haskell to Cole Avenue. This improvement will be necessary because of the erecting of the new North Dallas High School Building.

Houston, Bayshore & Texas City Traction Company, Houston, Texas.—The Houston, Bayshore & Texas City Traction Company has petitioned the City Council for the right of way over certain streets within the city limits. The proposed line is to begin on Polk Avenue and cross Telephone Road.

Franchises

Los Angeles (Cal.) Railway.—The Los Angeles Railway has applied to the City Council for a franchise to construct, operate and maintain a double-track electric railway in South Park Avenue, Los Angeles.

Webster, Monessen, Belle Vernon & Fayette City Street Railway, Charleroi, Pa.—This company has been granted a franchise to construct an electric line in Schoonmaker Avenue, Tenth Street and other thoroughfares in the borough of Monessen.

Power Houses, Shops and Buildings

Humboldt Transit Company, Eureka, Cal.—The Humboldt Transit Company has installed a 300-kw. rotary converter.

Los Angeles (Cal.) Railway.—A building permit authorizing the construction of a $550,000 terminal for the Los Angeles Railway at the northeast corner of Eleventh Street and Broadway, Los Angeles, has been issued from the office of the city building inspector. The structure will be 130 ft. in height, containing ten floors, and will be constructed of reinforced concrete. The executive offices of the company will occupy the four top floors, the remaining part of the building to be leased out for office purposes.

Trade Notes

The Sanford Riley Stoker Company announces the removal of its Worcester (Mass.) office from 25 Foster Street to 9 Neponset Street.

The Ohio Electric Controller Company, 6900 Maurice Avenue, has awarded contract for erection of an addition to its factory, to cost about $60,000.

The Electric Controller & Manufacturing Company, 2700 East Seventy-ninth Street, Cleveland, Ohio, has opened a new office in the Witherspoon Building, Philadelphia, in charge of H. K. Hardcastle.

The Locke Insulator Manufacturing Company, Victor, N. Y., announces the resignation of B. A. Plimpton, sales manager, effective Aug. 15. For the present his duties will be taken over by D. H. Osborne, acting sales manager at Victor, N. Y.

Ralph B. Coleman, formerly of the Chicago offices of the Maloney Electric Company, has joined the sales forces of the Consolidated Wire & Machinery Corporation, 519 West Van Buren Street, Chicago. Mr. Coleman has been in the West for the past twenty years and has a wide acquaintance among central-station men in that section.

L. F. Rurey, formerly in charge of the electrical department of the George H. Smith Steel Casting Company, Milwaukee, Wis., has been appointed electrical superintendent for the Milwaukee Rolling Mills Company, which was organized about a year ago. Mr. Rurey has been engaged in electrical maintenance and construction work for the past ten years.

Edward W. Harry, electrical engineer of the National Tube Company, McKeesport, Pa., left the electrical department on July 17 to become chief electrical engineer with the Pittsburgh Steel Company at Monessen, Pa. Mr. Harry started with the electrical department in 1910 as a lineman and while there took a course in electrical engineering in the Carnegie Institute of Technology, from which he was graduated in 1915.

The Porcelain Insulator Corporation, Lima, N. Y., recently incorporated with a capital stock of $250,000, is planning to erect a new plant on the old site of the plant of the Locke Insulator Manufacturing Company, which was destroyed by fire more than a year ago. The new company will manufacture high-voltage porcelain insulators and electrical appliances, starting with a four-kiln capacity. It is expected to have the plant in operation by January, 1921. W. F. Harvey is president, D. H. Finucan vice-president, B. A. Plimpton secretary and V. E. Taylor treasurer.

New Advertising Literature

Valve-Closing Device.—The Cutler-Hammer Manufacturing Company, Milwaukee and New York, has issued an illustrated leaflet entitled "Extension to L Street Station, Boston," in which a brief description is given of the Dean control.

Conduits.—The Garland Manufacturing Company, West Pittsburgh, Pa., is circulating two small leaflets, one entitled "Galvaduct" (galvanized) "Loricated" (enameled), covering its rigid conduits, and the other entitled "Sterling Flexible," describing its flexible armored conductor.

Waterwheels and Governors.—The Holyoke Machine Company, Worcester, Mass., has issued catalog No. 13, covering its different types of Hercules turbine waterwheels, and also a small booklet entitled "The Improved Governor," in which it describes its new governor for waterwheels.

Air Compressors and Pumps.—The Crowell Manufacturing Company, 298 Taaffe Place, Brooklyn, N. Y., is circulating two leaflets covering its type "A" and type "B" positive pressure blowers or rotary air pumps and type "D" rotary air compressors or vacuum pumps.

Voltmeters and Indicating Meters.—The Roller-Smith Company, 233 Broadway, New York City, has recently issued bulletin No. 150, covering its small portable type H A voltmeters, ammeters and indicating wattmeters for alternating current.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors   HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor   N. A. BOWERS, Pacific Coast Editor   H. S. KNOWLTON, New England Editor   C. W. SQUIER, Associate Editor   C. W. STOCKS, Associate Editor
L. W. W. MORROW, Special Editorial Representative   A. D. KNOX, Editorial Representative   GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor   W. R. ANDERSON, Assistant News Editor

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The Federal Commission Has Produced a Constructive Report

MOST important, probably, in the ultimate salutary effect of the report of the Federal Electric Railways Commission will be the general sentiment of the report that the problem of bringing the local transportation utilities to a position of greatest usefulness is one for the joint solution by the utilities themselves and the public. Quite definitely and, we believe, most fairly, the commission points out the obligations, duties and opportunities of both the railways and the organized public.

The report has lost some of its effect on account of the time which has been allowed to elapse since the hearings were held and the subject was more alive in the public mind. But wherever sober-minded students of the question are really trying to adjust relations, legal, financial and social, so that the railways may function most properly, we believe this report will prove to be a valuable aid. The very fact that this is the combined and unanimous judgment of so representative a group of men, after considering the immense amount of testimony and data presented to them, gives the report well-deserved weight and commands respect.

The report may not be perfect, but it is essentially sound and it is constructive. On the whole it analyzes the situation fairly, and it performs the even more important service of pointing the way to better conditions. There are railway men, there are labor men, there are members of the public, the last chiefly uninformed or politicians, who will disagree strongly with some of the recommendations and object to some of the analytical statements. We are inclined to the belief, however, that the report is not only right but stronger for having these very recommendations and statements included, and, further, those who object will, in the abstract and if the pinching shoe is removed, agree to the principles which they are at first inclined to criticize.

If there is one point to which we ourselves, succumbing to the admitted human weakness, would call attention, it is what we believe to be too great a conservatism in the estimate of the financial needs of the industry. From studies made as late as 1918 it was said that history showed the industry to need $500,000,000 to $600,000,000 new capital for replacements, extensions and improvements in addition to refunding requirements which were approximately half as much. While the latter sum does not of course represent additional investment in the electric railway industry, it is none the less an essential capital requirement which must be obtained if the industry is to develop. The commission states that it makes a "conservative estimate" when it gives its figures of $175,000,000 to $200,000,000 and our remarks are merely to emphasize how "conservative" these figures are.

Most of the principles discussed are not new to railway men, but the clearness and carefulness with which recommendations are made or conclusions drawn are worth special notice. We would call attention to I, the essentiality of rail transportation; VI, the combined duty of furnishing adequate economic service by the railways and of allowing a reasonable return on a fair value by the public; VIII, the necessity for the removal of public antagonism (which we take to mean, as well, elimination of politically inspired persecution), encouragement of public co-operation and insurance of integrity of investments; XI, the recognition of the unregulated jitney competition and the necessity of providing regulatory provisions equivalent to those to which railways are subject; XII, the right of labor to satisfactory living conditions and collective bargaining, but the duty of labor to co-operate; the necessity for arbitration or other lawful means of settling disputes and the intolerableness of strikes and lockouts; XVIII, the recognition and recommendation of the service-at-cost franchise based on fair valuation as "one means of solving a very difficult problem," and XX and XXI, the great desirability of properly regulated utilities rather than a resort to municipal ownership.

It is interesting and instructive to note in connection with the last subject that, although the commission in its letter states that "owing to the divergent representation of its personnel this unanimous report of the commission necessarily represents decided concessions by some of its individual members," it says in discussing government ownership that "each member of this commission believes that credit can be secured and private operation maintained under proper public supervision."

THERE are one or two points in the analytical discussion which deserve special attention. One of these is that, while what the commission says is true regarding the strength of the industry in having a market which pays cash as it goes, and in having a monopoly, nevertheless, this is also a weakness, for there is no possibility of "storing" the manufactured product. If the transportation is not sold as produced its cost is a dead loss. Another subject to which considerable attention is well given is the suggestion that extensions should be financed, at least in part, by assessments on property benefited. While the commission quotes sewers and pavements as examples, we would also mention water, and frequently the first cost, sometimes later amortized, of extensions to electric light and power, water, telephone, gas, etc. And finally the commission points out the close relation between public health and public economy—the social element, in other words—and transportation.

The national importance of the subject is well emphasized, but, even though there were some suggestions during the hearings that the national government might take a hand in the game, it is evident from the President's letter that the solution must come through local developments, as is probably necessary.

How can the report become really effective? is the next question. As we see it, the advice of the President should be followed; namely, get the facts to those interested, and these facts are most fairly set forth in the report itself. As we have said above, the report becomes a valuable aid. But railway men cannot, on that account, sit back and expect the situation to clear up automatically. The report emphasizes the duties of the railways themselves, but at the same time gives them most effective assistance.

Finally, we believe that the statement that "The electric railway problem admits of a satisfactory solution once the elements that compose it are made known and the principles of ordinary economic and business common sense are applied"—a statement already eagerly grasped by the daily press—can well be used by railway men and others interested to urge upon their fellows that men of good business judgment be elected to political office. For, as the report so ably points out, much devolves on the organized public, and we need sensible men in office to perform the work of the public.

Economic Conditions Increasingly Favor Electrification of Steam Railroads

IT IS now some time since any important announcement regarding steam railroad electrification has been made. This has been due to the condition of the industry, not to lack of interest on the part of railroad managers and engineers. A sound 25 per cent investment possesses no attraction for the moneyless individual and an offer of a means of increasing track capacity at small cost or of reducing fuel consumption falls upon deaf railroad ears when the treasury is empty. But now that the railroads are to have a square deal as to rates conditions will be changed and they can be reasonably expected to enter upon a constructive electrification program in due course.

Our view of this matter was indicated in an editorial in the Aug. 7 issue, written soon after the decision of the Interstate Commerce Commission to increase freight and passenger rates had been announced. The point made was that with the higher rates railway income and especially railway credit should so improve as to make judicious electrification possible. The reasons for ultimate electrification are so many and potent, however, that the forward-looking railway men and the makers of equipment who see large markets for their products in this field can afford to be patient.

Of course, the steam railroad properties are very much run down and are short of needed steam equipment, hence much of the available money at first will have to go to supply the deficiency. At the same time, the possibility of electrical operation, either by locomotive or multiple-unit cars, brings a new element into heavy traction, permitting some things to be done that could not be done at all before and making economies possible along other lines. Hence the sooner the job of electrifying the steam roads is tackled the better.

As we see it, the electrification proposition divides itself into three phases: namely, a first, in which electric power is applied in places where there is no possible competition with steam; a second, in which the electric locomotive or multiple-unit train is admittedly superior, and a third, in which there is competition, which will become keener as time goes on. As examples respectively of these phases it is only necessary to cite the Grand Central Terminal in New York City, the Pennsylvania Railroad Broad Street Terminal in Philadelphia, the Norfolk & Western or the Butte, Anaconda & Pacific, and the Chicago, Milwaukee & St. Paul electrifications. These and other examples which will automatically occur to the mind are harbingers of the electric age to come.

Credit and Transportation Are Partners

IT IS about time for harvests and crop movements. Crop movements necessitate adequate transportation facilities and a large volume of credit is needed to finance crop marketing.

Since last November the Federal Reserve Banks have limited loans and tried to reduce the outstanding credit volume, but with little effect. For the past year the railroads have been devoting their attention to the imperative transportation demands, also with little effect, because of lack of credit and equipment.

The outstanding credit in July exceeded that at the close of 1919 instead of being lowered, and the financial men say this was largely due to inadequate transportation facilities, which obstructed free movements of commodities.

To an unusual degree crops will have to be held by the producers this year, this because of lack of cars and because of an 8 or 9 per cent money rate on time loans.

It seems to us self-evident that the transportation system and the banking system are mutually dependent. Give the railroads and railways credit and transportation facilities will soon be made adequate and the credit volume of industry reduced.

The intelligent method to reduce credit volume is to insure rapid commodity movement; the foolish method is to reduce production and the volume of business. Which is this country trying to apply?

Progress in Rail Joint Construction

THE subject of rail joints never seems to lack interest on the part of maintenance engineers. This is largely due, no doubt, to the fact that in many instances the joints are so obviously present that they cannot be overlooked. However, a study of conditions on any road will generally indicate that those joints which are still "among those present" are not in the class of modern joints. The term "modern" has to be defined here and we shall define it as covering the period of the last ten years.

Modern rail joints are the product of a long and costly process of evolution and we cannot say that they have reached perfection. Nevertheless, the study and experiment which have been devoted to them in the past decade have led to marked progress in that direction. Among other features, the progress which has been made in the several forms of welded joints for steel work is particularly striking, and it may safely be said that the welded joint has come to stay. Just what particular type of weld will ultimately reign supreme as the acme of perfection cannot be predicted, principally because of the element of time required to prove the ultimate worth of any joint.

The general acceptance of the welded joint as the proper type to be used for street work marks a very important step in the progress of the art of track construction. With this question apparently settled, the next step will probably involve the gradual elimination of one or two of the types of welds now in use and, perhaps, the general adoption of one or more others which have some vogue today. It is quite possible that we may continue to have more than one type of welds to select from as the needs of the work indicate.

It is to be hoped that in our search for perfection in welded joints we shall not be too hasty in the extensive adoption of types which must still be classed as in the experimental stage. Some of the older types of welded joints which are now enjoying a great degree of success are the result of many expensive experimental installations undertaken without definite information as to performance over a period of years under service. The cost to the railway companies of the information thus gained is incalculable. The information contained in the article on rail joints in another part of this issue and covering the details of progress in several older types of welded joints should at least serve to caution engineers against too extensive experimentation with newer types until more is known as to service results extending over five years or more with the older types.

Electric Locomotives Prove Sturdy Under Strenuous Circumstances

AFTER several years of uneventful but eminently satisfactory service on the Rocky Mountain section of the Milwaukee electrification, three of the ten General Electric locomotives which were some months ago transferred to the Pacific Coast section, from passenger to freight duty, were soon thereafter given some jolts which severely tested their ruggedness. The story was told in last week's issue of this paper. Within a few weeks of each other two wrecks occurred in which these locomotives figured, but for neither of these were they in any way responsible. Minimizing the risk of repetition of the accidents will consist simply in increasing the preventive measures against man-failure and landslides, dangers which are necessarily incident to the railroad business.

The most remarkable thing about these wrecks is the way in which all three locomotives came through the ordeal. On the runaway train the main stress was on the motor armatures, geared as they were for a reasonable freight train speed. As the centrifugal forces vary as the square of the speed this inadvertent overspeed test involved forces which may be assumed at four times the normal value. Under these forces only one armature burst. The bars of several commutators "started," but the motor damage, as well as that in other parts of the machine, was insignificant compared with the wreckage as a whole. And the way this locomotive "hugged" the track was most remarkable of all.

This accident furnishes an ocular demonstration of the forces which are present when heavy trains are operating on steep grades. That of Beverly Hill is 2.2 per cent. Allowing 8 lb. per ton for friction, each ton on this grade produces a force of 36 lb. along the track, or a force of 100,800 lb. for a train weighing 2,800 tons, about the weight of the ill-fated wrecked train in question. It is easy to imagine what damage such a force, acting unrestrained upon even so ponderous a mass, could inflict. It inflicted it, all right, but of course the track curves must be credited with much of the damage.

And then, those locomotives that rolled down the bank; they proved themselves rugged even more surely. Locomotives must be designed for overspeed but hardly for overturn, at least not to this extent. The cabs were of course badly damaged, necessitating rebuilding, with straightening of some plates and replacing of others. There were also some minor breakages; but on the whole the damage was smaller than would be imagined possible and the reasonableness of the actual salvaging cost surprised the experts. That electric locomotives can be successfully salvaged after rolling down an embankment was proved years ago when four Great Northern machines were unceremoniously upset in this manner by an avalanche near the Cascade tunnel within a hundred miles of the scene of the Milwaukee accident. It is idle to speculate on the cost of salvaging Mallets under the same circumstances, but one cannot help but give this speculation a passing thought.

The Millennium Is Not Yet

WE RISE to remark that the statement that the motor bus will prove a panacea for all transportation ills can now at least be questioned. The news, as noted in this issue, of the strike of nearly 1,000 motor bus drivers in California indicates that labor will still be a factor in any system of transportation.

The Public, Too, Was Represented

SUPPOSE a judge in a case at law, after gravely hearing each side, should call the opposing attorneys to him and proceed to decide the case not on its merits, but on the basis of the minimum which each side would be willing to accept. Suppose that this was his general practice in deciding suits. How long would such a judge hold his place?

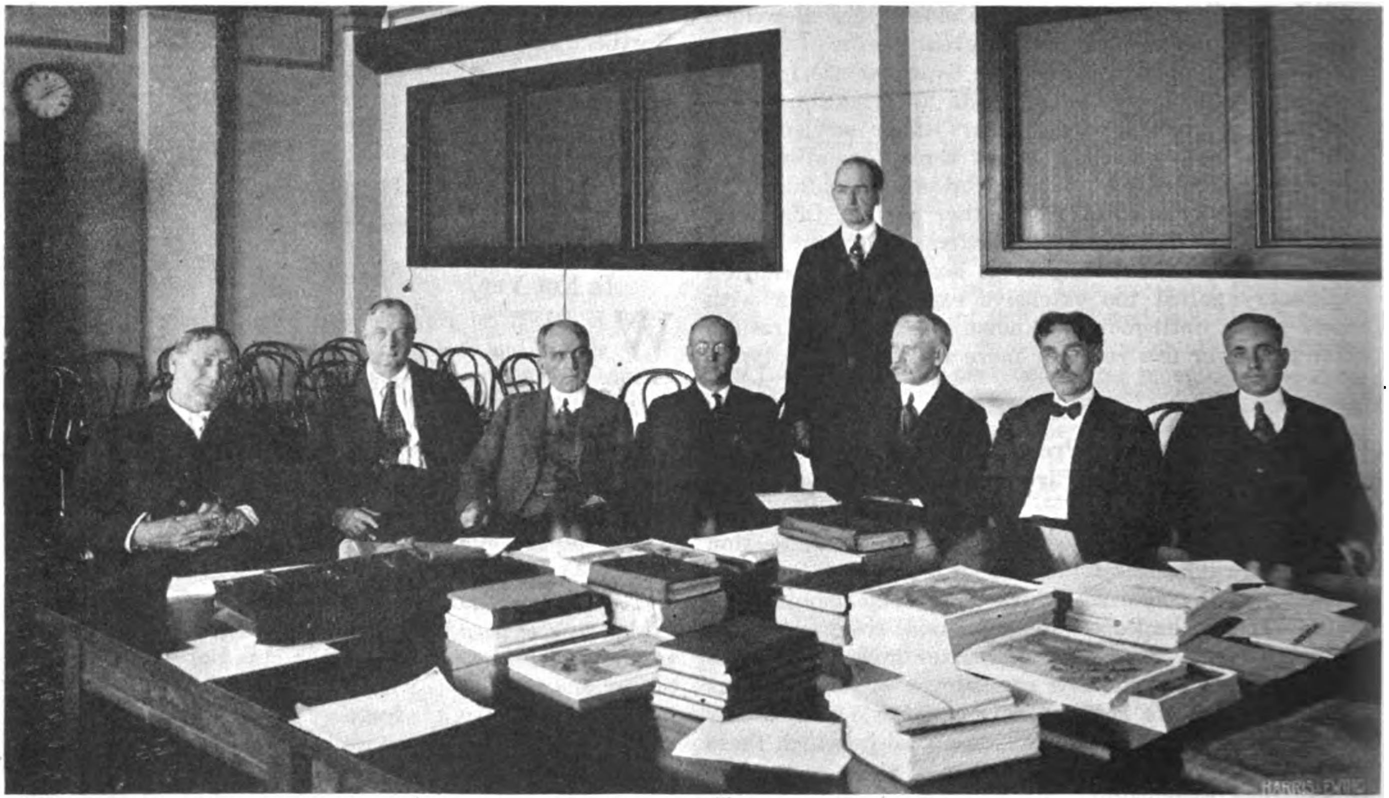
Yet it has been freely said that many of the wage awards of the past two years have been more than all the facts, if ascertained, would warrant, and that the figures arrived at have too often been mere compromises to which the third arbitrator would agree, have been dictated by political expediency, or have been forced grants, either as one necessary step in obtaining higher fares or as a means of preventing unbearable strikes or other serious troubles.

But in the Cincinnati case, mentioned last week, if we are correctly informed, no suggestion of a compromise or a forced solution received consideration. Upon assumption that the third arbitrator largely controls the spirit of an arbitration, real credit is due Prof. Alonzo Tuttle for his attitude and action in the case. And, further, it appears that, judging from the method of his appointment, the public was also represented in this arbitration. It is to be hoped that this arbitration is but the forerunner of others on the same policy.

As to the actual figures, we have no proof that 59 cents is the correct answer, but we presume it will be sure to be so when the record of the case is studied. The fact that a rate of 75 cents or 67 cents or 52 cents is in effect in some other city has no real relation to the rate in Cincinnati. What is important is that the decision should be as nearly right as possible. It is better for every one concerned to have a figure which can be substantiated than to have one based on false conclusions, only to have readjustments to make later.

Federal Commission Report

Hearings Held Last Year by Federal Electric Railways Commission Result in Constructive Report Submitted July 28, 1920, to President Wilson — Full Text of Report Is Given



FEDERAL ELECTRIC RAILWAYS COMMISSION

From left to right, W. D. Mahon, C. W. Beall, Philip H. Gadsden, Charles E. Elmquist (chairman), Charlton Ogburn (secretary, is standing), Edwin F. Sweet, Royal Meeker, Louis B. Wehle. George L. Baker was absent when this view was taken.

HONORABLE WOODROW WILSON,
President.

SIR: The Federal Electric Railways Commission begs leave to present the following report.

This commission was appointed by you in response to a suggestion outlining the need of such a commission in the following letter from two members of your Cabinet, the Secretary of Commerce and the Secretary of Labor:

Washington, D. C., May 15, 1919.

DEAR MR. PRESIDENT:

The electric railway problem to which your attention has been called on several occasions has recently assumed such serious national proportions as to warrant the prompt attention of the federal government. Already fifty or more urban systems, representing a considerable percentage of the total electric railway mileage of the country, are in the hands of receivers. The communities affected are among the most important—New York, Providence, Buffalo, New Orleans, Denver, St. Louis, Birmingham, Montgomery, Pittsburgh, Memphis, Ft. Wayne, Des Moines, St. Paul, Spokane, Chattanooga.

Other large systems are on the verge of insolvency, for the industry as a whole is virtually bankrupt. The continued shrinkage in the value of hundreds of millions of electric railway securities held by savings banks, national banks, life insurance companies and by the public at large threatens to embarrass the nation's financial operations. Furthermore, the withdrawal of this industry's buying power, which is said to rank third in magnitude, involves the unsettlement of collateral industries, naturally entailing labor dislocation that will affect hundreds of thousands of employees.

The return to normal conditions is being hampered and the efforts of the government to avert strained conditions in finance, labor and commerce are being less fruitful of satisfactory results than would be expected, if some solution of the electric railway problem were in view.

What the solution is may, we believe, be evolved by a thorough investigation of general franchise and operating conditions in their relation to rates, including service-at-cost plans, state and municipal taxation, local paving requirements, and internal economies that may be effected.

We therefore propose and recommend the appointment by you of a federal board or commission, whose duty it shall be to study and report upon the entire problem, in order that the State and municipal authorities and others concerned may have the benefit of full information and of any conclusions or recommendations that may be formulated. Such a study will, in our opinion, exert a helpful and constructive force in this critical period of the industry's existence, and will aid in the readjustment. If you would make such an appointment before June 30, your contingency fund could be used to defray the expenses, which would be about $10,000.

The National Association of State Commissioners has always invited federal aid in this matter and the recent conference of governors and mayors adopted a resolution recommending federal consideration of the problem of preventing the financial disaster threatening this industry.

We propose that such a commission shall be made up of one representative of each of the following groups:

Treasury Department or War Finance Corporation, Department of Commerce, Department of Labor, National Association of State Commissioners, American Cities League of Mayors, Amalgamated Association of Street & Electric Railway Employees, American Electric Railway Association, Investment Bankers' Association of America.

We respectfully urge your authorization for such a commission, to be followed by your formal proclamation upon the selection of personnel.

Cordially yours,
(*Signed*) WILLIAM C. REDFIELD,
Secretary of Commerce.
(*Signed*) W. B. WILSON,
Secretary of Labor.

The commission appointed by you on the 31st day of May, 1919, consisted of the following members, who were to serve and have served thereon without compensation.

CHARLES E. ELMQUIST, *president and general solicitor of the National Association of Railway & Utilities Commissioners.*

EDWIN F. SWEET, *Assistant Secretary of Commerce, representing the Department of Commerce.*

PHILIP H. GADSDEN, *representing the American Electric Railway Association.*

ROYAL MEEKER, *Commissioner of Labor Statistics, Department of Labor, representing that Department.*

LOUIS B. WEHLE, *general counsel of the War Finance Corporation, representing the Treasury Department.*

CHARLES W. BEALL, *of Harris, Forbes & Company, New York, bankers, representing the Investment Bankers' Association of America.*

WILLIAM D. MAHON, *president of Amalgamated Association of Street & Electric Railway Employees of America, representing that association.*

GEORGE L. BAKER, *Mayor of Portland, Oregon, representing the American Cities' League of Mayors.*

The commission met on June 4, 1919, in Washington, D. C., and organized by electing Charles E. Elmquist as chairman and Edwin F. Sweet as vice-chairman, and subsequently appointed Charlton Ogburn as its executive secretary. At its first meeting the commission announced that it would attempt to determine the general principles which should govern the regulation, operation and service of electric railways, but that the commission was without authority to hear and determine specific local controversies, and that it would not undertake in any way to encroach upon the functions of state commissions or of municipal authorities; that the purpose of the commission was rather to investigate and study the conditions of the electric railway industry, including franchises, rates, taxation and assessments, economies of operation, public relations, regulation, etc.

The commission gathered its testimony mainly in two ways: First, by public hearings, at which ninety-five witnesses testified in person and twenty-one others sent prepared statements; second, by a series of questionnaires sent to every city in which there is a street or interurban railway, addressed to the electric railways, the mayors, chambers of commerce and the central labor unions, and also to all of the state public utility commissions.

The first public hearing was held in New York on June 19, 1919. The next hearing was held in Washington on July 15, lasting two weeks, during which time the witnesses on behalf of the electric railways presented evidence under the direction of the Committee of One Hundred of the American Electric Railway Association. The next hearing was in Washington beginning Aug. 11, and lasted one week, testimony being offered on behalf of the public, chiefly by representatives of the municipalities and all state public utility commissions. At the last hearing held in Washington beginning Sept. 29, and lasting one week, testimony was offered by further witnesses representing the public and by witnesses on behalf of labor, represented by the Amalgamated Association of Street and Electric Railway Employees of America. All of these hearings ran through day and night sessions beginning at 10 a.m and usually continuing until 10 or 11 p.m., and totaling one month.

Among the witnesses were ex-President William H. Taft, Secretary of War Newton D. Baker, leading bankers, railway managers, economists, mayors, public utility experts and state public utility commissioners.

The testimony taken embraced 6,195 pages of typewritten transcript.

Three separate questionnaires were later sent out. The first was general, dealing with all phases of the situation. The last two were special, seeking traffic figures, month by month, for the past three years; that is, as to the number of revenue passengers, amount of passenger revenue, fare charges, and any occurrences affecting traffic, such as strikes, influenza epidemic, and the like.

At the conclusion of the final public hearing, the commission engaged the services of Dr. Delos F. Wilcox to aid in analyzing the testimony gathered and to make suggestions to the commission with reference to its report. Dr. Wilcox made a very comprehensive analysis of the evidence, containing 823 pages of matter. The commission regrets that it cannot publish this analysis with the proceedings, since it presents a complete and masterful study of the whole electric railway problem. Printed with the evidence, however, is a summary of the Wilcox report, prepared by him. The answers to the questionnaires resulted in bringing to the attention of the commission a great mass of information. All the evidence, exhibits, analysis of Dr. Wilcox, and tabulated summaries of information found in the answers to the questionnaires have been considered by this commission.

The final meeting of the commission was held in Washington July 22 to 27, 1920, inclusive, for the purpose of formulating this report.

Owing to the divergent representation of its personnel, this unanimous report of the commission necessarily represents decided concessions by some of its individual members.

A complete report of the testimony will be printed, together with this report, and will be placed in the Congressional Library in Washington and other leading libraries in the country, with all regulatory commissions, and with the mayors of the leading cities of the United States.

For convenience, we wish before proceeding to our discussion to state our principal conclusions and recommendations, which are as follows:

SECTION I

Conclusions and Recommendations

I. The electric railway furnishing transportation upon rails is an essential public utility, and should have the sympathetic understanding and co-operation of the public if it is to continue to perform a useful public service.

II. The electric railway has been, and will continue to be, a public utility, subject to public control as to the extent and character of the service it renders, and as to the rates it charges for such service.

III. It is of the highest importance that both the total cost of the service and the cost to the individuals who use it shall be kept as low as possible without injustice to those who take part in producing it.

IV. The electric railway industry as it now exists is without financial credit and is not properly performing its public function.

V. This condition is the result of early financial mismanagement and economic causes, accentuated by existing high price levels of labor and materials, and of the failure of the uniform unit fare of five cents, prescribed either by statute or by local franchise ordinances or contracts to provide the necessary revenues to pay operating costs and to maintain the property upon a reasonable basis.

VI. The industry can be restored to a normal basis only by the introduction of economies in operation, improving its tracks, equipment and service, and securing a reasonable return upon the fair value of its property used in the public service when honestly and efficiently managed.

VII. The electric railways must expand to meet the growing needs of their communities; therefore, the first essential is to restore credit in order to obtain necessary new capital for the extension and improvement of service.

VIII. Restoration of credit involves a readjustment of relations which will remove public antagonism, provide public co-operation, and insure to the investor the integrity of his investment and a fair rate of return thereon.

IX. Effective public co-operation should be exercised by eliminating, in so far as it is practicable, special assessments for sprinkling, paving, and for the construction and maintenance of bridges which are used by the public for highway purposes.

X. Extensions into new territory resulting in special benefits to the property in that vicinity should be paid for by assessments on such property in proportion to the benefits received, and that the amount of such assessments should not be added to the physical value of the corporate property.

XI. The great increase in the use of private automobiles, the jitney and motor buses, has introduced a serious, although not a fatal, competition to the electric railway. These forms of public motor conveyance when operated as public carriers should properly be subject to equivalent regulatory provisions.

XII. The full co-operation of labor is essential to the highest prosperity and the usefulness of the industry. The employees engaged in this occupation should have a living wage and humane hours of labor and working conditions. They should have the right to deal collectively with their employers, through committees or representatives of their own selection. All labor disputes should be settled voluntarily or by arbitration, and the award of such a board should be final and binding upon both parties. It is intolerable that the transportation service of a city should be subject to occasional paralysis, whether by strikes or by lockouts.

XIII. A private industry should not be subsidized by public funds, unless it is imperatively necessary for the preservation of an essential service, and then only as an emergency measure.

XIV. Unless the usefulness of the electric railways is to be sacrificed, public control must be flexible enough to enable them to secure sufficient revenues to pay the entire cost of the service rendered, including the necessary cost of both capital and labor.

XV. There can be no satisfactory solution of the electric railway problem which does not include the fair valuation of the property employed in the public service, and, where that is done, the companies should voluntarily reduce any excessive capitalization to the basis of such value.

XVI. There is no insuperable objection to a large, wide-awake city having exclusive jurisdiction over the rates and services of public utilities.

XVII. The necessity for scientific and successful regulation of systems, whether large or small, and especially those which operate through several cities and villages and in rural territory, leads to the conclusion that local regulation should generally be subject to the superior authority of the state, whether as a matter of original jurisdiction or through the medium of appeal.

XVIII. Cost-of-service contracts are in the experimental stage, but, where tried, they seem to have secured a fair return upon capital, established credit, and effected reasonably satisfactory public service. Such contracts may safely be entered into where the public right eventually to acquire the property is safeguarded.

XIX. The right of the public to own and operate public utilities should be recognized, and legal obstacles in the way of its exercise should be removed.

XX. While eventually it might become expedient for the public to own and operate electric railways, there is nothing in the experience thus far obtained in this country which will justify the assertion that it will result in better or cheaper service than privately operated utilities could afford if properly regulated.

XXI. Public ownership and operation of local transportation systems, whether or not it be considered ultimately desirable, is now, because of constitutional and statutory prohibitions, financial and legal obstacles, the present degree of responsibility of our local governments, and the state of public opinion, practicable in so few instances, that private ownership and operation must as a general rule be continued for an extended period.

XXII. If the reforms incident to public regulation which we suggest in this report should not result in making private ownership satisfactory to the public, such reforms should at least enable public ownership to be established upon a just and equitable basis.

SECTION II

The Street Railway Is an Essential Industry

THE electric railway industry at present is a factor of essential importance in the urban life and, to a scarcely less extent, in interurban relations of the country.

The experience of seventy-five years, the unanimous opinion of expert witnesses and of those who are students of transportation problems, and the assumption of the necessity for tracks by inventors working to improve the methods of street transportation, alike demonstrate the fundamental and permanently essential nature of the railway and, to the present time, of the electric railway—as the most nearly adequate, reliable and satisfactory system available for transporting the maximum number of people through the streets of our cities with the least interference with the use of these streets for other purposes of public ways.

The Bureau of Census reports for the year 1917 show the net capitalization as of December 31, 1917, to be $4,889,962,096, which makes this industry one-fourth as important as the steam railroads of the country in point of capitalization. The total mileage in 1917 was 44,835. The net capitalization per mile of track is $109,065. The total revenues for 1917 from railway operations were approximately $650,000,000.

These statistics do not include the electrified portions of steam railroads engaged in suburban service. Approximately 40 per cent of the mileage is suburban in character.

The number of people with whom the electric railways come into daily contact is shown by the fact that in the year 1917 they carried a total of 11,304,660,462 revenue passengers and 3,202,254,111 transfer and free passengers, as compared with a total of 1,066,638,474 revenue passengers carried by the steam roads.

In spite of the immense development of the automobile industry the demand for electric railway transportation has increased at a rapid rate. It is estimated that on December 31, 1917 there were 4,643,481 passenger automobiles and that two-thirds of the development of that industry was subsequent to 1912, but the number of revenue passengers carried by the electric railways was approximately 1,800,000,000 more in 1917 than in 1912. During the year ended June 30, 1919, the total number of revenue passengers carried by the local transportation lines of New York City was 2,079,942,604 as compared with 1,402,417,642 carried during the year ended June 30, 1909, an increase of more than 48 per cent in ten years. On the basis of the estimated population served the number of revenue rides per capita in New York City in 1909 was 304 and in 1919, 370, an increase of nearly 25 per cent in the riding habit.

In this connection Henry G. Bradlee, president of the Stone & Webster Corporation, stated in a letter dated October 1, 1919, as follows:

> It would appear that something has been and is still stimulating the street railway business; possibly the automobiles themselves have helped in this direction. People may be acquiring to a greater extent than ever before the riding habit and may be more and more inclined to move about and spend less time in their own home or with their own neighbors. The moving picture is probably also a factor in the situation, but whatever may be the cause, the facts seem pretty clear that the demand for transportation service is still growing apace. This fact, I think, is generally not understood; in fact, I am free to confess that we, ourselves, were surprised to see the extent of the increased demand for service.

In 1917 the number of employees were 294,826 and it is estimated that the total number of people who were directly and conveniently accessible to electric railway service is about 50,000,000 at the present time. The electric railways have overflowed municipal boundaries and now include a network of interurban lines in many portions of the country, but the fact still remains that the industry is primarily a street railway with its principal function the transportation of passengers within the limits of municipalities.

While the electric railway industry is essentially local it has certain national characteristics. Its difficulties cannot be regarded simply as the isolated problem of a local system repeated hundreds of times all over the country in varied forms and degrees, each problem being independent of all of the others.

On the contrary, although a local traction system may be separated by hundreds of miles from its nearest neighbor, it is in other ways inseparably connected with all of the others. As a purchaser in the equipment markets of other states it competes with other companies.

Its demands for labor and its scales of wages are necessarily felt at once by traction systems everywhere. In procuring its capital its officers have been generally compelled to market its securities to a large extent in other states, among investors who are particularly interested in such classes of investment. The close industrial and financial interdependence of the hundreds of physically unrelated local traction systems, the millions of dollars of capital placed by thousands of investors in plants which manufacture electric traction equipment and the five millions of dollars of electric traction bonds and stocks to be found scattered all over the country in banks, insurance company reserves and in private investment, translate the many local problems into a national problem.

SECTION III

Financial Condition of the Electric Railway Industry

THE investigation demonstrates that the financial condition of the electric railway industry is acute, and that, to a very great extent, it is not properly performing its public functions.

The record in this case shows that on May 31, 1919, there were sixty-two companies, having a mileage of 5,912, in receivership, that sixty companies had dismantled and junked altogether 534 miles of railway, and that thirty-eight companies together had abandoned 257 miles of track. Since that date and up to July 1, 1920, there have been fifty-six additional companies, having a mileage of 1,906, which have been thrown into receivership.

The capitalization of the industry according to the 1917 census report is represented by $3,058,377,167 in bonds and $2,473,846,651 of stock. For the year 1917 the net income of operating companies was $56,450,930, representing an average rate of return of 2.81 per cent upon the capital stock. In 1918, the evidence shows the net income was reduced to $20,183,413, which represents a return of only 1 per cent. As a whole, there has been some improvement in the industry since the commencement of these hearings, due to the fact that there has been an increase in the car-riding habit since demobilization, and in a great many instances the fare has been increased beyond 5 cents. In spite of this slight improvement, however, the condition of the industry at the present time is serious. A great many companies are unable properly to maintain their track and equipment and to perform efficient public service, to secure funds with which to purchase new equipment, to build necessary improvements and extensions, or to refund maturing obligations.

A large number of factors have contributed to the present plight of the electric railway industry. These may be mentioned:

(a) They were not conservatively financed in their early years, and have not since made good their overcapitalization, except to a limited extent, otherwise than through the process of bankruptcy and reorganization. In the early days the promotors of electric railway properties believed that long term franchises with a 5-cent fare would be permanently profitable. Large sums of money were required to develop the business. In many cases the promotors issued bonus stock to represent their hopes and expectations. This bonus stock did not represent money, service or property, and added nothing to the value of the plant. As a result of this practice, there are many cases where the existing capitalization exceeds the investment in the plant or the value thereof.

(b) Neglect to amortize this excess capitalization.

(c) Failure to amortize the normal accrued depreciation.

(d) Payment of unearned dividends and neglect of ordinary maintenance.

(e) Overbuilding into unprofitable territory or to promote real estate enterprises, involved sometimes with political improprieties.

(f) A uniform 5-cent fare, which established a constant rate to apply during variable cost periods. This contract fare has been a source of irritation, resulting in litigation. During normal times many communities sought to have the fare reduced below the contract price.

The railway companies insisted upon adhering to the contract, and they were sustained by the courts. During the recent high-cost period many companies have applied for an increase in fare to enable them to meet operating expenses and fixed charges. In many cases communities undertook to prevent the increase beyond the contract rate. Under the decisions of the Supreme Court of the United States and of the highest courts of a number of states, it is now established that a franchise provision naming a certain rate of fare creates no right of any car rider in such fare which cannot be properly changed by appropriate legislation and substituted by a higher charge.

As indicative of the fact that the 5-cent fare has not been adequate during the war period, we need only to call attention to the fact that on July 1, 1920, increased fares have been allowed in over 500 selected cities. 10-cent fares have been allowed in sixty-nine; 9-cent fares in two cities; 8-cent in 30 cities; 7-cent with 1-cent charge for transfer, in 26 cities; 7-cent zones in 6 cities; 7-cent in 145 cities; 6-cent zones with 2-cent transfer charge, in 10 cities; 6-cent for two zones with 2-cent per zone thereafter, in 13 cities; 6 cents for each two zones in 4 cities; 6 cents cash fare in some cases in 149 cities; 5 cent zones and elimination of reduced rate tickets in 50 cities.

Boston has a 10-cent fare. Chicago, Washington, Cincinnati, Kansas City, Youngstown and other large cities are on an 8 cent basis.

It would seem that so long as the railways depend upon earning power, and earning power depends upon passenger revenue, the fixed uniform fare is a broken reed for the industry or for the community to lean upon. Perhaps the general sentiment of the electric railways is best expressed by the evidence before this commission of Gen. Guy E. Tripp, as follows:

> We were all living in a fool's paradise in the street railway business when we suddenly woke up—when the war woke us up—to find that no business which cannot increase its revenues under any conditions can live or is sound.

Conversely, it may be said that no community should bind itself by contract or otherwise to continue after normal conditions have been restored a rate which might be found reasonable during this abnormal period.

(g) Limited franchises which impair credit and toward the expiration of the franchise result in neglect of the maintenance of the property.

(h) Special taxation and franchise obligations, having particular reference to street paving, street sprinkling, construction and maintenance of bridges used by the general public, general taxation, and so forth.

The American Electric Railway Association introduced a chart which showed that the total amount of taxes levied against the properties in 1917 amounting to $45,756,695, of which taxes on real and personal property was $21,804,619, and on earnings, capital and other taxes $23,952,076, representing 10.11 per cent of the operating expenses. In 1902 the ratio of taxes to operating expenses was 9.19 per cent. It is thus seen that there is only a small increase in the ratio of expense for this item since last year.

For the period from 1913 to 1918 the expenditures for all taxes including paving and other imports, has ranged from $60,000,000 to $65,000,000, corresponding to ten per cent of the operating revenues. The ratio varies very materially among the different plants.

The evidence on behalf of the companies therefore shows that on the basis of the 5-cent fare, the taxes represent about one-half of a cent in the nickel which the car rider has been paying, and that they thus contribute materially to the necessity for fare increases.

The argument has been made with considerable force that the car rider should be required to pay for service alone; that he should not, through his carfare, be required to pay for supporting the city's schools, its alms houses and other city institutions. It is contended that the company should be required to pay in taxes to the city only such an amount as would reimburse the city for its actual cost due to the presence of the street railway; and that such a plan of taxation alone would be consistent with the idea that the carfare should be based upon the real cost of rendering the actual service of transportation.

Although there is much force in this idea, and it should be borne in mind by all who are interested in street railway problems, we do not think the time is ripe for recommending its general adoption. The heavy taxation to which the companies are now subject came into being during the period of their prosperity and at a time when they were still essentially private concerns, relatively free from regulation. It was natural that their properties should be taxed in no less degree than the properties of other private corporations.

When a company comes to subject itself to such a comprehensive regulation as renders its property in effect a public instrumentality then tax exemption begins to be in order. This course has indeed been followed in Cleveland, where as an incident to the passing of the properties under the Tayler plan of municipal regulation they came to be exempted in large measure from taxation. To the extent that it may become possible in any community under similar conditions to exempt street railway property from taxation, the rider's carfare will come more nearly to represent the actual cost of rendering the service of transportation —in itself a desirable result. But it would seem that the status of the company as a public agency should be well assured before such exemption should be attempted.

(i) AUTOMOBILE AND JITNEY COMPETITION—For several years prior to the war, and to an increasing extent throughout the war period and up to the present time, the automobile has proven to be a serious competitor of the electric railways rendering local transportation service.

Jitneys and automobile buses operating as common carriers have been able in some cases, through the absence of sufficient public regulation, to engage in unfair and destructive competition with the electric railways for the most profitable part of urban passenger traffic. Strong as this competition has been, however, the electric railway industry as a whole has shown a very substantial increase in the riding habit. The operation of jitney buses as common carriers is much more restricted than the operation of private automobiles, but the jitneys have had a definite and intensive effect upon the street railway situation in particular communities, for the reason that they have engaged in direct and in some respects destructive competition with the street cars as public carriers. The experience of numerous communities, even before the extraordinary conditions growing out of the war, made it clear that unrestricted jitney operation though more or less temporary and precarious in character, threatens the service, credit and solvency of the street railways.

(j) HOLDING COMPANIES AND BANKER CONTROL — About 75 per cent of the public utilities of the country are held, in whole or in part, by so-called "holding companies," which are responsible for their operation. This financing is done in large part through the securities of the parent company, which securities are supported by the securities of the various operating companies. This frequently gives an element of strength to the securities of the parent company which a single localized operating company could not in all cases present. If it were not for the supporting strength of these parent companies, many of the individual operating companies would have gone under before Jan. 1, 1918.

Through these holding companies the electric railways threaten to become a banker-controlled industry. Those who have the ultimate say in matters of street railway policy from the point of view of investors have been dependent for their profits and their power upon the volume of securities outstanding and the frequency with which these securities have been exchanged or refunded. Holding companies in many instances have been responsible for overcapitalization, and have insisted upon drawing from the underlying companies every possible cent that could be secured in order to make a showing on these inflated securities. Hon. Joseph B. Eastman, at present a member of the Interstate Commerce Commission, discussed the question as follows:

> In the third place a factor of weakness I think was the control of the companies in many instances by holding companies organized in the form of voluntary associations, or to use a more technical term, express trusts. Although the stock and bonds of the street railway companies themselves were issued under public supervision, these voluntary associations which corralled all their stock were subject to no regulation whatever and issued shares upon an inflated basis, and that had the result of accentuating the desire to draw every possible drop of income out of the underlying companies that could be secured in order to support earnings upon the inflated shares of these voluntary associations.

Through this system of financing and management, the utilities have been largely controlled by persons living distant from the community affected by a particular electric railway, whose prime consideration has been to secure a return upon the property. This "absentee" management and control has not been successful in bringing about the proper spirit of co-operation between the local managers, employees, and the public. Since the electric railway companies come into immediate daily contact with large numbers of people, it is of the utmost importance that the industry should gain and hold the respect, confidence and good-will of its patrons. If the local public should invest its money in the stocks and bonds of its local utilities there would be an improvement in the relations now existing between the corporation and the public.

(k) USE OF REGULATORY POWER TO COMPEL MORE AND BETTER SERVICE—Through the exercise of this power the companies have been required in many instances to improve their standards of service and equipment; to equip cars with vestibules for the protection of the motormen and to give better heating, lighting and ventilation for the comfort and convenience of the passengers. They have also been obliged to install safety devices and make stops at frequent intervals. The exercise of the regulatory power of states and municipalities has undoubtedly added to the cost of the service.

(l) UNDERLYING COMPANIES AND LEASED LINES — Consolidations have been brought about through the unification of a number of separate corporations which owned and maintained lines of track within the same city. In many cases consolidations were made upon the condition that these companies should be guaranteed a certain rate of return or fixed sum, which represented a high percentage yield upon the investment. The returns thus secured have been a frequent source of irritation, induced by a feeling that these underlying companies are being paid more than a reasonable return upon the value of their property. Your commission believes that excessive payments to the underlying company by the operating company have greatly diminished the net operating revenue and that there can be no satisfactory solution of the street railway problem in such communities until the system has been valued as a whole and the accounts so kept that the public may know that the rate of fare paid yields no more than a fair return upon the value of such property.

(m) INCREASING DEMANDS OF LABOR—The wages of street railway labor prior to the war were generally insufficient from the viewpoint of the living wage, and the increases in wages that have taken place since the beginning of the war period have not on the average been as great as the increase in the cost of living.

At the time of our entry into the war the average wages of motormen and conductors for companies of 100 miles and over were approximately 31.5 cents per hour. Since the war there has been a rapid increase in the wages of employees. The National War Labor Board by its awards in the year 1918 established the normal wages for this class of service in different cities varying from 38 cents to 48 cents per hour, increasing wages 23½ per cent. The awards of the board mark the beginning of the rapidly increasing wages in this class of employment. An exhibit filed by the Amalgamated Association of Street & Electric Railway Employees of America shows the wages for conductors in the principal cities of the United States and Canada as of Jan. 1, 1920. For convenience the exhibit is published as an exhibit attached to this report.*

Since that date new contracts have been agreed to which substantially increase the wages in a number of cities.

(n) THE WAR AND THE DOLLAR—The conditions which have been here enumerated tended to break down the credit and stability of the electric railway industry. The increases in prices of labor and materials entering into the construction, maintenance and operation of electric railways during the war period have corresponded with the increases in the prices of general commodities and in the wages of labor in all industries. Operating costs became so high that in many cases the revenues were not sufficient to pay even the current expenses of operation. Material and equipment prices reached abnormal heights. The increases over 1915 in railway motors and car equipment show 87 per cent; locomotives, 87 per cent; rotary converters, 75 per cent; transformers, 70 per cent; switchboards, 100 per cent; motor generator sets, 95 per cent; turbines, 100 per cent; pig iron, 106 per cent; steel plates, 141 per cent; copper, 58 per cent; steel castings, 220 per cent; coke, 33 per cent; coal, approximately 100 per cent; asbestos material (which is largely used), 560 per cent; other insulating materials, 125 per cent; magnetic sheet steel, 280 per cent; labor, from 85 per cent to 90 per cent.

(o) COST OF NEW MONEY—The destruction of capital incident to the world war and the unprecedented demand of the government and industries for money resulted in largely increasing the interest rate for loans. More attractive loans are now absorbing money available for investment, leaving the electric railways where, even with credit restored, they would have to compete in the money market with prosperous and unregulated enterprises.

These factors, and more particularly the increase in wages, fuel, material and supplies during and since the war period have brought the electric railway industry to the point where in many instances it may be forced to abandon public service, and in most cases to a point where it will be unable to secure new capital to enable it to refund maturing obligations, secure new equipment, and to make necessary extensions and improvements, unless some solution of the situation can be found.

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*See page 411

SECTION IV

Emergency Relief

THE evidence in this case shows that the state regulating commissions, and in a large number of cases the local tribunals, have recognized that it has been necessary to grant emergency relief to secure to the communities the service of the electric railways.

With commendable initiative and oftentimes against a hostile public sentiment the regulating officers have granted temporary increases in the fares without undertaking to determine the value of the plants or without making a long and exhaustive investigation.

Very little if any criticism was made to us against state regulating commissions for their treatment of these utilities during the war period. The most serious difficulties were met with in communities where the charge was fixed by franchises and the state authorities were without jurisdiction to regulate fares.

During a war or other abnormal periods, it would seem to be the duty of the state and municipal officers to deal promptly with petitions for increased fares, and to afford such relief as will enable the street railway to serve the public and maintain its track and equipment in proper operating condition.

The public always pays for a run-down plant, either through inferior service or higher charges. The first essential is service to the public. Due recognition of this fact will secure to the investor a safe return upon his investment and to the public uninterrupted operation.

SECTION V

Credit and Co-operation Are the Co-ordinate Needs of the Electric Railways

IT IS clear from this record that the two serious needs in the electric railway situation today are its need of credit and its need of co-operation between the public and the utility.

Credit will enable the electric railways to rehabilitate themselves, to adjust their capital accounts and to meet the prices of normal replacements which are now upon higher price levels. The co-operation of labor will enable them to render continuous and popular service, to effect operating economies, and to get into their treasuries the full amount of revenue collected from the riding public. First-class credit and the full co-operation of their employees, if properly utilized in rendering adequate public service, would give the electric railways a well-nigh impregnable position in their relations to the public and tend to disarm and overcome the prevailing antagonism against them. With capital and labor performing their respective parts freely and well, restrictive regulation would be unpopular, and the demand for substitution of public ownership and operation for private management would shrink into relative insignificance.

The test of private ownership and management lies in the solution of these two problems of credit and co-operation. These problems must be solved, and if no solution of them is practicable under present ownership and control, then the only course open is the complete transformation of the electric railway industry into a governmental business. Each member of this commission believes that credit can be secured and private operation maintained under the proper public supervision.

Unless the confidence of the investor in the securities of companies furnishing this essential public service be restored, the public itself must in some way assume the burden of supplying the funds that are necessary for their continuance.

To a degree unknown to private business enterprises, which to a certain extent are able to finance capital expenditures from earnings, the electric railways are dependent upon new investment—new capital—for the extension, improvement and betterment of the service which they perform. Communities need and are constantly demanding additional local transportation facilities. They require large sums of money, which can come only from those with savings to invest. When the flow of new capital ceases, when the confidence of the investor in the ability of the enterprise to safeguard the integrity of the investment and to insure a fair return thereon ceases, new capital is unobtainable and the utility can no longer serve the purpose for which it was created.

This condition is now present. Lack of confidence in electric railway investment exists today to a degree which has caused a partial paralysis, is working havoc with the finance of the companies, and is depriving the public of the service to an alarming extent.

For rehabilitation and improvements and extensions which are vitally needed to meet the requirements of every growing community, new capital at once and in large amounts is imperatively required, and until the force of circumstances convinces those with capital at their disposal that investment in electric railway securities affords safety and a fair return, it cannot be obtained.

So far as the requirements in normal times are concerned, certain characteristics of the electric railways and certain conditions under which they operate tend to make their credit almost unlimited. In the first place, they have enjoyed a monopoly of the most convenient form of local transportation during a period of rapid industrial development and of rapid increase in urban population. They have a continuous and immediate market for their "goods." They sell transportation as it is produced. While electric railway traffic fluctuates somewhat from year to year according to the number of passengers and the prosperity that prevails, and fluctuates somewhat from season to season, from week to week, and from day to day, these fluctuations are relatively unimportant. The business of transportation goes on every day in the year. Under normal conditions the credit of the electric railway business is its relatively small need for "fluid" or working capital. In this respect it occupies a position more independent than that of any other utility or any other ordinary private industry. It does a cash business. Almost 100 per cent of its revenues are collected in advance, through the sale of tickets or at the time the service is rendered, from the collection of fares in the cars. Money flows into its coffers day by day in a relatively even stream. Before it pays the wages of its employees, the salaries of its officers, the claims resulting from injuries and damages, the rentals for the use of property, the interest and dividends on its investment, or its taxes, it has already collected from its patrons in cash full compensation for the service rendered. It does not send out bills.

The increase in revenues of the electric railways is a product of three lines of expansion. These are the increase in urban population, the increase in the riding habit, and the increase in the rate of fare. The gross operating revenues of the electric railways grew from $247,000,000 in 1902 into $650,000,000 in 1917, an increase of 163 per cent.

For a number of years, particularly during the first decade of the century, there was a strong tendency toward fare reductions in many urban communities, but the evidence shows that for the country at large the total amount of electric railway operating revenues increased by a much greater percentage than the number of revenue passengers during the fifteen years ended with 1917. Since the latter date there has been a strong upward tendency in street railway fares. Statistics covering 75 per cent of the electric railway traffic of the country indicate an increase of nearly 14 per cent in the average fare paid from 1917 to 1919, and an increase of about 22 per cent in passenger earnings during this two-year period.

Without a doubt the enjoyment by the electric railway industry of a steady inflow of revenue of rapidly increasing volume assured by the most fundamental conditions of modern life and the strongly developed habits of the people is extremely favorable to credit. In what other industry could investment be made with greater assurance of security and continued earning power? The tracks for the most part are in the public streets where everybody can see them. The operation of the cars is most conspicuous. It would be hard to find another industry where the investment is completely visible to all and so freely observed by the entire population. If publicity of operation is a guaranty against the waste and disappearance of capital, then the position of the electric railway, where everybody can observe it every day, is surely conducive to the development and retention of credit. From this viewpoint how different is a street railway investment from an investment in mining stock or in the fruit lands of the far West, or even in manufacturing enterprises in one's home city? The capital stock of electric railways does not require to be refunded, and under sound financial and regulating policies the proportion of stocks to bonds outstanding would undoubtedly be much greater than is shown to have been the case. Under such conditions refunding difficulties would be almost negligible.

The record is not clear as to the amount of new money which may be required year by year, but a very conservative estimate places the figures at between $175,000,000 and $200,000,000 per annum, to be used in replacements, refunding obligations, extensions, and improvements.

For the purpose of restoring credit, it seems to be the general impression of all witnesses that the first necessity is for the industry to put into effect such economies of operation as will enable it to give good service at the lowest cost. Generally speaking, this can be done by the elimination of deadheads and other free service, the abandonment of non-profitable lines, and, where practicable, the substitution of one-man cars for heavier equipment, the modification of special taxes or provisions for paving, snow removal, street cleaning, tools, contributions toward the cost of public highways, bridges, etc., reduction of such rentals and power rates as may on investigation prove excessive, the co-operation with the public in developing faster schedules and installing skip-stops at convenient places, rerouting of cars, the use of trailer cars, keeping streetcar tracks clear of traffic and other congestion due to parking of motor cars on curbs, and the regulation of vehicular traffic. Much can also be done toward reducing the cost of operation by developing the proper spirit of co-operation with employees. All of the matters herein suggested properly come under the head of good management and regulation, and in some cases would entail legislation, but in our judgment they do not wholly solve the street car problem or invite needed capital into the industry.

During the past two years efforts have been made to meet the difficulty by increasing fares. In many cases this has helped to tide them over a difficult period, but it has not stimulated the confidence of the investor in the integrity of the industry. New capital is not flowing in that direction.

An effort has also been made in a number of communities to increase the short-haul riding habit as well as the revenues by the introduction of the zone system for fares. This system has proven generally successful in some of the European countries but it has met with varying success in the United States.

Fundamentally the theory of the zone system is logical. It is that a passenger pays for what he gets. Under the present flat fare charge the short-haul rider is paying for a service given to the long-haul rider.

The original failure of the electric railways to vary their rates of fare for transportation service based upon the length of the ride, as services in all other lines of business are sold, is, in our judgment, one of the contributing factors to their present financial condition. The electric railway industry is the only public utility which as an industry has consistently adhered to a flat fare basis. Steam and suburban roads charge on a distance basis. Gas, power, electric and water power companies generally make their rates upon a measured basis, subject to a minimum charge per month, and the telephone companies grade all toll messages on a mileage basis, while observing in most cases a flat rate per month for local service. Whether or not, under present conditions, it would be to the interest of a community to introduce a zone system of fares, instead of the present flat fare system, is a question which we think should be decided by the community itself, having reference to the social problems involved.

Labor on Street Railways

THE labor policies of the electric street railways will in the future be of great importance as an element in the restoration and the permanent maintenance of their credit. The full co-operation of labor is essential to the highest prosperity and usefulness of the industry. This is particularly true because in the case of the street railways the employees who immediately handle the service come into direct contact with the people who consume that service.

The evidence before this commission shows that in the past the suspensions of service due either to strikes or lockouts have been costly to both the employees and to the operating company, but the loss occasioned to those two groups has been secondary to the damage wrought to the public interest. The conditions which recurrently bring about such interruptions of service should be treated at their roots. The employees engaged in this occupation should have a living wage and humane hours of labor and working conditions. They should have the right to deal collectively with their employers through committees or representatives of their own selection. In all contracts and working agreements made between them and the employing companies, there should be arbitration provisions under which all labor disputes which cannot be voluntarily settled shall be submitted to boards of arbitration composed of disinterested persons. The award of such a board of arbitration should be final and binding upon both parties to the controversy; for it is intolerable that the transportation service of a city should be subject to occasional paralysis, whether by strikes or by lockouts. It would seem that public authorities could well interest themselves in the formulation of such plans and rules for the arbitration of labor disputes under these contracts as will secure justice to both parties and as will assure continuity of service in so far as that may be possible of achievement.

But the full co-operation of labor in the street railway industry will not have been brought about alone by the recognition of the right of collective bargaining which we have just been urging. Such recognition is but a foundation for full co-operation. The actual work of insuring it must come from the employees themselves to whom the right of collective bargaining is thus given. For that right carries with it a duty.

It would seem to be the duty of the organization which bargains for the individual worker to interest itself actively and unremittingly in his delivering to the company his best strength and intelligence.

This commission thinks that where the street railway worker has the right of collective bargaining, the public has a right to expect that the organization or association representing him will not only procure his wage but will also continuously stimulate his whole-hearted constructive co-operation with the company and his effective service to the public.

Valuation

IT IS the law that utilities are entitled to a fair return upon the fair value of their property used in public service at the time of the inquiry. The methods for finding fair value are in dispute. No permanent solution of the electric railway question can be found in the absence of a finding of value for rate-making purposes. This applies to commission form of regulation, cost-of-service contracts, or public ownership and operation.

The public should know what it is paying for, and this question cannot be settled without knowing what the property is worth.

Although some evidence was introduced before this commission on the subject of valuation, the commission discouraged the introduction of testimony upon this question, mainly because such testimony, no matter over how many weeks or months it might have extended, would have been but a fragmentary duplication of material already available in the official records of the Interstate Commerce Commission.

Pursuant to an amendment of the act to regulate commerce, approved March 1, 1913, which amendment is known as the "valuation act," the Interstate Commerce Commission has during the past seven years been engaged in valuing the steam railroads, telegraph and long-distance telephone companies in the United States. In connection with this work it has carried on a most extensive investigation into the subject of valuation for rate-making purposes, in the course of which investigation the carriers have been represented by a conference committee of fifty, assisted by able lawyers, accountants and engineers, while the public has been represented by the State Public Utility Commissioners, their counsel, and by the general counsel of the Interstate Commerce Commission. Every theory and principle of valuation has been fully and ably discussed, argued and briefed.

On July 31, 1918, the Interstate Commerce Commission submitted its report in Valuation Docket 2, Texas Midland Railway. This report contains a full discussion of the different theories of valuation considered, the method employed by the commission in assembling all the essential data, and discussion of the requirements of the Valuation Act and the findings of the commission upon most of the disputed questions. Subsequent decisions were made in the case of the Winston-Salem Southbound, Alabama, Birmingham & Atlantic and Kansas City Southern Railroads. We are informed that decisions affecting many of the other railroads will be made during the present year.

The first requirement of the valuation act is for finding of original cost. The commission is reporting original cost as fully as it possibly can be obtained from the best available evidence in each particular case. In its valuation proceedings it has been earnestly contended that the cost of reproduction new as of the date of inquiry should be taken to be the value of the property. Others have contended with equal earnestness that the value of the property should be limited to the original cost, as this item represents the money which has been actually invested by the stockholders and bondholders in the property.

The rapid increase in the cost of labor, supplies and material during and subsequent to the war period seems to have served as a peculiarly vivid indication that the original cost is a primary factor in finding value for rate-making purposes.

In our opinion, the decisions of the Interstate Commerce Commission, based upon long experience and investigation, will in large measure settle the standards of valuation. For this reason we suggest that municipalities and states which may be engaged, by arbitration or otherwise, in fixing the values of electric railways, should familiarize themselves with the practice, experience and decisions of the Interstate Commerce Commission in these valuation cases.

The valuation, when once fixed as the basis for the financial return of the company, should logically come to affect the amount of capitalization. No matter what may be the plan of operation or of public regulation under which the company is working, if its financial credit is to be strengthened through just and stable arrangements with a friendly public, it should, in the judgment of this commission, voluntarily reduce any excessive capitalization to conform to such valuation as may have been determined upon.

Protection and Preservation of Records

WE WOULD particularly urge public officials and officers of the electric railways to co-operate seriously in the protection and preservation of all corporate and financial and cost records.

Service-at-cost plans have been recently rejected by popular vote, largely on the issue of valuation, in Chicago, Denver and Minneapolis. The public, justly or unjustly, has become so suspicious of the electric railway companies that it may be expected to reject any service-at-cost or public ownership question submitted to popular vote, no matter how fairly the plan may be formulated, if they are not thoroughly convinced that the capital item has been fairly and honestly arrived at.

The failure of a railway company to preserve its records may in the end hurt its stockholders more than it may the public.

Automobile, Jitney and Motor Bus

THE automobile and jitney bus are facts. Jitney competition began about 1912, and was at first entirely unregulated. Even today in some places it continues without regulation of any kind, and in many places with only partial and inefficient regulation. In no instance, so far as this record shows, has this so-called "jitney" carriage of passengers been subjected to obligations as to the payment of taxes, maintenance of highways, character and extent of service, and financial responsibility for accidents, under which the electric railway business is being conducted. The portion of the street paved and maintained by the electric railway, and in winter cleared of snow at its own expense, is taken advantage of by the jitney competitor without compensation either to the company or to the municipality, and often to the serious injury of the street railway by interfering with the prompt and regular movements of its cars. The jitneys prefer to confine themselves almost exclusively to the short-haul traffic. It appears that in the city of Bridgeport the jitneys carry about 50 per cent of the passengers riding within 1¼ miles of the center of the city; almost 69 per cent of the passengers riding between 1¼ and 2 miles from the center; a fraction less than 45 per cent of those riding between 2 and 2¾ miles from the center, and none riding more than 2¾ miles from the center of the city.

The question is—from the point of view of the street railway service—what, if anything, is to be done about them? The public, through its governmental agencies, would not concern itself with the effects of this competition if it were not that local transportation is recognized to be an essential public service. So far as private automobiles are concerned, although they undoubtedly have their effect upon the extent to which people make use of the street cars, they are even now less important that human legs as a competitor of the electric railways, and it is not deemed to be consonant with the theory of American institutions and government that the free movement of private citizens by their own means of locomotion should be restricted in order to compel them to make use of public vehicles, whether the latter be operated by private agencies or directly by the government. All that could properly be done in this direction would be to compel the private vehicles using the public highways to pay license fees or taxes proportionate to the burdens they place upon the highways as compared with the burdens placed upon the highways by the street cars.

While there is some diversity of opinion as to the permanency of the electric railway industry in view of the improvements which are being made in the use of gasoline and electric power machines, the opinion appears to be nearly unanimous that the electric railway operating on tracks is the most efficient means of furnishing local transportation service in the urban centers. The future of the gasoline public conveyance in urban transportation is entirely unreckonable. Great strides have been made and greater strides will doubtless yet be made in its use. Local public authority would indeed be exercising a dangerous power in unduly restricting the use of new inventions for public transportation at a time when in nearly every large city the physical task, even for an electric railway well equipped, of carrying the public in decent comfort, is becoming so formidable. If jitneys and automobile buses acting as common carriers were subject to regulation by state commissions and were required to procure a certificate of public convenience and necessity before establishing a route or undertaking to render public service, the motor vehicle would be prevented from entering into active competition with street car service unless the latter is shown to be wholly inadequate.

That street railway service and jitney service cannot permanently exist and pay their own way in competition with each other under any ordinary urban conditions seems to be well established by experience and by the conditions inherent in local transportation service, but the belief is general that the motor bus may properly be used to supplement the service rendered by the street cars. The motor bus may be used to render a sort of supplementary service, such as the service now rendered on Fifth Avenue and certain other high-grade residential streets in New York City by the Fifth Avenue Coach Company, or the buses may be operated on other independent routes merely as feeders to the street railway system to take care of traffic in partially developed territory in advance of the time when street railway tracks can be laid with reasonable assurance that the investment will be self-sustaining.

Undoubtedly the whole matter of the control or abolishment of jitney competition may be summed up in a few words. All transportation service is for the public. Jitneys and automobile buses cannot be repressed merely for the sake of compelling people to ride on the street cars, particularly if the car fares are higher than the jitney fares and the car service less convenient than the jitney service. However, it is clearly in the public interest that all common carriers engaged in local transportation service should be required to render adequate and safe service, and that local transportation facilities should be developed in the most economical and effective way from the point of view of the community. Unnecessary and destructive competition ought not to be permitted, and the community at large should conserve the established facility that still is and promises to continue for an indefinite period the principal means of local transportation. The problem in a considerable measure is a local one, but in every case it should be solved with intelligent regard to the permanent interests and obligations of the community. If the street railways are to be allowed the benefits of even a qualified monopoly, they should be required to fulfill their obligations. They must render service that is adequate and convenient at rates that are attractive. The community can afford to go a long way to preserve street railway service, and the efficient regulation of jitney and motor bus competition will aid considerably in restoring the confidence of investors in the future of the electric railway industry and in increasing their gross and net revenues.

Depreciation

THE electric railways should adopt the policy of setting aside a depreciation fund with which to take care of replacements and thus preserve the integrity of their investment. It would have a very wholesome effect upon credit. Such has not been the practice in the past. Deferred maintenance has accumulated to an alarming extent during the war period.

Generally speaking, regulating commissions have the power to prescribe methods of accounting and to establish the amount of the depreciation fund. This practice should be observed, and its adoption will improve the situation of the industry and be greatly in the interest of the public welfare.

Extensions Should Be Paid for by Assessments on Outlying Property Benefited

YOUR commission would urge that in every community, where and to such extent as may be practicable, consideration be given to the advisability of requiring extensions and rapid transit systems of subway and elevated to be paid for, not out of new capital invested through the medium of bonds or stock, which means for all time an added burden upon the car rider, but from special taxes assessed against the owners of property in the district the value of which is enhanced by such extensions.

This would not be a new principle; it would be merely the application of an old principle. The American property owner has been accustomed to contributing out of the increase in value of his property to the cost of building streets and other public improvements. The principle is peculiarly applicable to improvements of city transportation systems because of the enormous increases in real estate values created when new extensions open up new territory or when the creation of rapid transit facilities make outlying territory more available.

The City Club of New York, in 1908, a few years after the extension of the New York subway from 135th Street to 230th Street, in Manhattan, had been built at a cost of $7,375,000, made an authoritative study of new real estate values created by that extension in the district lying between 135th Street and 230th Street. After deducting $20,000,000 as a liberal estimate, based upon studies of parallel situations, of the natural increase in property values in that district which would have taken place without the subway extension, it was found that the increase in values clearly brought about by the subway extension was $49,200,000, an amount upward of seven times the cost of the improvements. The property in the district enjoyed an increase in value of 104 per cent. If, by assessment, it had borne the entire cost of the extension in the district, it would have still retained a new profit on the value of the land of 89 per cent, or an aggregate of $41,825,000 for the district. The Manhattan extension just referred to, together with the Bronx extension beyond 135th Street, cost $13,075,000. These two extensions directly created, in a limited area lying near these extensions, new land values solely due to the extensions, of $80,500,000.

Let it be borne in mind that the cost of the entire subway system from the Battery to 230th Street in Manhattan and to Bronx Park was about $43,000,000.

In Philadelphia recent estimates of improvements in land values expected from rapid transit projects in contemplation have been equally enlightening. Similar results would be certainly obtained in many other cities by studies similar to that made by the City Club of New York.

Is it not in accordance with the laws of economic justice, then, that the landowner, as such, should share his benefit of increased land values with the public? Instead of the cost, $7,375,000, of the Manhattan extension being borne by the owners of land in the newly served territory, it was capitalized and translated into an annual charge of $350,000 or more, a burden which had to be borne out of the car fares and which today helps to intensify the financial predicament in which the company finds itself. If the public pays out of its fares for the cost of maintaining and operating the line which will bring the outlying land owner such enrichment, should the latter not share with the public out of that enrichment, depending upon the degree in which he is benefited, by paying for or by helping to pay for the initial cost of construction of the line? That such a solution is just is rather significantly shown by the fact that in a number of cities land owners in outlying districts have offered spontaneously to contribute large sums to the company to assist it in constructing certain extensions. The present predicament of the street railway companies is in many places partly due to overbuilding, a fault traceable to political or business pressures exerted by speculators in suburban lands who had little or no financial responsibility in connection with the street railway extensions which they caused to be built for their immediate benefit. This action of the suburban land owners of certain cities, on the other hand, is a significant expression of enlightened self-interest and a sound, constructive recognition of a fundamental principle of justice. The establishment of that principle by law, whether by changes in city ordinances, state statutes or state constitution, should, in our opinion, not be delayed. This thought is especially recommended to the attention of a number of communities which are now facing the necessity of extensions or rapid transit improvements.

Three points in this connection should be briefly touched upon: First, the amount of the assessment on any owner would probably have to become fixed by an appraisal some time after the construction of the improvement, and the owner should be given the option of paying his assessment in installments over a course of years. Consequently, the actual first financing of the extension might have to be by the city. Second, it will doubtless be urged by some that such a system for building extensions would lead to municipal ownership. On the contrary, it seems to us that, if properly administered, it could, by reducing the acuteness of the fare question, serve with much force to offset the pressure for municipal ownership. Third, as to the problems incident to allowing a private company, for a nominal rent and in return for undertakings as to repair and maintenance, to take over or use public property, similar problems incident to similar arrangements have already been ably and effectively handled in Boston and a number of other cities under state or municipal regulation in connection with subways and other structures.

If objection to the employment of such principles in constructing extensions be made upon the ground that public officers and land owners along the line of the proposed extension are thus given the power to vote such extension, let it be remembered that the problem of extensions is not only a serious financial problem, but is also essentially and finally a long-range social problem. The development of a city's street railways should be guided primarily not by the fortuitous financial experiences of a small group of bankers or real estate operators. It should be guided by the foresight and vision of ~~those~~ who are officially responsible for planning the city's growth and life, in terms of its water supply, its light, its streets, its sewers, its schools, its parks, its playgrounds, its civic centers, its night amusements, its community life, its libraries, its hospitals. It should be guided by those whose public duty it is to be interested in the health and happiness of the average city toiler and his family of growing children.

The call for municipal ownership today does not all emanate from dissatisfaction with the service in a narrow sense as riding facilities. It is largely an expression of feeling on the part of many that the street railway, instead of helping to make conditions bearable, is contributing to making them unbearable; that it is not, with the functions and powers which it exercises, accomplishing what it might accomplish to reduce the abnormalities of city life. While areas within the city remain undeveloped and unserved by adequate transportation, toiling thousands find themselves dragged out miles further—not to green lawns and spaces, but to a repetition of the same ugly congestion that they know in the city. The time will come when employers and educators will be forced to take cognizance of the impairment in working efficiency caused by such inconveniences as are suffered by the traveling public today. The time is approaching when cities will find it necessary to extend their street railways, not on the basis of new property values or the earnings of any single line of rails, but on the basis primarily of what will be most consistent with the public health and public economy.

These motives are strongly at work underneath our situation today. The public's control over stock issues, service, routes, extensions, etc., is needed today not only in order that as part of a plan for restoring the credit of the street railways the community's interest may be protected by the guarantee of efficient management, but also because the city of today is taking a more conscious, constructive interest in the city of tomorrow. That interest can be recognized and cared for under private operation if the public authorities have the suggested control. If such control does not come into effective existence, then one of the strongest forces making for municipal ownership will continue to exert an increasing influence.

Your commission trusts that this principle of paying wholly or in part for the construction of extensions out of special taxation of benefited property will be seriously studied and adopted, where possible. It seems fundamentally sound. While its adoption presents legal difficulties, as has the adoption of many another newly recognized industrial-economic relation, it holds great promise for reducing the financial problems incident to public transportation.

Rate of Return

IT IS an axiom that property devoted to the public use should secure a fair rate of return. Where money is represented by bonds the return is a part of the contract and is not changed during the life of the contract. Where capital is represented by stock the rate of return may vary according to the operating or financial conditions, and naturally it should compare favorably with the income upon other classes of investment. The undisputed testimony proves that the rate must be certain as well as reasonable to attract capital and that the absence of either of these essentials will frighten the investor away. It may be a lamentable fact, but it is nevertheless true, that most of the electric railways are obliged to go to markets outside of their territory to secure new capital; and under existing circumstances the investor is no longer willing to place his money in speculative properties. The experience during the war period has taught investors that a fixed franchise fare fails to meet the requirements of the industry and there is no dissent from the suggestion that such a fixed fare is a relic of a bygone age.

There are certain conspicuous examples of an adherence to a contract fare which may be referred to, but they do not affect our conclusion that the rate of fare must be subject to prompt revision according to the needs of the particular property.

The Regulation of Public Utilities

THE foundation stone of the relations between the communities and the companies must be the local authority under which they are permitted to conduct business. Since practically in all states the local government alone has the power to permit the use of highways by electric railways, the primary authority is the franchise grant or agreement containing the permit. Franchises are of varying terms and conditions. Until recently the franchises were generally limited to a certain number of years, but now it seems to be the settled conviction that such contracts are inherently imperfect. A reserve fund set aside during the term to take care of the property at the expiration of the franchise would result in increased charges for service; and, upon the other hand, the failure to take care of the investment in this way leaves the company at the will and caprice of the public. Instances have been referred to in this record where the railways are having difficulty in securing new franchises, while in some communities there seems to be a disposition to take over the property for junk values. Under these conditions it is natural for the company to neglect maintenance and give poor service. From the evidence it appears that there will be difficulty hereafter in securing new capital for properties that are governed by such franchises.

The undisputed testimony favors an indeterminate franchise by which the company is permitted to operate subject to the right of the public to take over the property by paying its value or agreed price. Such contracts protect both the investment against confiscation and the public against extortion by providing for payment of just compensation for the use of the property. The indeterminate franchise has been most thoroughly developed in the State of Wisconsin and it has been rec-

ognized in the District of Columbia, and the States of Indiana and Massachusetts. Its earlier adoption by other states and communities would have prevented many conflicts and misunderstandings. We believe that this form of franchise should receive the favorable consideration of the public.

Prior to 1907 the regulation of electric railways was principally confined to the municipalities. The history of this industry is replete with examples where municipal corruption has resulted from this control. The street railway is, however, an essential local institution and it cannot permanently prosper unless it has the confidence and co-operation of the public which it serves.

Since 1907 many states have taken over the control and regulation of this service and the communities within those states have been deprived of all jurisdiction. While the evidence shows that exclusive state control is preferable to exclusive municipal control, yet there appears to be a happy middle ground by which the municipalities may exercise control of the things that are peculiarly within their province and the state retain jurisdiction over all other matters and also exercise supervision over the action of the local tribunals. No general rule would fit all cases.

We have street railways which do not extend beyond the limits of a city; others where two or more systems operate in the same city, while frequently a single company operates in, through and between a large number of cities and villages. In New Jersey one system serves practically the whole state and the same condition exists in Connecticut. Manifestly no rule of thumb can apply to these different conditions. The tendency is to extend the mileage and service of street railways and to unite different companies under one management, and as our cities and villages grow and the rural country becomes more populous and prosperous these electric railways will extend their lines to meet the growing demands. Under such conditions, safety, efficiency and economy will be promoted by extending to a superior regulatory board the control of the practices, rules, regulations, security issues, the system of accounts and the charges to be paid for the service.

Effective local control is well-nigh impossible where a single company spreads out over an entire section of the state and this condition even constitutes a serious obstacle to municipal ownership. Where the street railway company operates wholly within one city there can be no insuperable objection to exclusive municipal control, when the people are ready and willing to exercise it. Secretary Baker testified upon this point as follows:

> Because I think the responsibility for the management of its own affairs is the greatest educational influence that the city of Cleveland has. The **fact that the people of the city had studied and grasped and solved an intricate and complicated problem like** the street railway problem has made them a more self-conscious and a stronger mcre virile people than they were before that problem was put up to them; and I should be sorry indeed to see the responsibility for their own affairs in as intimate and important matter as street railway service taken away and transferred to a state agency.

Cleveland has made a more intensive study of the electric railway problem than any other city in the country. Intelligent regulation cannot be secured without the assistance of expert operative, statistical and engineering departments and these are expensive items in any municipal budget.

In some respects uniformity is not only desirable but essential. This applies to the control of security issues, to accounting, the study and determination of depreciation and the control of such funds, fixing reasonable maintenance standards and their enforcement and the methods and principles to be employed in valuing properties, either for rate-making, capitalization, condemnation or purchase. In a general way the rules and principles which may be applied to the electric railway industry will be found available for other utilities such as telephone, electric light, heating, power, gas and water companies. In our judgment the state public service commissions should determine finally these matters, subject, of course, to an appeal to the courts where they err in judgment or transgress the law. Regulation by municipalities should be subject to an appeal to the state public service commission, thus bringing to bear upon the question involved the judgment of a body of men somewhat aloof from local influences. This would place the final authority in the state, and surely the communities, which are but subdivisions of the state, should prefer to submit their cause to a state tribunal in preference to a court, which rarely, if ever, has any regulating experience.

Theoretically, state control is removed from the influence of community prejudices. It certainly exercises its functions with a more judicial attitude and with greater equity to both the communities and the companies; probably it is in most instances more economical and more efficient, since the state can create a better and more comprehensive organization for regulation at less cost. State control obviates conflict of authority between communities that is bound to obtain when utilities operate beyond the limit of a single municipality. It makes unnecessary the erection of metropolitan or public utility districts in order to secure uniform regulation and it also results in a large saving to single communities which would otherwise be obliged to maintain its expert departments to perform this service.

The possibility of combining the best features of state and local regulation through a division of powers and duties was suggested by several witnesses and has been carefully considered by this commission. It would seem to be desirable to leave to the communities, at least in the first instance, the determination of such questions as the assignment of streets upon which the railways may operate, questions involving speed, stops, schedules, rerouting of cars and service during peak hours and otherwise, the extension of tracks, rate of fare, and the securing of certain statistical information where such information does not directly interfere with the accounting rules which have been prescribed by the state. Under these conditions the cities would be compelled to take a direct interest in the transportation business, leading to a more wholesome co-operation between the public and the railway. We believe this principle is worth trying, because it places the initial regulating responsibility upon the community, thus leaving the way open for sympathetic understanding and co-operation between the public and the industry, without which the industry cannot survive, and yet places the final responsibility upon the state, which is best equipped to determine the questions involved in a sane, consistent and impartial manner.

In a number of states, commissions now have complete authority over all questions. There should be no change if the people are satisfied with that policy. It has unquestionably worked well in most of those states. We do, however, desire to emphasize our belief that any form of regulation will fail of its purpose if it does not secure public co-operation in the conduct of the utility. Our study of conditions as they exist in the principal cities of the country has shown that unless the local public is in sympathy with the purposes of the management and lends assistance in their achievement, neither efficient or economical service is possible. Co-operation cannot be obtained unless the public be informed as to all phases of the electric railway problem—financial, economical and operating—and will not be continued unless the process of information is continued. This psychological factor involves a continuing task of undoubted magnitude, but whatever the regulatory authority may be, and however great the difficulties, the duty involved must be performed if the relations of the public and these highly essential utilities are to be maintained upon a basis that will insure proper service.

The electric railway problem admits of a satisfactory solution once the elements that compose it are made known and the processes of ordinary economic and business common sense are applied. The duty of both the public authorities and those who control the electric railway enterprise of the country is plainly indicated. The time has come for a permanent and satisfactory settlement of the traction question. The interests of both the public and the companies lie so exactly parallel in almost every respect that there ought not to be any serious difficulty in arriving at a solution if both parties approach the subject in a proper spirit.

Service-at-Cost Plan

THE electric railways have responded to the improvements in the arts and sciences, and it may also be said that the science of regulation has fairly kept pace with the requirements of public service and the growth of the industry. Franchises have been the result of experiment. The contract fare established an unsound rate basis, and in some instances commissions were slow to reach conclusions in rate cases. Investors lost confidence in the electric railway business. It was thought that a contract must be evolved which would meet all the requirements of the industry as well as of the public. Thus came the cost-of-service contract. It has worked well in Cleveland during the most difficult period in the history of the industry. It seems to have worked fairly well in the other cities where it has been tried out, and to justify the following statement made by Secretary Baker:

> I believe that any community in America will pay cheerfully and willingly whatever rate of fare is necessary to carry the people on their street railroads and to maintain good service in their communities, if they are sure that they are paying only proper operating expenses, proper maintenance, and a proper return on capital.

Practically all of the witnesses for the electric railway industry favored service-at-cost franchises. That service should be provided at cost is not a new principle in the regulation of public utilities. It is back of all public service commission regulation, and expresses the reaction from the original contractual relations between utilities and communities under which fares were fixed and limited, while return was not. The application of the term "service-at-cost" in recent working agreements between the electric railways and the cities of Cleveland, Cincinnati, Dallas, Montreal, and to a limited extent the city of Boston, does not clearly describe such agreements. They are, in effect, devices for automatically and quickly adjusting price to cost. It is, therefore, not so much the principle back of such plans as it is the method provided for carrying that principle out that concerns the commission in this phase of the traction problem. Without going into unnecessary detail, it will suffice to state that the main features of the contract are:

(a) Fair valuation of the property;

(b) Capitalization to conform thereto;

(c) Agreed return upon capital;

(d) Public control of capital issues, and, to a certain extent, over expenditures;

(e) Public supervision over management, operation and service;

(f) Automatic changes of rates to meet fluctuating economic conditions, and to insure a proper return on the value;

(g) Private operation, subject to the right of the municipality to purchase the property at its value or upon an agreed price;

(h) Reduction of taxes and assessments.

The service-at-cost contract is still in its experimental stage, and naturally a number of criticisms have been made of it. These have been considered, but with the limited experience under this contract we believe that the criticisms are more theoretical than real. If these defects prove to be substantial and result in unduly increasing the cost of service, they can be removed by improved regulation, but if they cannot finally be avoided, then it would seem that the public has ample protection in the contract's purchase provisions.

Generally speaking, the main criticism of this form of contract is that it tends toward inefficiency and uneconomic operation; that it contains no provision for the control of strikes or uninterrupted service, and that labor and management may co-operatively increase the cost of operation to the point where the public may be unduly burdened.

From the point of view of credit restoration, the outstanding advantage of this contract is that rates are automatically adjusted to meet changing operating conditions. We are inclined to think that the assurance of an automatic adjustment of fare will do more than anything else to restore the confidence of the investor in these properties. Public confidence will be immeasurably strengthened through the valuation of the properties, because the figure that is established constitutes the basis of the return to the investor and fixes, at least, the minimum price which the public will be obliged to pay if, at some future time, it should decide to purchase and operate the property. When the value is thus fixed there can be no further dispute as to capitalization or excessive profits, because the people will know just what they are paying for. The controlling element in its favor is the restoration of public confidence in the corporation due to the removal of those elements of friction which have so frequently engaged the attention of the public. It might also be said that to a certain extent it removes the railway from the idea of speculative gain and places them upon a common-sense business basis where the people pay for the service they get and where the opportunity for large profits no longer exists, since economies and lower operating costs are reflected in reduced charges for service. When the contract is once established the opportunity for municipal corruption is reduced to the minimum.

We strongly recommend the principles of the service-at-cost contract, not as the only solution, but as one means of solving a very difficult problem.

In cases where the electric railways operate in more than one municipality and between different municipalities, such service-at-cost contracts can properly, in our judgment, be made only with the public service commission, and in such cases the provisions of the contract should apply in any particular community to the system as a whole rather than to its individual parts.

Public Ownership and Operation

IT is urged by many that public regulation of the street railways has failed and that the properties should be taken over by the municipalities or the state. Dr. Delos F. Wilcox concluded his able and interesting analysis of the testimony given in this connection with that suggestion. Some members of the commission individually feel that eventually municipal ownership might prove generally desirable and that there may, perhaps, be communities in the United States in which on account of the responsibility of the local government and the acuteness of the present conditions municipal ownership should be resorted to. The experiences of Boston, San Francisco and Seattle are being watched with great interest, but they have not continued long enough to justify any conclusion as to the relative merits of public as against private operation. The commission is unanimous on this point: that there has not been sufficient experience with public ownership and operation of street railways in this country to enable us to recommend it as the permanent solution of this problem. In some of the foreign countries it has apparently worked well. We do not believe under present conditions that this method of operation would be successful in most of the cities of the United States today.

Aside from the serious question whether municipalities as at present organized can operate electric railways as efficiently and satisfactorily as private enterprises, our conviction upon this subject is based upon the great political difficulties which would have to be overcome, such as constitutional amendment, legislation and the fiscal burdens incident to the purchase by cities of great public utilities, and upon the further fact that in many sections of the country the lines of the railway extend through many cities and villages and into rural territory. It is assumed, however, that these latter difficulties could be mastered by a community thoroughly awakened to the necessity for such a change.

We are certain that much can be accomplished by private initiative, stimulated and aided by thorough public regulation; that the final solution could, in many communities, be found under private management, and that in any event the reforms which have been urged by the commission should be instituted, since these reforms would serve to place the relations between the street railway and the public upon a more just and equitable basis.

Conclusions

WE have conceived the scope of this inquiry to be to ascertain, first, the actual financial and service condition of the electric railways of the United States at the present time; second, the causes which have contributed to such conditions; third, what readjustments of the relations between the electric railways and the communities which they serve must be brought about in order to restore the confidence of the public and to put the companies upon such a financial basis for the future as will enable them to render continuous and efficient service to their respective communities.

We have not entered into a minute discussion of the different franchise provisions throughout the country, nor have we undertaken to suggest any details which should be incorporated into any new contract, but have preferred to confine ourselves to suggesting the broad outlines of such new relations.

The commission is not pessimistic as to the future. The electric railway problem admits of a satisfactory solution, once the elements that compose it are made known and the principles of ordinary economic and business common sense are applied.

The duty both of the public authorities and of those who control the electric railway enterprises of the country is plainly indicated. The time has come for stable and satisfactory settlements of traction difficulties.

The commission can go no further than to point out the principles upon which the readjustment should be based. The task is really that of the state and local authorities upon the one hand and of the companies upon the other. Failure to rehabilitate the industry and the service is possible only if those upon whom the responsibility rests fail to undertake the work or pursue it in a spirit that makes settlement impossible.

Respectfully submitted this 28th day of July, 1920.

(*Signed*) CHARLES E. ELMQUIST,
Chairman,
(*Signed*) EDWIN F. SWEET,
Vice-Chairman,
(*Signed*) P. H. GADSDEN,
(*Signed*) W. D. MAHON,
(*Signed*) ROYAL MEEKER,
(*Signed*) C. W. BEALL,
(*Signed*) LOUIS B. WEHLE,
(*Signed*) GEORGE L. BAKER

President Wilson has written the following letter to Chairman Elmquist, of the Federal Electric Railways Commission:

THE WHITE HOUSE
Washington Aug. 14, 1920.

My dear Mr. Elmquist:

Will you not accept for yourself and be good enough to extend to the other members of the commission my sincere thanks for the very able and valuable report upon the electric railway situation, which you have placed in my hands? I am appreciative of the self-sacrificing efforts of the commission members in so freely devoting their time to the task undertaken at my request, but I cannot but believe that the results achieved will prove to be full compensation for their efforts.

I very much hope that this report will receive the wide publicity which it deserves and that it will be closely studied by all local regulative authorities having to do with the affairs and interests of public service corporations.

Sincerely yours,
(*Sgd.*) WOODROW WILSON.

MR. CHARLES E. ELMQUIST,
Chairman,
Federal Electric Railways Commission.

HOURLY WAGE RATES (CENTS) OF CONDUCTORS AFFILIATED WITH THE AMALGAMATED ASSOCIATION OF STREET AND ELECTRIC RAILWAY EMPLOYES IN PRINCIPAL CITIES OF UNITED STATES AND CANADA AS OF JANUARY, 1920

(Exhibit attached to Commission Report. See page 403)

NOTE—The wages given in this table are for regular conductors operating the ordinary type of equipment on city service. The wages of motormen were in most cases the same, but on the Chicago elevated lines the motormen received 67 cents per hour, and on the Boston elevated lines the motormen received 56 cents per hour for the first 3 months. 57 cents for the next 9 months and 62 cents thereafter

City	First Three Months	Second Three Months	Second Six Months	Second Year	Third Year	Fourth Year	Fifth Year	After Five Years
Cities in United States								
Brooklyn (Surface Lines)	54	54	55	1st 6 mos.-55 2nd 6 mos.-57	57	57	57	57
Brooklyn (Rapid Transit)	52	52	52	54	57	62	62	62
Staten Island, N. Y	40	40	42½	1st 6 mos.-42½ 2nd 6 mos.-45	45	45	45	45
Chicago (Surface)	62	62	62	62	62	62	62	62
Chicago (Elevated)	60	63	63	65	65	65	65	65
Boston (Surface)	50	55	55	60	60	60	60	60
Boston (Rapid transit) guards	53½	54	54	56	56	56	56	56
Newark, Hoboken, Jersey City, Paterson, Elizabeth, Camden, etc	46	48	48	50	50	50	50	50
Detroit	50	55	55	60	60	60	60	60
Cleveland	55	58	58	60	60	60	60	60
Pittsburgh	49	52	52	54	54	54	54	54
St. Louis	50	50	50	55	60	60	60	60
New Haven, Hartford, Bridgeport, etc	44	44	44	45	46	47	48	50
Fall River, Lynn, Lawrence, Lowell, etc	46	49	49	51	51	51	51	51
Los Angeles	41	43	43	45	46	46	47	47
San Francisco	62½	62½	62½	62½	62½	62½	62½	62½
Buffalo	43	46	46	48	48	48	48	48
Rochester, Syracuse and Utica	41	43	43	45	45	45	45	45
Washington, D. C	46	49	49	51	51	51	51	51
Providence	51	54	54	56	56	56	56	56
Cincinnati	43	46	46	48	48	48	48	48
New Orleans	38	40	40	42	42	42	42	42
Oakland	48	51	51	54	54	54	54	54
Richmond, Va	37	37	37	38	39	40	42	42
Norfolk	43	45	45	47½	47½	47½	47½	47½
Seattle	59⅜	59⅜	62½	65⅝	65⅝	65⅝	65⅝	65⅝
Columbus, Ohio	41	43	43	45	45	45	45	45
Akron and Canton	43	43	43	45	48	48	48	48
Worcester	47	52	52	57	57	57	57	57
Louisville	41	43	43	45	45	45	45	45
Omaha	51	53	53	55	55	55	55	55
Denver	43	46	46	48	48	48	48	48
Portland, Ore	58	60	60	62	62	62	62	62
Toledo	42	44	44	46	46	46	46	46
Atlanta	36	38	38	40	40	40	40	40
Youngstown	43	46	46	48	48	48	48	48
Springfield, Mass.*	$4.23	$4.68	$4.68	$5.13	$5.13	$5.13	$5.13	$5.13
Memphis	42	42	45	45	48	48	48	48
Spokane	46	46	47	48	50	53	53	53
Birmingham	40	40	40	45	50	50	50	50
Dayton	46	48	48	50	50	50	50	50
Jackson, Battle Creek, Kalamasoo and Lansing	40	40	40	42	42	42	42	42
Salt Lake City	39	39	1st 3 mos.-39 2nd 3 mos.-43	1st 9 mos.-43 last 3 mos.-47	47	47	47	47
Des Moines	51	54	54	57	57	57	57	57
Nashville	42	42	45	45	48	48	48	48
Scranton	46	48	48	50	50	50	50	50
Wilmington, Del	51	53	53	55	55	55	55	55
Grand Rapids, Mich	45	48	48	51	51	51	51	51
Erie	46	48	48	50	50	50	50	50
Schenectady	41	43	43	45	45	45	45	45
San Antonio	40	40	40	42	42	42	42	42
Portland, Me	41	43	43	45	45	45	45	45
Trenton	46	48	48	50	50	50	50	50
Tacoma	50	50	55	55	60	60	60	60
Cities in Canada								
Montreal	37	37	37	40	44	48	48	48
Toronto	50	52½	52½	55	55	55	55	55
Vancouver and Victoria	45	45	50	1st 6 mos.-53 2nd 6 mos.-56	56	56	56	56
Winnipeg	39	39	41	44	47	47	47	47
Calgary	45	45	50	1st 6 mos.-55 2nd 6 mos.-60	60	60	60	60
Edmonton	35	35	37½	40	45	45	45	45
Ottawa	39	39	39	41	43	45	45	45
Halifax	38½	38½	40	41½	43½	43½	43½	43½
London	39	39	39	42	44	44	44	44

*Figures for Springfield, Mass., are per day.

The Survival of the Fitter

At Terre Haute, Ind., Jitney Buses Have Dropped from 200 to 43 and Have Been Forced to a 10-Cent Fare During a Period When the Trolley Cars Have More Than Doubled in Number and Stayed at 5 Cents in the Face of an Enormous Increase in Private Automobiles

BAUR'S DRUG STORE
THE PRESCRIPTION STORE
THE ROOT STORE

TERRE HAUTE, WHERE THE SAFETY CAR HAS DEMONSTRATED THAT BUSINESS FOLLOWS SERVICE

IT IS one of the freaks of nomenclature that the general manager of an electric railway which is more than holding its own should bear the name of Walker! That name has not been a handicap with his public, as will appear from the following record of what E. M. Walker has done on the Terre Haute lines of the Terre Haute, Indianapolis & Eastern Traction Company because of his thorough introduction of safety car operation on the basis that "Business follows service."

Earlier articles in the ELECTRIC RAILWAY JOURNAL have recited how this service was introduced line by line after due publicity and how the people of Terre Haute showed their approval and appreciation by patronage even greater than the increase in service. The purpose of the present article, however, is somewhat wider in scope, as it is intended to review a period that might be called "The Rise and Fall of the Automobile as a Competitor." It tells the tale of three significant years: 1913, when neither the private machine nor the jitney had made any real inroads upon the trolley; 1918, when it was evident that old-style electric railway operation could not live against the automotive vehicles of public or private character; 1919, when it was demonstrated that modern electric railway service can annihilate jitney competition where both cover the same route and that such modern service is helped rather than hindered by the riding habit inculcated by automobile ownership.

Terre Haute is one of those cities where it is possible for people of moderate means to own and use an automobile without feeling the pinch of garage rental. So the use of the gas wagon has grown there just as rapidly as in hundreds of other American communities. In 1913, when the population of the city alone was 60,000, there were but 900 machines; in 1918, 68,000 people owned fully 4,300 machines; in 1919, 72,000 people had 5,100 machines, and in the first six months of 1920, 75,000 people had 5,500 machines. This six-fold increase in seven years was matched in the non-city portion of Vigo County, where the number of automobiles rose from 300 in 1913 to 1,950 in 1920.

JITNEYS ARE NOW PRACTICALLY ON A HACKING BASIS

As if this lawful drain upon electric railway traffic were not enough, the company had to endure the unfair forays of the jitney, whose depredations began early in the World War. In 1913 this genus was unknown;

DIAGNOSIS OF JITNEY TRAFFIC, MARCH 4, 1920—PATIENT FAILING AND 10-CENT OXYGEN ORDERED AS A LAST HOPE

Weather—Rain, snow and cold, all day.

Periods observed:

6:45 a.m. to 8:10 a.m.	25	license numbers
10:45 a.m. to 12:10 p.m.	17	not observed in previous periods
4:30 p.m. to 6:00 p.m.	1	not observed in previous periods
Total number observed	43	

Routes—South Seventh
South Seventeenth
Twelve Points
East Locust

South Seventeenth and Twelve Points are in only partial competition with street car lines.

Number of jitneys observed on March 4	43
Number of jitneys observed with 1919 licenses	6
Number of jitneys observed with 1920 licenses	37

	South Seventh	South Seventeenth	Twelve Points	East Locust
Number operating all three periods	4	1	1	2
Number operating two out of three periods	3	5	2	4
Number operating only one period	4	1	9	3

Number of jitney buses operating on two different routes in same period...... 1

Number of jitney buses operating one route in one period and another route the other two..........

SERVICE BEGETS BUSINESS—SAFETY CAR OPERATION, COMPARED WITH ORIGINAL SAFETY CAR OPERATION A YEAR EARLIER, SHOWS THAT PATRONAGE CONTINUES TO OUTSTRIP ADDITIONAL SERVICE

South Seventh and South Third Line	Dec. 1 to 18, inclusive
North Eighth and Union Depot Line	Dec. 11 to 18, inclusive
South Seventeenth Street Line	Dec. 15 to 18, inclusive

	South Seventh-Third	North Eighth	South Seventeenth
Gross earnings, 1919	$6,370.45	$1,906.55	$852.75
Gross earnings, 1918	4,683.24	1,667.36	527.97
Increase over 1918	$1,687.21	$231.19	$324.78
Increase over 1918, per cent	36	14	61
Two-man car headway in 1918, min.	10	8	10
One-man car headway in 1919, min.	8	7	6
Increase in service, per cent	20	12½	50

by 1918 there were 200 making the trolley's life miserable. It was not until December, 1918, that the company began to install safety cars upon the general basis of cutting ten-minute headways down to eight, seven, six minutes or less. By the end of 1919 the number of jitneys had dropped to 125, and when 1920 rolled around not more than forty-three busmen were found willing to keep up the fight, and only thirty-seven of these men had "1920" licenses. Full surrender came April 1, 1920, with the announcement that on that date and thereafter the jitney fare would be 10 cents. Strictly speaking, this will reduce (or is it promote?) the jitney to a hacking basis, because quite a portion of the present service already is along trackless streets and therefore not in actual competition with the street cars.

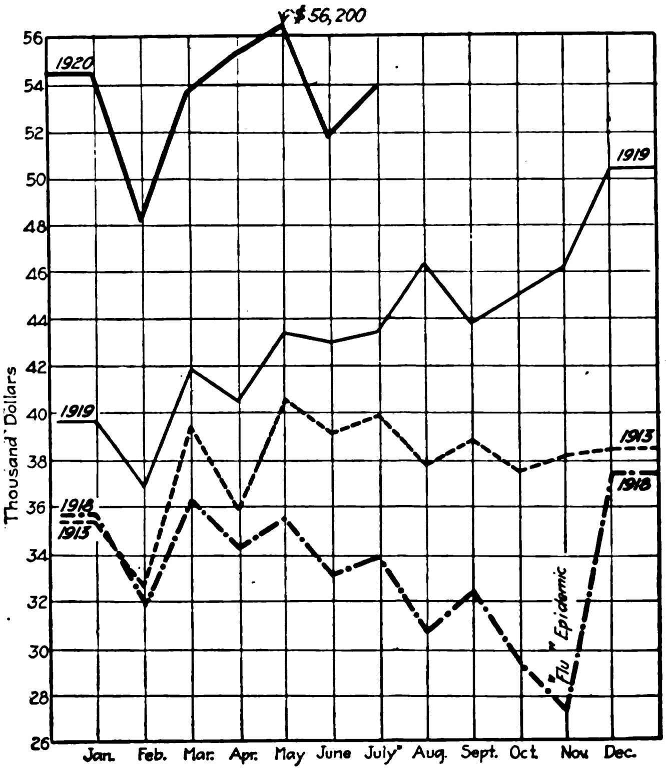
FROM DARKNESS TO LIGHT ON THE ELECTRIC RAILWAY

The year 1913 had been one of the best, if not the best, years in the history of the Terre Haute system. With six tickets for 25 cents and no competitor except the human leg, a population of 60,000 had taken 9,507,018 revenue rides, or 11,978,801 rides in all, making the respective numbers of rides per inhabitant per annum 160 and 199.5. By the year 1918 the population had risen to 68,000, but travel had dropped so badly that the respective riding indices were only 120 and 157. Reference to the graphs of the three years will show that from March, 1918, onward there was a most discouraging sag in traffic, accentuated still further by the influenza epidemic around October, but with a sharp upward turn in November, which was kept and improved upon through the inauguration of some safety car service in December. Throughout the year 1919 the company kept on replacing long-headway, old-car service with short-headway, new-car service, until the end of the year saw every route in the city equipped at least in part. At first, Mr. Walker had held the opinion that thirty to thirty-five safety cars would be enough, bearing in mind that some of the twenty-eight old cars once regularly operated could be used to help during rush hours. The response of the public proved so gratifying, however, that the first thirty new cars hardly sufficed to half equip the system. An additional twenty-five were ordered, and even this number was not enough. Consequently, the company ordered ten more, which, with the first safety car, gives a total of sixty-six new cars, against the twenty-nine old cars which Mr. Walker found in service upon his advent in the latter part of 1917.

VITAL STATISTICS OF THE SIGNIFICANT YEARS, SHOWING THE CONCURRENT INCREASE OF PRIVATE AUTOMOBILE AND ELECTRIC RAILWAY TRAFFIC DURING 1919 AND EARLY 1920

	1913	1918	1919	1920 (6 Mos.)
Population	60,000	68,000	72,000	75,000
Number of autos owned in city	900	4,300	5,100	5,500
Number of autos owned in Vigo County outside of city	300	1,500	1,700	1,950
Miles of city track	30	30	30	30
Revenue passengers carried	9,507,018	8,160,492	10,351,042	6,389,040
Employees carried	309,515	259,139	302,662	184,738
Complimentary passengers carried	66,896	39,694	7,299	189
Transfer passengers carried	2,095,372	2,200,114	2,603,427	1,392,880
Total passengers carried	11,978,801	10,659,439	13,264,430	7,781,920
Gross revenue, city lines	$452,736	$394,824	$518,627	$319,452
Jitney buses in operation	0	200	125	43
Car-miles, safety cars	0	77,572	1,428,380	1,288,882
Car-miles non-safety cars	1,968,400	1,717,597	1,036,802	208,382
Total car-miles	1,968,400	1,795,169	2,465,182	1,497,264
Kw.-hr. per car-mile	3.87	3.52	2.67	2.29
Earnings per car-mile, all city cars	0.2300	0.2109	0.2103	0.2133
Earnings per car-mile safety cars	....	0.2100	0.2110	0.2190
Safety cars operated	0	18(Dec.)	28	50
Non-safety cars operated	29	15	15	3
Total cars operated	29	33	43	53
Rate of fare	5c.	5c.	5c.	5c.
Tickets	25 for $1 6 for 25c.	25 for $1 6 for 25c.	None	None
Transfers	Yes	Yes	Yes	Yes

*Includes interurban cars at the average rate of 300 miles daily, on city track.



CITY RAILWAY EARNINGS TO THE NEAREST $100 BY MONTHS FOR 1913, 1918, 1919 AND FIRST THREE MONTHS OF 1920, TERRE HAUTE, IND.

The heartening response of the Terre Haute public to rapidly improving service is indicated by the fact that during 1919, with a population of 72,000, the riding climbed up to 10,351,042 revenue passengers and 13,264,430 total passengers, equivalent to riding indices of 145 and 184 respectively. Significant of still better results to come was the fact that the original safety car routes of December, 1918, showed gains of 14 per cent, 36 per cent and 61 per cent respectively when checked up a year later—safety car against safety car. One may prophesy that when the sixty-six cars are available to give 100 per cent safety car service the *trolley car* riding habit of Terre Haute will be better than it would have been had there been no private automobiles and jitneys at all to interfere with the business of the old-style operation.

An interesting sidelight on the development at Terre Haute has been the local financing of the later purchases of cars. In a period when electric railway credit had ebbed to its lowest point, the company had little difficulty in proving to the home folks that it had found a way to keep going. A second important point is that the company began installation of these money-saving and traffic-creating vehicles at a time when it had to ask no other increase in fare than the abolition of the cut-rate tickets as of Nov. 1, 1918. It has therefore had the advantage of operating under the happy conditions of a single-coin fare and a favorable public sentiment. There was a time, one may be sure, when the "Green Bugs" had many would-be squashers, but today there is a noticeable smirk of satisfaction on the face of every Terre Haute citizen who sees one of the numerous delegations that visit his burg to see how it's done!

Ole Hanson Discredits Municipal Ownership

Seattle Took Over the Traction Lines to Eliminate Politics, but Experience Shows That Lines Were Thereby Put Into Politics

THE famous ex-Mayor of Seattle, Wash., Ole Hanson, recently appeared before the Chicago Association of Commerce and spoke freely of the experience which has been had in Seattle subsequent to the purchase of the local traction lines by the municipalities. The views of Mr. Hanson, based on actual experience, were of particular interest to the citizens of Chicago, for Mayor William Hale Thompson and his political machine are trying by every means possible to bring about an end to the control of the local utilities by the Illinois Public Utilities Commission and to establish municipal ownership and a 5-cent street car fare.

Mr. Hanson's speech follows in part:

In discussing municipal ownership and operation of public utilities I do so only from the light of experience. I have cast theories into the discard. The stern facts, unpleasant as they may be to many, are illuminating, I think, to those who seek the truth.

I will tell you about our street car line. For years we had had the usual fight between the private corporation and the city government. Both were unquestionably to blame, and, because of their equality of wrongdoing, both had red entries in the ledger, when, by co-operation and understanding, both the citizens and the company would have been better off.

The war was on. I believed with others that the company was making money—plenty of it. Were not the cars crowded; didn't I have to stand? Were they not carrying more and more people daily? Yes, but when we "experted" the books we found that it was costing them more to operate every day, and that the more business they had the greater the loss. The government demanded better transportation for the shipyard workers, extensions, new equipment, etc. The company said: "We have just refunded a $12,000,000 bond issue and we paid 9½ per cent and do not know where we can get any more money."

After due consideration, the city of Seattle offered the company $15,000,000 for the car lines, houses, real estate, etc. The company accepted. Even then the city government did not close the deal, but submitted the proposition in plain words to the voters of Seattle. Every one was for it. It was a war measure and recognized as such. The Chamber of Commerce, the Central Labor Council, the building owners and every organization in Seattle approved the deal. The people voted and the vote stood over 4 to 1. After some months of legal quibbling, the council O. K.'d the deal. On April 1, 1919, we took over the physical operation of the lines.

THINGS GO WELL FOR A TIME

We had a superintendent of public utilities who was fearless, brave and honest. He inaugurated skip stops, one-man cars, and we had better transportation. We carried more passengers; we raised the pay of the workmen and, by careful, efficient business methods, success seemed certain. Then my health and poverty compelled me to resign. But a splendid man was chosen in my stead. He retained the same superintendent, but election day came nearer and nearer and, as three of our Council had to be re-elected, a change in vote was duly recorded in the Council chambers. Improvements which would have saved money were blocked; extensions which should never have been made for years were made at once; everything the lobby of special interest citizens wanted they got.

The superintendent pleaded and cajoled and begged, but the Council, which had voted to buy the car lines, were influenced by political considerations and progress was checked.

Then three candidates for Mayor filed and, to my surprise, the street car line became the dominant issue. The candidate who promised each section the most in service, extensions, etc., received the most cheers. The candidate who agreed to turn the management of the street cars over to a man without either courage or ability, but who would never fire a man or punish him, received the support of the car men and their friends.

Instead of taking the utilities out of politics they became the football of politics. When the votes were counted, the greatest promiser was elected. He fired the competent superintendent and appointed a political friend, and we realized what we were up against.

The first month the city operated the cars, April, 1919, it cost for operation 23 cents to run a car one mile. In the month of April one year thereafter it cost 31 cents to run a street car one mile. The average speed was greatly reduced. We had just been able to get by on a 5-cent fare. The fare today is 10 cents for a single ride—four tickets for a quarter. The present Mayor advocated at the beginning of his term the taxing of the citizens to pay for the car line. Verily, municipal ownership meant more than we thought.

POLITICS FATAL—PRIVATE OPERATION BETTER

In my best judgment, municipal ownership and operation of transportation lines, or any other utility where great numbers of men are employed, will never be really successful unless the great mass of people decide that brains are worth money, and that the men in charge are trained, competent, high-class men who can earn as well as receive as good compensation from the cities as they get in private employment. The spoils system must be abolished and the street car operated for efficiency and service and not for feathering some demagogue's political nest. The people themselves must agree that the car rider must pay for his ride and not the taxpayers, who, often, under some guise or other, are made to carry a part of the load. The employees of the city must be subject to the direction of the city officials and not of any outside body on the face of the earth. The employees must be paid a fair wage, and it should not be greater than the wage paid for similar employment in private life.

However, after due consideration, I am of the opinion that, under proper and just supervision by commissioners that are fair, the private company can furnish transportation at less cost than the average city government. Politics apparently cannot be kept out of the business of our municipalities, and politics is fatal to success.

I believe absolutely that the car rider must pay for his ride and not the taxpayer. I believe the capital invested in public utilities must be allowed to earn a fair and sure return on its investment. It is not true that the company's interest and the city's interest are opposed. Sometimes the corporations and sometimes the politicians have fostered this opposition, but it is wrong fundamentally.

Chicago is but at the beginning of its career as a city. Hate and strife will simply check Chicago's growth, hamper its future and delay its arrival at its sure destination of being the largest city in the world. The city's business is your business. The public utilities intrude upon every hour of your life. Any waste or unnecessary expense is simply loss to your city, to yourselves.

A commission has been appointed by the Warsaw government, according to a statement in the *Tramway and Railway World*, London, to gather information on the present position of the Polish railways and on electrically operated systems in other countries. The commission will then report to what extent it may be desirable to undertake the electrification of the Polish Railways.

Progress in Rail Joint Construction

Recent Developments in Rail Joint Construction Make This Subject of Particular Interest and a Review of the Progress Made Should Be of Benefit

By R. C. Cram
Engineer of Surface Roadway Brooklyn (N. Y.) Rapid Transit Company

BOLTED joints as well as the several types of welded joints have been given much careful study and experiment during the past few years and an attempt will be made to outline the progress made. In a general way, the form followed is that given in the progress report on rail joints presented in 1910 by the committee on way matters of the American Electric Railway Engineering Association (Proc. 1910, page 58).

The 1910 report gives the elements necessary to obtain a perfect rail joint, as follows:

> 1. The joint should prevent independent motion of the rail ends during the life of the rails. 2. The joint should be mechanically strong and should be such that the rail at the joint will be equal in strength and stiffness to the rail itself. 3. In the application of any joint it is essential that the top surfaces of the rail lie in the same plane.*
>
> It is to be noted that any joint that is suitable for paved tracks, the application of which does not result in continuous rails, will also be suitable for use in open track.†

The 1910 way committee report commented particularly upon the channel bar splice plate as used for girder rail joints and noted the tendency of these to buckle under loads applied in drawing up the bolts. A change in design was suggested in the proposal that the plates be made slightly concave to the web with the idea that the plates would flatten out and become practically vertical when the bolts were tight. This has been tried in a few designs such as that for the L.S. Co., section 95-400, but it is believed that the scheme has proven somewhat impractical, since it places too much dependence upon the strength of the bolts. The later, and what is considered the better, practice is to provide plates of greater thickness along their center lines and having a "bridge" shape providing ample clearance for concealed bonds, together with greatly increased bearing surfaces, such as the joints for the 7-in. and 9-in. grooved girder and 7-in. plain girder rails of the Engineering Association (see Engineering Manual, Wm 5a; Wm 4b; Wm 6a). Experience with the Engineering Association joints of the plain bolted type for 7-in. grooved girder rails has indicated that these joints are a vast improvement over any previous designs for simple mechanical joints and it is the writer's belief that the "bridge" type of plate is now being used quite extensively for bolted joints in grooved girder rail work.

Along this line, attention is called to the "recommended design" for similar "bridge" type of plates for the Engineering Association's recommended design of 7-in. 80-lb. and 7-in. 91-lb. plain girder rails, as found in the Engineering Manual, Wm 6a. The writer understands that these plates have never been rolled, but they have great merit, and it is hoped that the companies will take up their use with these rails so that information may be developed as to their value as compared with the manufacturers' design now in use.

It is quite certain that better results would be secured with plain bolted joints for girder rails if the splice bars and bolts were heat-treated and the subject should have further attention. As noted hereafter in remarks upon joints for open tracks, it is also quite certain that proper tests would clearly demonstrate that long, heavy 12-bolt joints are no more efficient than shorter heat-treated 8-bolt joints for deep girder rails. Some companies insist upon using 8-bolt joints for 7-in. grooved girder rails. Here again it may be remarked that heat-treated splice bars with single-row 6-hole drilling are probably just as efficient, and marked savings in joint costs can be had through a careful study of these features.

It is hardly necessary to repeat that it is the general practice to lay rails butt-tight in paved street work, no matter what kind of joint is used. The bugaboo of expansion under such conditions has long since been banished. But where bolted joints are used in pavements, attention is called to the suggestion of the 1910 committee on way matters to the effect that the holes in the rails for bolted joints should be only 1/16 in. larger than the diameter of the bolt to be used. It is thought that current practice now goes even farther and requires the holes in the rails to be 1/16 in. less than the diameter of the bolt, and that the hole shall be reamed during application of the plate to the diameter of the bolt, securing a reamed tight fit, all of which tends to prevent future play.

OPPOSITE VERSUS STAGGERED JOINTS

There is an increasing tendency toward placing joints opposite each other in paved track construction. This is particularly true where cast welds and other forms of welded joints are used. With cast welds it is very desirable so to place them in order to lessen the rocking motion imparted to cars by "staggered" joints where some of the joints are "cocked" up above the general level of the adjacent rails.

The "opposite" method permits shop punching of tie-rod holes. It is only necessary to pair the rails for length in order to have the shop-punched holes come opposite in the street. Damaged railheads are often found opposite "staggered" joints, where the latter become defective. Such damage lessens the relaying value of these rails.

The chief disadvantage that may be ascribed to "opposite" joints is the fear that in event of both joints becoming defective there would be more trouble from noise and derailment. However, this is not a serious matter because of the marked improvements in all forms of joints and "opposite" welded joints are known to have been in service more than twenty years without causing such troubles from their failures.

Where bolted joints of the base-supported type are used it is necessary, if the "staggered" method is followed, to install tie plates of a thickness equal to that of the base flanges of the joints on the ties opposite the joints. Otherwise the rails will not lie in the same plane unless the ties are adzed to receive the base flanges of the joints. Either scheme is expensive and the "opposite" method obviates these difficulties.

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*The writer would add to this that the same thing may be said with respect to the rail bases, particularly where a base-support type of splice bar is to be used.

†To this the writer would add a fourth item as follows: 4. The joint should have a conductance at least equal to that of the rail section to which it is applied.

Observation of special trackwork has also indicated that "opposite" joints in the curved rails and other parts are not objectionable provided the joints are of proper design and carefully installed with bolts of high tensile strength.

The statement made in the 1910 way committee report can be repeated as follows: "It appears that tracks in paved streets should be laid with 'opposite' joints."

Some form of bar which provides greater strength than the ordinary angle bar is believed to be necessary, and patented joints such as the 100 per cent, the Duquesne, the Bonzano, the Continuous, the Weber, the Wolhaupter, the Superior and the Abbot are widely used. The patents on several of these joints have expired.

The tendency toward the use of heat-treated bolts of high tensile strength is also recognized and good practice now requires their use. Such bolts are included in the recommended specifications of the American Electric Railway Engineering Association for material for use in the manufacture of special trackwork (Eng. Man. Ws 4b). It is also to be noted that the use of heat-treated angle bars is increasing. The Pennsylvania Railroad has conducted an important series of tests to ascertain the relative stiffness of its standard joints under transverse load with the view to increasing the stiffness either by change in design or by heat treatment. The results showed that while ordinary rail joints have a lower elastic limit than the unbroken rail, joints made with bars of suitable design and heat treated have elastic limits higher than the continuous rail. The complete report, in Appendix G attached to the report of the committee on rail of the American Railway Engineering Association, Proceedings, 1919, Vol. 20, page 561, is worth study by electric railway engineers.

Some Conclusions by Mr. Cram

1. The importance of rail joints and their direct influence on roadway structures cannot be overestimated, as the effect, both directly and indirectly, on the service, maintenance, public relations and reputations in the community can too often be traced largely to shortcomings in the design, application or serviceability of the rail joints employed by the railway company.

2. It has often happened that a particular type of rail joint has been employed on important track structure without proper consideration being given to the exact qualifications a joint must possess in order to meet the service required. Consequently, the lack of such qualifications, in the type of joint finally adopted, has resulted disastrously for want of reliable engineering knowledge.

3. The importance of thorough grinding of all rail joints of whatever type to a true head surface cannot be emphasized too strongly. Way engineers should be permitted to have a sufficient number of grinding machines to permit joint grinding immediately after installation.

4. Way engineers have been devoting time and money to the development of too many specialties in rail joints. An attempt should now be made to combine their experiences in some practical way which will result in a satisfactory solution of the joint problem.

5. A most business-like way of accomplishing this task would include the performance of a series of carefully planned tests, including physical and chemical analysis and a scientific examintion of every type of joint and welding process in current use in the industry. This should be done by the American Electric Railway Engineering Association and in co-operation with an unbiased authority such as the United States Bureau of Standards.

The principal points brought out are: (1) Plain angle bars properly designed and heat treated have an efficiency, at lower cost, equal to continuous joints and slightly greater than Bonzano joints untreated; (2) heat-treated plain bars should only be used with heat-treated bolts; (3) heat-treated bars should only be purchased under specifications and inspection which will insure that the treatment has produced in the bars the properties which are essential in order to secure results equal to those found in the tests; (4) it appears that there is nothing to be gained in strength under transverse loading by using a 6-hole instead of a 4-hole joint; (5) no loss in efficiency is to be expected from a reduction in the length of the splice bar to 18½ in.

As these tests were made on joints for 100-lb. standard section rail there may be some difference in results from similar tests of joints for 80-lb. rails, which are extensively used by electric railways, but it is probable that proportionately similar results would be found in similar tests.

This is certainly a matter which could well be investigated by the American Electric Railway Engineering Association.

FEW WELDED JOINTS IN OPEN TRACKS

The use of welded joints in open tracks has not been very extensive. The reason for this is principally that there are difficulties in providing for expansion and contraction. Some lack of facility in repair of failures has also been feared. It is probable that the benefits accruing from a continuous rail in tracks of electric railways, where the rails carry the return circuit and where the costs for joint bonding are high, have not been thought sufficient to offset the greater cost for maintenance of bolted joints. It may be a surprise to some engineers to learn that a long stretch in one of the tracks of a four-track high-speed electric railway system in New York City has been in operation with electric bar-weld joints since construction in 1907. The tracks are in open cut. There have been few joint failures and no troubles have developed from the use of the necessary expansion joints. The rails are 80-lb. A. S. C. E., and the joints will no doubt outlive the rail. The results of this test should tend to overcome the dislike which way engineers have for continuous rails in such situations.

SPECIAL FORMS OF BOLTED JOINTS GIVE GOOD RESULTS

The riveted joint is considered as a special form of bolted joint. Where such joints are designed as simple structural splices, without providing either head or base support, they have failed signally. On the other hand, when proper plates have been provided, of sufficient thickness to withstand the tendency toward buckling under riveting pressure and with broad bearing under the rail head and upon the base, they have given fairly good results. Riveted joints were used in Cleveland as long ago as 1892.

The idea of embodying a combination riveted-welded joint was originated by C. H. Clark in Cleveland, Ohio, and the joint has since been successfully used in Baltimore and other cities.' The original scheme consisted in riveting regular channel-bar plates to the rail ends and then thermit welding the base of the rail and lower portion of the plates. This weld was intended to give the joint sufficient permanent conductance and provide a strut directly at the joint to prevent any vertical movement of the rail ends.

The cost of the equipment and tools required when calculated to include all items was found to be such as to make the cost of the joints higher than many others. Here the arc welder was employed to reduce the initial cost of such joints, which resulted in arc welding of a portion of the edges of the plates to the head and base of the rails. This obviated the use of the thermit welding and reduced the cost of the joint considerably.

Through the efforts of H. B. Nichols, the Philadelphia Rapid Transit Company was successful in perfecting a composite joint, which for many years has been extensively employed on that system. This joint is composed of specially shaped plates well riveted to the sides and the bases of the rails. The voids between plates and sides are filled with spelter or similar metal to assure a reliable, uniform support to the head and to produce a permanent electrical contact. This joint has proven quite successful in the hands of the originator and his immediate successors, although it is believed its scope will be confined to Philadelphia, because the installation of joints of this type requires heavy apparatus of a costly nature and entails handling and maintenance problems of considerable importance, which are sufficient cause for other railways to avoid their use.

In recent years when continuous joints have been used in paved streets the practice of using machine-fitted bolts with them has increased. The rails and splice plates are drilled with circular holes fractionally smaller in diameter than the diameter of the machine bolts. The plates are held in place by drift pins while the holes are reamed to bolt diameter; the bolts are then driven home, and thoroughly tightened under car traffic.

CAST WELDS PROPERLY MADE ARE SATISFACTORY

There must be a reason why some railways continue to use the cast-weld type of joint, and those engineers who continue to use it claim that the results now obtained from this joint are equal to and in some cases better than those obtained by any other welding process, when based upon accurate statistics covering percentage of failure. The average annual percentage of failures for more than 15,000 joints upon one property is 0.004 per cent, with joints from one to eleven years old and an average age of four years. Furthermore, the electrical conductance test of these joints covering four successive years shows no appreciable change. This is a very important item in connection with any form of joint, and the one which continues to give high conductance throughout its life merits careful consideration.

The good results now obtained are largely due to extreme care in installation, the betterment of mold design and an appreciation of the fact that the metal must be brought up to such a height as to secure a thorough bearing under the rail heads. The failure to appreciate the last-named point has been the cause of more failures than any other one factor, and it may be noted that the overlooking of the same point with other forms of weld has contributed to their failures also in no little degree.

There have been claims made from time to time that the cast welding process injures the metal in the rail heads, tending to soften it through the sudden application of the hot metal. These claims were apparently based on the dishing or cupping which sometimes develops in the receiving rail head. However, most of this dishing has proven to be the result of either the failure to grind the heads to a true surface or to insufficient grinding. It has also been due at times to failure to keep the joint butt-tight during the welding, thus leaving a slight but often non-apparent "open joint" in the weld. This will usually cause cupping in any kind of a joint. Its effect is increased with the cast weld due to the anvil effect of the mass of metal which tends to resist the blows from the car wheels, increasing the force or effect of the blow, upon the head metal.

The writer understands that recent tests made by R. W. Hunt & Company, for the Twin City Rapid Transit Company, clearly indicate that the heat does not cause a softening of the rail heads.

The use of the thermit type of welded joint has increased of late. Since the report of the way committee on the thermit process of rail welding, in 1910, very radical changes have been made in that process of welding and in 1912 an entirely new method was perfected known as the "thermit insert" weld. It was necessary to make a radical change because experience proved that the first thermit weld, brought out in 1903 and 1904, in which only the base and flange of the rail were welded, was not of sufficient strength due to the fact that the head was not welded. The next development, made in 1908, was to cast-weld the entire rail section with thermit steel, including the head. This, however, developed another weakness due to the melting of the head of the rail and the softening of it at that point. The result was that a number of these welds showed bad indications of cupping. In 1912, however, the thermit insert weld was perfected. In this the base and flange are cast welded with thermit steel, as is also the head of the rail on the outside of the head. The head along the gage line, however, is not melted, but is compressed on an insert cut from rail steel and inserted between the heads of the rails before welding, the rails being spaced ¾ in. apart for this purpose. The high temperature, combined with the tremendous compression caused by the expansion of adjacent rails against the insert, serves to butt-weld this insert firmly to each side of the head of the rail, so that the final result is a weld of the entire section. This is then ground to form and is ready for service. The thermit insert weld was first installd in 1912, but was not used on an extensive scale until 1918.

The improvement brought about in this joint in addition to the butt-weld of the insert comprises the following very important points: (1) The amount of thermit required to make the weld has been reduced to practically half that previously required, due to the preheating of the addition to the thermit charge, the addition being packed in a sheet iron container and heated red hot at the time the rail is being preheated preliminary to welding; (2) a new method for luting molds has been perfected by which runouts have been practically eliminated. Asbestos strips soaked in molasses are placed around the rails just inside of the mold box. These are compressed betwen the mold and the rail and form a very effective luting. Powdered fireclay is then blown in under air pressure and, being caught by the molasses, tends to seal any small holes which might still remain. Should there be a break in the asbestos, making a runout possible, it can immediately be detected during the fireclay test as the fireclay can be seen blowing out at that point. Such a defect can readily be sealed with the fireclay luting on the outside.

It is understood that no changes in method are contemplated this year except in certain apparatus. A smaller preheater is now being developed and possibly a small rail grinder will be put on the market.

ELECTRIC BAR-WELD JOINTS HAVE DEMONSTRATED THEIR GREAT STRENGTH

The 1910 report states that the weakness shown by the cast-weld, which is designated as "slip," also occurs to a degree in the electric weld. It is now believed that there were very few instances where the failure of electrically welded joints was due to a failure of the central weld. With the plain bar joint what may have appeared to be a "split" or failure of the central weld was in the great majority of cases caused by the loosening of shims due to excessive undercutting of the rail ends in the first instance, which prevented a firm bearing from being obtained over the entire rail ends and causing the bearing to take place only at the very top of the rail.

As the surface of the rail wore off under traffic this bearing finally became so slight that the shims did not remain in place, leaving an opening between the adjacent rails which caused a "pound" on the receiving rail and finally fractured the web of the receiving rail above the central weld. A failure of this kind, when viewed from the street surface, would give the impression that the central weld had failed, whereas the fact was that the web was split horizontally above the central weld of the receiving rail, but the central weld itself was as firm as ever.

In addition to the above many joints have been noted on which the receiving rail was very badly pounded and dished, but the central weld was still perfect. To overcome this difficulty the head support joint was brought out, in which spelter was poured into a space between the welded bars and the under side of the rail head. Experience proved, however, that while this was a step in the right direction it did not entirely overcome the trouble, owing to the gradual flowing out of the spelter from between the bar and the rail head as the head wore thin, and fractured rail webs on the receiving rail were still too numerous. The chock joint was then adopted. In this a drop-forged chock, several shapes of which are made to conform to various shapes of rails, is welded to the under side of the head of both rails and to the back of the head at the same time that the central weld on the bars is made. This really welds a portion of the abutting rails together and effectually overcomes any tendency of movement on the part of the receiving rail independent of the running off rail.

The chock type of joint is being used at the present time on nearly all girder rails and it is claimed that there have been no failures due to the receiving rail going down. It is claimed that there have been very few failures of the chock joint due to rail breakage, although on joints first installed there were some failures from chocks which had not been properly welded due to inexperience of the operators on this form of weld, and most of the failures were due to the parting of the chock from the rails without any fracturing of the rails.

The failure in bar-weld joints due to fracture of the rail at the end of the bars is not so much due to deterioration of the steel caused by the welding process as it is to the concentration of all of the stress on a small area of cross section of the web of the rail. When such joints withstand a tension of more than 400,000 lb. it shows how slight must be the deterioration which actually takes place in the metal due to the welding process. There is no other process of welding that will show the high tensile strength per square inch produced by the process of resistance welding and holding under pressure while the weld cools. The trouble is that in the bar joint the weld is applied to the weakest member of the rail, the web.

TRUE BUTT-WELD MADE BY NEW PROCESS APPLYING OLD PRINCIPLE

A new process of butt welding of joints has recently been put on the market by the company which has long exploited the electric bar-weld process. It is, in some respects, a reversion to the earliest form of butt weld as originated by Elihu Thomson and it is being produced under the Jacobs patents. In this process a true butt weld is made between the adjacent rail ends and no additional metal is introduced at the joints. It produces a truly continuous rail, eliminating the joint entirely.

The rails are first placed with the ends about ½ in. apart, being held by a clamp with hydraulic rams for forcing the rails together after a welding heat has been reached. The rail-ends are surrounded by a clay mold, leaving a rectangular receptacle of which the rail ends form part of the side surfaces. The terminals of a 30 to 50-kw. generator are clamped to each rail, but no current will flow as long as the rails are not in contact. A melted flux is then poured into the mold, which provides a path for the current from rail to rail. The resistance of the flux causes it to heat very rapidly so that in a few minutes a temperature of 2,800 to 3,000 deg. is obtained, and the rail ends, being in contact with this hot material, are heated to a welding heat, at which time the rails are forced together through the flux and their entire ends are welded to each other. Grinding the burr off the head, groove and tram completes the process. In case a joint should break it is a simple process to grind off the burr on the under side of the head and tram, and on the top of the flange on each side, and to put on a pair of joint plates, without the necessity of cutting off a piece of rail, which is generally necessary for the repair of any other form of welded joint.

It is possible by the use of two independent clamps, one on each rail, to set one joint while the joint on the opposite rail is being welded, and a joint can be made in from 20 to 30 minutes. The actual time for the current to be on a weld is from 8 to 10 minutes. In Pittsburgh last December twenty-six joints were made by this process under very unfavorable weather conditions. One parted through the weld during the winter, but this failure was attributed to insufficient pressure due to trouble with the hydraulic pump caused by the cold weather.

The principal advantage claimed for this process is that the whole of the rail ends are uniformly brought to a welding heat due to the circulation of the hot flux over them, so that a homogeneous weld is produced over the whole rail section. However, the process is not available for joint repairs, owing to the need for drawing the rails together during the welding. In repair work the pavement prevents this.

The electric arc-weld joint is a new type of welded joint which came into use about 1913. Its use is an outgrowth from the use of arc-welding apparatus originally designed for the building up of cupped joints and hard centers in special trackwork. The universal use of welding apparatus for the latter purpose offers a comparatively cheap and convenient method of joint welding and, as a result, there are several such joints which have been installed with an insufficient knowledge of the proper methods and regardless of consequences.

Arc-weld joints are made up in two general forms, although there have been numerous modifications of these by individual railway companies by way of experiment. In one form, plates of special shapes are welded to the sides of the rail webs around their entire periphery. The plates are staggered in position so that the welding lines of one plate do not come opposite those of the other, preventing burning through. One form of this general type brings up the outside plate to a bearing for the support of the rail head, while other styles of plates of this type have a bearing on the bases only.

In the other general form, rectangular plates quite similar to plain joint plates are arc-welded along their top and bottom edges to the heads and bases of the rails. The structure thus formed is a box girder with a central rib (the rail web). In both forms the plates are held in place before welding by bolts or clamps. Both general types of joints have been used for repair of defective joints as well as for joints on new rails.

In the box type the web of the rail tends to prevent the adjustment of the members to the condition created by the welding. The plates are in a highly heated state, while the rails remain comparatively cool. Shrinkage stresses thus produced are often sufficient to draw up the rail bases at the edges, resulting finally in a fracture, either through the rail near the joint or in the weld itself. The web-plate type is subject to conditions which are more or less similar and an examination of several installations of arc-welded joints of both types reveals defective conditions which are very unsatisfactory. Many failures have occurred in the rails at or near the ends of the plates. Welded seams first crack and then give way, and once the failure is complete the entire joint usually has to be cut out.

It is understood that practically all of the failures in the web-plate type have been due to one of the following conditions: Failure to regulate current, resulting in either burning or melting instead of welding the electrode; attempt to weld rail covered with rust, cement or other foreign substances; use of wrong grades of welding steel; use of second quality rail very high in carbon; application of joints to rail ends already crystallized by pounding of car wheels and failure of operator to direct the arc jointly between the two members, resulting in failure to make a perfect weld.

Several schemes have been tried, or are being tried, for overcoming and reducing these difficulties. Some have failed, while others have not yet had time to prove their worth.

ESSENTIALS FOR SUCCESS OF ARC-WELD TYPE OF JOINT

There is considerable apprehension as to the results which will ultimately be obtained from attempts to apply this process to high carbon steel rails. The arc-weld method is the one which requires the nearest approach to theoretically correct principles and its success will be based upon an accurate application of electric energy correctly measured by thoroughly skilled operators. The skill of the operator, however, is an essential to the success of any joint process.

The working conditions, materials to be welded and the welding material proper must be carefully considered. The use of special welding-quality steel plates of proper design, and of suitable welding rods and other materials composed and manufactured especially for this purpose, are very essential factors in producing even an approach to good results. There are altogether too many cases of promiscuous use of joints of this type where the conditions, materials and apparatus are neither known nor correctly used, while really skilled operators are exceedingly rare. These factors lead to doubts on the writer's part as to ultimate results which will be obtained from this type of joint when accurately compared with other types of welded joints.

It is thought that the subject of arc-weld joints is one which will bear very careful investigation and that the general application of such joints should not be taken up too hastily. However, the ease with which this type of joint may be installed by skilled operators, the simplicity of the apparatus proper and the economic features are so attractive that it is earnestly hoped that a successful solution of the difficulties attending the process may be found.

Make Anthracite from Bituminous

THE burning of raw bituminous coal is uneconomical, as the market for coal-tar products has made the volatile portion more valuable for other purposes. George Esherick, Jr., in a recent paper presented before the Kentucky Mining Institute indicates a process that will convert bituminous coal into a fuel resembling anthracite. The requirements of such a fuel are that it be smokeless, easily burned and cheap.

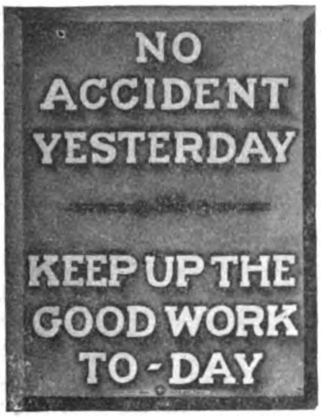
The process is as follows: Raw coal is crushed and fed continuously into low temperature horizontal retorts by means of paddles. The volatile products, i.e., tar, gas and ammoniacal liquor, are treated as in coke-oven practice. The residue which is continuously discharged from each retort is softer than coke, contains 8 to 10 per cent of volatile matter and burns readily. It could be used directly in a power plant as fuel under boilers, but is not in a condition to market for general use. In the next step of the process this semi-coke is ground, mixed with pitch, fluxed and passed through a briquet press. The raw briquets are then carried to inclined retorts and again distilled, dumped and quenched.

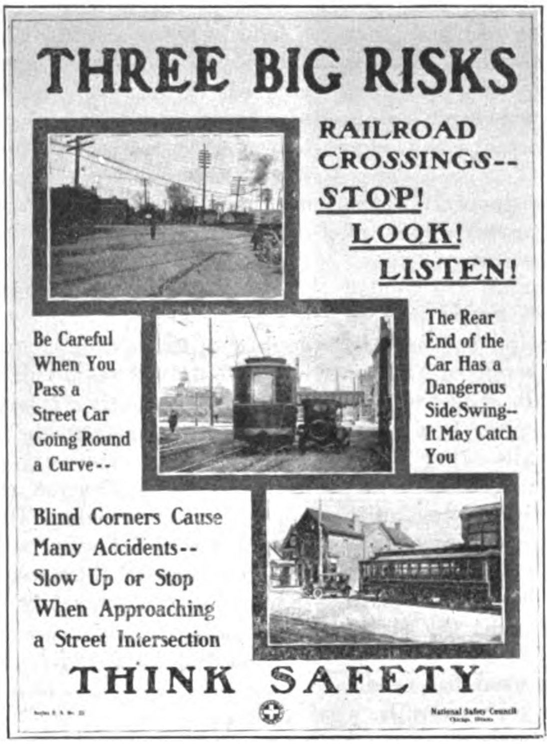
The yields of "carbocoal," as it is called, and the various byproducts depend on the coal used. A coal of the following typical analysis, moisture 3 per cent, volatile matter 35 per cent, fixed carbon 55 per cent and ash 7 per cent, will yield, per ton, carbocoal, 1,400 lb.; tar, 30 gal.; gas, 9,000 cu.ft.; ammonium sulphate, 20 lb.; light oil from gas, 2 gal.

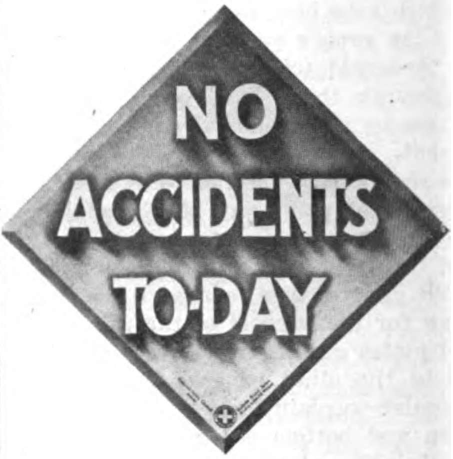
The carbocoal has a B.t.u. content of about 13,000 and burns with a clean light ash. It has been used with success in several plants and a large plant for its production is now being erected at Clinchfield, Va.

Such attempts as these are preferable from a conservation standpoint, Mr. Esherick thinks, to attempts to pulverize or change raw coal without first extracting the byproducts. Power producers will watch the development of the process with interest.

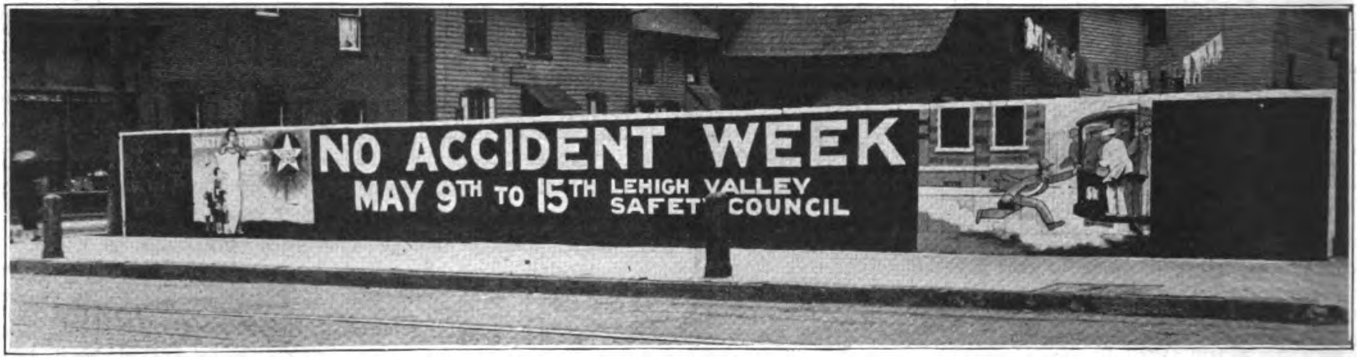
Some Reasons for Success of "No Accident" Week in Allentown


NO
ACCIDENT
YESTERDAY
KEEP UP THE
GOOD WORK
TO-DAY

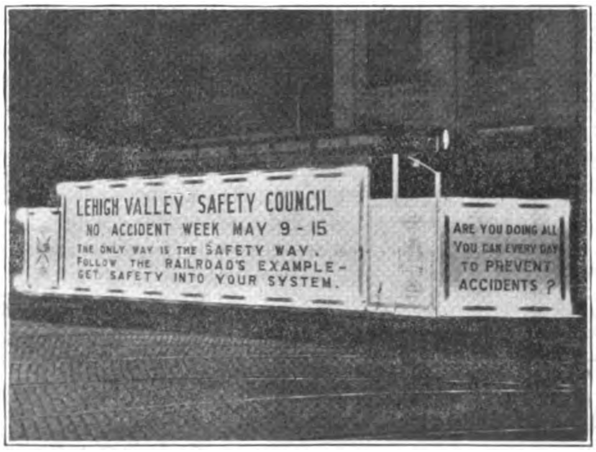

THREE BIG RISKS
RAILROAD
CROSSINGS--
STOP!
LOOK!
LISTEN!
Be Careful
When You
Pass a
Street Car
Going Round
a Curve--
The Rear
End of the
Car Has a
Dangerous
Side Swing--
It May Catch
You
Blind Corners Cause
Many Accidents--
Slow Up or Stop
When Approaching
a Street Intersection
THINK SAFETY
National Safety Council
Chicago, Illinois


NO
ACCIDENTS
TO-DAY

The Lehigh Valley Transit Company helped make the "no accident" week in the Lehigh Valley a success. The illustrations show some of the publicity used in the drive, which was described in the July 10 issue of the ELECTRIC RAILWAY JOURNAL.


NO ACCIDENT WEEK
MAY 9TH TO 15TH
LEHIGH VALLEY
SAFETY COUNCIL

SAFETY
ALWAYS


LEHIGH VALLEY SAFETY COUNCIL
NO ACCIDENT WEEK MAY 9 - 15
THE ONLY WAY IS THE SAFETY WAY.
FOLLOW THE RAILROAD'S EXAMPLE -
GET SAFETY INTO YOUR SYSTEM.
ARE YOU DOING ALL
YOU CAN EVERY DAY
TO PREVENT
ACCIDENTS ?

TICKET OFFICE
THE SAFETY MOVEMENT ISN'T
A THEORY IT'S A CRUSADE

Encouraging Thrift

Alert Management of Philadelphia Rapid Transit Shows Men How to Spend Intelligently and Save —Budget Book Furnished with Instructions

THE Philadelphia Rapid Transit Company has been doing some excellent educational work among the employees of the company with reference to the proper division of income into the various items of expenses and saving.

A family budget book is furnished to every employee of the company and, in addition to supplying blanks upon which expenditures may be listed and analyzed, this book gives hints on how to save and typical budget divisions for various wages which might be received by the employees.

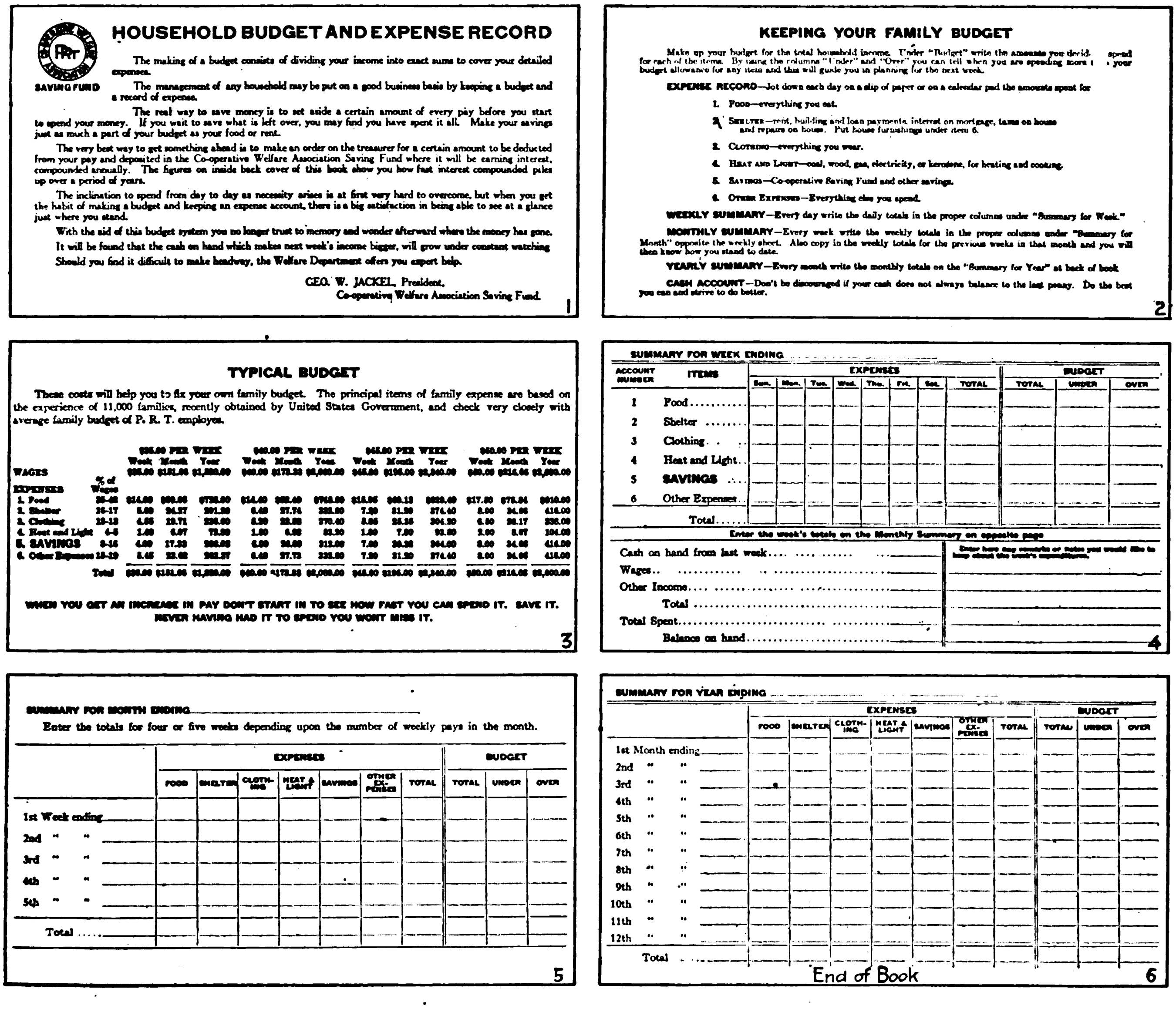
The accompanying illustration shows the details of the budget book with the pages indicated by numbers, 4 and 5 being repeated in sufficient number to make up the entire year.

The principal items in the "typical budget" are based on the actual experience of 11,000 families as reported by the United States Census Bureau and check closely the type of expenditure of the average family of P. R. T. employees.

The budget is based on the average family of five persons, consisting of husband, wife and three children.

Employees of the company have been urged to sign the slip authorizing the co-operative association of the Philadelphia Rapid Transit Company to deduct from $1 to $10 a week from their pay envelopes for saving. The money is placed in the company saving fund. Interest at 5 per cent, compounded annually, is paid. The little table in the back of the booklet shows that a man saving $1 a week for thirty-five years under this plan will have $4,814.07 at the end of that time, and one saving $10 a week would have ten times that amount, which placed at 5 per cent interest would give him $962.80 a year income in interest.

The response to this effort of the management of the company is most gratifying. In July out of 10,000 employees nearly 7,200 were depositors in the co-operative welfare saving fund and their yearly savings amounted to $980,752. This money is invested in car trust certificates of the company.



HOUSEHOLD BUDGET AND EXPENSE RECORD

SAVING FUND

The making of a budget consists of dividing your income into exact sums to cover your detailed expenses.

The management of any household may be put on a good business basis by keeping a budget and a record of expense.

The real way to save money is to set aside a certain amount of every pay before you start to spend your money. If you wait to save what is left over, you may find you have spent it all. Make your savings just as much a part of your budget as your food or rent.

The very best way to get something ahead is to make an order on the treasurer for a certain amount to be deducted from your pay and deposited in the Co-operative Welfare Association Saving Fund where it will be earning interest, compounded annually. The figures on inside back cover of this book show you how fast interest compounded piles up over a period of years.

The inclination to spend from day to day as necessity arises is at first very hard to overcome, but when you get the habit of making a budget and keeping an expense account, there is a big satisfaction in being able to see at a glance just where you stand.

With the aid of this budget system you no longer trust to memory and wonder afterward where the money has gone.

It will be found that the cash on hand which makes next week's income bigger, will grow under constant watching

Should you find it difficult to make headway, the Welfare Department offers you expert help.

GEO. W. JACKEL, President,
Co-operative Welfare Association Saving Fund.

1

KEEPING YOUR FAMILY BUDGET

Make up your budget for the total household income. Under "Budget" write the amounts you decide [illegible] spend for each of the items. By using the columns "Under" and "Over" you can tell when you are spending more [illegible] your budget allowance for any item and this will guide you in planning for the next week.

EXPENSE RECORD—Jot down each day on a slip of paper or on a calendar pad the amounts spent for

1. FOOD—everything you eat.
2. SHELTER—rent, building and loan payments, interest on mortgage, taxes on house and repairs on house. Put house furnishings under item 6.
3. CLOTHING—everything you wear.
4. HEAT AND LIGHT—coal, wood, gas, electricity, or kerosene, for heating and cooking.
5. SAVINGS—Co-operative Saving Fund and other savings.
6. OTHER EXPENSES—Everything else you spend.

WEEKLY SUMMARY—Every day write the daily totals in the proper columns under "Summary for Week."

MONTHLY SUMMARY—Every week write the weekly totals in the proper columns under "Summary for Month" opposite the weekly sheet. Also copy in the weekly totals for the previous weeks in that month and you will then know how you stand to date.

YEARLY SUMMARY—Every month write the monthly totals on the "Summary for Year" at back of book

CASH ACCOUNT—Don't be discouraged if your cash does not always balance to the last penny. Do the best you can and strive to do better.

2

TYPICAL BUDGET

These costs will help you to fix your own family budget. The principal items of family expense are based on the experience of 11,000 families, recently obtained by United States Government, and check very closely with average family budget of P. R. T. employes.

		$35.00 PER WEEK			$40.00 PER WEEK			$45.00 PER WEEK			$50.00 PER WEEK		
		Week	Month	Year	Week	Month	Year	Week	Month	Year	Week	Month	Year
WAGES		$35.00	$151.66	$1,820.00	$40.00	$173.33	$2,080.00	$45.00	$195.00	$2,340.00	$50.00	$216.66	$2,600.00
EXPENSES	% of Wages												
1. Food	35-42	$14.00	$60.66	$728.00	$14.40	$62.40	$748.80	$15.95	$69.12	$829.40	$17.50	$75.84	$910.00
2. Shelter	16-17	5.60	24.27	291.20	6.40	27.74	332.80	7.20	31.20	374.40	8.00	34.66	416.00
3. Clothing	12-13	4.55	19.71	236.60	5.20	22.53	270.40	5.85	25.35	304.20	6.50	28.17	338.00
4. Heat and Light	4-5	1.40	6.07	72.80	1.60	6.93	83.20	1.80	7.80	93.60	2.00	8.67	104.00
5. **SAVINGS**	8-16	4.00	17.33	208.00	6.00	26.00	312.00	7.00	30.33	364.00	8.00	34.66	416.00
6. Other Expenses	15-19	5.45	23.62	283.37	6.40	27.73	332.80	7.20	31.20	374.40	8.00	34.66	416.00
	Total	$35.00	$151.66	$1,820.00	$40.00	$173.33	$2,080.00	$45.00	$195.00	$2,340.00	$50.00	$216.66	$2,600.00

WHEN YOU GET AN INCREASE IN PAY DON'T START IN TO SEE HOW FAST YOU CAN SPEND IT. SAVE IT. NEVER HAVING HAD IT TO SPEND YOU WONT MISS IT.

3

SUMMARY FOR WEEK ENDING

ACCOUNT NUMBER	ITEMS	EXPENSES								BUDGET		
		Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	TOTAL	TOTAL	UNDER	OVER
1	Food											
2	Shelter											
3	Clothing											
4	Heat and Light											
5	**SAVINGS**											
6	Other Expenses											
	Total											

Enter the week's totals on the Monthly Summary on opposite page

Cash on hand from last week
Wages
Other Income
Total
Total Spent
Balance on hand

Enter here any remarks or notes you would like to keep about the week's expenditures.

4

SUMMARY FOR MONTH ENDING

Enter the totals for four or five weeks depending upon the number of weekly pays in the month.

	EXPENSES							BUDGET		
	FOOD	SHELTER	CLOTHING	HEAT & LIGHT	SAVINGS	OTHER EXPENSES	TOTAL	TOTAL	UNDER	OVER
1st Week ending										
2nd " "										
3rd " "										
4th " "										
5th " "										
Total										

5

SUMMARY FOR YEAR ENDING

	EXPENSES							BUDGET		
	FOOD	SHELTER	CLOTHING	HEAT & LIGHT	SAVINGS	OTHER EXPENSES	TOTAL	TOTAL	UNDER	OVER
1st Month ending										
2nd " "										
3rd " "										
4th " "										
5th " "										
6th " "										
7th " "										
8th " "										
9th " "										
10th " "										
11th " "										
12th " "										
Total										

End of Book

6

PAGES WHICH MAKE UP THE BUDGET BOOK FURNISHED TO ITS EMPLOYEES BY THE PHILADELPHIA RAPID TRANSIT COMPANY. PAGES 4 AND 5 ARE REPEATED ENOUGH TIMES TO MAKE UP THE ENTIRE YEAR

Comparative Power Sources

THE United States Geological Survey has just published the kilowatt-hour output of public utility plants for the first five months of 1920. The figures are based on returns from about 3,000 plants, including central stations, electric railways and certain other plants that contribute to the public supply. The total capacity of the plants reporting is about 90 per cent of the plants listed. The average daily production for the five months was as follows: January, 124,700,000; February, 119,000,000; March, 120,800,000; April, 119,300,000, and May, 114,600,000.

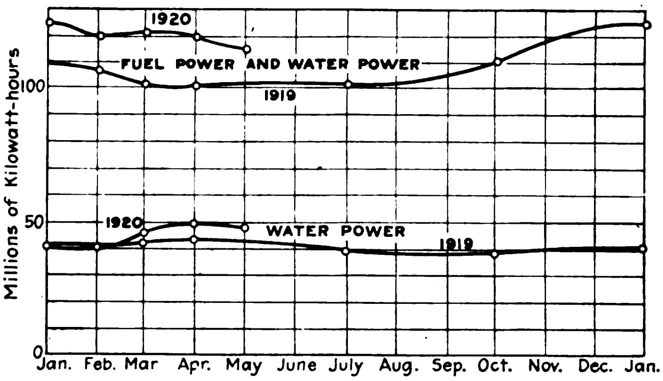


CHART SHOWING AVERAGE DAILY PRODUCTION OF KILOWATT-HOURS BY PUBLIC UTILITY PLANTS IN THE UNITED STATES, 1919 AND 1920

The proportion of monthly totals produced by water power is 33, 33, 38, 41 and 42 per cent respectively.

The mean daily output for 1920 was 119,860,000 kw.-hr. and in 1919 for the corresponding period was 102,680,000, and thus represents an increase of 16.7 per cent. The total fuel consumption in 1920 was: Coal, 15,933,213 short tons; petroleum, 5,292,206 barrels; gas, 7,914,114,000 cu.ft.

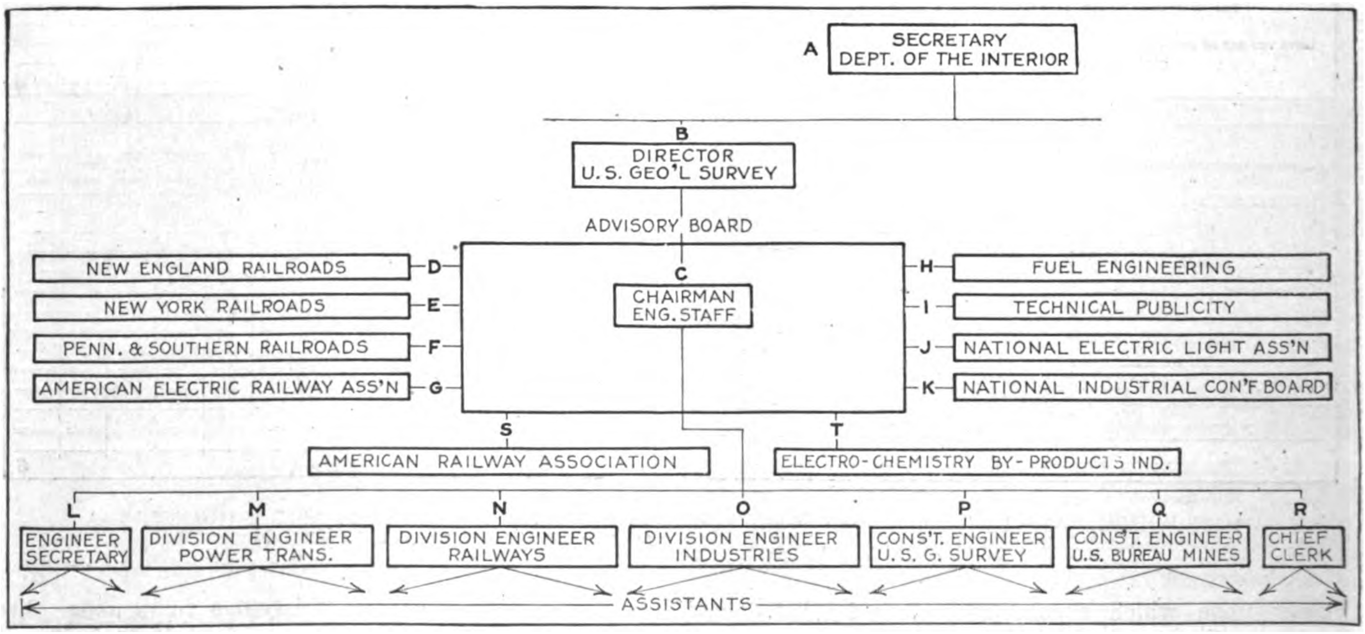
It is interesting to note that Montana, Washington and California produced 40 per cent of the kw.-hours produced by water power during the five months and if New York's water power production is also considered the four states produced 50 per cent of the total energy generated from water powers.

Super-Power Survey Staff Organized

THE chart below shows the organization for the super-power survey between Boston and Washington as announced by W. S. Murray, chairman of the engineering staff. The advisory board consists of all interests directly connected with the super-power survey. The seven engineering assistants will be occupied in collecting and preparing field data.

As the object of the investigation is to allocate the wastes in labor, fuel and other materials used in power production and in transportation in the eastern seaboard district and the design of a regional power system to eliminate these wastes, it was considered advisable to form three divisions, with a chief for each. The divisions are those of (1) power and transmission, (2) railways and (3) industries, and an engineer-secretary collaborates with these division chiefs in the collection and presentation of the field data in the survey report which is due June 30, 1921.

Meetings of the advisory board will be called not less than every two months, when the chairman of the enginering staff will review the progress of the work and the procedure for the next two months will be outlined. It is expected that all field data will be collected by May 1, 1921, so that two months will be available for final preparation of the reports.


A
SECRETARY DEPT. OF THE INTERIOR
B
DIRECTOR U. S. GEO'L SURVEY
ADVISORY BOARD
C
CHAIRMAN ENG. STAFF
NEW ENGLAND RAILROADS
D
NEW YORK RAILROADS
E
PENN. & SOUTHERN RAILROADS
F
AMERICAN ELECTRIC RAILWAY ASS'N
G
H
FUEL ENGINEERING
I
TECHNICAL PUBLICITY
J
NATIONAL ELECTRIC LIGHT ASS'N
K
NATIONAL INDUSTRIAL CON'F BOARD
S
AMERICAN RAILWAY ASSOCIATION
T
ELECTRO-CHEMISTRY BY-PRODUCTS IND.
L
ENGINEER SECRETARY
M
DIVISION ENGINEER POWER TRANS.
N
DIVISION ENGINEER RAILWAYS
O
DIVISION ENGINEER INDUSTRIES
P
CONS'T. ENGINEER U. S. G. SURVEY
Q
CONS'T. ENGINEER U.S. BUREAU MINES
R
CHIEF CLERK
ASSISTANTS

ORGANIZATION CHART AND PERSONNEL OF ADVISORY BOARD AND ENGINEERING STAFF FOR SUPER-POWER SURVEY

A. John Barton Payne, Secretary Department Interior.
B. George Otis Smith, Director U. S. Geological Survey.
C. W. S. Murray, consulting engineer, New York, chairman engineering staff.
D. E. G. Buckland, vice-president N. Y., N. H. & H. R.R.
E. A. T. Hardin, vice-president N. Y. C. & H. R. R.R.
F. Appointment not made.
G. John H. Pardee, president A. E. R. A.
H. L. P. Breckenridge, head department mechanical enginering, Yale, chairman advisory board.
I. James H. McGraw, president McGraw-Hill Company.
J. Appointment not made.
K. Magnus W. Alexander, managing director National Industrial Conference Board.
L. Henry Flood, Jr., consulting engineer, Pittsburgh, Pa.
M. L. E. Imlay, consulting engineer, Niagara Falls, N. Y.
N. Cary T. Hutchinson, consulting engineer, New York.
O. Henry W. Butler, consulting engineer, New York.
P. N. C. Grover, chief hydraulic engineer, U. S. Geological Survey.
Q. O. P. Hood, chief mechanical engineer, U. S. Bureau of Mines.
R. J. J. Madigan, chief clerk, U. S. Geological Survey.
S. R. H. Aishton, president American Railway Association.
T. Appointment not made.

Another Argument for State Regulatory Commission

THE *Electrical World* commented editorially last week as follows with reference to the Denver strike:

> The destruction of life and property which attended the strike of the Denver Tramway Company employees may be attributed in a measure to the peculiar regulatory system existing in Colorado. In a test case before the Colorado Supreme Court brought by the municipal authorities at Denver it was held that that city and other home-rule cities in Colorado could regulate their public utilities to the exclusion of the state authorities. However, when local regulation became effective in Denver trouble ensued. Lower fares were fixed by ordinance, necessitating a lower wage scale, and naturally a strike resulted. Cars stopped running, business was paralyzed, and newspapers which had theretofore proclaimed home-rule regulation as a victory for the people reversed themselves and urged the recall of the Mayor. Conditions became normal again in Denver only with the restoration of the higher wage scale and the 6-cent fare. The causes of the recent disturbance were not very different from those which precipitated the previous strike, and they call attention anew to the fallacies of home rule and municipal regulation. The moral is very plain and the prayer of every public utility manager should be, "From the machinations of local politicians and municipalities good Lord deliver us!"

There may be, and doubtless are, many other elements which entered into the reasons for the strike, independent of those causes for the subsequent riots, but at the bottom was the inability of the company to make both ends meet on the wholly inadequate fare imposed by the city commission in its "home rule" ecstacy.

Excitation of Alternators

IN ITS July issue the *General Electric Review* summarized the discussion on exciters and exciter systems which was a feature of the A. I. E. E. convention held June 29 to July 2 at White Sulphur Springs. The summary pointed out that the field of exciter systems was covered by a number of papers from manufacturers, from operators and from engineers having to do with the design of new stations. It was noticeable that all of the authors attempting classification of exciter systems divided them into two general classes: First, the common bus system with exciters operating in parallel, and, second, separate exciters or individual exciters for each generator not operating in parallel. This division was independent of the method of drive. The general conclusion reached from the opinions expressed in the papers and brought out in the discussion was that for plants where the speed is not too low or too high to obtain a good design of exciter, the direct-connected individual exciter provides a most reliable form of excitation at the lowest cost. There are some engineers, however, especially those connected with large city central stations, who still prefer the common bus exciter system on account of the fact that a storage battery can be operated on this bus at all times, ready to take up the excitation load in case of exciter trouble. The general opinion, however, and the trend of present practice is toward the individual direct-connected exciter, which has the advantage that its circuit to the generator field is short and simple and not liable to trouble, that its method of drive is exceedingly reliable and efficient and that trouble on the exciter affects only one generator.

Suggestion to Railway Employees

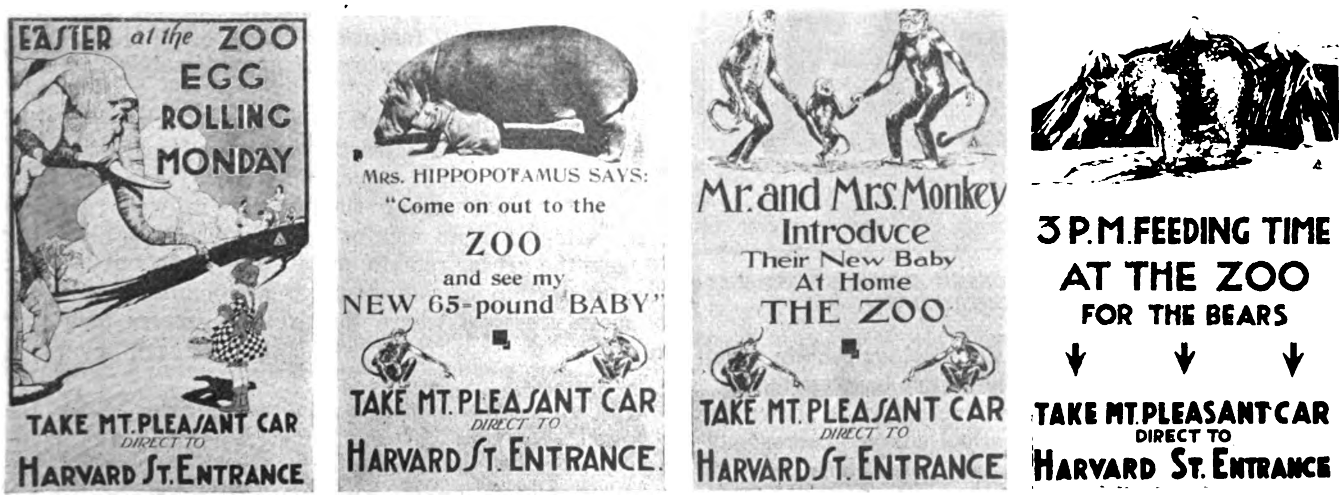
IN ITS latest monthly bulletin the National City Bank of New York suggests to railway employees how they may gain their desired control of or at least a voice in the management of the railways. The same plan, of course, is applicable to electric railways. The bulletin says:

> The railroad wage bill after the new wage scale goes into effect will be about $3,600,000,000 per year, and if the employees would set aside 5 per cent they could begin to accumulate an interest in the railroads at the rate of $180,000,000 per year. If this was applied to the purchase of stock rather than bonds they would come quite rapidly into an influential position in the control of the roads, particularly if they concentrated their purchases upon certain systems. The New York Central system has $222,729,300 of stock outstanding, now selling in the market at about $70 per share, or at a valuation of $155,950,510 for the entire stock. A majority would give control and even a respectable minority interest would give representation.

Something New in Selling Transportation

INTRODUCING a new angle to the publicity work of a railway, the Washington Railway & Electric Company of Washington, District of Columbia, has been issuing some very interesting "zoo" posters which it has used in its cars to encourage more passenger traffic to the National Zoological Collection in Rock Creek Park.

Four of these posters are shown in the accompanying illustrations, but it is impossible to do full justice to the artistic quality of these posters in a halftone reprint. The posters are 14 x 21 in. in size and are printed very artistically in colors, mostly yellows and browns.

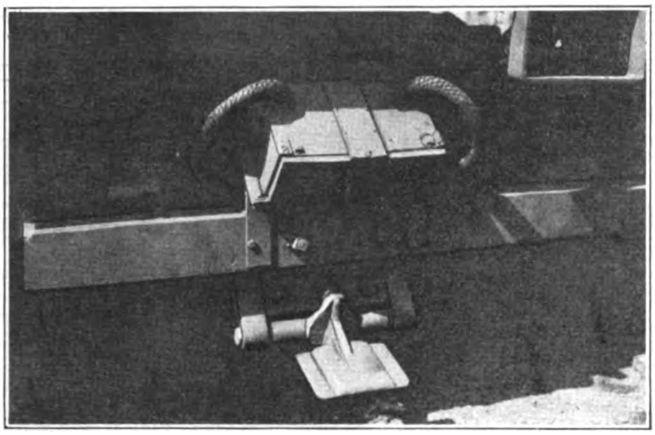


ZOO POSTERS USED BY THE WASHINGTON (D. C.) RAILWAY & ELECTRIC COMPANY TO ENCOURAGE STREET CAR RIDING TO THE ZOO

Third Rail Shoe Maintenance

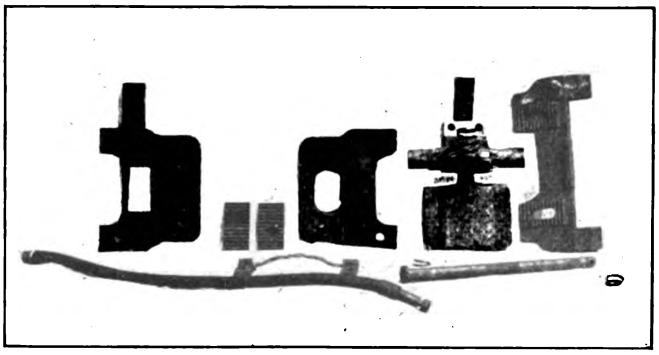
Description of Manufacture and Maintenance of Third Rail Shoes and Appurtenances on the Wilkes-Barre & Hazleton Railway

THE Wilkes-Barre & Hazleton Railway operates approximately 30 miles of third rail interurban line between Wilkes-Barre and Hazleton, Pa. For this service the company makes its own third rail shoes and attachments, the designs and details of which are shown in an accompanying illustration, as is also the method of attachment to the car.



METHOD OF ATTACHING THIRD RAIL SHOE AND LOCATION OF FUSE BOX

In the illustration of the unassembled shoe the piece of equipment at the extreme left is a template for drilling holes in the third rail hanger. This template is made of cast iron and the drillhole guides are lined with tool steel. On top of this template is shown a small block which is inserted in the opening in the template as a guide for drilling the terminal holes. The hanger itself is a casting and is shown in the center of the illustration. The toothed surfaces are made in the shaper and permit vertical adjustment of the bracket and also insure that the bracket will remain in position when bolted. Between the hanger and the hanger template are shown two blocks which are used against the toothed surface to insure that the castings remain parallel in the drill press when the holes are being drilled.



THIRD RAIL SHOE AND FASTENING MADE BY WILKES-BARRE & HAZLETON RAILWAY

At the extreme right of the illustration is shown the third rail bracket with the toothed surface corresponding to those on the hanger and with oblong holes to permit of vertical adjustment. After the teeth are made in the shaper this casting is placed in the drill press and bored out 1¼ in. and reamed to take hardened bushings 2 in. long for the shaft which holds the third rail shoe in position. This shaft is shown in the right foreground and is 1 in. in diameter with a collar on one end and a cotter pin on the other. A cushioned spring is used on either side of the shoe to take up the end thrust.

The shoe itself is shown between the hanger and the bracket. It is made of gray iron with a chilled face. The shaft hole is made in the lathe by a 1 1/32-in. diameter four-lip high speed drill. The neck of the shoe is made slender so that in case of obstruction on the third rail the shoe will break at this point and thus leave no part of the shoe to interfere with the third rail or appurtenances. The shoe is planed off to accommodate the shunt terminal, and two holes are drilled by means of the small template shown standing on top of the shoe. The shoe is held down against the third rail by the 3/16-in. diameter wire tension spring shown in position on the shoe. This is in addition to the weight of the shoe, which is 26 lb.

The collector cable shown in the foreground has special terminals, one clamping to the third rail frame and the other fitting the GE-M.A.-10-A fuse box.

As shown in the second illustration, the fuse box is placed on a special bracket made of ¼-in. x 2-in. iron, so that it is at a pitch of approximately 45 deg. to the horizontal. This permits water to drain from the top of the box and keeps it from warping. A very good life is said to be obtained from this third rail shoe. The castings are made in a local foundry at a reasonable expense.

New Anti-Rust Compound

THE first public demonstration of "Stazon," an invention of the Conversion Products Corporation, of New York City, was made at the Lawyers' Club on July 19. This is a new anti-rust compound that withstands intense heat. It is intended for use on tools or finished machinery parts which cannot be painted or otherwise protected from rust during transit or while being stored for use. The present practice of manufacturers and other users is to coat the finished parts with vaseline or some other petroleum compound. The trouble now experienced from these compounds is due to their melting when temperatures from 90 deg. upward are reached, as is quite common in warehouses or other storage places during summer months. The melting of the grease leaves the parts unprotected and they soon rust. The principal feature of "Stazon" is that it will not melt until a temperature of approximately 210 deg. is reached.

This new compound contains no metallic element in its composition and possesses the ordinary lubricating and insulating qualities of petroleum jelly. There may be a field for its use among the electric railways for the lubrication of parts such as gears, where it is desirable to have the grease remain on rotating parts and also for the lubrication of valves which are subjected to high temperatures and where the present greases melt and run out.

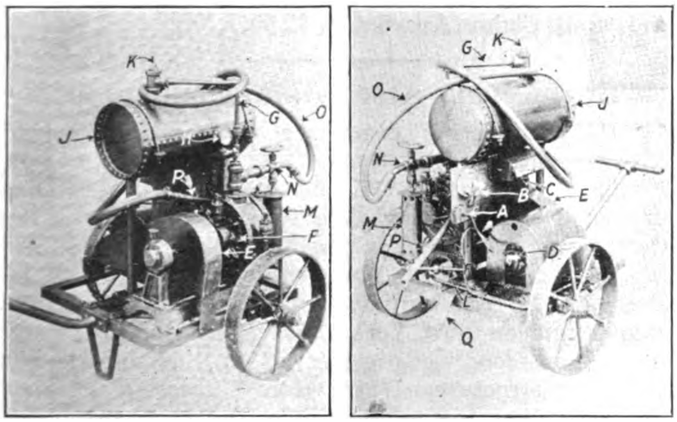
The committee on public service securities of the Investment Bankers' Association of America, O. B. Willcox, chairman, is sending out to all members of the association a pamphlet, entitled "Appraisals and Rate Making," by Cecil F. Elmes of Sanderson & Porter.

Light-Weight Rail Preheater

New Outfit Is Particularly Adapted to Heating One Joint at a Time as Is Necessary for Scattered Work

A NEW light-weight preheater for thermit rail welding has been recently developed by the Metal & Thermit Corporation, New York, N. Y. Until lately preheating for this process has always been accomplished by means of an electrically driven blower mounted with a gasoline tank on a three-wheeled truck and capable of heating four joints at once. This has given very good results where quantity production was desired. There are many cases, however, where it is only possible to heat one joint at a time, and in such cases this small light-weight machine will be found to be much more economical, because it can easily be moved from one joint to another and because two or three of them can be supplied at the cost of one of the larger preheaters. Two or three small preheaters will take care of the same amount of work as one large preheater.

Another feature embodied in the small preheater is a vaporizing apparatus, by the use of which kerosene may be used instead of the more expensive gasoline required by the large preheater. In addition, by using kerosene the advantage of its greater heating value is gained.



NEW DESIGN OF SMALL RAIL PREHEATER

A—Trolley and ground connector. *B*—Snap switch for starting and stopping the motor. *C*—Fuse box with 6-amp. fuse. *D*—⅓-hp. 220-volt compound wound motor. *E*—Guard for drive. *F*—Rotary pressure blower. *G*—By-pass air pipe for air pressure in tank. *H*—Pressure gage. *J*—Fuel tank. *K*—Filling plug. *L*—Fuel feed pipe. *M*—Combination vaporizer and external resistance heater coil. *N*—Needle valve for mixing. *O*—Fuel and air hose. *P*—Preheating nozzle. *Q*—Leg to prevent backward overturning of machine.

The preheater is of the single-burner type and is equipped with a rotary blower driven by a 220-volt motor connected in series with an 85-ohm external resistance coil. This arrangement, in addition to permitting the use of the low-voltage motor, also permits the use of kerosene oil for fuel, as the resistance coil is wound on a porcelain tube which surrounds the oil pipe leading to the burner and the heat developed in this resistance is sufficient to convert the oil into a perfect vapor. The oil is stored in an overhead 6-gal. tank and is fed through a looped pipe connected to a needle valve which controls the flow of oil from the tank. The resistance coil is located on a vertical leg of this loop directly under the needle valve and the oil is completely vaporized before entering the needle valve. The object of the loop in the kerosene oil pipe line from the tank to the needle valve is to eliminate the possibility of oil vapor getting into the tank.

The use of a shut-off valve was purposely omitted in the oil line in order to avoid creating an extremely high pressure in the line in case the operator should have both the needle valve and shut-off valve closed while the current was flowing through the resistance. As the machine is constructed at present, there can, at no time, be a pressure within the tank greater than that supplied by the blower. For the same reason no valve was put in the by-pass air pipe connected to the top of the tank.

This machine, being single burner only, is not equipped with and does not require any air adjustment valve, as the rotary blower furnishes a uniform and constant supply of air. The only adjustment, therefore, is at the needle valve, which should be regulated to obtain proper combustion at the burner. More oil will be required at the start than after the burner has been going for some time. The regulation of this valve will depend also on the voltage, to a considerable extent, as this will affect the speed of the motor and the air pressure.

At 550 volts the full-load current for this machine is 3.2 amp., and the machine has been so designed that even at considerably lower voltages it will deliver sufficient air for all purposes. This is important, as in many cases, particularly in repairing old track, the line voltage will drop so low, due to defective bonding and broken joints, that it is difficult to obtain sufficient air properly to preheat at all.

Making Cement Sack Cleaning a Better Job*

CEMENT sacks have to be cleaned, sorted, counted and bundled for return. This forms an odd job at the track store yard of nearly every electric railway company that nobody wants to do. It has been made a more pleasant job, the cost has been reduced, more cement recovered and a great deal of labor saved by the scheme which has been adopted at the store yard warehouse of the United Railways of St. Louis.

A No. 5 Buffalo blower is installed overhead with the intake pipe extending down to a point about waist high. The discharge from the blower is piped a short distance along the wall, where it connects to a cyclone separator. A cement sack is put over the mouth of the intake pipe. The suction draws the bag up into the pipe and turns it inside out. The workman then pulls it out and again puts it over the end of the intake, which turns the sack the other way out and sucks the cement from the opposite side. This process leaves the sacks cleaner than it is possible to get them by hand. The cement recovered is deposited in a sack attached to the bottom of the cyclone. By this means from one and one-half to two sacks of cement are recovered per 1,000 sacks cleaned. Two men can clean 2,000 sacks a day, besides sorting, counting and bundling them. The cement recovered makes a credit to the cost of handling of about $2.50 a day. The use of this machine makes the bag cleaning not a particularly undesirable job, and furthermore largely overcomes the spreading of cement dust over everything in the warehouse. "The machine would be worth while if it didn't do any more than make the job fit for a white man to work at," was the way C. L. Hawkins, engineer maintenance of way, expressed the value of the blower system of cleaning.

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*Another article describing cement sack cleaning at Cleveland appeared in the issue of this paper for October 9, 1915, page 773.

How an Englishman Appraises American Railway Practice

C. J. SPENCER, manager Metropolitan Electric, London United and South Metropolitan Tramways Companies, gave an interesting paper on American electric railway conditions before the annual congress of the Tramways and Light Railways Association held in London in July. Mr. Spencer spent six weeks in America recently, and, as the chairman said, "perhaps, like many other people who had spent a short time over there, he knew far more about the conditions than Americans themselves." He stated that the main problem facing the American railway industry was financial and that this is being met in two ways, viz., increasing fares and the introduction of improved operating methods.

Mr. Spencer states that the cost of operating a railway system is now about equal in England and the United States, but that the fare charged in America is very much higher than they have ever dared suggest in England.

He believes that the necessity for the high fare in America is due to an absence of short-haul traffic and the short-haul riding habit has not been properly cultivated in America. In this connection he points out that the receipts and costs of operation per car mile are about the same on both sides of the Atlantic but the British car shows a much larger number of passengers carried per car mile. He intimated that a lower minimum fare and the permission to smoke would help the short-haul traffic.

He remarks on the failure of the double-deck car in America and suggests research for English railways to determine the most suitable vehicle for the future. The average speed is the same in each country, and Mr. Spencer thinks the greatest future economy will be found in increasing schedule speeds. He further states that America has been very progressive in rolling stock design and has equipment and conveniences such as air brakes, control doors, etc., far in advance of any found in England. He commends the safety car and the fare collecting systems and was startled to find that American railway labor was paid only at the same rate as English labor since the war.

Mr. Spencer spoke of the efficiency engineer and the use of modern labor saving machinery and said they offered opportunity for profitable study. In conclusion, he said that American systems showed that many improvements could be made in English railway practice, but that he noticed no differences in fundamental transportation methods.

The American Railway Engineering Association has become a member society of Engineering Council and will be represented by its president, Harry R. Safford. Mr. Safford is assistant to President Hale Holden of the Chicago, Burlington & Quincy Railroad and was formerly chief engineer of the Grand Trunk Railway. The societies now represented in Engineering Council have an aggregate membership of 45,000.

The fortieth anniversary of the piercing of the Gotthard tunnel between Switzerland and Italy was celebrated recently. This important artery of travel is now doubly interesting because it is in process of electrification.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

The Electric Railways Commission Report

THE American Association has arranged for the printing of an edition of the report of the Federal Electric Railways Commission, released for publication on Aug. 24 and reprinted in full in this issue of the ELECTRIC RAILWAY JOURNAL. The printing was done by the Government Printing Office, Washington, D. C.

The association is also arranging for the printing of the testimony taken by the commission, which will occupy three volumes.

1917-1919 Proceedings Ready for Distribution

SECRETARY Burritt has announced the publication of the volumes of the proceedings for the several associations, each volume covering the 1917-1919 period. The full set sells for $12.50 and individual volumes as follows: Accountants' Association $2.50, American Association $3, T. & T. Association $3, Engineering Association $4, Claims Association $2.50.

Engineering Association Nominations

THE nominating committee of the Engineering Association, consisting of F. R. Phillips, J. H. Hanna, C. R. Harte, J. H. Libbey and N. B. Trist, has presented the following slate for consideration at the October convention: For president, W. G. Gove, superintendent of equipment Brooklyn Rapid Transit System, Brooklyn, N. Y.; for first vice-president, C. L. Cadle, chief engineer New York State Railways, Rochester, N. Y.; for second vice-president, C. S. Kimball, engineer way and structures Washington Railway & Electric Company, Washington, D. C.; for third vice-president, C. F. Bedwell, assistant engineer Public Service Railway, Newark, N. J.; for secretary-treasurer, E. B. Burritt, New York, N. Y.; for members executive committee, H. A. Johnson, organization engineer Metropolitan West Side Elevated Railway, Chicago, Ill.; L. C. Datz, engineer American Cities Company, Birmingham, Ala.; E. H. Scofield, engineer of power Minneapolis Street Railway, Minneapolis, Minn.; A. B. Stitzer, chief engineer Republic Engineers, Inc., New York, N. Y.

Henry L. Doherty was fifty years old on May 15, 1920, and in honor of this event the Doherty Men's Fraternity, through its chapters in the various properties of the Doherty organization, planted trees as a lasting and appropriate tribute to its chief. An account of the ceremonies in the different cities in which these observances took place are collected in a pamphlet recently issued by the fraternity and the hope is expressed that through these trees succeeding generations of the organization may have tangible evidence of the esteem in which the first generation of Doherty men held their chief. Incidentally, it might be said that the Doherty Men's Fraternity now includes a membership of 5,794, with representatives in twenty states. The membership is still restricted to men employed exclusively in the service of the Doherty enterprises.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

$195,016 Divided

Profit-Sharing Plan Has Been Instituted by the Virginia Railway & Power Company

Employees of the Virginia Railway & Power Company in Richmond and in all other divisions of the company will receive an average of 6 per cent on their present wages by the institution of the company's new "profit-sharing" plan. The announcement concerning the basis for the wage increase follows:

COMPANY'S STATEMENT

> Desiring to deal both justly and liberally with its employees, the company hereby makes effective from Aug. 1, 1920, until further notice, the following profit-sharing plan through an increase in wages, based upon a division of the net profits for the year ended June 30, 1920, after paying from the gross earnings: Operating expenses, interest on bonds and other debts, sinking fund charges and taxes, discount on bonds and uncollectable accounts, and reserve depreciation (6 per cent on gross revenue), 6 per cent on preferred stock, and 3 per cent on common stock.
>
> The amount to be made the basis for increase of wages on a division (on a fifty-fifty basis) between the company and all classified employees, superintendents and below, who have been in the service for the last six months, is $195,016. This will justify an increase of 6 per cent. Therefore, 6 per cent will be added each pay day to the wages or salary of each classified employee who has been in the service six months at the time each pay roll is made up, effective from Aug. 1, 1920, in the following six months.
>
> For each six months' period hereafter ending Dec. 31 and June 30, there will be an ascertainment of the profits to be made the basis of the wages for the following period of six months. The statements of the company will be subject to verification by a certified public accountant, if so desired. Through the profit-sharing plan hereby made effective employees of the company are made "partners," and it is the sincere hope and belief of the management that teamwork will win just reward for all concerned and insure to the public the high class of service it deserves.

Thomas S. Wheelwright, president of the Virginia Railway & Power Company, issued the following statement:

> The profit-sharing plan at present announced by the company is based on its present method of accounting, which has been in vogue for the last ten years. It has been the policy of the company to set aside 6 per cent of its gross revenue for depreciation or renewal reserve. This was according to the best practice at the time the policy was adopted.

OPERATING EXPENSES HAVE DOUBLED

> However, in this period, operating expenses have been more than doubled, whereas rates and charges upon which revenue is based, have remained practically stationary, and hence the 6 per cent on gross earnings for depreciation or renewal reserve, as shown on the books of the company, has become increasingly inadequate. The present accepted standard of depreciation reserve is based upon 6 per cent of the value of the property used in operation, and if this method of setting aside depreciation or renewal reserve was adopted, instead of showing a surplus a large deficit would be the result.
>
> Lately the company had all of its properties inventoried and appraised and is now seeking to have its franchises so revised as to insure an adequate return on the capital at present properly invested in the business, as well as to set aside a suitable amount for depreciation or renewal reserve so as to keep all of its equipment up to the highest standard of practical efficiency.
>
> It has been the policy of the company in the past to meet, as far as it could possibly do so, the increased cost of living by advancing the compensation of its employees, and realizing their situation under present conditions the company has deemed it just to continue this policy based upon a profit-sharing plan. This is the best possible evidence to its employees of the sincere desire of the company to act fairly by them.
>
> As to the dividends on its stocks: In common with public utilities all over the country, our company has been unable for the last six years to sell any of the bonds issued into its treasury for financing the continued necessary capital expenditures required to keep the service going. Hence these expenditures have had to be financed out of the earnings and dividends on the stocks have necessarily had to be withheld. However, we expect relief in this situation by a revision of the franchises and rates for service based on the capital invested in the business in the light of the recent valuation of the properties.
>
> It is our definite belief and expectation that when the necessary changes are made in the franchises governing rates and charges, that this will meet all reasonable expectations of the invester for a return on the capital, of the employee for his services rendered to the public, and of our patrons who will be insured a morale expressed in team-work which will greatly benefit the service.

Eastern Massachusetts Arbitration Concluded

The hearing before the board of arbitration in the Eastern Massachusetts Street Railway wage controversy was concluded on Aug. 9.

At the closing session Henry F. Hurlburt, special counsel to the trustees of the company said:

> It is significant that the men have declined to produce any evidence to show that they cannot get along on their present wages. The road has a fare schedule fully as high, if not higher, than any other road in this part of the country, and the fares cannot be raised to produce increased revenue with which to pay the men, because the public simply will not pay the increase. Regardless of what has been presented here in behalf of the men, I maintain that the old law of supply and demand should hold sway.
>
> These men have their services to sell; that is their commodity in the market. If they are now receiving a living wage, as I contend they are, and there is a plentiful supply of labor, as the company officials have shown there is, then, under the law of supply and demand, no reason in the world why the company should pay its men higher wages.

Discussing the situation from the standpoint of the men, Mr. Vahey said:

> This board is bound to award the men a living wage, regardless of its effect upon the company. The position of the company that the men should work for 3 cents an hour less in those places where it did not earn the cost of service illustrates the absolute lack of regard for the men by the trustees. If this was carried out, it would mean a contribution of $84 per man, against the contribution of $2 per inhabitant by towns which contributed toward the deficit of the road.

Arguing in support of the demand of the men for eight hours' work in ten, Mr. Vahey declared that the eight-hour day is inevitable. He also brought out the fact that the road has shut down 16 per cent of its trackage, and has installed 200 one-man cars out of a total of 900 cars on the system.

New Orleans Still Puzzled

Settlement of Wage Matter Brings Up Service-at-Cost, New Fare and Credit Matters

Three steps are considered essential by Receiver O'Keefe of the New Orleans Railway & Light Company, New Orleans, La., to give the city proper electric railway and power service. They are service-at-cost for the railway, the expenditure of $16,000,000 in the next five years for extensions and improvements, and a return on the company's investment sufficient to attract additional capital.

RAILWAY VALUE $29,191,210

Prof. Albert S. Richey has suggested an automatically adjustable fare under service-at-cost, with a net return of 7 or 8 per cent on an appraised value of $55,000,000. This is asked as a fair reward for investors. In giving the total valuation of the property of the company at $55,566,855, the different departments were valued as follows: railway, $29,191,210; gas, $11,218,548; electric, $15,087,097.

With reference to the expenditure of $16,000,000 in the next five years, it was stated that $12,000,000 in new capital was needed and that $4,000,000 must be spent to maintain and repair equipment already owned by the company. The money would probably be distributed from 1920 to 1925 as follows: power, $4,576,000; equipment, $5,576,000; track, $4,576,340; and distribution, $2,009,600. Since 1918 only about $1,000,000 has been spent on additions and betterments. The normal program is several million dollars behind. The sum of $2,000,000 to $3,000,000 should be expended at once, and thereafter, $1,500,000 a year.

An 8-cent fare has been requested by the receiver. This may not furnish an adequate return, but is expected to result in a restoration of credit sufficient to enable the properties to be reorganized and thereby provide necessary new capital for additions, extensions and betterments. No dividends have been paid on the common stock since 1916 and none on the preferred since 1917. The interest on the bonds and debentures has not been paid since January, 1919.

Much discussion has ensued relative to the wages that should be paid the employees of the railway. If he is granted a fare of 8 cents, the receiver has offered a wage scale for platform men of 46 cents an hour for the first year, 49 cents for the second year, and 52 cents for the third year and thereafter. The present rates are 38, 40 and 42 cents an hour.

Wage Increase Disallowed in Omaha

State Railway Commission Decides There Is No Need for Increase—Service Attractive Under Present Scale

The State Railway Commission of Nebraska has denied the application of the trainmen of the Omaha & Council Bluffs Street Railway for an increase of 13 cents an hour in wages. The present scale paid by the company is 53 to 57 cents an hour. The commission held that the increase in wages would necessitate an increase in fare and would take additional toll from other working men, many of whom do not earn as much as the trainmen. The commission also found the present wages sufficient to attract enough men to maintain efficient service, as evidenced by an average of ten applications received every day by the company. It was further held that an employee of the company working twenty-six days a month at reasonable hours is able to earn $150 a month. The order of the commission says that "the evidence does not sustain the complaint that the wages are inadequate and it should be dismissed."

THE men brought their case to the State Railway Commission, holding a strike vote in abeyance. During a hearing which was held in Omaha, they endeavored to withdraw when the commission declined to go into the high cost of living as an element of the case. The men have not indicated whether they will accept the order of the commission. They are holding executive meetings.

The following are the allegations of the pleadings, according to the text of the commission's finding:

The complainants allege that the wages paid in the various divisions and classes of employment are not sufficient to permit the employees to maintain themselves in keeping with the nature of their employment and are not sufficient to enable the company to keep an adequate number of competent conductors and motormen, and that they have taken a strike vote and intend to strike if adequate relief is not provided in wages and conditions. An increase of 13 cents an hour is asked. This would make the pay of all motormen and conductors, 66 cents for the first three months, 68 cents for the next nine months, and 70 cents thereafter, with a corresponding increase over present wages for all other classes of employees.

The defendant alleges that the State Railway Commission has no power to fix or determine a scale of wages to be paid by defendant to its employees; that the right of contract is guaranteed by the constitution of the United States and by the constitution and laws of the state of Nebraska; and that no governmental authority has the right to interfere in the fixing of terms between defendant and its servants. After extended argument on the plea, it was overruled.

COMPANY'S SIDE STATED

The defendant then filed its answer in which it is denied that the wages paid are insufficient, and denied there is any impairment of the service. The defendant alleges that there would be no impairment of the service, even temporarily, in the event that a strike should occur unless complainants use force to produce such impairment. It also alleges upon information and belief that the strike vote referred to in the complaint does not represent the will of the employees of the company and that a large proportion of them wished to continue their service at the existing scale of wages and do not intend to strike. It denies that the scale of wages is inadequate to secure the services of a sufficient number of men capable of operating the system, and alleges generally that the scale of wages is fair and reasonable. It sets forth that there have been numerous increases of wages during the last six years; that the company is operating at a loss and that it is unable to pay larger wages; the complainants having voted to strike and intending to do so unless their demands are complied with, are not acting in good faith and therefore have no standing before the Commission. It alleges generally that the service rendered by the company is efficient and that it will, if it receives proper protection of law, continue to furnish such service to the public.

The reply denies that the strike vote does not represent the will of the employees; denies that a large proportion of them are willing to continue in service at the existing scale of wages; and particularly denies that at any stage of the controversy the complainants, or anyone in their behalf, have interfered or threatened forcibly to interfere with the service of the company.

Prior to entering upon the hearing the commission made the following statement for the record:

We hold that our jurisdiction extends only to the maintenance and continuance of adequate service by the Omaha & Council Bluffs Street Railway within the city of Omaha and its suburbs; that to that end we can, after proper inquiry, establish a general schedule of wages sufficient, in our opinion, to attract and secure the necessary number of men to operate the system. In fixing a general schedule we shall go only as far as is required to determine what amount will be necessary to insure service. Collateral economic questions will not be considered. The ability of the company to pay any schedule we may determine is of necessity a prime factor, and for that reason we shall receive evidence with reference to the present revenues and operating expenses and general financial condition of defendant; so that we may, if found necessary, make emergency rates to cover the new obligation imposed. Such a showing need not involve a valuation of the property, as that might take so long as to defeat the purpose of the rate increase in the event such increase is required.

Another excerpt is taken from the commission's finding:

The commission struck out all references in the pleadings to the cost of living, and all references to the fixing of a general wage standard. Throughout the hearing the complainants endeavored to introduce evidence as to rents, cost of food, cost of clothing, etc. The commission consistently refused to go into such an investigation. It conceived its jurisdiction to be limited to fixing a scale of wages that would attract an adequate number of capable employees to enable the defendant to carry on its service, and further than that it refused to go. There is some reference to working conditions but not much stress is laid on that phase.

The controversy centers on the issue as to wages and principally on the wages of motormen and conductors. The controversy seems to have arisen because at the time of the increase in fares granted by this commission to the defendant on Aug. 1, 1919, the employees considered they did not receive as much increase in wages as they were entitled to. The company urged that it was still operating at a loss, but some of the employees seemed to doubt the accuracy of the figures presented by the defendant and insisted upon submitting their differences to arbitration. It was finally suggested by the men, and agreed to by the defendant that the controversy be submitted to this commission as a board of arbitration. The commission, of course, declined to act in that capacity in a matter in which it was likely to be called upon officially. Therefore the complaint was filed.

Another statement by the commission reads:

One object of the people in establishing the Railway Commission was to protect the public service against interruption. When information is brought in the form of a complaint, it is not material who files the complaint or what his attitude may be. If the commission has information that the public service is threatened with suspension it immediately becomes its duty to protect it. It must be presumed that the complaint was filed in good faith and that if, after a full hearing, the employees are not satisfied with the decision of the commission, they will not strike but will pursue their right of appeal.

The commission offered the following comment on the duties of common carriers and their employees:

It is the duty of the Omaha & Council Bluffs Street Railway to render service as a carrier to the public of the city of Omaha. Can the employees of the company who have undertaken equally with the stockholders of the company to serve the people of that city, lawfully agree to strike—to leave en masse and thus paralyze the industries and social organization of a great center because they are not receiving what they consider a suitable wage?

The state has provided a tribunal for the adjustment of wage difficulties and there is no occasion for the settlement of such difficulties other than by resort to it. In short, there is no place for a strike in the public economy of a state that has provided for regulation.

This view is wholly consistent with the right of employees to leave the company as individuals. The company passes upon the merits of each individual as he is taken into the service. The employer can not secure its employees collectively, but must secure them individually, assigning them to the respective departments to which they are best adapted. It is no great loss to the company and does not disturb its working power when an individual drops out of the service. Adjustments are readily made and there is no appreciable injury. But when the employees form themselves into an organization and quit work as a unit, the public service is totally disrupted regardless of the high standard of efficiency prior to the strike and the public suffers until the company has had time to reorganize and develop a new working body and gradually build up the service anew.

That the employees of the company in this instance have invoked the jurisdiction of this commission to settle the controversy between them and the company is a recognition of the fact that the people have the power to adjust these matters and that they have created a tribunal for that purpose, and we have every confidence that the decision of the commission will be received as a final determination by all parties except so far as they may desire to exercise their right of appeal.

A digest of the conclusions of the commission follows:

The company employs 1278, not including the accounting and clerical force. This represents an increase of 13 per cent in the operating force during the last year.

In general the service of the company is at a high standard. It has on its payroll a larger number of men than ever before and at present there is no lack of men.

The company is now averaging ten applicants a day for positions as trainmen received without advertising and without special efforts. It is daily turning away many applicants who have the required qualifications.

The trainmen are now receiving 53 to 57 cents an hour, according to length of service.

The evidence shows that 720 men worked twenty-five days or more during May, 1920. Of these, 652 earned, on the average, $155 for the month, the highest being $204. The remaining sixty-eight of the 720 worked twenty-five days or more, but a lesser number of hours per day, and received on the average $125. The average wages earned by the 720 men for the month were $152. The average earned by all trainmen for the month of May, regardless of the number of days or hours, was $140.

The wages of trainmen have been more than doubled from Aug. 1, 1914; to be exact, they have increased 114.98 per cent.

It was necessary to compare the wages of carmen with wages paid to other employees in Omaha, whose occupations are comparable with the employees of the railway. As the result of an independent survey of wage conditions in Omaha the commission notes the following:

Teamsters, $20 to $28 per week; standard wage about $27.

Truckman, $23 to $31 a week; drivers of large trucks with considerable responsibility and part time on Sunday, $150 a month.

Truck drivers for ice companies earn $110 to $120 a month. Route ice drivers are paid $125 a month.

Employees of the fire department are paid $100 per month for first year; $110 second year; $140 a month thereafter.

Policemen are paid $125 a month for first year; $135, next six months; $140 a month thereafter.

Men in charge of gasoline and oil stations, $90 to $110.

Bank clerks, $80 to $140 a month.

We cannot, therefore, say that the wage paid by the defendant company is not sufficient to attract suitable men and the fact that its lists are now full is evidence that they are coming in sufficient numbers.

It also follows that if the pay of the railway employees is to be raised, the operating expenses will be correspondingly increased, all of which in turn must be met by an increased fare. To give increased wages to the railway employees would be to subtract that much from the income of those engaged in other lines of labor in the city of Omaha, and who are now getting, on the average, a smaller wage than the employees of this company.

The company should be allowed by the commission to charge the public only such a rate of fare as will enable it to furnish proper service. This, of course, includes a wage that will keep in its employ an adequate number of men sufficiently qualified to carry on the work. When the men receive the wage that is offered generally for like service and the company has properly maintained its facilities, set aside sufficient reserves and paid a fair return to its stockholders, the surplus, if any, should and must stand for the rate-paying public. The commission has no right to allow this surplus to be encroached upon either by the stockholders or by its employees.

Commissioner Browne dissented from the conclusions of the majority by holding that a section of the Clayton Anti-Trust act and a decision of the Nebraska Supreme Court "specifically permitted employees 'singly or in concert' to quit employment and 'recommending, advising or persuading others by peaceful means to do so.'"

Rehearing Asked in St. Louis Wage Case

The State Public Service Commission is asked to disregard the inability of the United Railways, St. Louis, Mo., to increase wages and to ignore the fact that such increases might require an advance in fare, in a motion for rehearing of the United Railways wage arbitration case, filed in Jefferson City on Aug. 11 by Edward W. Foristel, attorney for the employees of the railway. The commission in July granted the employees an increase of 5 cents an hour. They had requested an increase of 20 to 25 cents an hour over the prevailing scale of 50 to 60 cents for motormen and conductors. It was stated recently that because of the wage increase the company might ask for a higher fare. Six grounds for rehearing are set out in the motion, as follows:

1. The award is based on matter outside the facts submitted in the stipulations filed by parties to the controversy, in that the award stated that "wages have about reached the limit the traffic will bear or that the public should be asked to pay."
2. The only matter submitted was the fixing of a reasonable rate of pay and reasonable working conditions, regardless of the company's ability to pay, and the rate of street car fare.
3. The finding was against the weight of testimony adduced at the hearing and the pay allowed is less than the decent living wage of American workmen.
4. All evidence introduced as to increased living costs shows that the increase in cost of necessaries amounted to 22 per cent in 1920 and the increase in rents to 30 per cent and that the pay advance was less than 10 per cent.
5. The award was based on the assumption that if the demands had been allowed, a uniform car fare of 8½ cents would have been required.
6. The commission erred in basing its findings on those facts and therefore it should disregard the ability of the company to pay and whether a higher fare would be required.

Toledo Will Vote Again

Service-at-Cost and Municipal Ownership Measures, Recently Defeated in Referendum, Repassed by Council

Three propositions aiming at a solution of railway troubles in Toledo, Ohio, will confront electors when they go to the polls at the general election on Nov. 2. The City Council on Aug. 23 passed both the cost-of-service ordinance and the twin municipal ownership ordinances which were decisively defeated at the primary election on Aug. 10. An attempt was made to put the Milner cost-of-service plan up alone at the coming election, but the municipal ownership enthusiasts backed by the Socialists in Council formed a deadlock and it was necessary to pass both plans in order to have any chance at the cost-of-service plan.

MAYOR CORNELL SCHREIBER also urged Council to resubmit the bonding propositions. The two municipal ownership ordinances call for $7,000,000 in general credit bonds for some unknown kind of transportation system, but with definite provision for added tax levy to pay the interest and sinking fund requirements of the bonds.

PROPOSAL A MODERN ONE

The service-at-cost plans is one of the most modern and complete of its kind. It has a rate-making valuation of $8,000,000 which was accepted by the Toledo Railways & Light Company, in a written agreement delivered to the city on Aug. 21.

The agreement was executed by the Toledo Railways & Light Company, and a copy was delivered to the newly incorporated Community Traction Company, provided for in the cost-of-service ordinance, and a third copy to the city. The Rail-Light assigns upon the passage of the ordinance all its franchise rights and railway property to the Community Traction Company.

The Community Traction Company is capitalized at $10,000,000 of which amount $8,000,000 is represented in bonds and is the accepted valuation of the present railway property. These bonds will bear 6 per cent interest. The other $2,000,000 of capitalization represents the funds Henry L. Doherty agrees to bring into Toledo for extensions and a cross town line. It will be represented by an 8 per cent preferred stock. Matters are so worked out that the city would own the lines at the end of twenty-five years.

DEFEAT AGAIN LIKELY

It is conceded by most municipal ownership advocates that the unchanged twins will be defeated by a greater majority when they come to the people for the second time. The fate of the Milner ordinance is doubtful. If both should be passed the Mayor and legal authorities have declared that the cost-of-service plan would be put into immediate operation and the bonds for municipal ownership held up indefinitely.

Upon the organization of the Community Traction Company, officers were chosen. They are practically the same as those of the present Toledo Railways & Light Company. Frank R. Coates is president, Morton Seeley, vice-president, S. D. Carr, treasurer, Henry Ledbetter, secretary, and A. C. VanDriesen, assistant secretary.

The company will only begin to function if the cost-of-service is approved by the people. A transportation commissioner, selected by a city board of management, will have supervision of management of the railways and all accounting.

On account of a conflict in state and city constitutional requirements the three measures will have to be repassed by Council at its session on Sept. 13.

Barratry Act Constitutional

U. S. Supreme Court Passes on Texas Statute Affecting Laymen—Law's Chief Features Reviewed

In 1917 the Texas legislature amended the State barratry statute by making it apply to laymen as well as attorneys-at-law. The statute as redrafted is a very comprehensive one and is aimed to prevent unnecessary litigation, the penalty for its violation being a fine of $500, with possible imprisonment for three months.

The history of the act can be summed up briefly. In 1916 the San Antonio Traction Company brought suit against a layman who had been active in soliciting claims against it, alleging that he was engaged in the business of soliciting and stirring up claims and suits for unliquidated damages for personal injuries against the company, that he maintained an office and had a large number of employees for this purpose, with agents that kept a lookout for accidents and hunted up prospective claimants and urged them to make contracts with him, and caused many of them to enter into such contracts, assigning him one-third or one-half of the amount of their cause of action. The company asked for an injunction to restrain him from engaging in this business, but the injunction, on appeal, was refused because the existing act did not cover laymen.

The legislature then promptly enacted an amendment so as fully to prohibit the business not only by lawyers but by laymen. Soon after an action was taken under the act, whose constitutionality was attacked, but the Supreme Court of the United States confirmed the act as constitutional.

Fred. C. Johnson, chief adjuster of the claim department of the San Antonio Public Service Company, has issued in handy form a copy of the law.

Denver Company Stands Firm

Has Recruited 700 Out of 1,100 Men for Permanent Service Since Strike—New Men Will Be Retained

Striking trainmen of the Denver (Col.) Tramway met on Aug. 20 upon call of G. Y. Harry, Portland, Ore., federal mediator. In this meeting the applications to return to work, which had been signed by 940 strikers on Aug. 16 in an effort to prove their good faith and stave off jail sentences for the executive committee and officials of the union, were torn up. The executive committee sent from jail a written statement urging the men not to go back to work.

ANOTHER mass-meeting was held Sunday morning to act upon what was announced by Mr. Harry as "a new proposition to end the street car strike." The proposal was submitted to F. W. Hild, general manager of the railway, Monday morning. It was virtually a reiteration of all previous demands with the exception of the demand for recognition of the union. In fact, reference to the Amalgamated or Local Division No. 746 was carefully avoided.

700 MEN RETURN

The letter, which was addressed to Mr. Harry, was signed by two of the striking trainmen as "Presiding Officer" and "Secretary," respectively. They agreed that the men would return to work provided they were taken back 100 per cent, the company to remove all strikebreakers and discharge all men employed since the beginning of the strike, arbitrate the increase in wages from 58 to 75 cents an hour after the Supreme Court decision in the tramway injunction case, restore the seniority rights of the strikers and the company enter into a working agreement with the strikers after their return.

Nearly 700 men, including old employees who have returned to work, have been employed as permanent members of the new organization which the tramway is building up. These men, together with about 300 remaining strikebreakers, are taking the place of the 1,150 strikers.

The company the same day rejected the strikers' proposal, stating that on Aug. 10, in response to a statement from the former employees that they were ready to go back to work, it had given the strikers ample opportunity to return to work with former seniority rights and former wage schedule. Those employees who had not returned within the time limit set had been cut off from all seniority rights and wage standing, and would have to come back into the company's employ as new men.

COMPANY'S POSITION STATED

General Manager Hild's letter further stated:

> The position and policy of the Tramway Company with respect to its employees has not changed. For your information I wish to say that at the present time, entirely apart and above the first group of temporary employees originally brought here by the Jerome agency, we have since Aug. 12 taken on more than 600 permanent employees, most of them from the city of Denver and the state of Colorado, whose positions and seniority rights have been assured them and must be respected. Certainly in fairness to these new, permanent employees no one can reasonably and honorably expect that we will dismiss them from our service in order to make room for former striking employees who have, up to this late date, failed to avail themselves of the opportunities extended to them to return to work.

Mr. Hild was asked whether he would discharge any new men to make places for strikers. He said that the company would remove strike-breakers as fast as possible, but no permanent employee would be discharged to make room for anybody.

Asked whether the men on strike would be taken back in a body and whether all of them would be re-employed, he replied: "They can't be. We have between 600 and 700 new employees now."

Another mass-meeting of the strikers was held at 4 o'clock Monday afternoon to receive Mr. Hild's reply to their proposal.

The North Division car barns of the tramway were cleared of strikebreakers Saturday morning and all cars from this division, as well as South Division, are being operated by new men. At the rate new employees are being put to work, it is anticipated that the entire system will be operated without strikebreakers by Sept. 30.

VIOLENCE AGAIN RESORTED TO

Saturday and Sunday two cars were mobbed and their crews beaten by strike sympathizers. As a result, two soldiers were placed on each car run through trouble zones.

Car service is rapidly being restored to normal; trailers being operated on fully half of the lines.

The Supreme Court of Colorado was appealed to on Aug. 25 to release seven members of union's executive committee, who are serving ninety days in jail for contempt of court. The city's attorney characterized the strike as "a willful and violent violation of the law and a breach of faith with the District Court. The tramway has obeyed the order against it to the very letter, but the men determined they would violate this injunction. They determined they would break faith with the District Court, the court they had told they did not object to an injunction."

Attorneys of the union men, while admitting that they were in contempt of court, claimed that the District Court had no jurisdiction and could not prevent any American citizen from quitting work.

Apart from this action of the union the tramway strike situation appears hopelessly deadlocked. Conciliator Harry of the Department of Labor announced: "I am simply watching the situation. I have no present intention of making any new demands to settle dispute within the next few days."

Reports are circulating that the strikers will modify the conditions under which they will agree to return to work. Eight hundred and fifteen new men and returned strikers had been employed up to Thursday morning to replaced 1,150 strikers. Tramway officials reiterate that the strikers have waited too long, for no new men will be discharged to make way for strikers.

On Aug. 26 all cars from the East Division were operated by new permanent employees. Only one division then remained to be manned by new men. More than 500 strikebreakers have been shipped out of town to date.

The Colorado Supreme Court on Aug. 26 denied the application of the executive heads of the Tramway Employees' Union for a stay of execution, and an order directing the District Court to release them under bond. The court intimated that after the application for a writ of supersedeas the strike leaders may be admitted to bail. The hearing of the supersedeas probably cannot be had until late September.

Akron Reports Progress on New Grant

So far only a small part of the proposed new street railway ordinance between the city of Akron, Ohio, and the Northern Ohio Traction & Light Company has been tentatively agreed upon. All the points agreed upon have, however, been made public. Announcements have been made by the city that the ordinance provides for city control over service. That is one point which has been tentatively agreed upon. Another point which meets the approval of both the city and the company is that the basis of the contract shall be a service-at-cost plan similar to the service-at-cost plans in other cities throughout the country. In the new ordinance provision is being made for the purchase of the property when the city desires. The new grant will also give the city control over service, and provide for extensions that may be necessary from time to time.

Men at Nashville Strike

Despite the strike of union conductors and motormen cars of the Nashville Railway & Light Company, Nashville, Tenn., were running the first of the week following the Sunday stoppage. Service was 70 per cent normal on all lines Monday and Tuesday. It was decided not to operate after 6 p.m., until conditions more nearly normal are restored. Mayor Gupton of Nashville, issued a statement urging all stores and factories to close at five o'clock in order that employees might ride home. The strike was not unexpected. Some weeks ago, however, the union asked a closed shop and a 25 per cent advance in the wage schedule. The same day the company posted a notice of a new schedule of pay amounting to about 12½ cents, but the demand for the closed shop was refused. Not all the trainmen are members of the union.

D. U. R. Plans Improvements

Insists on Carrying Out Work for Relieving Congestion—City Suspects Company's Motives

Permission is again sought by the Detroit (Mich.) United Railway to construct a single-track loop to turn Woodward Avenue cars at Grand Circus Park. The proposed plan is to swing east at Elizabeth Street and return to Woodward Avenue at the Park. The necessity for the loop is emphasized in a communication to the City Council by E. J. Burdick, general manager for the railway. The loop is suggested as a means of relieving congestion.

This question was brought up before by the Detroit United Railway just prior to the election on April 5, when the bond issue was carried providing for the construction of the municipal railway.

CORPORATION COUNSEL RAISES OLD QUESTION

In the endeavor to obtain this permission, Corporation Counsel Wilcox sees another attempt on the part of the railway to obtain rights in the street that it may come into court at a later date and make claim that in allowing the loop the city admitted that the company had rights in Woodward Avenue. He maintains that exactly the same question is raised as when the company sought to continue work on the St. Jean, West Warren and Harper lines after the Couzens plan was approved by the voters. Further work was prevented on these lines by the city's orders and a rescinding resolution passed by the Council.

The city's rights were decided by the Supreme Court in 1913 when it was held that the city could take over the Fort Street and Woodward Avenue lines in the downtown district, and the Corporation Counsel recommends that the company's petition be denied as it was before when it was held that to grant the petition would confuse the municipal plan issue.

CONSTRUCTION CONTRACTS BEING LET

Although several members of the Council maintain that the voters in the April 5 election decided on what streets certain municipal lines should be built, and that any amendments to the people's action cannot be taken according to the charter until six months have elapsed, a resolution was passed by the Council ordering the Street Railway Commission to make a study of alternate routes which might be taken instead of the proposed one on Burlingame Avenue west of Hamilton Boulevard. This action on the part of the Council is the result of petitions by the property owners along that section of the proposed line.

Immediate action will be taken by the contractor in starting excavation and foundation work for the road bed of the Charlevoix-Buchanan crosstown municipal line. This line extending across the city for a distance of about 9 miles will be the first important line of the new system. Contract for the foundation work entails an expenditure of approximately $605,500.

Total construction contracts amounting to $1,600,000 have been entered into and $1,750,000 bonds have been authorized.

Interurban to Build Detour

Residents of Lockport, Ill., have in prospect a walk to the outer edge of the city if they intend to use the Chicago & Joliet Electric Railway for transportation. That company intends to detour its line avoiding Lockport. There is good reason for this. The franchise of the company in Lockport will expire on Feb. 18, 1921. The tracks of the company through the city are in bad condition and the company tried on several occasions since 1917 to have its franchise renewed so that it could reconstruct the tracks. The terms of the city administration were prohibitory.

After the company had submitted to the city several propositions which seemed fair, all of which were rejected by the city, the company finally sought relief through the Public Utilities Commission, which ordered the railway to build the detour, with the right of eminent domain. Upon the issuance of this order a delegation of Lockport citizens waited on the company and suggested a settlement. The railway then submitted a draft of an ordinance acceptable to it. Action was taken on this at a meeting of the Council and it was voted down four to two.

The company plans to proceed to acquire a right-of-way, and build a detour for operation by Jan. 1, 1921. The detour means the lengthening of the interurban line 1 mile between Joliet and Chicago. At the center of the city the new line will be about 0.95 of a mile east of the present location.

Monongahela Company Advances Wages

Substantial wage increases were granted employees of the Monongahela Valley Traction Company, Fairmont, W. Va., at the closing of negotiations on July 21, when members of unions No. 812 and No. 813 voted unanimously to accept the contract which had been agreed on by their representatives and the company. The new contract covers the period from July 1, 1920, to July 1, 1921.

The scale of wages under the old contract was from 45 to 55 cents an hour. Under the new agreement the men will receive wages on a sliding scale basis covering two and a half years and ranging from 51 to 63 cents. This means that beginners will receive 51 cents an hour, employees who have been in the service six months 52 cents, those of one year's employment 54 cents, those in the service a year and a half 57 cents, and so on. The closed shop plan will be carried out as in the past. The company owns 190 miles of track and serves Fairmont and neighboring towns.

Auto Drivers Strike

One Thousand Men at Los Angeles Return to Work Following Compromise

Motor stage drivers of the Motor Transit Company working out of Los Angeles, Cal., went out on a strike on Aug. 17 for a 25 per cent increase in wages, thus tying up service on nearly 500 auto stage buses. Close to 1000 men are out. Only a few stages were in operation, the drivers of others failing to appear for their scheduled runs. The stage companies claim the drivers went out without notice. Patrons of the bus lines were obliged to use steam and electric railways to reach their places of business. The bus drivers are organized as the Operators of Motor Transport.

TREAT MEN AS INDIVIDUALS

Managers of the companies indicate that they will be willing to deal with the car owners as individuals, but not as members of an organization, and restore them to their old runs at the old rate of pay, $32. per trip, Los Angeles to San Diego.

The manager of the Motor Transit Company states it is impossible to grant the raises in pay asked by the drivers until the State Railroad Commission grants increased passenger fares. He states that the drivers between Los Angeles and San Diego own their own buses and are paid $16 for a one-way trip of 127 miles, or $32 for the round trip, and out of this allowance the drivers pay all expenses of the trip. All the drivers on the Bakersfield run do not own their cars and are paid $4 on a one-way trip of 171 miles with an eight-passenger car and $5 for a one-way trip over the same route with an eleven-passenger car.

After one week the strike was called off on Aug. 22. A settlement was effected and the drivers returned to work. Both sides made concessions. It has been agreed that all drivers are to be paid increases, but the advances will not reach the figure originally demanded by the strikers. The motor transit company, however, made promises of further advances if it is permitted by the Railroad Commission to raise its rates. An application for a hearing is now pending before the commission.

MEN OWN THEIR CARS

The drivers employed on the Los Angeles to San Diego runs, under the new agreement, will be paid $35 for the round trip. The strikers demanded $40. They had been receiving $32. The men own their cars, leasing them to the Motor Transit Company, which sells bus transportation to the public. If a rate raise is granted the corporation drivers will be paid $40 a round trip. Drivers on other runs where cars are owned by the Motor Transit Company are likewise to be given an increase in salaries. These drivers are hired outright.

News Notes

Increase for Long Island Traction Men.—The New York & Long Island Traction Company, Hempstead, N. Y., recently advanced the employees' wages 10 per cent.

Strike Action Delayed.—Strike action by employees of the Toledo, Bowling Green & Southern Traction Company Toledo, Ohio, has been delayed, according to announcement made by officials of the union on Aug. 20. The men are demanding an increase in wages of 40 per cent.

Strike at Ashtabula Settled.—Because of an order from the company that cars would be operated as one-man cars thereafter, the trainmen of the Ashtabula (Ohio) Rapid Transit Company walked out on Aug. 5 and the road was idle for the greater part of the day. The company finally agreed to resume service with crews of two men.

Boston Men Receive Wage Award.—More than 7,000 trainmen of the Boston (Mass.) Elevated Railway shared in the distribution of between $225,000 and $250,000 on Aug. 12 and 13. The distribution is the carrying out of the award handed down on June 7. According to the officers of the union the average payment per member was between $35 and $40.

Trackmen Return to Work.—Between 100 and 125 trackmen and oilers employed by the Monongahela Valley Traction Company who struck on Aug. 2 returned to work on Aug. 9, after they had been granted a wage increase from 38 to 46 cents an hour. Under the new agreement the men will work nine hours a day and will receive time and half for overtime and for Sundays and holidays. They asked 50 cents an hour.

Requested to Complete Improvements.—The Dallas (Tex.) Railway has been called on by the city authorities to spend between $300,000 and $500,000 on right of way improvements on certain streets. Four street paving projects involving expenditures by the company were outlined by Mayor Wozencraft, who notified the company that the city desired to have these projects completed before May 1, 1921, and that traction company was requested to notify the city of its intended action by Sept. 20 next.

Trackmen Accept Compromise.—Trackmen in the employ of the United Traction Company, Albany, N. Y., to the number of 150 have accepted the compromise offer of an increase of pay of 13 cents an hour. The men have been receiving 42 cents an hour. They asked for 15 cents an hour increase, or 57 cents, but after a number of conferences in which 53 cents an hour was rejected the men voted to accept 55 cents. The agreement will go into effect from July 1 last, and will continue for one year.

Mayor Favors City Ownership.—Mayor David L. Whiton, Quincy, Mass., recently announced that he favored municipal operation and ownership for the Quincy division of the Eastern Massachusetts Street Railway rather than have the city pay the deficit of $137,000 which Homer Loring, chairman of the public trustees of the company, declared had accumulated because of low fares since Jan. 1 of this year. Under the Public Control Act municipalities may be called upon to make up the deficit in the operation of the electric railway lines.

Wages Adjusted on Ohio Electric.—Agreement on a wage scale for trainmen employed by the Ohio Electric Railway in the cities of Lima, Newark, Springfield and Zanesville, Ohio, prevented a walkout of nearly 1,100 men. The men had asked 75, 77 and 80 cents an hour to supplant the present scale of 38 to 40 cents an hour for city men and 41 to 50 cents an hour for interurban employees. The closed shop was also asked. The company offered city men 43 to 50 cents an hour and interurban men 46 to 55 cents an hour. More was promised as soon as fares are increased in all the cities.

Rapid Transit Extensions in Brooklyn Opened.—The Eastern Parkway and Nostrand Avenue (Brooklyn) extensions of the Interborough Rapid Transit system began running at 12:40 o'clock on Aug. 23, thus furnishing rapid transit facilities to a large section of Brooklyn not served heretofore. This section extends for approximately three-quarters of a mile outside the new routes, as well as the large triangle between President Street and Utica and Flatbush Avenues. These extensions, which complete the principal Brooklyn link of the Interborough system, consist of 5¼ miles of a four-track subway. Of the fourteen stations on the extensions only eleven are now open, because the others are not sufficiently near completion to make it safe to use them.

Company at Rutland, Vt., Advances Wages.—Announcement has been made by the officials of the Rutland Railway, Light & Power Company, Rutland, Vt., of the granting of an increase in wages to the employees. About thirty-five motormen and conductors will be affected by the new advance wage schedule. They will get an increase in pay of 10 cents an hour, making the minimum wage for a motorman or a conductor who has worked six months or more, 53 cents an hour. New employees will be paid at the rate of 49 cents an hour for the first three months, 51 cents for the next three months and 53 cents for service after that. The trackmen have received an advance of 25 cents a day, making the salary for their day's work $4.75.

Macon Men Get More.—Motormen and conductors of the Macon Railway & Light Company, Macon, Ga., have made a new working contract with the company whereby they will receive from 12 to 16 per cent increase in pay. The employees of the operating department under the new contract, which dates from Aug. 1, receive from 40 to 53 cents an hour and double time for working holidays. Under the new scale the men can make as much as $200 per month by working extra time. The employees of the mechanical department were also given an increase. The car inspectors, who are now working on a salary basis, are also asking for an increase in pay. A few months ago they were given an increase of $10 per month.

Ban Proposed on Natural Gas.—Five state public service commissions are to meet on Sept. 10 to consider whether natural gas for firing boilers and for certain industrial heating operations will not be cut off altogether in order to insure more nearly adequate supplies for domestic users and industries which are regarded as more essential. The States involved are Pennsylvania, West Virginia, Ohio, Maryland, and New York. It seems certain that the Pennsylvania commission, at least, will follow out certain of these recommendations, and effort is being made to have the other commissions co-operate so that a joint action to this end can be taken. If the proposed regulations now under consideration are adopted, public utilities generating current from natural gas will have to use other fuels.

Parson a Conductor on Interurban.—The Auburn & Syracuse Railway, Auburn, N. Y., has the distinction of having in its employ Rev. H. H. Van De Myer, the conductor-parson. Rev. Van De Myer, who was studying in Auburn, found that employment as a conductor on the South Street Lake run was best suited as a means for him to earn money to continue his studies and accordingly accepted a job for the summer. His fellow employees soon learned that besides being a very efficient fare collector, he was also an ordained Presbyterian minister and he was recently prevailed upon to officiate at a ceremony by which Berton F. Hoskins, a motorman, became a benedict. Rev. Van De Myer appeared in his brass buttoned coat, disregarding clerical attire. The bridegroom also wore his working uniform. The clergyman is studying for his doctor of divinity degree at the Auburn Seminary.

Program of Meeting

Iowa Electric Railway Association

The mid-year convention of the Iowa Electric Railway Association will be held on Sept. 16 and 17 at the Fontanelle Hotel, Omaha, Neb. A program of great interest to mechanical and operating men is being prepared. It will be announced in the near future.

Financial and Corporate

Financing Method Attacked

Detroit United Railway Keeps Up Its War on City—Seven Suits Now Pending

The city's methods of obtaining money for the new Detroit municipal lines by the sale of bonds to the sinking fund commission is the basis of the latest suit filed by the Detroit United Railway in the District Court against the city. This is the seventh suit filed by the Detroit United Railway. In it the city is charged with juggling funds to raise money.

WANTS LEGALITY ESTABLISHED

The Detroit United Railway is now seeking to enjoin the prosecution of construction work and further purchase of railway public utility bonds by the sinking fund commission. It is claimed that the city has violated the charter by selling the bonds to the sinking fund commission, thus indirectly using the tax money for street railway financing.

Mayor James Couzens, Controller Steffens, City Treasurer Ingalls, the three members of the Street Railway Commission and the eight councilmen are named as defendants. Commissioner of Public Works Martin and the contractors who have been awarded contracts are also made defendants. The contracts which have been entered into by the city are held to be illegal. The Mayor, the Comptroller and the Councilmen are all members of the sinking fund commission.

Word has been received from Washington to the effect that the Detroit United Railway has also filed an appeal with the United States Supreme Court asking a permanent injunction restraining the city of Detroit from building the proposed municipal ownership lines. This appeal from the adverse decision of Federal Judge Arthur J. Tuttle in the case of the first two suits filed against the municipal lines, one by the Detroit United Railway and the other by the New York Trust Company and is based on the claim that the election authorizing the municipal ownership is invalid and the $15,000,000 bond issue for its construction is illegal.

CITY COMMISSION GOING AHEAD

The Street Railway Commission is ignoring the company's actions. It maintains that substantial progress is being made with regard to the new lines. Construction superintendents have been hired and it is expected that track laying will be started soon. Efforts will later be turned to the planning of carhouses and overhead systems. Plans are already being worked out for the type of cars to be used on the municipal line.

In commenting on the city's plans for financing, the Detroit United Railway points out that of the $1,750,000 of railway bonds that have been sold, $1,628,000 have been taken by the city itself and paid for out of sinking fund and invested funds cash, money raised by taxation. Mayor Couzens purchased $100,000 of bonds and the general public $22,000.

COUNCIL CONFIRMS BOND SALE

The Council has confirmed the sale to the sinking fund commission of $1,450,000 of railway bonds bearing interest at the rate of 5½ per cent. The first two issues bear only 5 per cent interest.

When the company applied for authority to build the Elizabeth-Grand Circus Park route for the relief of the Woodward Avenue service by doing away with the necessity for all Woodward cars going through the congested section, the Council suggested that the loop be built by the street railway commission and rented to the Detroit United.

PRIVATE COMPANY READY TO BUILD

This loop, according to the Detroit United Railway, could not be built by the city under the present authorization, as none of the $15,000,000 of bonds cover this piece of track work. On the other hand, the company points out that it has the rails and other material on hand for the immediate completion of the work.

Dividend Increase Voted Down

The ordinance increasing the dividends of stockholders of the Cleveland (Ohio) Railway from 6 to 7 per cent was defeated about three to one in a referendum vote on Aug. 12.

J. J. Stanley, president of the company, stated that an attempt will be made to sell stock for the purpose of securing funds for carrying out the improvement program for next year, but that it will be offered over the counter at par. Whether this can be done successfully remains to be seen, as the stock is now quoted below par on the stock exchange.

The increase in dividends was asked in order to make the stock more attractive. It is said that the company will ask for a new rate of fare of 6 cents, with 1 cent for transfers, before Sept. 1. This will not only strengthen the stock, but will be necessary to meet the expenses.

This year's program of extensions will be completed, but Mr. Stanley said that work for next year will have to go until additional funds are secured to carry out the program which the company contemplates putting through.

Rhode Island Sale Ordered

Trustees Required to Sell Stock—Some Lines May Be Abandoned and Scrapped

The Rhode Island Company, the Providence & Danielson Railway and Sea View Railroads will be sold at public auction on Sept. 3, in Providence, R. I., according to an announcement made on Aug. 24 by the Federal Trustees.

The trustees will sell the stock of these roads and the purchaser will then obtain possession and control of the physical properties. The sale is authorized by the United States District Court for the Southern District of New York which has entered an order directing the trustees appointed by the Court to dispose of the property before Sept. 4.

The sale of the Rhode Island Company includes the Providence and Burrillville and the Woonsocket lines. The Danielson line includes the Chepachet line from Providence.

The lines of the United Traction & Electric Company and the Rhode Island Suburban Railway, which are leased by the Rhode Island Company, are not affected by the sale.

DISPOSITION OF ROADS UNCERTAIN

Just what will become of the properties after they are sold is a problem. There are interests seeking to get hold of the Chepachet line, which is a part of the Danielson line, but they do not want the line from Providence to the State line to Danielson, Conn.

The general impression is that the Danielson and the Sea View lines will be junked. As noted elsewhere in this issue these two lines are to be turned back to their owners on Sept. 7 by the receivers of the Rhode Island Company, by authority of the Superior Court.

When the Federal Trustees learned of this, knowing that the lines did not pay and that the trustees had no money with which to operate them, they applied to the Federal Court in New York for instructions. The result was that the court ordered the sale of these two lines and of the Rhode Island Company as well.

The sale of the Rhode Island Company involves the entire 96,885 shares of outstanding stock held by the trustees. At the same time 9,132 shares and $600.000 in bonds of the Providence & Danielson Railway, and $700,000 in stock and $600,000 in bonds of the Sea View Railroad will be sold.

Public Service Railway Appraisers Named

State Comptroller Bugbee and State Treasurer Read, of New Jersey, members of the commission created by the last Legislature of that state to value the property of the Public Service Railway for rate making purposes, on Aug. 24 announced the selection of the firm of Ford, Bacon & Davis, New York, to do the actual work of appraising.

The act of the Legislature under which the appraisal will be made was a storm center from the time of its introduction before the Legislature. The measure was passed in April, but was promptly vetoed by the Governor. He considered that it was loosely drawn and offered an invitation to litigation. The bill was then passed over the Governor's veto. Under the law the Governor was designated as a member of the valuation commission, but he announced that he would not serve.

According to the bill the valuation commission consisting of the Governor, the State Treasurer and the State Comptroller was constituted "for the purpose of ascertaining and determining the value of all the property, including every proper and lawful element thereof, of any or all street railway and traction companies" in the State of New Jersey. The manner in which this is to be carried out is prescribed by the selection of "a competent electrical or mechanical engineering concern of the highest established reputation, equipped and organized for and experienced in the work of valuing street railway property."

When the value of any property has been completed as directed by the act, "the value of the property as set forth in said report shall be accepted by the Board of Public Utility Commissioners of this state as the value of said property as of the date specified in said report in any rate proceeding under any law of this state to the extent that the value of said property is a factor in the fixing of a rate."

Opponents of the measure contend that the act is defective in that proper provision is not made for the review of the findings of the engineers.

New Haven Trolleys Do Better

The results of the operations of the various electric railway properties of the New York, New Haven & Hartford Railroad for 1919 are unsatisfactory, but there are signs that the situation is improving. Operating revenue and the total operating expenses increased respectively 11.4 per cent and 12.1 per cent over that of 1918. The increase in the net operating revenue was a little more than 7 per cent. The non-operating income fell far short of the previous year. The decrease in this item was about 22 per cent. On the whole, however, operations were slightly encouraging as the net income, which showed a deficit, decreased over 1918 by 3.3 per cent.

The volume of business done by the various companies is increasing. Valuations of the Connecticut Company show property substantially equal to the securities, and valuations of the other road controlled by the New Haven but not included in the Connecticut Company would probably show the same results.

Municipal Roads Go Behind

Figures for 1917 Show a Deficit in Net Income for Eight Publicly Operated Roads of $141,896

The census bulletin for electric railways for the year 1917, recently issued by the United States Bureau of Census, presents for the first time a separate table showing the operating and financial statistics of municipally-owned and operated electric railways.

The accompanying table gives the names on nine municipal companies, together with the total passengers carried by each, and their miles of track and number of passenger cars. The net income is shown except in the case of the Monroe Street Railway and the Capitol Car Line, where the deficit from operating expenses is given.

	Total Passengers	Miles of Track	Passenger Cars	Net Income
Municipal Railway of San Francisco	36,234,723	58.55	197	*$103,908
Monroe Street Railway	935,776	9.11	9	†12,774
Municipal Lines of Seattle, Wash	899,387	23.37	14	*34,938
Municipal Street Railway of Alexandria	825,075	6.40	12	*1,189
St. Louis Water Works Railway	353,851	13.60	7	....
Pekin Municipal Railway	364,817	3.11	5	4,345
Tacoma Municipal Railway	254,292	6.79	9	7,405
Lincoln Municipal Railway	169,562	4.61	6	*867
Capitol Car Line of Bismarck, N. Dak	48,525	1.00	1	†5,344
Total	40,086,008	126.54	260	....

* Deficit in net income.
†Deficit in operating expenses.

Figures for the Bismarck line are not included in the totals of operation, a full report upon the road not being obtainable. The total operating revenue is given as $2,426 and the total operating expenses at $7,770 so that there was at least an operating deficit of $5,344 before fixed charges were approached.

The St. Louis Water Works Railway might well have been omitted from the table. This road was built primarily for the purpose of transporting freight and employees of the city water works. Of the total of 358,851 passengers, 215,603 were carried free. The figures of operating revenue and expenses given by this road are misleading, operating revenue being $29,103 and operating expenses at exactly the same amount. No deficit in either gross or net income is indicated although a cash investment of $274,800 is admitted.

For the eight roads covered by the totals of the Census Bureau the income account shows:

Operating revenue	$1,682,354
Operating expenses	1,462,719
Net revenue railway operations	$219,635
Taxes	126,146
Operating income	$93,489
Non-operating income	$28,608
Gross income	122,097
Deductions from gross income:	
Interest on funded debt	262,977
Interest on unfunded debt	1,016
Total deductions from gross income	263,99ɛ
Net income	*$141,896

* Deficit.

This deficit does not show the true conditions of operation for two reasons. In the first place, in the St. Louis and Monroe operations, no provision is made for the payment of interest on the funded debt, although in the case of St. Louis, there is an investment of $274,800 and in Monroe, an investment of $90,550. In the second place, only in San Francisco, Lincoln and Tacoma is there any allowance for taxes, and in

STATEMENT OF EARNINGS OF ELECTRIC RAILWAYS CONTROLLED BY NEW YORK, NEW HAVEN & HARTFORD RAILROAD FOR 1919

	New York, Westchester and Boston Railway		Berkshire Street Railway Company		The Connecticut Company		New York and Stamford Railway		The Rhode Island Company		The Westchester Street Railroad		Total	
	1919	Per Cent Increase Over 1918	1919	Per Cent Increase Over 1918	1919	Per Cent Increase Over 1918	1919	Per Cent Increase Over 1918	1919	Per Cent Increase Over 1918	1919	Per Cent Increase Over 1918	1919	Per Cent Increase Over 1918
Total operating revenues	$752,307	30.0	$918,644	3.1	$11,043,805	11.5	$434,003	15.9	$6,970,675	10.4	$298,585	22.9	$20,418,019	11.4
Total operating expenses	662,594	19.1	868,178	—19.7	9,210,376	13.0	388,824	16.1	5,928,263	15.9	336,855	15.4	17,395,090	12.1
Net operating revenue	$89,713	305.0	$50,466	1.3	$1,833,429	2.7	$45,179	11.8	$1,042,412	—12.8	*$38,270	21.8	$3,022,929	7.4
Taxes	147,810	3.5	64,371	4.1	619,658	7.6	23,676	2.4	621,885	2.9	11,918	22.0	1,489,318	5.0
Operating income	*$58,097	51.8	*$13,905	9.5	$1,213,771	0.4	$21,503	24.4	$420,527	—29.0	*$50,188	14.5	$1,533,611	9.9
Non-operating income	7,883	105.0	1,694	57.4	232,831	— 3.8	608	— 6.0	37,853	—65.8	879	156.0	281,748	—21.6
Gross income	*$50,214	57.0	*$12,211	95.3	$1,446,602	— 0.3	$22,111	23.3	$458,380	—34.8	*$49,309	15.5	$1,815,359	3.4
Deductions from gross income	1,672,930	3.8	317,397	— 0.6	1,338,567	7.3	97,458	1.5	1,491,760	0.8	35,654	7.4	4,953,766	3.4
Net income	*$1,723,144	0.3	*$329,608	41.3	$108,035	—46.5	*$75,347	3.5	*$1,033,380	29.1	*$84,963	7.2	*$3,138,407	— 3.3
Profit and loss account	*$11,667,095	....	*$1,724,789	.....	$2,653,854	.....	*$324,571	.....	*$1,262,684	.....	*$355,740	....	....	.....
Miles of single track	54.41	....	163.08	.....	696.48	.....	36.29	.....	299.11	.....	28.09	....	....	.....

* Deficit.

the two latter this is below what a private company would have to pay. If the interest on the investments of the two companies mentioned had been added, as had also the taxes for five of the companies not taxed, then the deficit in net income would have been larger. These facts lead to the conclusion that the showing made by municipally owned roads is not very impressive.

Loss of $17,135 in Jacksonville in July

Unless the rates of carfares of the Jacksonville Traction Company, Fla. are increased, the company will not be able to continue to function. The existing conditions are not suitable as shown by the report for the month of July, 1920, with cash on hand on July 1 of $48,617, the report, filed in the office of the clerk of the Federal Court, shows that the expeditures were such as to leave a balance on Aug. 1 of only $31,482 in cash, a loss during the month of July of $17,135. The statement follows:

Cash on hand July 1	$48,617
Passenger receipts	86,717
Sale of tickets	380
Accounts received, miscellaneous	1,885
Miscellaneous	53
Total railway revenue	$137,652
Salaries and wages	46,999
Supplies	9,266
Supplies—fuel	31,955
Accidents causing expenditure	1,299
Taxes	7,850
Miscellaneous expenditures	8,471
Total operating expenses	$106,170
Balance on hand Aug. 1	$31,482
Balance of accounts assumed and unpaid Aug. 1	$3,542

Plea for Sale at Foreclosure Entered

Counsel for the Guaranty Trust Company, New York, N. Y., as trustees for the holders of the first mortgage bonds of the New York Railways sought on Aug. 17 to have Judge Julius M. Mayer of the United States District Court accept and enter a proposed decree which would end the receivership of the surface railway system by putting it up at auction. After a protracted hearing the court deferred consideration of the subject until Nov. 10.

Joseph P. Cotton, in offering the decree, declared that the property, now in the hands of Job E. Hedges, receiver, should be sold for the benefit of the senior bondholders before equities are further diminished, but evidence introduced by counsel for the company disclosed the fact that many of the surface lines are showing a large increase in revenue, attributed mostly to action of the courts in eliminating competitive city buses.

E. H. Blanc, representing the junior mortgage holders, and Frederic Coudert, counsel for additional interests, pronounced the proposed decree premature and discriminatory. It was finally decided to sell, but not under a foreclosure decree, certain unused carhouses. The court ordered another hearing on Oct. 18 on winding up the receivership.

Financial News Notes

Texas Line Suspends.—The Longview & Junction Railway, Longview, Tex., has suspended operation indefinitely. The line is 1 mile in length.

Resort Lines Suspend.—The Jersey Central Traction Company, operating 44 miles of line with principal offices at Keyport, N. J., shut down its Keansburg division and Carr Avenue lines on July 19. The lines which have been abandoned comprise less than 2 miles of the entire road. The business which is offered in these places, it is explained, is all being cared for by jitneys.

Refunding Issue Authorized.—The Public Utilities Department of Massachusetts has authorized the Holyoke Street Railway to issue bonds to the extent of $85,000, to mature in April, 1935. They will bear interest at 6 per cent. The new issue is planned to provide funds to refund an issue of $85,000 of Holyoke Street Railway debenture 5s dated 1899 and due Oct. 1, 1920.

Abandonment Plans Before Commission.—The Westchester Street Railway and L. S. Miller, receiver, have applied to the Public Service Commission for approval of the action of the company on June 29 in a declaration of abandonment of the Westchester Avenue and Mamaroneck Avenue lines on the ground that "they are no longer necessary for successful operation of its road and the convenience of the public."

Receiver for Ashtabula Road.—The Ashtabula, (Ohio) Rapid Transit Company has been placed in receivership, resulting from failure of the city to take over the lines as a municipal system as contemplated. The city withheld action until an agreement could be reached regarding $350,000 bonds of the company and because some creditors were unwilling to pro-rate their claims with the bondholders.

Railway Being Dismantled.—The work of removing the abandoned trackage of the Shore Line Electric Railway from New Haven to Flanders, Conn., is now under way. The American Railway Equipment Company, New York, is in charge of the work. Two months will be required to remove the 60 or more miles of rails. Insufficient patronage to support the road, followed by a strike of its employees who demanded increased wages, caused this public utility to pass into the hands of a receiver.

Purchased Companies Are Dissolved.—The United Light & Power Company which was organized in East Moline on Feb. 2, 1908, but later was purchased by the Tri-City Railway & Light Company, Davenport, Ia., has been dissolved and its charter surrendered to the Illinois State Secretary. The same has been done with the Watch Tower & Campbell's Island Park Company. Officials of the Tri-City Railway & Light Company explain that the dissolution of the companies was merely to clear up their records. Both of the companies were purchased by the Tri-City Railway & Light Company and ceased to exist several years ago so far as operation was concerned.

Preparing Reorganization Details.—The International Railway, Buffalo, N. Y., on Aug. 18, made application to the Public Service Commission for the Second District, for approval of the increase of its capital stock from $17,000,000 of which $16,707,500 is outstanding, to $17,500,000, consented to by the stockholders in writing and also authorizing the issue of $792,500 in capital stock which shall or may be sold to the protective committee for collateral trust 4 per cent bonds of the International Traction Company, now owner of all the stock of the railway, at a price not less than par. The commission will give early consideration to the petition.

No Action in P. R. T. Lease Controversy.—The Union Traction Company, Philadelphia, Pa., has yet to appoint a committee to meet the four directors of the Philadelphia Rapid Transit Company picked to deal with them in regard to the resignation as a Union Traction director, of Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, following the refusal of the Union Traction directorate to assent to the $6,000,000 car trust certificate issue sought by the P. R. T. except on terms deemed excessive by the P. R. T. The next regular meeting of the Union Traction directors is scheduled for Sept. 18 and if no meeting is held before that time, the compromise agreement espoused by J. J. Sullivan, president of the underlying body, will have to wait.

Rhode Island Company Will Discontinue Some Lines.—The receivers of the Rhode Island Company, Providence, R. I., have decided to discontinue operation of cars over the Chepachet, Danielson and Sea View lines after Sept. 6. The federal trustees, as yet, have made no decision, as to the future of the lines. The Chepachet line is the newest of the three, having been opened about five years ago. It runs to Greenville, Harmony and Chepachet. The Sea View runs through Wickford, Hamilton, Saunderstown, Narragansett Pier, Wakefield and Peace Dale. The Danielson line touches, North Scituate, Rockland, Clayville, Foster Centre in Rhode Island and East Killingly. Elmville, Danielson, Dayville and Putnam in Connecticut. Other phases of the affairs of the Rhode Island Company are referred to on page 433 of this issue. As indicated there the holdings of the company will be sold on Sept. 3 unless court action, unforeseen now, should intervene.

Syndicate May Purchase Railroad for Automobile Road.—The Ocean Shore

Railroad, San Francisco, Cal., recently discontinued operation on account of labor troubles. Primarily this was due to the increase in wages, but also to the difficulty of maintaining satisfactory service under present labor conditions. Several months ago a syndicate of real estate men made a proposal to buy the property, sell the rolling stock, scrap the rails and construct an automobile road along the right-of-way. Although this proposal was abandoned for a time it is now being revived. The Ocean Shore Railroad is a broad gage line running from the depot at Twelfth and Market Streets, San Francisco, to Tunitas, about 38 miles down the coast. The company has a total of 54 miles of track and the terminals in San Francisco are electrified.

Franchise Passed at Bellaire.—The Council of Bellaire, Ohio, passed the Wheeling Traction Company franchise ordinance, inserting a provision authorizing the solicitor to institute injunction proceedings to oust the company if the franchise is not accepted in thirty days. If the company declines to accept the franchise, the solicitor is empowered to attempt to stop the company from operating in Bellaire, and to compel the removal of its tracks, cars, poles, and other equipment from the streets of the city. The ordinance has been passed twice previously, with provisions that it must be accepted within fifteen days, but due to delays in getting the ordinance into the hands of the company officials, ouster proceedings were not instituted.

Interurban Has Deficit of $727.—The Northwestern Ohio Railway & Power Company, which operates the interurban line connecting Toledo, Lakeside and Marblehead, announced that it had a deficit of $727 for the year ending June 30. The company has outstanding an issue of first mortgage 5 per cent bonds totaling $1,293,000, the interest charges on which amounted to $64,650. The total revenue for the year was $392,663, an increase of 22.1 per cent over the previous year. The expenses increased 18 per cent to a total of $328,740. The net profit before interest charges was $63,923. Because of the company's inability to secure contract coal in sufficient quantities to keep its power house going it has been buying power manufactured at the Acme plant of the Toledo Railways & Light Company in Toledo.

Boston Elevated Refused Lease.—The Board of Trustees of the Eastern Massachusetts Street Railway have refused to lease their lines in Chelsea and Revere to the Boston Elevated Railway. To lease the lines, in the opinion of the former, would further complicate the traffic situation between Boston and points north. If the Boston Elevated Railway operated the lines to Revere, the passengers concerned would have to pay the higher fare to Boston. The Eastern Massachusetts trustees suggest the construction of a joint terminal at Chelsea in connection with the train service in the tunnel, in order to do away with drawbridge delays. It has been proved that the East Boston tunnel capacity can be increased from 6,000 to 20,000 passengers per hour by the use of trains and the elimination of surface cars.

Receiver for Road at Alton.—Judge George E. English, Federal Judge for the Eastern District of Illinois, has appointed Fred E. Allen St. Louis, and W. H. Sawyer receivers for the Alton, Granite City & St. Louis Traction Company, East St. Louis, Ill., as the result of a petition filed by bondholders of the road. The interest coupons for the last two periods, which became due in August and February, are in default, according to the petition. The Alton, Granite City & St. Louis Traction Company operates between Alton and St. Louis, passing through Edwardsville, Mitchell, Woodriver, Eagle Park, Granite City and East St. Louis. Including connections, the road controls 62 miles of trackage. Mr. Sawyer is president of the railway, which is controlled by the East St. Louis & Suburban Company.

Huntington Road Will Resume.—The Huntington, (N. Y.) Traction Company has been granted a certificate of public convenience and necessity by the Public Service Commission for the Second District of New York for the operation of the former Huntington Railroad between Halesite and Melville, Long Island, a distance of about 7 miles. Operation of the trolley line will permit residents along its line to make connection with the Long Island Railroad. The commission has also approved assignment by William A. Dempsey, Brooklyn, of a franchise granted to him by the Huntington authorities. The former Huntington trolley line was dissolved. There was a hearing before Commissioner J. A. Kellogg in New York who holds that operation of the line is a public necessity. The commission also authorized the company to execute the necessary securities, the proceeds of which are for the construction and acquisition of the road.

Court to Pass on Rentals.—Judge William B. Lynn of the Superior Court of Pennsylvania has signed a writ of supersedas removing from the hands of the State Public Service Commission the case of the United Business Men's Association, Philadelphia, vs. the Philadelphia Rapid Transit Company. The association had complained to the commission against the payment by the P. R. T. of large rentals to the Union Traction Company and its other underlying companies. The commission recently dismissed the demurrers of the underlying companies and ordered them to defend the action. The commission is now prevented from taking further steps in the matter until after a hearing by the Superior Court. Mayor Moore recently signed an ordinance for an appropriation of $50,000, which will enable the city to make a valuation of the P. R. T. system. This fund will be used for the employment of engineers, accountants, assistants and advisers.

Purchase of Bluefield Line Discussed. The directors of the Chamber of Commerce of Bluefield, W. Va., have endorsed and agreed to promote a plan of the Princeton Power Company to take over the electric railway system of the Appalachian Power Company in Bluefield, W. Va., and Graham, Va., and own and operate it in the future. Details of the plan have been worked out which are acceptable to both of the companies involved, and it now remains only for the people to support the proposition morally and financially to the extent necessary to put the deal through. S. J. Evans, president of the Princeton Power Company, and S. P. Hardy, the treasurer, appeared before the directors of the chamber and stated that their company stood willing to assume the ownership and management providing the business men of the city would subscribe to $50,000 of preferred stock to provide funds to rehabilitate the present system. The directors of the Chamber of Commerce passed a resolution endorsing the plan and authorized the president, Edwin Mann, to appoint a committee of five to assist in the sale of the stock.

Dismantlement May Be Prevented.—There are prospects that the Charleston-Isle of Palms Traction Company's line may escape being dismantled and junked. The State Railroad Commission of South Carolina has decided to permit the company to charge 5 cents a mile. The order is based on an act of the Legislature of 1920. The request for the increase was a resolution adopted at a mass meeting in Charleston several days ago, urging the commission to grant the higher mileage charge. The railroad seemed to be indifferent to the outcome of the situation because the road was operating at a daily loss. Judge Smith recently issued an order for the road to be sold and the company liquidated. The case went before Judge Smith on an appeal from a ruling of the Railroad Commission which refused to allow the road to increase its fares, instituting a zone system. This was before the passage of the act of the 1920 Legislature making possible the 5 cent a mile limit for small lines. The court on Aug. 11 authorized the company to conform to the regulations of the commission for the safety of passengers and to pay $12,500 in interest to the Baltimore Trust Company for the year ended Aug. 15. The company must make a full and complete return of its business and affairs on or before July 15, 1921, or sooner, if so ordered by the court. On this return will depend the ultimate future of the concern, for if it does not show that with the increased rates which have just gone into effect the company is able to operate without a continuous loss and to meet its just obligations, Judge Smith will put into effect the provisions of his decree of June 29, the effect of which would be the cessation of operations and the sale of the property, according to the order of the court.

Traffic and Transportation

Fare Order Brings Strike

Des Moines Men Plan to Ignore Court Because Dissatisfied with Terms of Rate Advance

Announcement of a walkout of the employees of the Des Moines (Ia.) City Railway to take effect at 1:15 on Aug. 24 was made on Aug. 23 by officials of the men's union.

This action toward a strike follows dissatisfaction of the men over the fact that in his order granting the receivers the right to place the fare in Des Moines temporarily at 6 cents and to pay an increased current wage to the men, Judge Martin J. Wade of the Federal Court made no definite order as to the back wages. The men claim an increase from 60 to 70 cents maximum from March 1, the date the arbitration board awarded an increase to the men.

RATE INCREASE TEMPORARY

Judge Wade's order granting the increase in fare was made on Aug. 21. It went into effect on Aug. 22 at 5 o'clock. While not writing it into the order, Judge Wade intimated that the new rate was to extend over a period of from sixty to ninety days and that by that time the solution to the problems of fare in Des Moines might be found.

The fares fixed by Judge Wade are as follows: adults, 6 cents; children and school children, 3 cents; owl fares, 10 cents; Valley Junction, Fort Des Moines and Urbandale lines (where an additional fare of 5 cents has been collected when the cars passed the city limits) an additional fare of 4 cents.

Judge Wade further ordered that for the convenience of the public tickets were to be placed on sale at the company's office at four for 24 cents.

Earlier in the week action was started in the Des Moines City Council to grant the company a rate of 7 cents for a period of ninety days. The corporation counsel and the special counsel, however, fought the move on the grounds that it would prejudice the city's power to reduce the rate at the end of the temporary term. The resolution in the City Council was lost by a vote of three to two. The deciding vote was cast by the union labor member of the Council who had been considered to be the member strongest for the increased fare.

JUDGE ACTS TO PRESERVE SERVICE

In his order Judge Wade said:

> Of course no one connected with the proceedings claims that service can be continued at a 5-cent fare. I will not, however, undertake to determine what fare shall be paid as a permanent matter. I shall only undertake to act on this emergency so that for a short period of time the people of Des Moines will have street car service.
>
> A strike has been suggested. Of course the men have the legal right to strike, but I have no hesitation in saying that they have no moral right to strike during the period of the State fair which would result in punishing hundreds and thousands of people who do not live in Des Moines and who are utterly innocent of any wrong with regard to the controversy about rates and wages.
>
> I shall not undertake to enjoin a strike. I am making a temporary order which I trust will be the beginning of a permanent settlement. This order will give some relief to the employees and I trust will lead to the ultimate settlement of all matters in controversy.
>
> It is only fair to the men and to the people of Des Moines to say that if after this order there is a strike the court will feel that it is its duty to cancel the wage contracts between the company and its employees. The receivers will be instructed to operate the cars if they can secure enough men to do so. If they cannot the receivers will be instructed to cease operation entirely until men can be procured to render service.

If at the end of sixty to ninety days the city and receivers have not settled the controversy Judge Wade announced that he would appoint a commission to fix fares which will be paid under future court orders.

The present week was settled upon by the men as a strategic week for a strike by reason of the fact that it is the time set for the Iowa State fair which brings several hundred thousands of visitors to Des Moines. The strike vote was taken some time ago by the men with Aug. 25 named as the last date for settlement.

Judge Wade promptly ordered the receivers to suspend service indefinitely and keep the cars in the carhouses and only to employ sufficient men to guard the property. The court also canceled all wage agreements and specifically ordered that no re-employment contracts be entered into with the men without the court's consent.

Seven-Cent Fare Appears Insufficient

Intimation has been made that the Connecticut Company may ask a higher fare of the Public Utilities Commission at the hearing to be held Oct. 1, when the test period under the present system ends. Leonard M. Daggett, one of the trustees of the company, in an interview is reported to have stated that the 7-cent fare is producing more revenue than the preceding zone system, but that the increased income is not sufficient to meet the expenses of operating the system.

In authorizing the present flat 7-cent fare system, which began on Aug. 8, the Public Utilities Commission set Oct. 1 as the date for a resumption of the hearing on the Connecticut Company's financial condition. On that date the Connecticut Company is to submit a report of the operation of the 7-cent system during the two months, and whatever recommendations it may have for the future.

R. I. Buses Quit

Company Placed in Receiver's Hands Pending Reorganization—Poor Management Alleged

Service has been temporarily discontinued by the Rhode Island Omnibus Company, Providence, R. I., because of lack of funds. The company, which has been operating in competition with the Rhode Island Company for about a year, has been placed in the hands of a receiver by agreement of all parties at interest. It is said that the company's assets are greater than its liabilities. An attempt is to be made to secure additional capital for the enterprise, which is claimed to have been run on a profitable basis up to the past few months.

ATTACHMENTS PLACED ON BUSES

William Law, one of the chief creditors in the concern, has been appointed temporary receiver. In asking for a receiver the creditors set forth that many persons had placed attachments upon the property of the corporation and that other creditors had threatened to do likewise. The naming of a receiver was deemed advisable for the preservation of the assets and for the best interest of all parties concerned in the venture.

Twenty-one buses are owned by the company. At a recent meeting of the creditors it was stated that the liabilities amounted to $7,764. The concern is capitalized at $51,000, of which Abraham Luff and J. C. Doran, former president, own $25,000 each. Mr. Doran put in $23,000 in cash while Mr. Luff is said to have $28,000 invested. An attempt is to be made to secure $15,000 in additional capital through stock subscriptions from the communities served by the company to permit the resumption of service.

POOR MANAGEMENT CHARGED

Poor judgment in the management of the affairs of the company is given as the chief reason for the company's difficulties. Unsuccessful experiments cost several thousand dollars.

J. C. Semonoff, counsel for the company, recently made the following statement outlining the reasons for the corporation's temporary embarrassment:

> For various reasons the Rhode Island Omnibus Company has decided to discontinue business temporarily until the reorganization of the affairs of the company can be effected. The company has made the mistake of trying several experiments which have proved to be failures, and these experiments, together with the fact that there has been lack of harmony among the directors as to the methods of management, have been responsible for the present situation.
>
> The company has operated very successfully, doing a good business with substantial profits until recently. At the present time, its assets, allowing for a reasonable depreciation, are understood to be in excess of its liabilities. From the experience gained the owners of the company are confident that with sufficient capital and with the proper management, the business will be so organized as to be very successful.
>
> The public has greatly appreciated the service given by the company, and the residents of the suburbs, who have particularly profited by the service rendered, are understood to be making arrangements to do their part toward restoring the company to a sound basis.

Bridgeport Transportation Committee Reports

Open Meeting Monday to Consider Report and Its Recommendations—Admits Jitney Service Inadequate

Recommendations that the jitneys be barred from the central portions of the city of Bridgeport, Conn., giving the trolleys full right of way on Fairfield Avenue and State Street, from Water Street to Park Avenue, and the business section of Main Street, are contained in the report filed on Aug. 25, by Mayor Wilson's transportation investigation commission. Mayor Wilson has called a public meeting for Aug. 30. The members of the Board of Aldermen will be in attendance. In the report, the Connecticut Company is advised to take prompt steps to exercise its franchise by resuming operating of cars. The city is also urged to take legal action accorded it by the state laws to insist on a resumption of service or abandonment of franchise if the company fails to operate within a reasonable time. The city is further urged to use every effort to have the State Legislature grant permission to the Connecticut Company to operate motor buses. A further study will be made of the fare matter.

THE lines of the Connecticut Company embraced in the report cover 104 miles of track and include what the committee recommends be considered as the Bridgeport district. The first part of the report is given up to a review of the need of Bridgeport for adequate transportation and to a summary of the early financial history of the companies now included in the system of the Connecticut Company in and around Bridgeport. The commission lays very largely to the automobile the failure of the state-wide system represented by the Connecticut Company to meet its expenses, rentals and taxes.

On the matter of the frequently suggested plan for the segregation of the Bridgeport lines from the rest of the system, the commission says that "it is indisputably proper that each community represented by such towns as Bridgeport and its suburbs should be considered and administered apart from alliance with the rest of the State and its transportation salvation should be had with respect only to its own problems."

Reference is made to the valuation of the lines in Bridgeport made in 1910 by Westinghouse, Church, Kerr & Company. As of 1919 the valuation is $9,367,518 based upon unit values suggested by the engineers, with additions entered at cost at the time of purchase. The commission says that "if replacement values as of 1919 were to be used the total value would be about doubled," but that "it is not proper that increment in value under present inflated costs should be used." The figures mentioned are considered by the commission to represent a basis of valuation believed satisfactory to all.

STATEMENT OF OPERATING EXPENSES OF CONNECTICUT COMPANY IN BRIDGEPORT DISTRICT FOR THE PAST FOUR YEARS

Expenses:	Year Ended Dec. 31, 1916	Year Ended Dec. 31, 1917	Year Ended Dec. 31, 1918	Year Ended Dec. 31, 1919	6 Mos. Ended June 30, 1920
Maintenance of way	$258,657	$270,193	$160,213	$205,528	$123,558
Maintenance of equipment	100,539	137,815	191,055	171,678	105,824
Cost of power	185,807	247,934	354,547	438,532	199,534
Conducting transportation	501,994	558,583	598,385	762,344	439,635
Traffic expenses	1,743	1,273	2,163	5,188	2,980
General and miscellaneous, including accident and insurance	153,017	175,629	181,350	238,361	122,314
Taxes	77,214	76,441	70,342	77,498	36,960
Return on property value at 7 per cent	655,726	655,726	655,726	655,726	327,863
Total costs	$1,934,701	$2,123,598	$2,213,783	$2,554,858	$1,358,671

The commission says that it must be conceded that the increases in the item "conducting transportation," which includes the wages of trainmen, are not excessive and were necessary.

On the question of fares the commission says:

> There are possible combinations of fare with transfer charges, and other combinations, but the correct combination to enact is the one that will yield the greatest number of passengers per car-mile possible, within the economic fare range. These details require several weeks of additional study before conclusive recommendations can be made. We cannot treat the problem as one merely of raising sufficient returns to keep the lines solvent and pay interest upon investments, because a combination of high fares and small travel which might do this, will not furnish the city with a proper service.

A resident vice-president and general manager for Bridgeport lines of the company is recommended, the incumbent to be a man who will identify himself with the city as a citizen interested in the growth of the city. The local manager should be "limited in authority only as necessary for coordination."

More safety cars are recommended. The report says:

> While now possessing excellent and sufficient number of cars, at earliest possible date the number of modern safety cars should be increased from the present number of forty-six to the number required for the full service on lines where this type of car has been found desirable, approximately thirty more such cars being required. It is believed that this addition can be deferred until 1921, at which time the city, or Bridgeport interests, might well underwrite a trust fund for the purpose. Further large outlays appear unnecessary for several years.

The commission would have the Connecticut Company prepared to enter the bus business. On this point it says:

> At the coming session of the Legislature the city should use its influence to secure passage of an act, if necessary, providing the Connecticut Company with authority for operation of rubber-tired motor buses in service complementary to its rail service. Such power should be made subject to full municipal control as to standards of vehicle, service and fares, and similar control in every phase should also be made effective concerning all public motor buses following specific routes.

It is the view of the commission that prior to the suspension of the railway, there were unfair elements in the competition between the trolleys and the buses, resulting in some degree in the inability of the railway successfully to operate its cars as contemplated under the railway's franchise; but, says the commission, "at the same time it seems proper to say that to take action that would virtually suppress responsible motor bus service in the city would hamper the line of progress toward better things in future transportation." Further, the commission says that it is of the opinion that "a properly organized bus corporation, surrounded by control, can meet with entire satisfaction, all the transportation requirements of the district."

A CONDITION; NOT A THEORY

While it is deplored that the railway thought it advisable, or was able under the law, to discontinue its passenger service on Aug. 2 and that the city was without adequate means to control the situation, the commission is mindful of the fact that "we are dealing with a condition and not a theory." The commission says:

> It is to be expected that the railway will voluntarily, or by necessity, resume, but should the railway fail now, upon further demand to restore its service immediately under the system of fares legally provided, it seems proper that the city should initiate such action as may under the law be done, for requiring such restoration, or sacrifice of franchises and should thenceforth proceed to lend its aid and encouragement to the organization of a modern standard motor bus company.
>
> It is believed that the failure of the present system of bus service fully to meet the requirements is due to the fact that operation is voluntary by individuals and lacks the possibility of control that may be exercised over an enfranchised body.

In conclusion the commission says:

> To this end it is recommended that a local permanent transportation commission for the city be appointed and legislative action be sought at the coing session under which such commission shall be recognized as a medium and clearing house for intercourse, reports, and regulation between the railway, or bus operators, and city. Thus, a permanent body of men will be provided through medium of which fare adjustments and service matters may be handled with better degree of preparedness, protecting both public and the companies in all situations that arise.

The rates outlined in the program of the commission would eliminate the motor buses from Main Street, south of E. Washington Avenue, and Fairfield Avenue between the Plaza and Park Avenue, and from State Street between Water Street and Park Avenue, and from portions of Stratford Avenue, Noble Avenue and Barnum Avenue.

A draft of an ordinance which would bar buses from many central streets of New Haven was submitted to the Board of Aldermen at its special meeting on Aug. 26 by the Aldermanic committee. The report is a short one and recommends the enactment of an ordinance laying down the street from which public service autos would be barred. A fine of $100 would be imposed for every violation of the provisions of the ordinance.

California Commission Takes Lead

Grants Pacific Electric Railway and Other Lines a 20 per Cent Rate Increase, Co-operating with Interstate Commerce Commission

Announcing a policy of co-operation with the Interstate Commerce Commission, the California Railroad Commission has issued a decision authorizing steam railroads, electric interurban railroads and boat lines operating in California to increase both passenger and freight rates in conformity with the decision of the Interstate Commerce Commission. Under this decision the Pacific Electric Railway, Los Angeles, is authorized to increase all rates by not to exceed 20 per cent, which means that the company's local fares in Los Angeles and outside cities may be raised from a 5-cent to a 6-cent basis. All other interurban electric railways in California have heretofore been allowed, under decisions of the commission, to increase their local fares and therefore this increase will not be effective as to these lines.

THE action of the commission follows the application made by the carriers and hearings held by the commission in both San Francisco and Los Angeles, following the decision of the Interstate Commerce Commission. The Railroad Commission states in its decision that it is confronted with two alternatives: that either it must base its conclusion on the conditions in California alone, regardless of the fact that the income produced by the rates thus fixed would have been contrary to the action of the Interstate Commerce Commission, or it must proceed in harmony with the decision of that commission. The decision goes on to say:

> We have given this matter very careful consideration, and in so doing have attempted to give weight to the probable consequences of proceeding upon either of these alternatives. We realize that without requiring more evidence that is now before us in this proceeding, to impose on intrastate business the identical percentage authorized by the Interstate Commerce Commission would, in effect, be the fixing through us of all State rates by the Interstate Commerce Commission. Whether or not this constitutionally may be done is a question we do not consider it our function to decide.
>
> On the other hand, to proceed in the usual manner as though this were an entirely independent proceeding would result in serious delay, as it is evident that to gather and submit technical data upon which to base sound judgment of what practically all transportation rates in California ought to be, would require many months, and all possibility of immediate relief to the carriers would disappear.
>
> ### Would Avoid Friction
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> This, however, is not the most serious result that would follow independent action by this State. If this commission, under the circumstances that now confront us, fixes State rates regardless of the order of the Interstate Commerce Commission, and if such rate fixing resulted in a return to the railroads of the Mountain Pacific group less than the 6 per cent authorized by the Interstate Commerce Commission, either the Interstate Commerce Commission must further burden interstate commerce with rates high enough to make up the deficit resulting from the California action or, if legally possible the Interstate Commerce Commission would be compelled to overrule this commission, or the Esch-Cummins Act would be a demonstrated failure.
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> It appears to us that if each State in a given group insists upon wholly independent action and judgment the whole spirit and purpose of the Esch-Cummins Act is in danger of nullification. It must be realized that the Interstate Commerce Commission, a national body entitled to the respect and confidence of the country acting under the mandate of Congress, has proceeded impartially, using the best available information and the best judgment of its members in the determination reflected in the order referred to. It has evidently in good faith sought to carry out the mandate of Congress.
>
> It is our deliberate judgment that it is the duty of this commission to co-operate in every feasible way to give the Esch-Cummins Act a fair trial.

The commission makes it clear in its decision that it in no way abdicates its function in rate fixing as it states its determination to grant the prayer of the carriers is sustainable on the ground of reasonableness. Shippers who appeared before the commission at the hearings practically without exception stated their conviction that the roads must have relief in increased rates in order to be able to continue functioning and that it was their belief that the commission should co-operate with the Interstate Commerce Commission in making the increases effective.

The Pacific Electric Railway some time ago applied to the commission for a general increase in fare over its entire system amounting to approximately 33⅓ per cent. The commission was asked to conduct a thorough investigation of the company's affairs with a view to fixing a valuation upon which permanent rates might be fixed. Several hearings have been held on this petition, which is still in the commission's hands.

Seven-Cent Fare for Rochester Approved

The Public Service Commission for the Second District of New York on Aug. 24 authorized the New York State Railways to charge a 7-cent fare in Rochester on one day's notice to the public.

On Aug. 5 the New York State Railways presented evidence to the Public Service Commission, upon its application for authority to charge a 7-cent fare in Rochester under amendment of the Rochester franchise which was the subject of litigation through the Court of Appeals in the Quinby case.

The proceeding on Aug. 5 was under a waiver by the Rochester authorities of the railway's franchise agreement and a stipulation in the Quinby case permitting the commission to pass on the company's petition for right to charge a 7-cent fare under agreement with the Rochester Common Council and Mayor.

A statement was introduced in evidence showing that in May and June the operating revenues on the Rochester lines totaled $743,522, the operating expenses $802,433, and taxes $50,820, leaving a deficit in income of $110,107.

Chairman Hill brought up the question of service in Rochester which it was shown at a prior investigation by Commissioner Barhite was not efficient. He asked the company to submit evidence as to improved service under the proposed new fare.

James F. Hamilton, president of the railway, said there had been an improvement since the commission's investigation, and schedules of operation are now being prepared which will insure better service. These will go into effect in thirty days under the increased fare. He said details of the proposed improved service would be submitted to the commission.

Mr. Barnes said it was planned to give a service in Rochester which would be beyond criticism. Travel will be closely watched for improving service in the future.

Mr. Pierce stipulated in the present proceedings that the value of the company's property used on the Rochester lines was $17,500,000.

The 7-cent fare now allowed is the initial rate fixed under the terms of the new service-at-cost contract under which the lines of the New York State Railways in Rochester will be operated in the future.

Massachusetts Road Gives Up Freight Service

Freight service was discontinued by the Eastern Massachusetts Street Railway on June 16. It has been unprofitable. On paper it appeared that the company was breaking even, but figuring the wear and tear on equipment and tracks and the interruption of passenger service at a time when the agitation for better passenger service was at its height, it was deemed best to discontinue the service.

Another obstacle was the large number of bridges to be crossed on the various lines of the company. The capacity of most of these bridges was insufficient for the weight of their freight cars which had a capacity of 60,000 pounds.

In addition to all this the company was confronted with the purchasing of snow fighting equipment or the converting of some of its present equipment into snow plows, etc., and it was decided to convert the forty freight cars into equipment for keeping the lines open this coming winter.

The men formerly employed in this branch have gone into the passenger service and retained their rating. Some of the men with low ratings have left the company, but the majority are satisfied with their ratings in the passenger service.

As to the executives, Frank D. Ward, formerly superintendent of rolling stock, has accepted a position with the Robert Dollar Company, New York, as construction engineer and has departed for Shanghai, China. On his departure Walter C. Bolt, formerly purchasing agent, was made superintendent of rolling stock, and Perley P. Crafts, formerly manager of the freight department, became purchasing agent.

Asks Indefinite Rise

Los Angeles Railway Applies to State Railroad Commission for Rate to Yield Just Return

Application for an increase in fare was filed with the State Railroad Commission by the Los Angeles (Cal.) Railway on Aug. 20. The present rate is 5 cents. The application does not ask for a specific increase but asks that the commission "make such order, granting authority to the applicant to increase the rate of fare as will afford the applicant sufficient revenue to pay the cost of the transportation service which it renders the public." In this way it is left to the commission to decide what increased revenue the company must have to meet present obligations, and those of the future which the commission can foresee.

The commission is asked to resume the investigation of the Los Angeles Railway which it made last year and which led up to the rerouting of many lines and introduction of safety car service. It is pointed out in the application that while the last survey showed where economies could be effected, new factors which the commission could not then foresee have arisen and increased expense has more than wiped out the savings resulting from these economies.

It is stated that the cost of power has increased 27 per cent since the last survey was made and that it has been necessary to raise wages practically $990,000 since Jan. 1, 1920. Prices of nearly all materials have been advanced substantially, the application states, and will be materially increased again by the rise in the interstate freight rates.

The application of the Los Angeles Railway follows the award of a 20 per cent increase to the Pacific Electric Railway, which operates interurban service out of Los Angeles and local service throughout the Hollywood district. The commission awarded the Pacific Electric a temporary 6-cent local fare and will make an investigation before announcing a permanent increase.

Still Fighting Kansas City Buses

Continuing its fight for the extermination of jitney competition with its electric lines, the Kansas City (Mo.) Railways is publishing from week to week in the *Railwayan* articles dealing with various aspects of the local railway situation in which it points out that bus traffic on the present scale makes the difference between profit and loss to the company. In a recent issue the company said:

> Jitneys are taking away from this company approximately $3,000 per day in revenues. As against 11,828,364 revenue passengers carried in June, 1917, the company in June, 1920, carried 10,656,374. In June of last year 580 cars were operated in the evening rush. Today 662 are operated, or an increase of 82 cars, or 14 per cent. Due to the system of turn-backs on through lines and because of the increase in scheduled speed, each car is today giving much more service than it gave a year ago. In other words, as against 580 cars in June, 1919, 700 are being run today on the same basis, showing an increase of 20 per cent in service.
>
> Assuming that jitneys are making expenses and some profit, and this assumption must be correct or these individual would not continue in the business, the fact remains that transportation in Kansas City both for jitney and railway passengers is being furnished at a loss of $3,000 per day. In other words, the investors in the Kansas City Railways are paying this amount daily in order to support the operation of jitneys. The unfairness and injustice of this is so apparent that we do not believe it can long continue in a city where fair play and the square deal is the basis of its industrial life, as is the case in Kansas City.
>
> It is a situation that cannot continue indefinitely and which in the end must result either in the removal of jitney competition or in some readjustment of service and fares that will permit this company to exist. No one for a moment believes that Kansas City's transportation could be adequately furnished by a haphazard system of jitneys. The withdrawal of street railway service in the outlying portions of the city would result in deteriorating the value of property and homes millions of dollars.

The Kansas City Jitney Men's Association is investigating various types of motor buses with a view to standardizing vehicles used in bus traffic. The association aims to make the bus the chief means of surface transportation in Kansas City. As soon as the association has made its selection it plans to replace vehicles now in use with those of standardized type. It is reported that the investigators favor a double-deck, steam-driven bus seating fifty persons.

Transportation News Notes

Seven Cents in Winnipeg.—The Winnipeg (Man.) Electric Railway has been allowed by the Manitoba Public Utilities Commission to advance its fares to 7 cents, effective Sept. 1. Labor tickets are ordered abolished. The company was granted an increase of 25 per cent in gas rates, after an eighteen month struggle, which places it on a sound economic basis. The city is appealing the case. The company is now charging a 6-cent fare.

Interurban Raises City Fare.—Permission has been granted by the Wisconsin Railroad Commission to the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., under an order issued August 19, to increase the rate of fare on its line within the city of Milwaukee from 5 cents to 6 cents. The company gave the increased cost of coal and labor as the chief reasons for seeking an increase in fare. The higher rate was not opposed by the city authorities of Milwaukee, and has already become effective.

Ticket Withdrawal Meets Protest.—A petition signed by 1,000 residents of Winthrop, Mass., was filed with the State Department of Public Utilities as a protest against the elimination of reduced rate tickets on the Boston, Revere Beach & Lynn Railroad's narrow gage line. Under recent order the department reduced the fare from Boston to Lynn from 20 cents to 10 cents, allowed the single fare of 10 cents to Winthrop to stand and abolished the commutation tickets formerly sold at the rate of ten rides for 85 cents.

Memphis Rise Takes Effect.—A cash fare of 7 cents took effect on the lines of the Memphis (Tenn.) Street Railway on Aug. 18. The new rate had previously been approved by Judge Cochran of the United States District Court. Based on the report of the receivers for the month of July, the increase in the fare will bring to the railway an additional revenue of approximately $29,000 a month. T. H. Tutwiler, one of the receivers of the company, stated recently that the sale of tickets would result in a net increase in the rate of fare of between six-tenths and seven-tenths of a cent. The July report shows a deficit of more than $17,000 under the 6-cent fare, which, according to the receivers, indicates that even under the new rate the report for August will not show a surplus above the cost of operating expenses.

Commutation Rates Increased.—The Rochester & Syracuse Railroad, under a tariff which it has filed with the Public Service Commission for the Second District of New York, effective on Sept. 6, will increase its rates for fifty-trip commutation and fifty-trip school commutation books for travel between the Rochester city line and the Syracuse city line and intermediate points from 1.5 cents to 2 cents a mile, minimum rate increased from $6 to $7 a book. Other changes proposed are: mileage books of 300 miles increased from $7.50 to $8.25 a book. Twenty-five strip book good between Rochester city line and East Rochester, increased from $2 to $2.50, and between the city line and stops 11 and 12 from $2.40 to $2.90 a book. Increases will also be made for carrying newspapers from 25 cents to 50 cents a hundred weight and for chartered cars.

Six-Cent Measure Passed.—A new franchise permitting the Ohio Valley Electric Railway, Huntington, W. Va., to raise the fare in the city to 6 cents was passed unanimously over the Mayor's veto on Aug. 13 by the City Council of Ironton, Ohio. Whether or not the decision will affect the situation in Huntington is uncertain. The Councilmen had investigated the fares of various cities before taking final action, and were of the opinion that the increase was just and reasonable. W. R. Power, general manager, stated some time ago that the company had taken up with the Huntington officials an increase in rates and that in the near future a petition would be filed with the Interstate Commerce Commission, at Washington, requesting permission to advance the fare. The petition has not yet been filed. The fare increase on the Ironton lines met with no opposition from the public or the press. The *Irontonian* commented favorably on the Council's action.

Personal Mention

F. L. Butler Steps Up

Becomes Manager of the Winnipeg Electric Railway Under Reorganization Plan

Several changes of importance have been made in the official personnel of the Winnipeg (Man.) Electric Railway. These changes have for their purpose the effecting of a more compact organization, in which the various departments are co-ordinated under the direction of A. W. McLimont as vice-president. This arrangement relieves Mr. McLimont of the more direct operating duties, enabling him to give his time more fully to administrative matters.

Frank L. Butler, heretofore general superintendent, becomes manager of the system. In this capacity Mr. Butler will have complete charge of the operation and maintenance of the company's railway, light, power and gas properties and also of the subsidiary companies, the Suburban Rapid Transit Company and the Winnipeg, Selkirk & Lake Winnipeg Railway.

F. L. BUTLER

W. E. Blodgett has been appointed comptroller of the company in charge of all accounting matters. Mr. Blodgett has been serving as secretary-treasurer of the Utah Light & Traction Company, Salt Lake City, Utah. He succeeds A. R. Ross, resigned.

W. F. Edwards, traffic instructor, has been promoted to traffic superintendent. Mr. Edwards succeeds A. MacDonald, who has resigned because of ill health and has returned to Montreal.

An experience of more than twenty-five years in the operation of public service companies in the United States and Canada makes Mr. Butler well qualified for his new position. He began his career in 1894, when he entered the service of the Vandalia Railroad, now a part of the Pennsylvania Railroad lines. He remained with that company in various capacities and at various points until 1909, when he resigned to become superintendent of the Denver & Inter-Mountain Railway, Denver, Colo. Later he was promoted to the position of vice-president and general manager of that property. He resigned on Sept. 1, 1911, to accept the position of general manager of the Alton, Jacksonville & Peoria Railway, which road was then under construction. Shortly thereafter he was appointed receiver of that railroad, and later completed the line as far as Jerseyville, Ill. In July, 1913, Mr. Butler was appointed general manager of the Chicago & West Towns Railway and the Suburban Railway, with headquarters in Chicago, Ill., and remained in charge of that property until April 1, 1918, when he accepted the position of general superintendent of the Winnipeg Electric Railway.

Mr. Schreiber, Division Manager

The Public Service Railway, Newark, N. J., announces changes for the Southern Division. William B. Graham, whose position as division superintendent will be abolished, will be transferred to a position on the general superintendent's staff at Newark. The new manager of the Southern Division will be Martin Schreiber, the present chief engineer of the railway. Robert A. McArthur will be superintendent of transportation for the Southern Division and John T. Torbert and William G. Scheiner will be made assistant superintendents. William Matlack will be supervisor. James M. Symington will be transferred from Camden to succeed Mr. McArthur at Newark.

William H. Wright will be given the title of superintendent of distribution, while J. Walter Wright will be made superintendent of maintenance of way. John Hanf will be master mechanic instead of division master mechanic. The changes will go into effect on Sept. 1. The Southern Division comprises the territory around Camden.

F. P. Edinger has been appointed superintendent of transportation of the Chicago (Ill.) Surface Lines. Mr. Edinger has been serving as acting superintendent of transportation since last February, when Henry A. Blair took control of the company's affairs as president. Mr. Edinger has been with the transportation department of the Chicago Railways and its subsidiaries since 1893. He began his career as a conductor and, working up through the transportation department, became superintendent of one of the North Side districts. In 1914, at the time of the unification of the Surface Lines, he was placed in charge of the Sixth division.

W. F. Collins at Rochester

Announcement Made of Appointment of Transportation Engineer Under Service-at-Cost Grant

Plans are rapidly being developed to put into effect all the conditions sought to be imposed under the new service-at-cost franchise under which the New York State Railways, Rochester Lines, will operate. One of the first moves by the city was the appointment of Charles R. Barnes as city street railway commissioner. Now comes the announcement of the appointment of the assistant to Mr. Barnes with the title of transportation engineer.

Willis F. Collins is the appointee. He is a young man who has been reared in an atmosphere of railroading, being the son of W. H. Collins, general manager of the Fonda, Johnstown & Gloversville Railroad. The natural aptitude of the younger Mr. Collins for things mechanical was rounded out by attendance at Rensselaer Polytechnic Institute, of which he is a graduate, and by varied experience in electrical and railway work obtained while in the service of the General Electric Company on construction and installation work.

W. F. COLLINS

From the engineering side Mr. Collins branched out into the problems of management of electric railways, starting in a minor capacity and advancing to be superintendent of transportation of the Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va. It was under the supervision of John N. Shannahan that the abolition of the physical properties of this company was carried out, and while the work of Mr. Collins had primarily to do with the railway operations of that company, still an opportunity was afforded to him for the collateral study of problems of the gas and electric industry, which a combined property such as that at Hampton affords. Mr. Collins has already left Hampton to enter upon his new duties.

Mr. Collins will be the right-hand man to Mr. Barnes. He will be responsible for keeping the railway commissioner informed as to operating conditions.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Lower Cotton Not Affecting Electrical Goods

Price of Raw Material Is Frequently a Small Factor in Ultimate Cost

Despite recent drops in the price of cotton electrical products containing this material have not yet generally declined in price. About the only drop of importance has been a considerable reduction about Aug. 15 in the price of some lines of cotton insulating tape and webbing. In general the reasons for the firmness are the excellent demand, the large number of unfilled back orders, the high labor cost and the fact that the price of cotton is a small part of the cost of finished products. Another reason is that the spinning mills still have some 40-cent cotton with which they are filling orders placed some time ago.

In the matter of cotton insulating tape, which is more directly dependent on the price of cotton than other electrical products, there was in some cases a notable drop in price about the middle of August.

The demand for cotton insulating tape is just ahead of the supply, though deliveries are not longer than one month. The thinner grades are harder to get as the fine yarns are scarce. Cotton-sleeving deliveries are made in two to six months. There is a very heavy demand for this material, which cannot be met by the mills because of a scarcity of sleeving machinery.

Friction tape is more plentiful than it has been for some time and immediate deliveries can usually be made. No changes in price are reported.

The fine yarns used on magnet wire are difficult to obtain; consequently there is some scarcity of this material and prices are firm. Stocks of nonmetallic flexible conduit are in good shape and the demand is fair. Prices are holding firm.

Cloth manufacturers are hoping for still lower cotton, crop prospects are good and there is talk of heavy cancellations by tire manufacturers, who use an enormous amount of cotton fabrics, but in spite of these factors manufacturers of electrical material whose basis is cotton state that present prices will continue to hold firm for several months.

Strong Market for Steel Rails Abroad

Mills Are Already Well Booked Up and Electric Railways May Find Difficulty in Placing Orders for Future Needs

In view of the needed repairs to worn-out railway equipment that are now expected to be made as the result of the financial relief that has been granted to steam railroads, a heavier buying movement of steel rails is anticipated. This circumstance, in connection with the strongly increasing demand for rails that exists abroad, should more than take care of the output of domestic mills for some time to come, it is thought. In fact, few of the rail makers in the Pittsburgh district are taking any orders for shipments this year, as many of them have more than sufficient business booked for the remainder of the year and are practically out of the market.

Hence it seems logical to draw the conclusion that purchasing agents of electric railways who must enter the market for rails would do well to anticipate their needs long in advance so as not to be left in the lurch with their orders. The growing volume of rails exported is an especially important factor in the situation. The total figures of 553,860 gross tons of steel rails exported for the fiscal year ended June 30, 1920, do not compare very favorably with the total of 621,728 tons in 1919 it is true, but the increase in recent inquiries from abroad is significant.

The city of Glasgow, Scotland, a short time ago awarded a contract of 10,000 tons of steel rails at a total cost of about £250,000 to an American firm, and the offer of the latter was almost £4 10s. per ton lower than the best British bid. The price paid for the rails to the American firm, according to advices from abroad, was £24 10s. a ton. Egypt is also in the market for rails, and the surveyor general of that country has invited American firms to submit bids for immediate or future delivery, on same footing with British mills.

Italy is in dire need of grooved rails for the traction companies of her cities, as production there is wholly inadequate to cope with the demand, and the former sources of supply in Belgium, France and Germany are temporarily closed. As soon as the rate of exchange, which is now so heavily unfavorable to Italy, improves, a strong demand for American rails is expected to materialize there.

In the steam railroad field the state of Nigeria has bought 20,000 tons of rails which the United States government intended for use in France during the war, and 11,000 tons have also been purchased from the same source by the Swedish State Railways.

Nor is continental Europe the only active foreign market for rail production here, as South America is also showing great interest. One of the recent inquiries is from the Brazilian government, which is asking for bids here on 13,000 tons of 50-lb. rails.

Railway Motor Deliveries Excellent

Demand Continues Quiet, but Inquiries Are Active and Prices Holding Firm

Railway motor sales are running relatively low in volume at present, although the business being booked by some manufacturers appears to be somewhat above that of a year ago at this time. The safety car motor continues to rank as the season's "best seller," and interest in this standardized product grows with each passing month. Inquiries are received from a good many of the smaller operating companies, and if their financial needs were less acute there is no question that many more orders for these motors would be soon forthcoming from these companies. Notwithstanding recent price increases of 10 to 15 per cent that were announced by various leading makers of polyphase and direct-current motors, railway motor quotations are still holding steady at late levels. On account of difficulties recently experienced in securing raw materials, however, and fluctuating conditions that exist in manufacturing plants generally, it is cutomary in representative motor sales to present factory quotations only, but while these are being made up for each representative order booked in typical cases, there can be seen no disposition to mark up prices further at the present time.

Deliveries on safety car motors are being quoted now at about three months for the completion of the order, initial shipments beginning in from twenty-one to thirty days after the signing of the contract. Motors of larger size and varied type, such as are required in four-motor car equipments, are quoted about four weeks longer than the safety car outfits. The advantages of standardization and hence of mass production are thus realized by the manufacturer and purchaser alike. The raw material situation is somewhat improved at present, chiefly as a result of the resumption of work in the brass and copper industry, following the end of unsuccessful labor agitation. Stocks of motors are running pretty low at present, and the "floating" reservoirs of motors maintained at car builders' plants are not up to previous levels. Very little spare part ordering is being handled at this time, but a good deal of this business is expected in the coming winter.

Electrical manufacturers are finding the completion of control equipment the chief difficulty in filling motor orders. The disturbed transportation conditions have upset the supply of numerous comparatively small parts and fittings, and labor troubles have played their part in delaying the completion of orders for such outfits. Some of the trolley systems in the medium-sized cities within fairly easy reach of the electrical factories are picking up financially, and there is good ground for optimism in regard to future business from roads which are getting on a better monetary basis. The further development of express car service should result in increased motor sales, notwithstanding the singular policy adopted by one large operating company of doing away with this branch of its transportation functions.

Small Prospect of Relief in Rigid Conduit Supply

Some Factories Forced to Close as Result of Car Shortage and Inability to Obtain Pipe

Reports received from the metropolitan territory on the rigid-conduit situation within the past couple of weeks may, according to representative manufacturers, give an erroneous impression of the true general market condition of this material. A curious situation exists in that while the supply of conduit for New York and certain points to the south has somewhat improved, the general situation throughout the rest of the country apparently shows little betterment. This is only natural when the true significance of the improved supply in these instances is understood.

According to representative manufacturers of conduit, the transportation situation as it affects them is very little, if any, better. Added to this circumstance is the dwindling supply of pipe that has for some time past been available for the manufacture of conduit. Steel mills attribute the shortage to their inability to get cars for shipping their product to the makers of conduit. One of the latter has received no pipe for a month and a half, and another manufacturer has received no recent supplies except by boat. As a result of this lack of raw material caused by the car shortage, one of the large makers of conduit has ceased production during the past two weeks and another company has not turned out any conduit in over a week.

Prior to this, however, stocks of finished conduit had accumulated at the mills awaiting cars to carry it away, but a system of embargoes that was placed upon producers in the Middle West made it very difficult to move their product. At one time a permit was even necessary to ship the material. Recently, however, the situation has been relieved to the extent that shipments can be made to certain territory in the East and some points southward in a little better shape, although the car shortage continues and the rest of the country remains almost as restricted in its supply as before. Consequently, with the outlet to their market restricted, conduit manufacturers have shipped their product in large quantities to the metropolitan district, creating a misleading impression that conduit is becoming very plentiful. This condition would seem to be but temporary, however, inasmuch as manufacturers say the unusual flow of conduit into the favored territory will cease as soon as freight conditions improve generally.

Regarding the general market for conduit over the country, no let up in the insistent demand has as yet appeared, and in distant places like Cuba a condition of absolute famine prevails. New orders are accepted with no promise as to date of delivery and with price quoted in effect at time of shipment. Back orders have in some cases piled up sufficient to absorb production for nearly a year to come. The large labor turnover found among the many foreigners employed in this industry is a further source of inconvenience.

In spite of these factors, prices have generally remained firm, but some producers hold to the opinion that an advance may be necessary owing to the increased freight rates.

Demand for Bare Copper Wire Not Extra Heavy

Drawing Process and Shortage of Fuel and Cars Are Impeding Deliveries

Although raw copper is in an easy position and copper rods are plentiful, the supply of bare wire has suffered from unfavorable conditions of manufacture. Chief among the latter are insufficient supplies of fuel and a shortage of cars. Labor has also caused some concern, for though no strikes have been experienced recently it is reported that a certain indifferent attitude in the past has materially reduced the output of work per man. Some improvement in that respect is now noticed, however. Production is in most cases close to normal, although a few wire manufacturers report a subnormal output. The operation of drawing the wire seems to be causing some delay, as manufacturing facilities have not increased as did demand during the war. Consequently the finer sizes of copper wire are much the hardest to obtain.

ELECTRIC RAILWAY BUYING IS LIGHT

Demand at present is not exceptionally heavy, and in several quarters it is said to be slackening. Foreign demand is also decidedly off and seems likely to remain so until exchange rates improve. The increase in freight rates granted to steam railroads, however, is expected to result in large orders on their part, but this buying has not yet begun to materialize. Electric railways are not heavy purchasers of copper wire at present, nor have they been for some time past, because financial relief in the form of rate increases seems to be necessary before appreciable orders can be expected from that quarter. One of the reasons why bare copper wire has not been as plentiful as might be expected is the very large call which exists for insulated wire. This demand has been so great that much of the bare copper wire which would normally supply the market has been insulated to meet the demand which exists for the covered wire. Consequently, in order to safeguard their needs, some consumers largely overbought and pyramided their orders, with the result of eventually causing demand to slow up as is now happening. Some few cancellations are reported as the result of this inflation of orders.

Producers seem to be optimistic about the future volume of business, for transportation is easing up slightly and many new projects long held up by freight difficulties are expected to go forward. Some wire makers believe the price of copper, and hence of wire, must advance and not decrease, in view of the estimated increase of a cent per pound in the cost of transportation of copper. Still others hold that no price increase is possible until foreign demand once more makes itself strongly felt here. One of the leading producers is quoting copper wire on a 22¼-cent base.

Deliveries are slightly improved. One of the largest buyers of copper wire, who was formerly unable to obtain supplies under six to ten weeks, is now securing deliveries in from ten days to three weeks. This is apparently not a representative case, however, as in general manufacturers are quoting about six to eight weeks' delivery.

Rolling Stock

Detroit United Railway, Detroit, Mich., states that its car construction program for the coming year contemplates the building of 150 new motor and trail cars, for which material is being ordered. This program is to be carried on independently of any cars which may be purchased from outside manufacturers. Several of the new motor cars will be of the Peter Witt center-entrance type. Since the beginning of this year, 65 new motor and trail cars have been built by the company in its shops, and by Jan. 1, 1921, it is expected that at least 35 more cars will have been completed and added to the service, making a total of 100 or more new cars for the year.

Franchises

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway has been granted a franchise for the construction of a single spur track connecting with the company's line in Santa Monica Boulevard, Los Angeles County.

Springfield (Mass.) Street Railway.—The Springfield Street Railway, has been granted franchises for the building of its East Springfield-Indian Orchard extensions. New lines are to be laid from Liberty Street to Page Boulevard, and on Page Boulevard, from the turnout east of the Westinghouse plant to Berkshire Street. Relocations are provided on St. James Avenue. Several relocations are to be made, which call for the construction of long turnouts and considerable double-tracking.

Track and Roadway

Rhode Island Company, Providence, R. I.—The Rhode Island Company is laying new rails on its Oaklawn line beyond Meshanticut.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway is making plans for the building of a subway from the Hill Street station to Figueroa Street.

Eastern Massachusetts Street Railway, Boston, Mass.—The Eastern Massachusetts Street Railway is double-tracking its line in Boston Street, Lynn.

Pacific Electric Railway, Los Angles, Cal.—The Pacific Electric Railway proposes to construct an overhead trestle crossing its tracks at Atlantic Avenue and Newport Street, Long Beach.

Jacksonville (Fla.) Traction Company—The Jacksonville Traction Company proposes to build an electric railway extension in Monroe Street from Broad to Clay to connect with the Clay Street line.

Springfield (Mass.) Street Railway—The Springfield Street Railway has begun work on an electric railway extension in Carew Street, Springfield. The line will run through Carew Street from Chestnut Street, to connect with the company's Liberty Street line.

United Railroads of San Francisco, Cal.—The United Railroads is installing a loop at Fourth and Market Streets to permit a turnback service on the Market Street line. The Municipal Railway of San Francisco is making a similar installation.

Trade Notes

The American Welding Society now has a Chicago section, which was organized on Aug. 3 at the rooms of the Western Society of Engineers, in that city, where meetings will be held on the second Tuesday of each month.

The Leeds & Northrup Company, 4901 Stenton Ave., Philadelphia, Pa., manufacturer of electrical measuring instruments, has purchased property totaling about three acres on Germantown Avenue, for the erection of a new plant. The consideration is stated to be about $35,000.

The Franklin Moore Company, Winsted, Conn., manufacturer of electric hoists, small electric cranes, etc., has appointed William C. Briggs vice-president in charge of manufacturing. Mr. Briggs was formerly sales engineer and New York manager for the Shepard Electric Crane & Hoist Company, Montour Falls, N. Y.

The Lehigh Portland Cement Company, Allentown, Pa., has secured a tract of 450 acres on the outskirts of Birmingham, Ala., and announces the early building of a 1,000,000 barrel plant as the initial unit, at an estimated cost of $3,000,000. The location is contiguous to the Alabama By-Products Company, from which by-product gas will be used as fuel if found advantageous.

J. J. Costello, formerly sales engineer with James C. Barr, Boston, Mass., has established offices at 201 Devonshire Street, Boston, where he will represent the Lewis & Roth Corporation, Philadelphia, manufacturers of high-tension devices and power plant specialties, and will also handle the New England sales for the Cutter Company, Philadelphia, manufacturers of the I-T-E line of circuit breakers and other equipment.

A. E. Roberts, formerly vice-president and general manager of the Hedden Iron Construction Company, Newark, N. J., has been elected first vice-president of the Milliken Brothers Manufacturing Company, Woolworth Building, New York City, manufacturer of radio towers, transmission towers, fabricated all-steel buildings for electrical service, etc. He will be in charge of the New York office and direct all matters pertaining to sales.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has introduced an Insurance and Savings plan to which 90 per cent of its employees have subscribed. An employee after six months' service with the company is given a $500 life insurance policy free, and by depositing at least 2 per cent of his earnings in the Employee's Savings Fund, additional insurance of from $500 to $1,500 may be secured, depending upon the length of service. The savings fund pays 4½ per cent interest on all deposits.

The Black & Decker Manufacturing Company, Baltimore, Md., announces that it has sent a letter to all jobbers handling its line, stating that there will be no reduction in prices this year, and that, starting Jan. 1, 1921, the company will protect its jobbers against loss through price reductions for sixty days after the purchase of goods. The letter says, however that if conditions make a reduction possible, it will be made promptly so as to give the ultimate purchaser the benefit, and the company will absorb any loss which would otherwise be caused the jobber who bought within sixty days before the change in price.

The Sprague Electric Works, 527 West 34th St., New York, N. Y., has a new factory at Maspeth, L. I.. It is a two-story building of approximately 100,000 sq.ft. In addition there is a two-story structure containing about 12,000 sq.ft. . which will be used for the New York district sales warehouse. Work is to be started at once on a warehouse containing about 19,000 sq. ft., and another small warehouse 100 ft. x 15 ft. for the storage of rigid conduit.

New Advertising Literature

Fuses.—E. W. Snow & Company, Rochester, N. Y., are circulatng catalog No. 15, covering their different types of inclosed electric fuses.

Instruments.—"A Few Simple Methods of D. C. Testing in Routine Practice" is the subject of bulletin No. 13, recently published by the Pyroelectric Instrument Company, 636 East State Street, Trenton, N. J.

Power Plant Devices.—The Yarnell-Waring Company Chestnut Hill, Philaphilphia, Pa., has issued folder No. G 1301, covering the Yarway devices for modern power plants, and booklet No. B 410, describing different types of the Yarway blow-off valves.

The Canton Culvert & Silo Company, Canton, Ohio, has just issued a new catalog on Acme Nestable Corrugated Culverts. Information regarding use and shipment is given, together with tables of the safe load in pounds per square foot.

Devices for Conduit Connections.—"Spraguelets" is the title of a small booklet issued by the Sprague Electric Company, New York City, covering its Spraguelet devices for conduit connections. The company is also distributing a booklet entitled "The Universal Key," "a cross-reference for matching any standard wiring device to any desired box and cover."

Gages.—The Schaeffer & Budenberg Manufacturing Company, Brooklyn, N. Y., has issued catalog sections No. 1, 50 and 75, covering its pressure, vacuum and draft, gages and gage testers; also a preliminary bulletin describing its hand and stationary tachometers.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. B. ANDERSON, Assistant News Editor

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Cock-and-Bull Story Starts Strike in Brooklyn

THE facts elicited at the hearing before the New York Public Service Commission on Tuesday of this week clearly show the haphazard way in which the present strike in Brooklyn was called. A meeting attended by some 3,000 employees is held early Saturday evening and adjourns after a "no-strike" vote is taken. A later gathering, held shortly after the ghostly hour of midnight and attended by a smaller number of employees who were unable to be present at the first meeting, becomes excited over a mysterious story that the company had declared a lockout of its power station men, and declares a strike. The legend about the lockout is found later to have no foundation, but the evil has been done and a transportation system which is practically essential to a community of some 2,000,000 inhabitants is seriously crippled. Events like this do not enhance the prestige of the labor organization in control in Brooklyn, nor do the extortionate demands of the men, which, according to Receiver Garrison, would require the company to pay out for wages more than the gross receipts. They also emphasize the importance of some means by which strikes in public utilities would be impossible.

Wages Determined by Supply and Demand

THE Nebraska State Railway Commission has taken action which it appears to us is a departure from anything previously done by regulating commissions in that it has acted upon the question of wages to employees of a public utility. As indicated in our news columns last week, the commission argues in its order in the Omaha & Council Bluffs Street Railway Company wage controversy that the Nebraska Constitution permits the commission to assume jurisdiction in wages on the theory that the wage determines the number of men who will be attracted to this employment, and that this fact, in turn, affects the service of the company, over which the State Railway Commission admittedly has jurisdiction.

On this basis the commission justifies itself in neglecting all consideration of cost of living and wage standards, open shop and unions. It does, however, state that there is "no place for a strike in the public economy of a state that has provided for regulations."

The hearing was not an arbitration. The conclusion reached after investigating various other similar lines of work was that the wage paid is sufficient to attract suitable men and that, if this is so, service is insured and the commission's duty ends.

We wonder if this is not in line with the "principles of ordinary economic and business common sense" recommended by the Federal commission in its recent report. According to Einstein's theory of relativity, how do we know anything is so unless it is referred to something else? Likewise, how can we determine a fair wage unless we have something to refer it to? And what better comparison can we make than by seeing whether a given wage attracts the necessary numbers of men of satisfactory qualifications? A similar proposal has been made with reference to determining the proper return to capital.

True, there may be pitfalls in such arguments applied to public utilities, and we would not neglect the effort made to improve living conditions for all. But our present labored means of determining both reward to labor and return to capital are surely somewhat artificial, and it is refreshing to anticipate relations based on natural economic laws.

Report Is Favorably Received and Will Prove Beneficial

BELIEVING that the industry would be interested in obtaining the views of a number of railway men in different parts of the country this paper has attempted to make a quick canvass, quite difficult in this vacation season, and a few representative views are published elsewhere in this issue. We hope to publish others later and invite contributions and discussions on this important report.

The views already secured show general unanimity on the value placed by the industry upon the work of the commission, and we might add that the general sentiment in the daily press is in line with this view. It is of interest and value to note that every one urges full publicity and welcomes the report as an opportunity to get the facts of the situation adequately portrayed to the public.

We hope indeed that the report will mark a turning point in the history of the industry. The electric railway has been termed the "sick man of business," and while this report shows clearly that the patient has been suffering from a variety of causes, it proves with equal definiteness that he is worth saving.

He is organically sound and is capable of doing work which no other agency is able to perform. Yet in some respects the treatment recommended is a severe one if credit, which the commission says is one of the two serious needs of the industry today, is to be reestablished.

For instance, at one point the report says that "utilities are entitled to a fair return upon the fair value of their property used in public service at the time of the inquiry." But it also says that "no permanent solution of the electric railway question can be found in the absence of a finding of value for rate-making purposes" and that "the valuation, when once fixed as the basis for the financial return of the company, should logically come to affect the amount of capitalization," and that the company "should voluntarily reduce any excessive capitalization to conform to such valuation as may have been determined upon."

Although a logical argument can be built up in defence of a capitalization independent and not directly related to valuation, we believe that the position taken by the Federal Electric Railways Commission on this point is a sound one. Such a policy, we realize, will bear hard on some companies. To continue the metaphor already used, in their cases the sickness calls for a major operation. But even with them we believe that this course is better than a continuation of the present situation. They are not earning now a fair return on their value, and while this value may not be as large as their capitalization, the two approximate much more closely, we believe, than the public as a whole realizes. We are not referring to this phase of the report because it is of the most importance, for there are many other recommendations which have a much stronger bearing upon successful operation. We are mentioning it because it is part of the program recommended by the commission which is largely in the hands of the companies.

Broadly speaking, the establishment of official values for the various electric railway systems, the abolition of high taxes and other non-railway imposts like paving, and the grant of a rate of fare under which a fair return would be earned on the valuations officially established would be a great boon to the railways and to the communities served by them. It would mean that a necessary system of transportation would be continued under circumstances which would warrant its expansion and improvement according to the needs of the public.

Municipal Ownership Not Considered the Logical Solution

AN INTERESTING and instructive aftermath to the publication of the report has been the statement distributed by Dr. Delos F. Wilcox and mentioned on another page of this issue. It will be remembered that after accumulating a vast amount of testimony and data the commission secured the services of Dr. Wilcox to digest and analyze this testimony. This analysis was made by him, and, in his opinion, pointed to municipal ownership as the logical solution of the electric railway problem. Hence he included in his analysis a recommendation to this effect. The commission commended the analysis and adopted, as part of its report, some of the statements contained in it, but when it came to deductions from the facts the commission made certain recommendations which differ from those of Dr. Wilcox and with which he strongly disagrees. Without expressing any opinion in the case, we believe these are the facts.

Dr. Wilcox says that the commission declares both municipal ownership and service-at-cost are experimental and that it chooses the latter while he chooses the former. As we analyze the situation, it is not quite so simple as that. The commission, viewing the matter from the national standpoint, and it must be remembered that five of its eight members were appointed as representatives of the public, believes that the testimony and facts indicate that greatest usefulness to the public will result from a continuation of private operation and that the service-at-cost arrangement will probably prove one very useful means of establishing a satisfactory basis for this. It does suggest that any steps taken now should not impede the public in taking over the industry, should it so desire. But there are many problems, more pressing, if not more fundamental, to which energies may well first be directed.

As to the publication of Dr. Wilcox's study, it is to be regretted that funds have not been made available for its publication. If it is a "masterful analysis," it would save the time of every one desiring to digest the testimony. But it is doubtful if the effectiveness of the commission's report has been decreased by the fact that this analysis was not published by the commission.

Fare Is Not the Only Factor Which Affects Riding

VARIOUS conclusions are drawn from time to time as to the effect of changes in fare on riding, based on a comparison of the number of passengers carried during a certain period before and after the fare was increased. There is no doubt that the rate of fare affects riding, but it is only one of many causes, some more important than others. It would certainly be erroneous for any one to assume that changes in fare are the only or even the controlling influence which affects riding.

Some other factors are: (1) Headway of cars; (2) speed of cars; (3) comfort, etc., of cars; (4) courtesy, etc., of employees; (5) popularity of management; (6) weather; (7) general industrial activity of community; (8) general industrial activity of certain sections of the city with large traffic requirements; (9) population; (10) prosperity of community; (11) trackage in service; (12) competition from public and private automobiles.

We also want to warn electric railway statisticians of the danger of too readily accepting as still true the old rule that an annual increment in passengers of from 3 to 5 per cent might be expected, so long as no changes are made in fares. This rule was based on the theory that as the population increased from 10 to 20 per cent during the ten-year period, or from 1 to 2 per cent per annum, the riding would increase in even greater proportion. This, indeed, was the experience on American city properties for many years. It was during a time, however, when the length of line was constantly being increased by the construction of extensions and other track facilities. It is quite probable that these extensions had as much, or more, to do with the increase in traffic as did the increase in the population. Where there has been no increase in track, as during the last few years, it is unsafe to expect a large increase in riding even with an increase in population.

This Valuation Will Possess Special Interest

THE much-valued Public Service Railway Company of New Jersey is to be valued once again and it is to be hoped that the results this time will constitute a forward step in valuation theory and practice. As has already been noted, the engineers, Ford, Bacon & Davis, employed to make the valuation under the recent law are empowered to determine the "value" of "all the property, including every proper and lawful element thereof." No restriction, other than being required to use and consider all data collected in previous studies, is imposed on the engineers, and no definition of value is laid down. It is then the law that the "value" thus determined "shall be admitted as evidence in courts and shall be evidence of facts therein contained" as if "the same had been produced and proved" and "shall be accepted by the Public Utilities Commission as the value of said property . . . in any rate proceeding . . . to the extent that the value of the property is a factor in the fixing of a rate."

What view the United States Supreme Court might take of the value as determined in this manner or under this law is somewhat problematical, to say the least. But it appears to us that the very uncertainty of the attitude which various authorities and critics may take affords an opportunity to as well as imposes a duty upon the engineers.

The opportunity is to give authority to such sound and logical developments of valuation practice as have been made by the engineering profession in the intensive study that has been given to this subject in the past ten years. The duty lies in selecting and presenting such developments with conservatism and force. In this valuation by such a process there will not be opportunity for having widely varying figures set down side by side to beget confusion and unending debate. It is hoped that the standards adopted will be so clearly and fully set forth that commissions and courts can compare or reconcile them with their own interpretation. And it is further hoped that the electric railway industry as well as all other public utilities will out of this proceeding secure some firm ground to stand upon in answering the question as to what their property consists of and what it is worth.

Cheap Power Is a Transportation Essential, but——

WE SYMPATHIZE with the railway power superintendent these days; he is up against a difficult proposition and has no commission or board of arbitration to help him out. His only joy lies in the fact that fuel cannot protest audibly, no matter how it is treated. Coal prices are out of sight and any kind of black dirt goes. Powerhouse organizations are still suffering from the disruption caused by the war, and the present labor is expensive, green and unskilled when compared to pre-war labor. Power-house equipment has depreciated and become obsolete because no money for maintenance or renewal has been available. Load curves are being affected and not always improved by attempts to lower outside operating costs.

The general manager calls up the power man and says, "Look here, in 1914 you operated on 3 lb. of coal per kilowatt-hour and now you use 4 or 5; get busy, for we haven't got the money." We haven't heard very much about the power superintendent's problem, although we have heard more than a few whispers about fuel prices and platform labor costs. He has not kicked or whined, but has gone ahead, "sawed wood" and produced power by any and every means at his disposal in spite of adverse conditions.

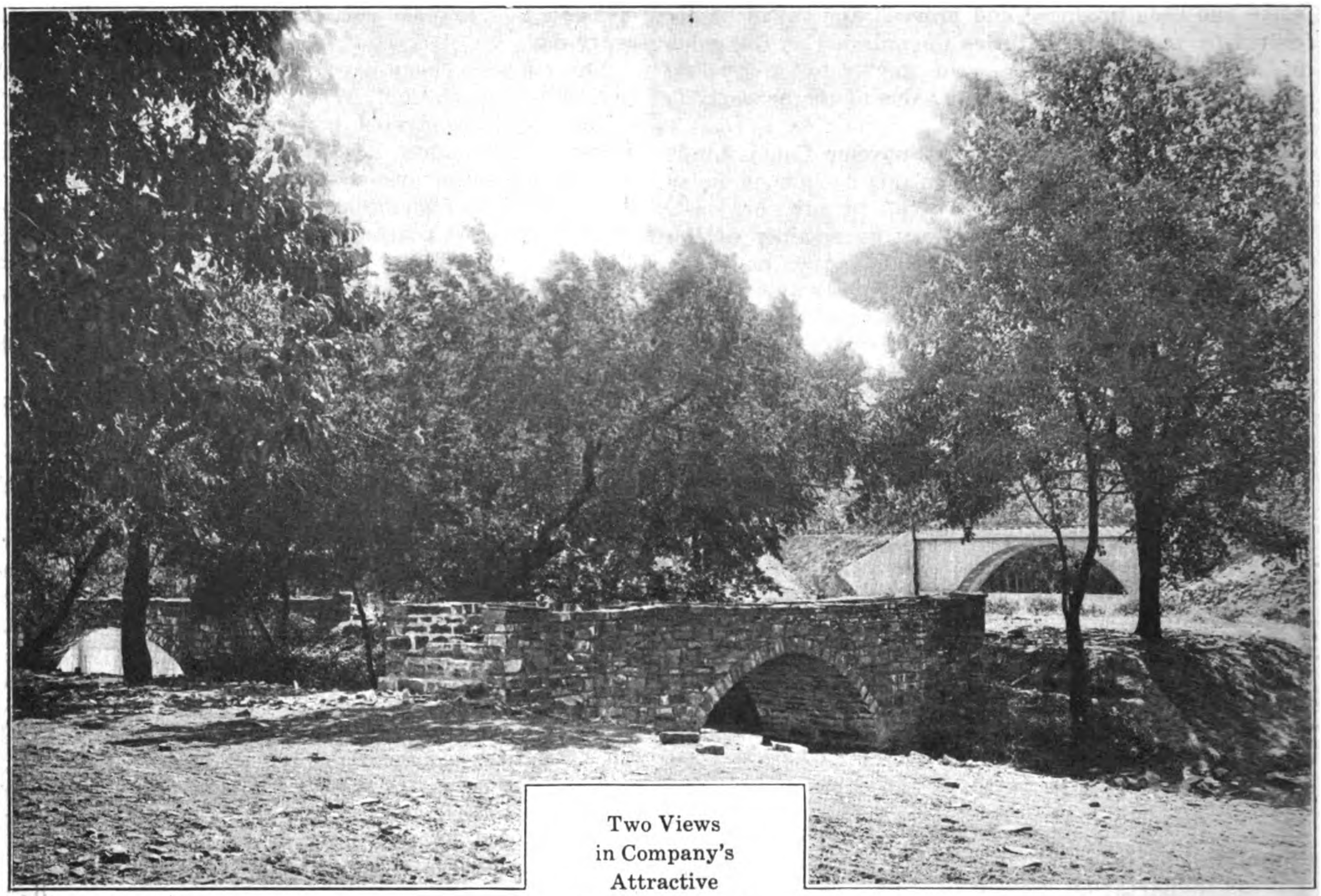
By way of contrast, think of the golden days of the past with $3 coal—real coal from one group of mines, clean, uniform and furnished on a B.t.u. basis; think of the skilled personnel and competent but cheap labor then available, of the comparatively new and well-maintained equipment. These good old times are gone, and we must adjust ourselves to the new conditions. Coal will never be back at the old figure, old equipment will never be new, the world-renowned American firemen and stationary engineers are being replaced by automatic machinery and unskilled foreign labor. These elements tend to make power more expensive and scarcer every day.

Nevertheless, cheap power in plenty is an essential to electric transportation. What can be done to insure it? Of course, concentrated power production in modern high-pressure plants, load-factor improvement through interconnection of systems, etc., are factors in the economic solution of the problem. Developments are occurring along lines that prove these elements to be the ultimate solution. But such things take time and money and we are facing existing conditions. Nevertheless, great improvements can be obtained right now in existing plants at an expenditure of a little time and a little money, and a dollar saved is a dollar earned, without dwelling on the fact that coal is difficult to obtain at any price.

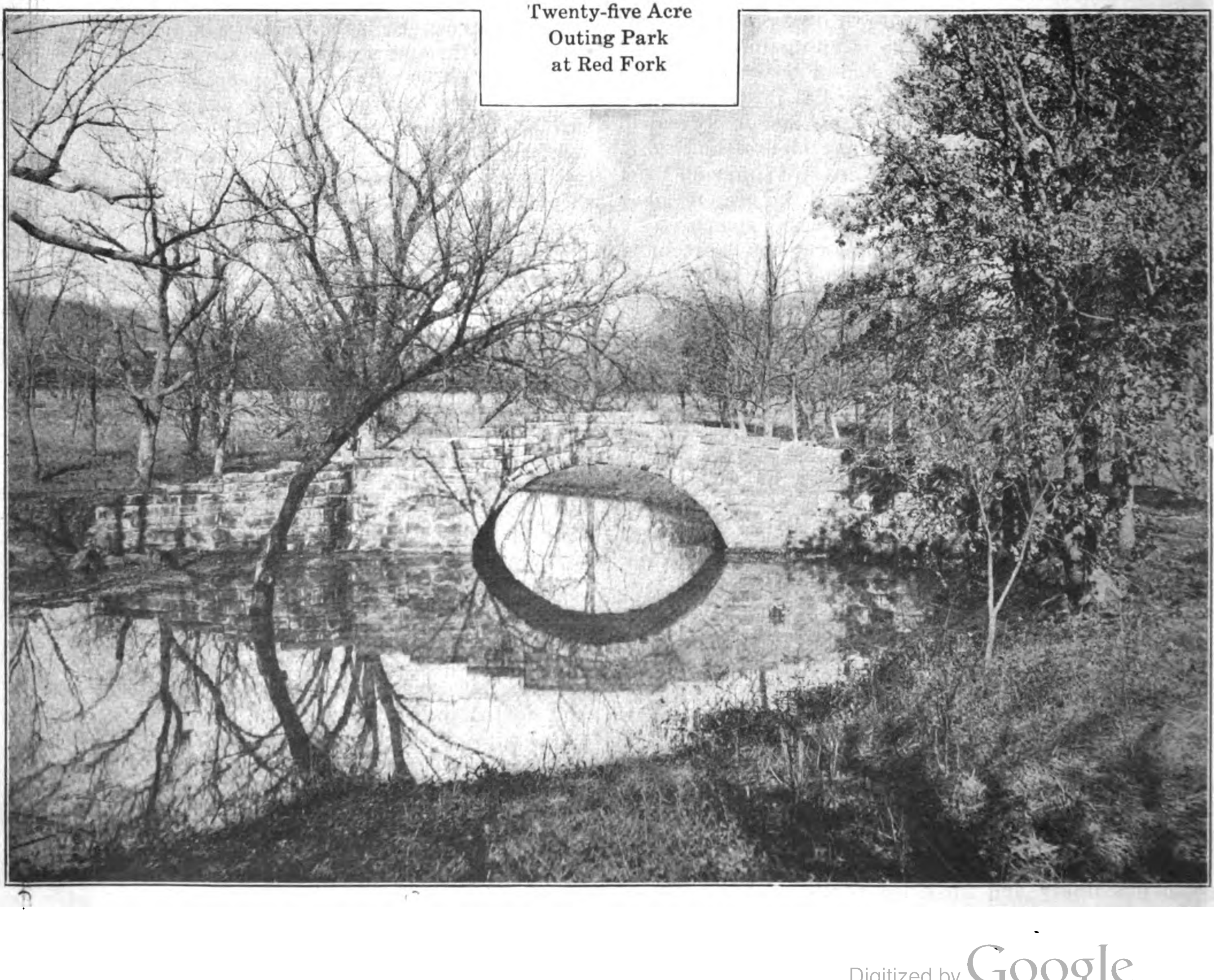
In the first place there is opportunity for improvement in operating efficiencies. Poor but cheap coal, old equipment, automatic machinery and an unskilled but expensive personnel are elements that indicate the need for competent direction in power production. A combustion engineer with efficient auxiliary and control apparatus can therefore be of great value in a railway power plant. There is no longer any need for guesswork in steam production—any fuel can be burned in any equipment in the one proper manner through the application of engineering skill to existing apparatus, fuel and personnel. Put a competent combustion engineer in the boiler room, give him the necessary meters and control apparatus to enable him to care for the changing fuel and operating conditions and he will produce results and maintain efficient combustion conditions at all times with the existing equipment.

The power-plant superintendent can appreciably lower power costs through a more intensive study of the economies that can be obtained by properly scheduling and forcing boilers, by properly using and grouping existing turbines, engines and auxiliaries, by attempting to maintain a continuous economic heat balance and by intelligent interconnection with other power plants. He should have time and opportunity to study possible operating improvements in connection with steam production and utilization under existing conditions. If he can show that junking some equipment and installing new will pay a good return, he should be allowed to do it. If he wishes to remodel the auxiliary system or the excitation system to yield more economical results the management should permit such action. If stokers, automatic controls and regulators, new tubes, water and steam meters and new types of auxiliary apparatus are needed to enable him to know, not guess, how he is operating, he should have what he needs. Money spent thus may be as useful in lowering costs as in doing such other desirable things as buying safety cars, rerouting cars, adopting skip stops, using trailers, etc. Less money needs to be spent in the power house for beneficial financial results than in any other part of the system.

Railway managements have been so harassed by platform labor, financial and fare troubles recently that they have possibly been lax in their attention to the power plant during recent years. It is a managerial function to deal with all elements of cost, and the economic production of power under existing conditions requires broad vision and real engineering skill. Railways can neither afford to burn black diamonds ignorantly nor to throw away steam by inadequate use. Conditions change in the power plant as well as in the outside plant and what is, is not always right.



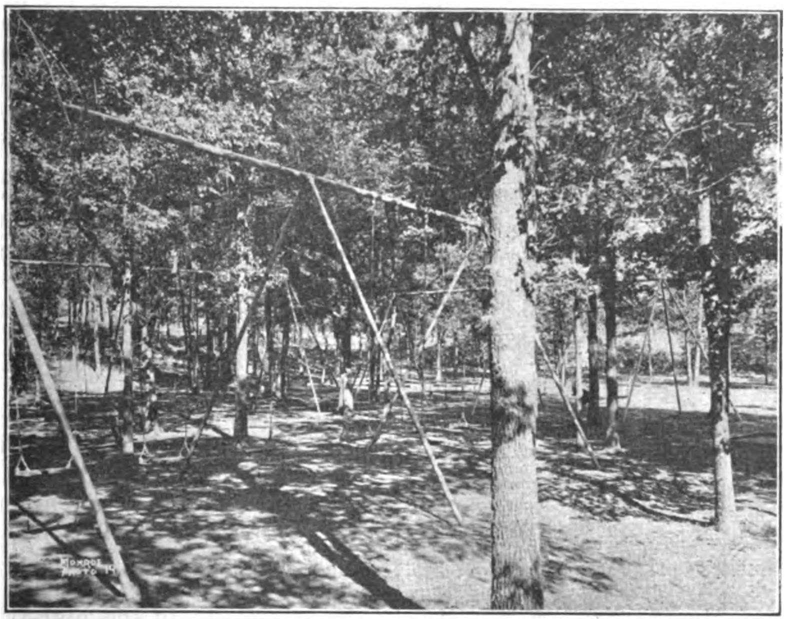
Two Views
in Company's
Attractive
Twenty-five Acre
Outing Park
at Red Fork



New Interurban Railway in Oklahoma

Serves Activities of Prosperous Oil Fields—Built Cross-Country, with 2-Deg. Curves and 1 per Cent Maximum Grade and Concrete Bridges Designed for Heavy Loads, Looking to Future Freight Business

THROUGH the center of the oil fields to the south of Tulsa, Okla., a new interurban property has been built and its operation is now well under way. It runs from Tulsa southwest through West Tulsa and Red Fork to Sapulpa, Okla., a distance of 14 miles, where it connects with the Sapulpa Electric Interurban Railway. This latter line runs from Sapulpa southeast through the old Glenn Pool oil field, which is almost a forest of derricks, to Kiefer, Okla., a distance of 5 miles. This older line is controlled by the same interests, and while the present service does not include through cars from Tulsa to Kiefer, this is contemplated for the future, and at present the cars of the two lines meet on regular schedule for transfer of through passengers at Sapulpa.



PROVISION IS MADE FOR CHILDREN, ALSO, IN THE PARK AT RED FORK AND A WELL-EQUIPPED PLAYGROUND IS A FEATURE

Tulsa is a flourishing city of some 80,000 people—a beautiful, almost entirely new city, whose inhabitants are nearly 100 per cent engaged in the oil industry, or are farmers who have been retired to ease and luxury through the good fortune of the discovery of oil on their own or adjacent land. Sapulpa is similarly an oil city, but in addition it is a division point of the Frisco Railroad and the home of several large glass works and other industries. It has a population of 18,000. Kiefer is a small town of 2,000 in the heart of the oil field, whose inhabitants are the real workers in the production of petroleum. There is plenty of ready money in these communities, particularly in Tulsa, the new interurban line herein discussed having been entirely financed by local people. No bonds were sold.

Construction of the new line between Tulsa and Sapulpa was begun in January, 1917, and first operation started in October, 1918, under the corporation name of the Oklahoma Union Railway, which had previously acquired the property of the Sapulpa Electric Interurban Railway between Sapulpa and Kiefer and the local lines in Tulsa of the Tulsa Traction Company, which has 4.2 single-track miles of line. The entire property comprises 27.2 single-track miles of line, all of which is now under the general management of R. V. Miller.

The need for the new line grew out of the activities in the oil fields, which demanded a frequent means of transportation between Tulsa and the oil fields to the south. Evidence of this demand is afforded in the accompanying table of gross earnings, which covers the total city and interurban lines, exclusive of the older Sapulpa-Kiefer line. For August, 1918, just prior to the inauguration of interurban service, the earnings for the city lines alone in Tulsa was $10,371. Comparing this figure with earnings for the entire company for the next few months will show in what manner the interurban contributed from the beginning to the total income. The number of car-miles operated on the city lines is about one-half of the total, though the income from the city lines is less than half the total. Taken by themselves, the interurban cars are earning a gross revenue averaging nearly $1 per car-mile. The figures shown in this table include an earning of about $100 a day made by an express car which makes one round trip a day between Kiefer and Tulsa and carries packages and miscellaneous freight. Express matter is carried on the regular passenger cars.

October, 1918	$16,283.22	September, 1919	$27,285.33
November, 1918	17,564.68	October, 1919	27,489.06
December, 1918	18,014.78	November, 1919	28,071.70
January, 1919	23,267.74	December, 1919	29,547.52
February, 1919	20,848.23	January, 1920	27,954.34
March, 1919	24,614.70	February, 1920	27,747.71
April, 1919	24,658.51	March, 1920	30,484.87
May, 1919	26,687.76	April, 1920	32,168.12
June, 1919	17,323.52	May, 1920	34,463.25
July, 1919	*9,384.34	June, 1920	33,075.92
August, 1919	25,588.16	July, 1920	34,898.40

* Strike of employees. Cars were kept running, but people were afraid to ride.

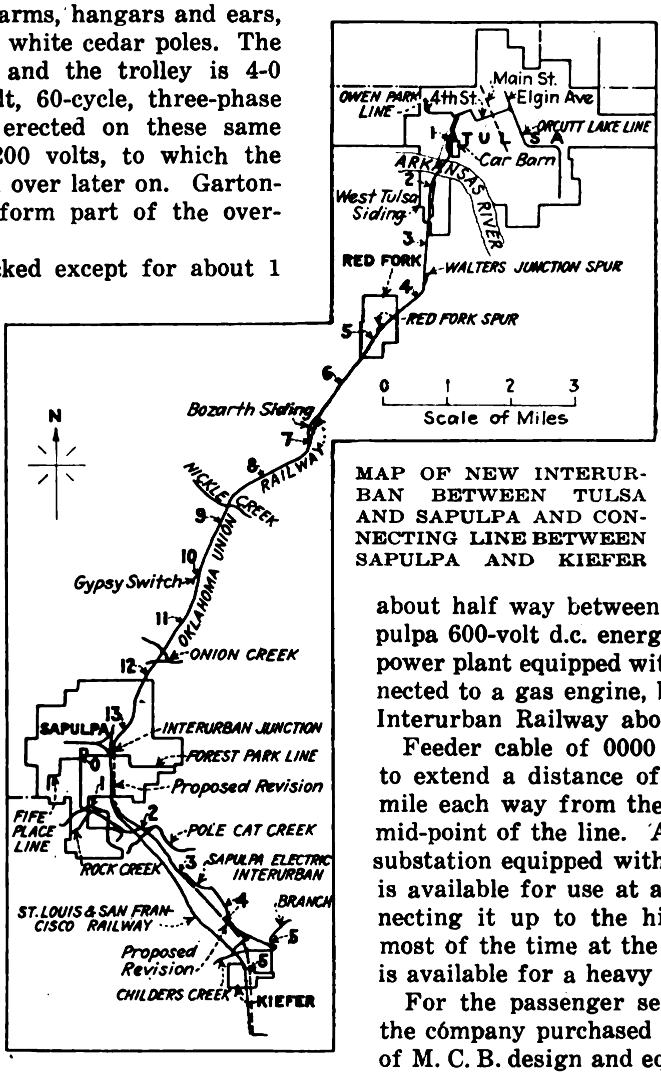
Contributing to these figures are the activities already referred to at Tulsa and Sapulpa and a good deal of oil industry along the line between these two towns. Immediately adjacent to the right-of-way is the plant of the Cosden Refining Company, the second largest refinery in the country, and other sizable plants of the Texas Company, Pan-American, Phœnix, Constantin and Mid-Continent oil companies and several other smaller companies.

CONSTRUCTION OF NEW INTERURBAN LINE

Beginning about ½ mile from the terminal in Tulsa, the new line is built on a cross-country right-of-way 100 ft. wide. The track was laid with 70-lb. A. S. C. E.

rail on 6-in. x 8-in. x 8-ft. Northern white cedar and white oak ties spaced on 2-ft. centers. The joints were completed with continuous joints and Ohio Brass acetylene-welded 4-0 bonds. To begin with, no ballasting was done except in low places.

The overhead trolley is of the bracket type construction, using Ohio Brass mast arms, hangars and ears, supported on 35-ft. Northern white cedar poles. The mast arms are 10 ft. long and the trolley is 4-0 grooved section. A 6,600-volt, 60-cycle, three-phase transmission line was also erected on these same poles and insulated for 13,200 volts, to which the line will probably be changed over later on. Garton-Daniels lightning arresters form part of the overhead equipment.


Main St.
OWEN PARK LINE
4th St.
Elgin Ave
TULSA
ORCUTT LAKE LINE
ARKANSAS RIVER
Car Barn
West Tulsa Siding
RED FORK
WALTERS JUNCTION SPUR
RED FORK SPUR
0 1 2 3
Scale of Miles
N
Bozarth Siding
NICKLE CREEK
OKLAHOMA UNION RAILWAY
Gypsy Switch
ONION CREEK
SAPULPA
INTERURBAN JUNCTION
FOREST PARK LINE
Proposed Revision
FIFE PLACE LINE
POLE CAT CREEK
ROCK CREEK
SAPULPA ELECTRIC INTERURBAN BRANCH
ST. LOUIS & SAN FRANCISCO RAILWAY
Proposed Revision
CHILDERS CREEK
KIEFER

MAP OF NEW INTERURBAN BETWEEN TULSA AND SAPULPA AND CONNECTING LINE BETWEEN SAPULPA AND KIEFER

The road is all single-tracked except for about 1 mile of double track in Tulsa and West Tulsa. The roadbed has been graded and filled so that the maximum grade is 1 per cent outside of the cities, and the track is laid out for a maximum curvature of 2 deg. The building of the road required the construction of four bridges, three of them having 75-ft. spans and one a 40-ft. span. All of them are designed for Cooper's class E-40 loading for carrying heavy freight trains and are constructed of concrete, the frequent oil fires on the streams having made this permanent construction essential. All culverts up to 2 ft. in diameter were laid with vitrified pipe, while all requiring a larger opening were constructed with stone side walls and have a concrete slab spanning them.

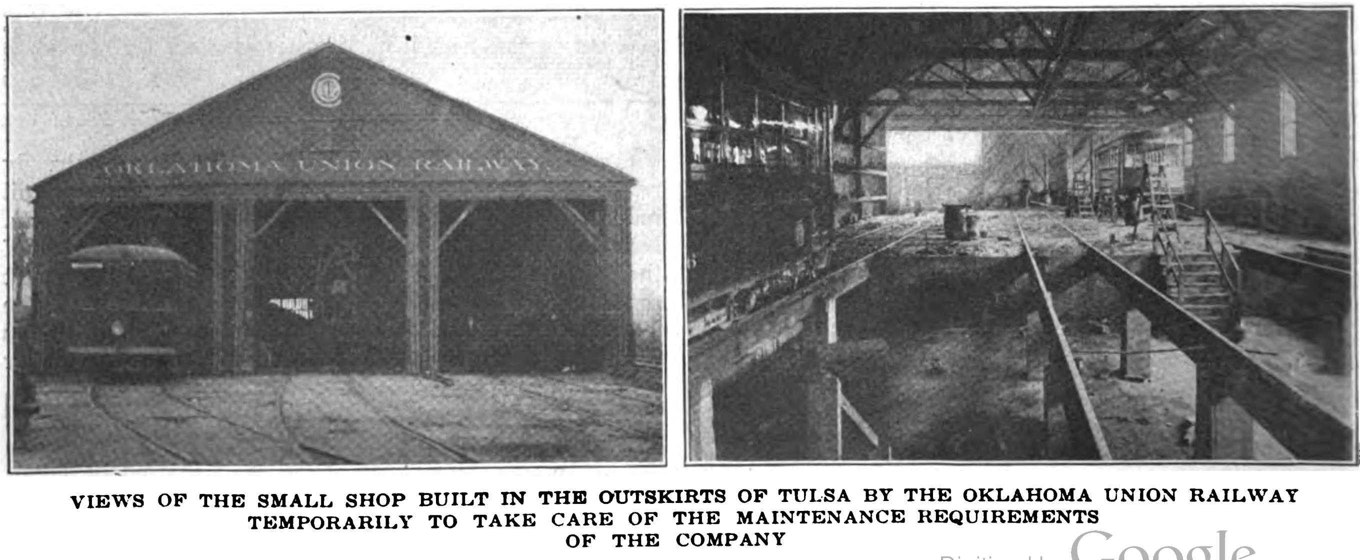
Nachod signals protect a curved stretch of single track in Tulsa and a stretch over the Arkansas River bridge, also two highway crossings.

Near Tulsa a strip of the right-of-way about 2 miles long has been leased to the Midland Valley Railway for the purpose of installing a side track for tank cars to serve the Standard Oil Company's storage plant.

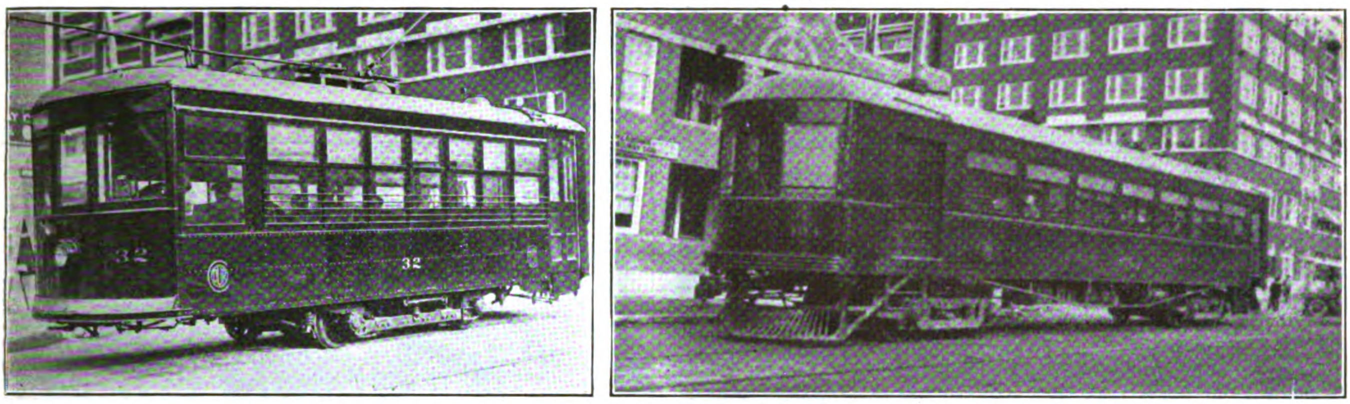
Power for operating the Oklahoma Union Railway is supplied from three sources. At Tulsa energy is purchased from the Public Service Company of Oklahoma, an Insull property, in the form of 600-volt direct-current energy supplied at the railway company's switchboard. At West Tulsa 6,600-volt, three-phase 60-cycle power is received from the Sand Springs plant of the Sand Springs Railway, 7 miles west of Tulsa, and is delivered over the O. U. R. company's high-tension line to an automatic substation equipped with one 300-kw. G. E. rotary converter and automatic equipment and situated about half way between Tulsa and Sapulpa. At Sapulpa 600-volt d.c. energy is received from a 300-kw. power plant equipped with a d.c. generator direct connected to a gas engine, built by the Sapulpa Electric Interurban Railway about nine years ago.

Feeder cable of 0000 and 00 sections is installed to extend a distance of 3 miles out of Tulsa and 1 mile each way from the automatic substation at the mid-point of the line. A manually operated portable substation equipped with one 300-kw. rotary converter is available for use at any point on the line by connecting it up to the high-tension line. It is used most of the time at the Sapulpa end of the line, but is available for a heavy load at any other point.

For the passenger service on the interurban line the company purchased three all-steel passenger cars of M. C. B. design and equipped with four G. E. 201-G, 65-hp. motors, G. E. type PC-5 multiple-unit control, Brill trucks and Westinghouse 18-ft. compressor and air-brakes. The car bodies are 56 ft. long over all and are built with a 9-ft. baggage compartment, a smoking


OKLAHOMA UNION RAILWAY

VIEWS OF THE SMALL SHOP BUILT IN THE OUTSKIRTS OF TULSA BY THE OKLAHOMA UNION RAILWAY TEMPORARILY TO TAKE CARE OF THE MAINTENANCE REQUIREMENTS OF THE COMPANY



AT LEFT, STANDARD BIRNEY SAFETY CAR, OF WHICH NINE ARE USED IN THE CITY SERVICE IN TULSA. AT RIGHT, PASSENGER CAR OF NEW OKLAHOMA INTERURBAN STANDING IN FRONT OF THE TULSA TERMINAL AND GENERAL OFFICES BUILDING

compartment and general passenger section, giving a total seating capacity of fifty. The trucks are mounted on 32-ft. centers and equipped with 36-in. Davis wheels. The cars complete weigh 31 tons. There is also one express car, which is likewise of all-steel construction and equipped with the same types of motors, control, air brakes and other equipment as the passenger cars.

Two of the passenger cars are required to give the hourly service betwen Tulsa and Sapulpa. The running time each way is forty-five minutes, and the cars leave each city on the hour, giving a short layover at each end of the line. The time required to go from Tulsa to Kiefer now, with the transfer at Sapulpa, is one hour and thirty minutes, but with the line ballasted and through service installed it is expected that this run will be made in one hour. Like the newly constructed line, the old section of line between Sapulpa and Kiefer is on private right-of-way except for about 1 mile through the main streets of Sapulpa.

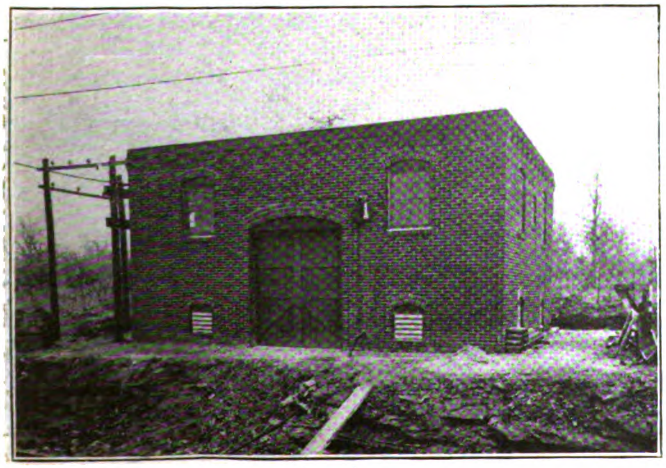
The cars on the new line are dispatched from Tulsa, where the duties of the dispatcher and ticket agent are combined in one job. The dispatching is handled through the installation of a Western Electric Company railway telephone system with a telephone jack installed every ½ mile on the line and an instrument on each car.

The city service in Tulsa is now supplied with nine standard safety cars, six of which are required in the regular schedule. These operate on a fifteen-minute headway. In addition there are two double-truck cars equipped with the Westinghouse Traction Brake Company safety devices and four G. E.-258 motors which provide a fifteen-minute service to West Tulsa and a thirty-minute service to Red Fork, a town of some 600 population situated on the interurban line 4½ miles south of Tulsa. These double-truck safety cars seat sixty people and weigh 28,000 lb. They are operated by two men, with front entrance and exit, and the fares are collected within the car on account of the different denominations required for the different lengths of ride. They are arranged for double-end operation and the door openings made wide to expedite loading and unloading in the downtown section.

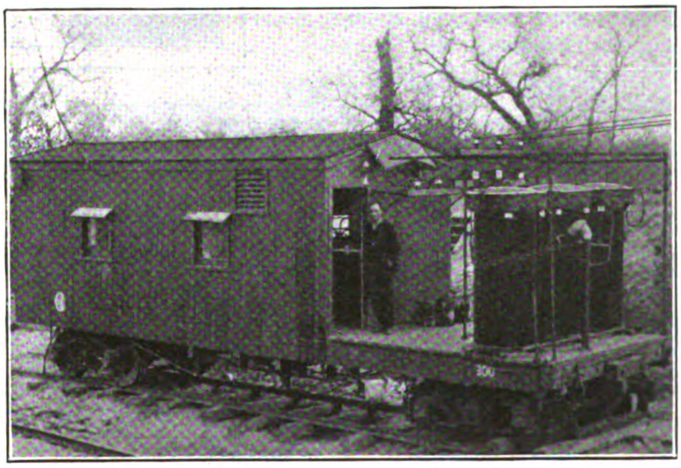
DOUBLE-HEAD CARS DURING RUSH HOURS

On account of the interurban and suburban service operating over the same single track at the Tulsa end of the interurban property, it is necessary to double-head the cars during the rush hours, for the interval cannot be reduced without double-tracking the line. This character of operation has made highly acceptable the counting feature of the Nachod signals protecting dangerous sections of the line over which both interurban and city cars must operate.

At Red Fork the company owns 60 acres of land, of which 25 acres have been set aside and partially improved for a recreation park. Adjacent to this park it is planned at some future time to build a shop which will be adequate to take care of the entire maintenance requirements of the system. For the present a small shop, pictures of which accompany this article, has been

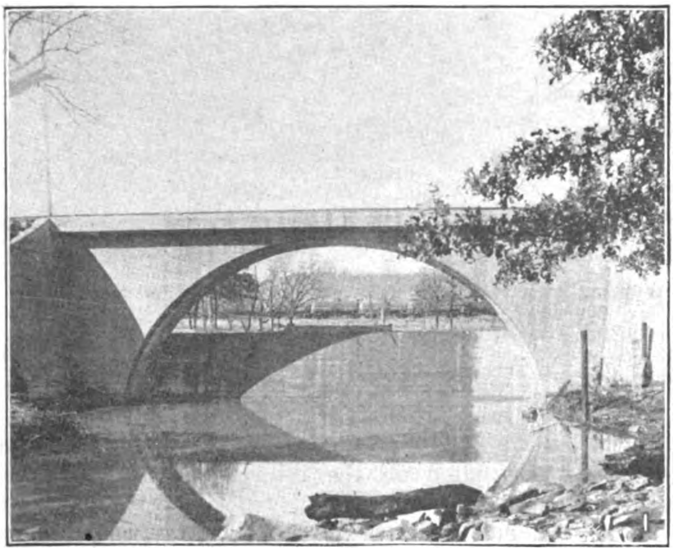


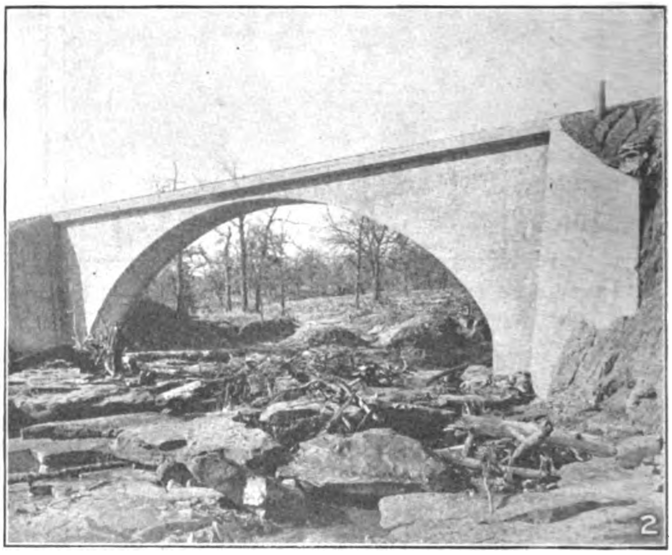
AUTOMATIC SUBSTATION EQUIPPED WITH ONE 300-KW. ROTARY AND INSTALLED HALF WAY BETWEEN TULSA AND SAPULPA

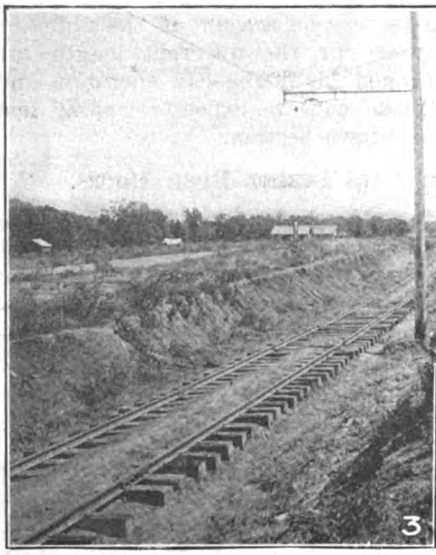


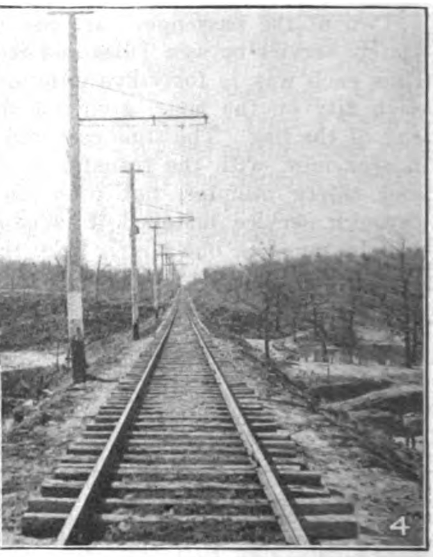
PORTABLE SUBSTATION HOUSING ONE 300-KW. ROTARY CONVERTER FOR EMERGENCY USE ON OKLAHOMA UNION RAILWAY

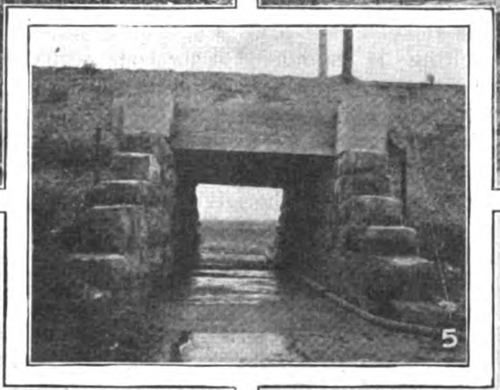
The Structures Along the Right-of-Way Present Many Interesting Features

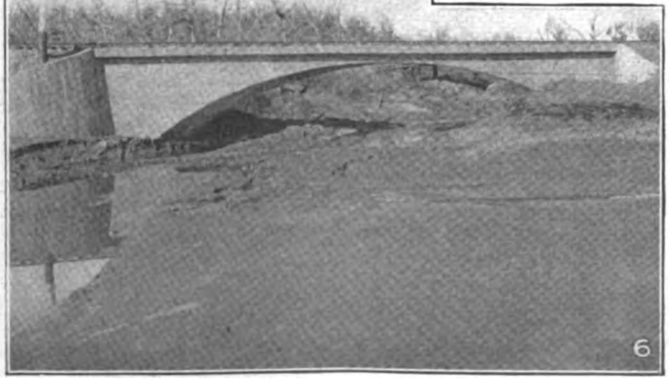


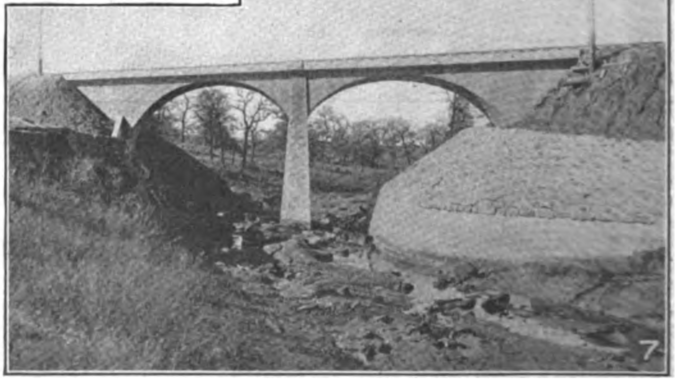




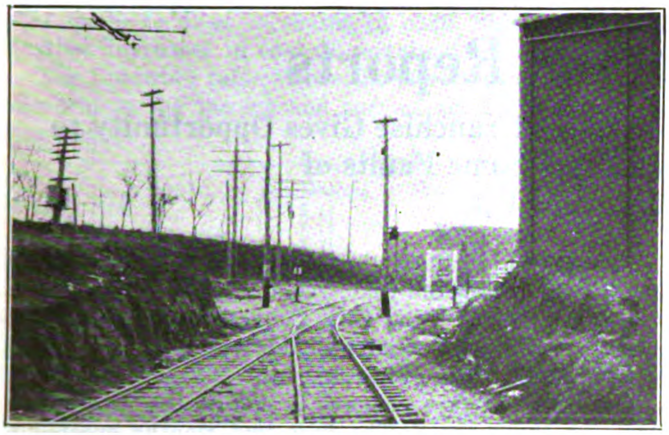




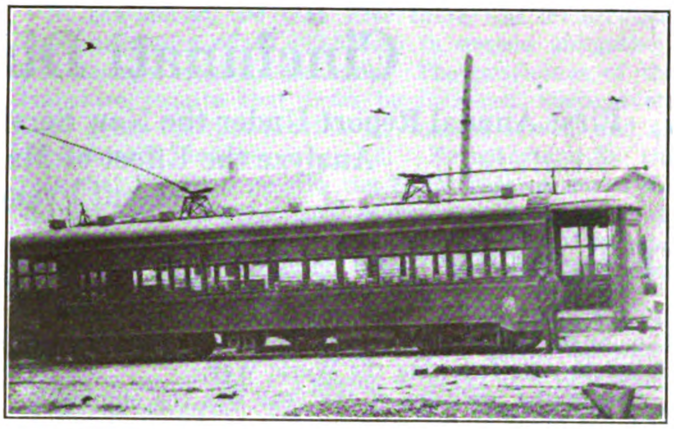




Numbers 1, 2, 6 and 7—Concrete bridges along right-of-way, original permanent construction being necessary on account of oil fires on streams. Numbers 3 and 4—Roadbed and overhead construction, with telephone wires and provision for high-tension line on same poles. Number 5—Standard culvert construction, where opening required exceeded 2 ft.



TROLLEY CONTACTOR SIGNAL INSTALLATION TO PROTECT MOVEMENT ON THE SINGLE TRACK OVER THE ARKANSAS RIVER BRIDGE



DOUBLE-TRUCK SAFETY CAR USED IN SUBURBAN SERVICE BETWEEN TULSA AND WEST TULSA AND RED FORK

built in the outskirts of Tulsa and equipped with a wheel lathe, drill press and a few other machines, so that the company is enabled to take care of its own maintenance of equipment except for that work which requires a wheel press. The pit capacity permits work on three large cars or six safety cars at one time.

The very rapid development of the territory in this section of Oklahoma has led to the serious consideration of extending the interurban line to Beggs and Okmulgee, about 25 miles from Kiefer. However, this extension will not be built so long as present prices prevail.

Swiss Dynamometer Car

THE use of dynamometer cars in connection with trunk line electrification is advocated by the Swiss State Railways. The need for reliable determination of train speed, drawbar pull, brake performance, etc., was appreciated and a car was designed to meet the requirements. This car is described in the *Railway Engineer* for May, 1920. It is 57 ft. long over all and weighs about 37 tons completely equipped. The car body rests on two four-wheeled bogie trucks of standard design with an exceptionally strong underframe with double side sills. The interior of the car is divided into four compartments. The first, in front, is 21 ft. long and is the test room which contains all indicators and measuring apparatus. The second compartment is a workroom, 13 ft. long, which gives access to a small corridor. This reaches the room on the back platform, containing an outfit for making running repairs, a workbench with chemical apparatus and lockers for supplies.

Westinghouse air brakes are provided on the wheels of three truck axles only, as the rear axle of the front truck is used to transmit the car motion to the measuring devices.

A hydraulic dynamometer was used instead of the spring type usually encountered, as the springs of the latter are cumbersome and difficult to calibrate when used for large dynamometers. The hydraulic dynamometer is of the usual principle, but was modified in many ways. For instance, the cylinders and pistons were so accurately ground that all packing and stuffing boxes were omitted and friction was reduced by using oil film lubrication. In this dynamometer there are two rams of polished steel projecting into two cylinders, which open outward on opposite faces of a single block of forged steel. The pressure exerted on the rear piston is given by the tractive effort of the engine, while the front piston receives the braking effect as felt on the bumpers. The pressure in the dynamometer cylinders is transmitted by pipes to a pair of small recording cylinders arranged in tandem, with the piston ends extending opposite to each other. The pressure acts on two differential pistons, permitting the use of either of two piston areas, depending on the setting of the distributing valve. A calibrated helical spring is located between the two pistons and the amount of its compression indicates the load acting on the small pistons. Then, when the ratio of these piston areas to the area of the dynamometer pistons is known the drawbar pull or braking load is readily determined.

A special type of tachometer is used on the car which continuously records the train speed. It is so sensitive that practically no time elapses between a change of speed and the action of the instrument. Among other special devices used are the ergometer, for determining the inertia forces and work done in overcoming train mass, omitting air and frictional resistance; a drawbar-pull meter, which works on the same principle as the ergometer; a horsepower meter, for getting the drawbar horsepower; a Kapteyn apparatus, for determining brake performance, and a special device for "indicating" the cylinders of a steam locomotive when the car is used for steam locomotive testing.

All of the apparatus and registering devices are mounted on a cast-iron table 69 in. x 35 in. and all the records are made on a continuous chart, using paper rolls about 2 ft. wide. This car is used on all the steam and electric lines and has proved to be very satisfactory.

Stimulating Freight Car Movement

"MORE Transportation" is the title of a bulletin now being issued by the Association of Railway Executives, the first number being dated Aug. 20. The advisory committee of the association, of which Daniel Willard is chairman, has set for its goal in the improvement of transportation service the following definite ends: (1) An average daily minimum movement of freight cars of not less than 30 miles; (2) an average loading of 30 tons per car; (3) reduction of bad-order cars to a maximum of 4 per cent of total owned; (4) an early and substantial reduction in the number of locomotives now unfit for service; (5) the making of more effective efforts to bring about the return of cars to the owner roads.

Cincinnati Director Reports

First Annual Report Under the New Service-at-Cost Franchise Gives Opportunity to Analyze the Effect of Many Items—Some Faults of Present Franchise Show Up

THE Director of Street Railways of the city of Cincinnati, W. C. Culkins, has just issued his report for the year 1919. This is the first full year under the Cincinnati service-at-cost franchise and also the first complete year following the World War.

One of the problems of the year was the elimination of what Mr. Culkins calls the "inadequate and uncomfortable type of box car operated on many lines." The question in Cincinnati is complicated by the inclined planes and certain heavy grades over which the cars must operate, the company holding that no larger type could be used, but the Department of Street Railways does not agree. After a consideration of the question, agreement was made on the adoption of a type of four-motor, double-truck equipment and the purchase of one hundred and five new cars of this type. One element of this consideration was that the maximum operation of small cars had been reached on some lines and the service was still inadequate.

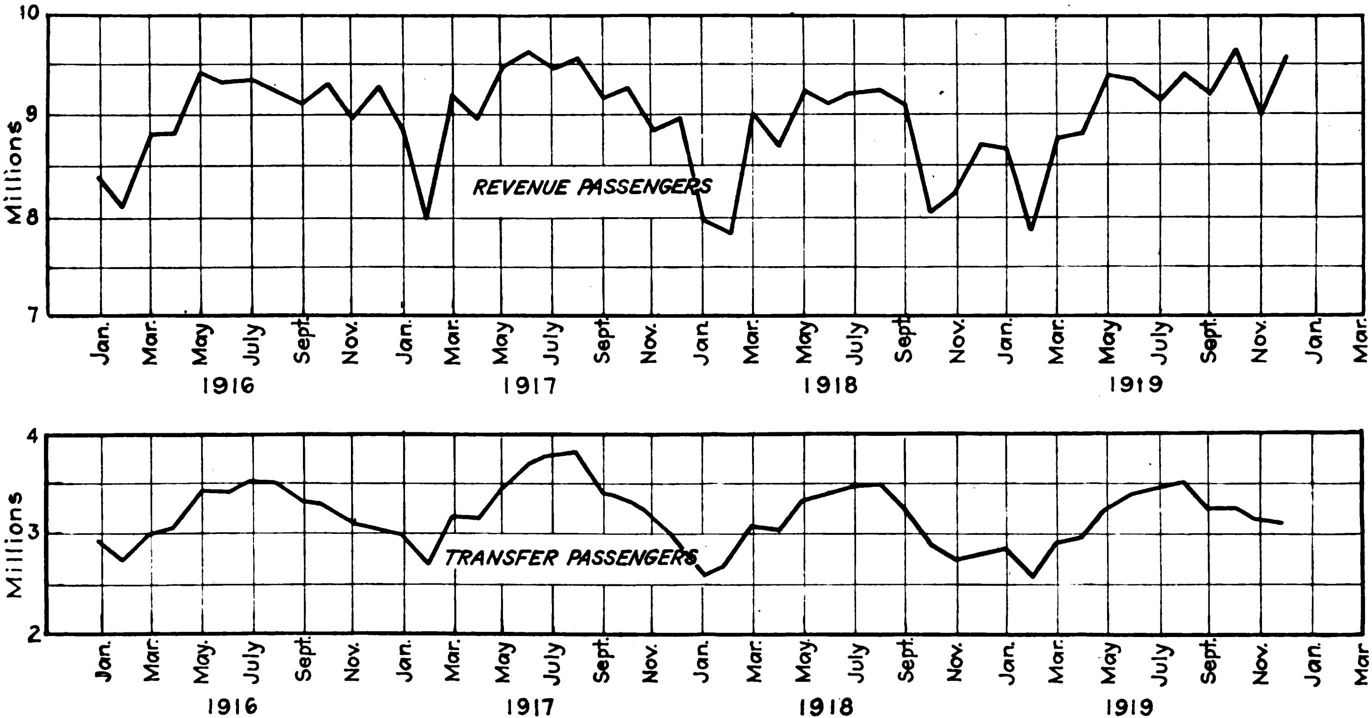
Elimination of some serious grades, such as the Milton Street hill, having a grade of nearly 12 per cent, was one of the problems of the year, and it was finally decided to widen Liberty Street in order that double tracks be laid there and the use of Milton Street avoided.

Efforts of the department have also been directed to improving the power supply conditions. Low voltage in some of the outer zones of many of the long lines resulted in slow movement of cars, with consequent delay. Solution of this problem is expected in 1920.

The report outlined the work which was done on extensions during the year. One extension, referred to the department by the City Council, was disapproved against because it would probably result in a net loss of all the cost of its operation.

The effect of fare changes is one of the interesting items of the report. The first two months created a deficit and under the terms of the service-at-cost franchise this necessitated a change in rates. Each subsequent two months' period, that being the length of the test period in each case, failed to show the necessary gain, and consequently there were periodical fare changes. Mr. Culkins states that the mistake was made in putting the fare too low to start with, but this was set at 5 cents upon the urging of a committee of citizens, even though a deficit was expected. Although the next two months' period indicated that receipts were entirely inadequate, it was impossible to adjust the fare to a satisfactory figure because under the terms of the franchise the only adjustment which can be made is to go to the next higher fare.

Contributing to the other elements which tended to make the income from the rates of fare used ineffective were the decisions of the War Labor Board increasing the wages of conductors and motormen and shortening the time limit in which the maximum rate of pay should be reached from five years to two years. Coal prices also rose and certain track relaying was called for, all of which increased expenses. Each step in fare which



FLUCTUATION OF REVENUE AND TRANSFER PASSENGERS BY MONTHS FOR YEARS 1916-1919 was made to meet increases in costs was followed by further increases in cost of certain items.

The following table shows the effect of varying conditions upon the income and cost of service per revenue passenger:

	Total Income	Cost of Service	Surplus or Deficit
October, 1918	5.11	6.56	—1.45
November	5.13	6.20	—1.07
December	5.11	6.76	—1.65
January, 1919	5.75	6.96	—1.21
February	5.69	6.99	—1.30
March	5.63	6.89	—1.26
April	6.09	6.84	— .75
May	6.09	6.56	— .47
June	6.10	7.22	—1.12
July	6.71	7.27	— .56
August	6.76	7.09	— .33
September	6.74	7.05	— .31
October	7.04	6.79	.25
November	7.03	7.02	.01
December	7.08	7.07	.01

The average fare per revenue passenger for the year was 6.28, as compared with 4.98 in 1918, and the average for all passengers was 4.67, as compared with 3.71 in 1918. Under the 7-cent rate the average in December was 6.92 per revenue passenger and the average per passenger, including all passengers, was 5.23.

For two periods of three months each there was a saving of ½ cent made by the purchase of tickets. There were two similar periods, in which no discount was obtained by the purchase of tickets, and this situation afforded an unusual opportunity to study the public tendency in this regard. The ratio of cash fares and tickets throughout the year was as follows:

	Cash Fares		Ticket Fares	
	Rate	per Cent to Total	Rate	per Cent to Total
January, 1919	6 cents	18.62	5½ cents	81.38
February	6 cents	18.86	5½ cents	81.14
March	6 cents	24.17	5½ cents	75.83
April	6 cents	77.53	6 cents	22.47
May	6 cents	82.28	6 cents	17.72
June	6 cents	86.67	6 cents	13.33
July	7 cents	31.63	6½ cents	68.37
August	7 cents	30.83	6½ cents	69.17
September	7 cents	32.33	6½ cents	67.67
October	7 cents	74.96	7 cents	25.04
November	7 cents	76.66	7 cents	23.34
December	7 cents	78.32	7 cents	21.68
Twelve months average	6½ cents	53.54	6½ cents	46.46

To attempt a direct answer to the question, "What has become of the money produced by the increase in fare?" he gives the following table to show the increase in earnings and increase in expense in 1919 as compared with 1916:

Increase in earnings	$1,531,505.25		
Increase in total income	1,578,620.09		or 26.52 per cent
Increase in expenses—wages and salaries		$1,485,794.55	or 66.54 per cent
Increase in materials and supplies		271,570.11	or 100.27 per cent
Increase in coal		222,816.01	or 73.21 per cent
Increase in valuation expenses		20,710.17	or 100.00 per cent
Increase in depreciation		35,000.00	or 26.52 per cent
Increase in insurance		10,302.02	or 37.77 per cent
Increase in other expenses		49,092.73	or 28.27 per cent
Total increase		$2,095,285.59	or 66.70 per cent

In addition, general taxes increased $152,726.97, or 37.46 per cent; taxes for city of Cincinnati and Norwood increased $17,451.92, or 5.15 per cent. Since the total expenses exceeded receipts, the company was compelled to borrow and became liable for interest charges amounting to $57,464.69, an increase of 100 per cent, since there was no similar charge in 1916. The story in three lines is this:

		Per Cent of Increase	Ratio to Income
Increased income over 1916 from increased fare and all other sources	$1,578,620.09	26.52	100 per cent
Increases in expenses over 1916	$2,328,562.50	45.14	147.51 per cent
Excess of increase in expenses over increase in income	$749,942.41		47.51 per cent

At the end of the year 1919 there was an accumulated deficiency of $1,669,567.35 in unpaid obligations and moneys owed to the bank. The provisions of the franchise require that fares be increased successively until gross receipts provide for cost of service and all accumulated deficits are paid. Notwithstanding the fact that for three months the 7-cent fare produced the current cost of service, further increases would be necessary to pay off deficiencies for previous months and years, and this alone would require increases by successive stages to 9½ cents.[*]

It was, therefore, decided that it would be fair to the public to fund deficits by issuing securities which would be amortized in a period of years at a rate which could be absorbed by the current operation of the company.

Authority was, therefore, granted by the Public Utilities Commission of the State and the Director of Street Railways to issue $4,650,000 in bonds bearing 6½ per cent to be sold at not less than 95 per cent, and also $2,100,000 in 6 per cent debenture notes, each maturing in twenty-five years, a sinking fund being provided to meet these maturities. But even these issues were impossible to market and the plan was modified so that there were issued $2,250,000 of three-year notes bearing 7 per cent interest sold at 96½ and $2,250,000 debenture notes, bearing 6 per cent, in lieu of the accrued dividends and payments allowed to the stockholders under the ordinance and to provide the initial $250,000 of the reserve fund. The company was also permitted to sell an additional $1,500,000 of three-year notes to provide for improvement on the property, and further $1,250,000 of 6 per cent equipment notes for the purchase of additional cars.

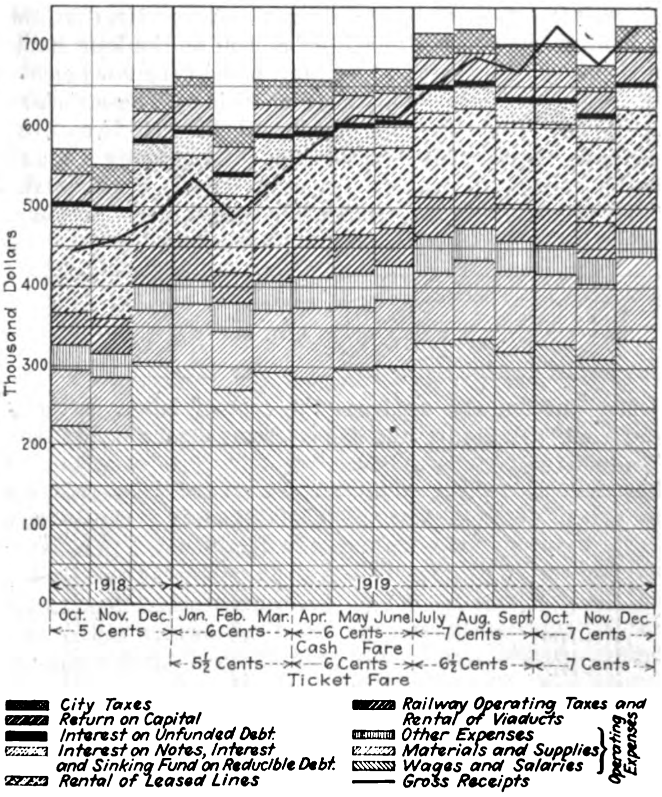


CHART SHOWING ANALYSIS OF COST OF SERVICE AND ITS RELATION TO GROSS RECEIPTS FROM OCT. 1, 1918 TO DEC. 31, 1919

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[*] The present fare is 8 cents cash, 7½ cents ticket.—EDITORS.

Another interesting opportunity for study was the effect of increased fares upon the car-riding habit. Mr. Culkins concludes that there seems to be no considerable number of passengers who were influenced to walk short distances, because the percentage of increase and gross receipts in each case was greater than the percentage of increase in fares. Apparently the rate of fare has had little, if any, effect upon the number of passengers. The trend of traffic, however, did not show the increase that has been found in other cities, but this is not difficult to understand when it is realized that the late census shows Cincinnati not to have grown as did other cities.

The following table shows the number of revenue passengers for the last four years:

1916	116,599,800 revenue passengers	1918	112,525,698 revenue passengers
1917	118,152,860 revenue passengers	1919	117,495,936 revenue passengers

Density of traffic is of course a large item in the cost of service. Cincinnati, by reason of the long hauls through sparsely settled territory, has a very low density of traffic as compared with other cities. The standard of service furnished in Cincinnati in 1919 was .184 car-miles per revenue passenger. Comparing Cincinnati's density of traffic with other cities, he finds the following, the figures indicating passengers per car-mile:

Cleveland	8.73	Kansas City	4.94
Detroit	7.41	St. Louis	5.98
Boston	5.95	Cincinnati	5.55
Baltimore	6.83		

Mr. Culkins also analyzes the cost of labor, material and coal. Bringing the labor figures to a table, the results are about as follows:

Year	Minimum Rate per Hour Cents	Maximum Rate per Hour Cents
1901-1906	19	21
1907-1909	20	22
1910-1913	20	25
1914-	20	27
1914-1915	20	27
1915-1916	20	27
1916-1917	23	30
1917-1918	24	30
1918-part	26	32
1918-(latter part)	31	37
Nov., 1918, to June, 1919	43	48
July 1, 1919, to date	45	50

The following table of material increases will be of particular interest:

Material		1914	1915	1916	1917	1918	1919
Iron poles (line) 6 in.x7 in.x30ft.	Each	$20.70	$20.70	$27.60	$55.20	$41 40	$48.30
Wood poles (line) 8 in.x35 ft.	Each	6.80	6.80	6.80	7.60	11.55	13.86
Steam pipe	%*	78.00	77 00	74.11	42.30	42.30	49.11
Fittings	%*	60.00	60.00	60.00	List	List	10 00
Rails	Ton	38.10	38.10	38.10	69.30	69.30	64.70
Switches	Each	164.00	164.00	164.00	284.00	284.00	375.00
Mates	Each	109.00	109.00	109.00	198.00	198.00	225.00
Ties	Each	.70	.67	.67	.78	1.00	1.30
Cement	Barrel	1.73	1.69	1.84	2.09	2.79	2.90
Sand	Ton	.50	.50	.50	.70	1.20	1.15
Gravel	Ton	.60	.60	.60	.90	1.40	1.15
Track bolts	Cwt.	2.05	2.34	2.20	5.55	5.55	4.88
Cast iron wheels	Cwt.	1.42	1.42	1.42	1.52	2.50	3.19
Brake shoes	Ton	28.00	28.00	28.00	31.65	74.50	65.00
Axles	Cwt.	3.50	3.50	3.50	6.00	7.00	6.00
Trolley rope	Pound	.20	.19	.26	.35	6.47	.62
Bell cord, ¼ in.	M. ft.	13.75	13.75	13.75	27.50	30.60	32.42
Manila rope	Pound	.12½	.14½	.18	.26	.33	.35
Dry batteries	100	14.50	14.50	14.50	28.70	28.85	33.05
Gears—W. H. No. 92	Each	23.05	22.50	22.50	36.45	43.15	42.50
Armature coils	Set	27.50	33.20	30.35	51.70	51.70	35.00

*Figures given are per cent discount from list prices.

One of the efforts of the department is to maintain service and to allow the service-at-cost principles of the franchise to work to repay the company, along the proper lines.

The standard adopted is based upon the principle that during the non-rush hours there should be supplied during each half hour as many seats as there are passengers in that period and during the rush-hour period, from 6 to 9 a.m. and 4:30 to 6:30 p.m., there shall be a sufficient number of cars to provide 4 sq.ft. of floor space for each standing passenger during each fifteen-minute period. The department made forty-three careful checks of service and traffic at given points and fifteen platform checks. The information thus obtained furnished the basis of various improvements in the service. Mr. Culkins gives a rather complete survey of the results of these inspections on each of the lines in the city and from this shows up the necessity of increased or better distributed service on these various lines. He then makes recommendations with reference to relief in many parts of the city.

With reference to rail, he states that the custom in Cincinnati has been to require grooved rails in all kinds of track construction, but that inquiry shows where the "T" rail had been used the engineers of the cities and companies favored it strongly and where it had never been used there was strong opposition. In some places the department has been able to get agreements, to a limited extent, for the use of the "T" rail in Cincinnati.

NEW FRANCHISE AUTHORIZES FREIGHT HAULING

With reference to freight hauling, it is stated that the new franchise authorizes the use of tracks and equipment for hauling of freight and express matter, but that not much progress had been made with the subject in Cincinnati during the past year. It is believed, however, that it offers an opportunity for additional earnings, which, under the ordinance, would be of immense benefit to the car-riding public.

In connection with the accident record of the company, satisfactory progress is being made in reducing the number of accidents and the seriousness of the accident account. Complete statistics of the accident record for the year 1919 and also the two previous years are given in the report. Another table shows that the percentage of injuries and damages totaled 2.13 of the total passenger earnings for 1919, whereas in 1914 the percentage has been 3.10. The statistics also indicate that during the skip-stop régime the accidents were lower than before this skip-stop was inaugurated and also lower than after the skip-stop was discontinued.

The report also includes an analysis of car inspections, defect reports, supervision of accounts and many financial items, as well as a résumé of suggestions and recommendations made by the director during the year; also discussions of the probable replacement of the double trolley system with the present heavy cars by one-man cars, with single trolley.

Other points covered were traffic congestion, cleaning and ventilating of cars, the suggestion of a standard parade route and regulations to give minimum interference with street traffic, fare boxes, departmental expenses, and the interurban situation with respect to city terminal facilities.

The report closes with a discussion of the service-at-cost franchise, parts of which have already been included in the abstract, and a comparative statement of revenues, expenses and incomes, details of operating expenses and other financial analyses.

Accidents Lessened by Safety Cars

Statistics from Group of Stone & Webster Properties in Widely Separated Sections of Country Show Accidents on Basis of Car-Mile or Passengers Carried Far Less with Safety Cars Than with Two-Man Cars—Other Statistics Given

BY W. H. BURKE

FROM time to time some of the newspapers have given considerable publicity to a few more or less minor street railway accidents in which the safety or one-man car has happened to be involved. In most cases these accounts have not been unfriendly to the car. The press in general has been among the first to see the tremendous advantages which the safety car has over the older type of rolling stock in the way of faster and more frequent service. Hence it is clear that any exaggerated impression of the accident hazard which these newspaper reports may have conveyed has been the result of a misunderstanding of the facts in the situation and that they were not in any sense prompted by a feeling of hostility. Nevertheless, in many cases they have laid a great deal more stress on the one-man feature of the car than the importance of the particular accident or the circumstances surrounding its occurrence would warrant.

In the early days of the safety car it was not unnatural for the layman to feel that there was an inherent accident hazard in a car operated by one man which would not be present in a two-man operated car. The safety car was an entirely new departure, and naturally the public did not understand its mechanism nor the fact that the safety features embodied in its design, with the added advantage of responsibility for its operation being lodged with one man instead of two, were bound materially to reduce the accident hazard rather than increase it. Unfortunately, however, there were no tangible results or actual figures available in the early days to prove this, and in the circumstances it is remarkable that practically no popular opposition developed on this score.

The answer is to be found, of course, in the appeal which the car immediately made to the public on account of the faster and more frequent service which it made possible. Its popularity is best evidenced by the fact that, although it was not developed on a commercial scale until late in 1916, more than 5,000 safety cars were in use or on order by the end of May this year, and this number of course is considerably greater at the present time. One of the large car builders is authority for the statement that more than 75 per cent of all the cars purchased in 1919 by the electric railways of the United States were of the safety type. Furthermore, this record has been made in the face of the most serious financial conditions which have ever confronted the street railway industry.

Practically all of the Public Service Commissions which have passed on the matter have indorsed the car, and in at least one recent case a commission criticised the management of a large Western property for not having taken advantage of the safety car and the economies in operation which it makes possible.

The simplicity of the car's operation is evidenced by the fact that in one Middle Western city, where the Birney safety car is used exclusively, the service was operated entirely by women during the war and with wholly satisfactory results from an accident as well as from every other standpoint.

ROADS SELECTED FOR COMPARISON

In spite of the fact that the car has already sold itself to the public and is now generally accepted as the greatest advance step in street railway transportation since the electric railway motor was first developed, it is worth while to consider the actual results which have been achieved from an accident standpoint, if for no other reason than to vindicate the judgment of the early advocates of the safety car idea. With this thought in mind a careful analysis has been made of the accident records of thirteen representative street railway companies covering the first five months of the current year.

All of these companies are under Stone & Webster management and are widely scattered, their geographical location being as follows:

Texas	4	Iowa	1
Washington	3	Kentucky	1
Florida	1	Louisiana	1
Georgia	1	Canada	1

These thirteen companies serve a combined population of about 1,000,000 people and during the period in question operated more than 12,000,000 car-miles and carried more than 70,000,000 passengers, exclusive of those using transfers. The safety cars in these cities are operating under all kinds of conditions as regards street and traffic congestion, and in at least two of the cities this congestion is as serious in sections of the business district during rush hours as will be found anywhere in the country. As of May 31, these companies owned approximately 400 cars equipped for one-man operation.

It should be stated further that the figures used herein are not for any group of especially selected companies, nor are they for certain selected lines of any particular companies. On the contrary, they include all of the companies under Stone & Webster management where any appreciable number of safety cars are being operated.

These facts are set out to show that the data given are representative, and if the accident record of the safety car as compared with the ordinary two-man car is favorable under these circumstances it would seem to be pretty conclusive proof that from an accident standpoint alone, and entirely aside from its many other advantages, the car has vindicated the judgment of its many advocates; also that it is reasonable to expect similar average results on any other street railway property as far as the accident situation is concerned.

The summary in Table I shows the passenger car mileage and passengers carried (excluding transfers) divided as between safety and two-man cars. These

TABLE I—CAR-MILES AND PASSENGERS CARRIED ON SELECTED GROUP OF THIRTEEN STONE & WEBSTER PROPERTIES, FIRST FIVE MONTHS OF 1920

	Passenger Car-Miles Operated		Passengers Carried (Transfers Excluded)	
	Safety Car	Two-Man Car	Safety Car	Two-Man Car
Baton Rouge, La.*	120,700	0	1,006,700	0
Beaumont, Tex	325,000	192,700	1,439,600	1,537,800
Bellingham, Wash	379,500	58,800	1,467,000	256,300
Columbus, Ga	240,200	167,600	1,107,300	1,192,100
El Paso, Tex	735,700	478,000	3,731,300	3,140,200
Everett, Wash	352,900	15,200	1,821,600	213,200
Fort Worth, Tex	924,600	1,407,500	5,037,900	10,715,400
Halifax, N. S	134,400	631,500	947,100	4,618,000
Houston, Tex	731,300	1,615,800	3,625,200	11,595,300
Keokuk, Iowa*	109,700	0	508,900	0
Paducah, Ky.*	259,400	0	1,036,300	0
Tacoma, Wash	962,700	953,800	4,035,700	5,122,500
Tampa, Fla	685,600	557,400	3,407,900	3,222,400
Total	5,962,700	6,079,300	29,172,500	41,613,200
Per cent of total	49.5	50.5	41.2	58.8

* 100 per cent safety-car operation.

TABLE III—ACCIDENTS CLASSIFIED AS "IMPORTANT" PER 200,000 PASSENGERS ON THIRTEEN SELECTED PROPERTIES DURING FIRST FIVE MONTHS OF 1920

		Number Important Accidents per 200,000 Passengers (Transfers Excluded)	
		Safety	Two-Man
1	Collisions with pedestrians	0.14	0.18
2	Collisions at railroad crossings (other than company's)	0.01	0
3	Collisions between cars of company	0.12	0.12
4a	Collisions with automobiles	1.22	0.74
4b	Collisions with other vehicles	0.09	0.10
4c	Collisions with animals	0.03	0.03
5	Derailments	0.06	0.06
6	Equipment	0.01	0.06
7	Boarding cars	0.02	0.25
8	Injuries on cars	0.11	0.20
9	Alighting from cars	0.17	0.57
10	Falling from cars (not purposely alighting)	0.01	0.01
11	Stealing rides	0.01	0.01
12	Doors, gates and guards	0.04	0.04
13	Miscellaneous	0.22	0.34
		2.26	2.71

figures are reproduced merely to emphasize the widely varying conditions under which the safety car is being operated on the thirteen properties under consideration.

ACCIDENTS, TOTAL AND PER 200,000 PASSENGERS, COMPARED

In reporting accidents all of these companies use the classification of "accidents and occurrences" adopted at the 1916 convention of the American Electric Railway Association. Under this head is included every accident or happening on which an accident report is turned in. These, in turn, are segregated as between "important" and "trivial." Accidents reported as "trivial" are those where there is no injury or damage, or where the injury or damage is very small. Generally speaking, "trivial" accidents cover those where there appears to be no liability on the part of the company and which would hardly be considered important enough to report except as a matter of protection in case a claim should later result. All accidents other than "trivial" are classified as "important." A similar plan is followed in classifying personal injuries.

The total number of "important" accidents on all of the properties segregated as between safety and two-man cars and the number per 50,000 car-miles operated by each type of car were, for the first five months of 1920, as shown in Table II.

These figures show that on a car-mile basis the average number of accidents for the two-man car is substantially 70 per cent greater than for the safety car. Except for collisions with automobiles, where the figure for the two-man car is somewhat lower, the comparison is overwhelmingly in favor of the safety car. Furthermore, even in the matter of collisions, the showing favors the safety car slightly when collisions of all kinds are considered (Items 1 to 4c inclusive), the number per 50,000 car-miles being 1.95 for the safety car and 1.99 for the two-man car.

TABLE II—ACCIDENTS CLASSIFIED AS "IMPORTANT" ON THIRTEEN SELECTED PROPERTIES DURING FIRST FIVE MONTHS OF 1920

		Total Number		Number per 50,000 Car-Miles	
		Safety	Two-Man	Safety	Two-Man
1	Collisions with pedestrians	20	37	0.17	0.30
2	Collisions at railroad crossings (other than company's)	1	0	0.01	0
3	Collisions between cars of company	17	24	0.14	0.20
4a	Collisions with automobiles	178	154	1.49	1.27
4b	Collisions with vehicles	14	21	0.11	0.17
4c	Collisions with animals	4	6	0.03	0.05
5	Derailments	9	12	0.08	0.10
6	Equipment	2	12	0.02	0.10
7	Boarding cars	3	52	0.03	0.43
8	Injuries on cars	16	41	0.13	0.34
9	Alighting from cars	25	120	0.21	0.99
10	Falling from cars (not purposely alighting)	1	3	0.01	0.02
11	Stealing rides	1	2	0.01	0.02
12	Doors, gates and guards	6	9	0.05	0.07
13	Miscellaneous	32	71	0.27	0.58
		329	564	2.76	4.64

The figures show in a striking manner the advantage which the safety car has as regards boarding and alighting accidents, the number of these two classes of accidents per 50,000 car-miles being 1.42 for the two-man car as compared with only .24 for the safety car. The two-man car operated an average of 35,300 miles for each boarding and alighting accident, while the safety car operated 213,000 miles; the two-man car carried 241,900 passengers (transfers excluded) for each boarding and alighting accident and the safety car 1,042,000 passengers.

STEP ACCIDENTS MATERIALLY REDUCED

Step accidents have always been the bane of the claim agent's existence. They are not only costly but they involve life and limb to a much greater extent than does any other common form of street railway accident and therefore they are of greatest moment to the car rider. The fact that they are all but eliminated with safety-car operation is a tremendously strong point in its favor.

Out of 329 important accidents with the safety car there were 207 personal injuries, while with the two-man car with 564 important accidents there were 446 cases of personal injury, the percentage of personal injuries being 63 for the safety car and 79 for the two-man car. This indicates, as would be expected, that the accident results are likely to be less serious with the lightweight car than with the heavy two-man car.

The accidents classified as "trivial" are not of sufficient importance to warrant showing the results in detail here. The figures show an average of 16.2 trivial accidents per 50,000 car-miles for the safety car and 24.9 for the two-man car.

Based on the comparative number of passengers carried, the showing as to number of important accidents is again very materially in favor of the safety car, as is shown in Table III.

Expressed in another way to show the average number of car-miles operated and passengers carried for each important accident the combined results for the thirteen companies are:

	Number Car-Miles per Accident	Number Passengers Carried per Accident
Safety car	18,124	88,670
Two-man car	10,779	73,782
Total	13,485	79,267

In some of the more recent wage arbitration proceedings it has been contended that the safety car introduces an additional hazard for the operating employee and this has been used as an argument for higher wages than might otherwise be justified. As an example of the extreme to which such a claim may be carried, considerable stress was laid on some testimony in a recent wage case of a large Eastern property to the effect that a safety car had skidded for some distance on a bad rail because the emergency sander had failed to operate. The fact was later developed that no damage had resulted and that the failure was due to the sandpipe having been clogged with stones. Under similar circumstances a heavy two-man car would probably have skidded considerably further and the chances of a serious accident would certainly have been greater. In other words, the argument in this case was, if anything, in favor of the light-weight car rather than against it.

The detailed figures from which the data as to the number of accidents were compiled show the following as to employees' injuries for safety and two-man cars:

	Car-Miles per Employee Injured	
	Important	Trivial
Safety car	542,075	156,917
Two-man car	129,349	51,961

As far as the hazard to the employee is concerned it appears that disregarding trivial accidents the odds are more than four to one in favor of the safety car.

As regards the comparative money cost of accidents for safety and two-man cars the records of the companies in question show that for the first five months of the current year they paid out 4.16 per cent of their combined passenger revenue for accident settlements. These payments do not, of course, correspond exactly with the accidents occurring during this period. Some of them applied on prior claims, while on some of the accidents which have occurred during this period claims are still pending. However, with as large a group of companies as is being considered here the effect of this difference should affect the results but little if at all, and the fact that the percentage of earnings paid out for accident settlements during this period corresponds almost exactly with the average for the entire year 1919 indicates that this assumption is a reasonable one.

The amounts paid out in settlements per 1,000 car-miles for the five months period are as follows:

Safety car	$10.60
Two-man car	15.00

The thirteen companies operated an average of 255 eighteen-hour safety cars and 245 eighteen-hour two-man cars during this period. On this basis the safety car shows an annual saving of $300 per car per year in accident cost, or substantially $75,000 for the 255 eighteen-hour cars in operation on a car for car basis, compared with two-man equipment, quite a respectable sum in these days of high operating costs.

Briefly, the above analysis, covering operations under such widely varying conditions as to make the information thoroughly representative and extending over a sufficient period of time to make it conclusive, shows:

(a) That the average number of accidents on a car-mile basis is about 70 per cent greater with the heavy two-man car than with the light-weight safety car.

(b) That the average number of accidents on the basis of passengers carried is 20 per cent greater with the two-man car.

(c) That the accident risk from the standpoint of the car operator is overwhelmingly in favor of the safety car.

(d) That the accident cost is about $300 greater per car per year with the two-man car.

(e) That in proportion to the number of accidents the number of personal injuries is 25 per cent greater for the two-man car.

As the use of the car is still further extended, sporadic attempts may be made in some cases to show that the term "safety car" is a misnomer. This need occasion no great concern provided the car is being properly operated, because it is then its own best and most convincing argument against claims of this nature. Furthermore, those responsible for such claims can make no great headway without the support of the car rider, and this, judging from past experience, will not be forthcoming.

Like any other mechanical equipment the safety car requires a reasonable degree of care and intelligence on the part of the organization which is responsible for its operation. In the hands of a prejudiced operator, favorable results are not to be expected. Careless and reckless operation will involve accidents with any type of equipment, and in this respect the safety car is no exception to the general rule. Run at high speeds in heavy traffic, any car will, sooner or later, kill some one. Operated at dangerous speeds over bad track, any car will sooner or later be ditched, with the usual attendant results. The safety car is not infallible. No one who understands the situation, and least of all the operating men. who have been largely responsible for its success, and to whom the lion's share of the credit belongs, will claim that it is immune from accidents. They will contend, and with good reason, as the figures given above amply prove, that given a square deal and operated according to the dictates of ordinarily good street railway practice its accident record is decidedly better than that of any other type of car developed.

Great Britain's Tramways Hard Hit

THE present condition of the city electric railways is editorially summarized thus in a recent issue of the *Electrician*, London:

> The lot of the present-day tramway manager is not a happy one. Faced with frequent demands for increased wages and with steadily advancing prices of materials for repairs and track reconstruction, he has been compelled to resort to increases of fares in order to balance his accounts. In some cases these increases have amounted to as much as 100 per cent of the pre-war figures. Just as in taxation, there is a limit in tramway charges beyond which it is useless to go, and there are indications that this limit has been passed in some undertakings, though, unfortunately. there is no guarantee that finality has been reached in demands for advances in wages or in the upward movement of other items in the working costs. In many provincial towns the minimum fare is now 1½d., and in some cases it is 2d. The effect has been a great reduction in the number of passengers carried, and though there has been an increased gross revenue in some cases this has not been as high as was anticipated. People prefer to walk or to patronize rival motor omnibus or char-a-banc services rather than pay the higher fares. For instance, at Portsmouth there was a reduction of 1,500,000 passengers in eight weeks after the abolition of penny fares. At Glasgow, which possesses the cheapest and probably the best tramway service in the United Kingdom, the disappearance of the half-penny stages has caused a weekly drop of more than 1,100,000 passengers, but the net result is a substantial increase of revenue.

Wilcox Issues Statement

Criticises Federal Commission Report for Rejecting Public Ownership and Not Publishing His Analysis—Effect of Fare Increases

SEVERELY criticising some aspects of the Federal Commission report, Dr. Delos F. Wilcox has made a statement which he has widely distributed to the daily press. This statement to the press, some eleven pages in length, is almost wholly devoted to arguments supporting public ownership as the logical conclusion of the commission's investigation. Dr. Wilcox believes municipal ownership less experimental than service-at-cost, recommended by the commission. He regrets that the meagerness of the federal appropriation of $10,000 makes it impossible for the commission to publish the entire record and closes with the discussion of the traffic analysis showing the effect of fare increases which he made. From this analysis Dr. Wilcox would conclude that the fare increases had caused the railways to be less useful to the public. The summary of this analysis is given in the accompanying table.

Dr. Wilcox accompanies his statement with his nine-page letter of June 8 to Chairman Charles E. Elmquist of the commission, in which he summarizes his conclusions.

GENERAL SUMMARY OF ANALYSIS OF EFFECT OF FARE INCREASES UPON TRAFFIC AND REVENUES OF PRINCIPAL STREET RAILWAY SYSTEMS OF THE UNITED STATES—COMPILED FROM DATA COLLECTED BY THE FEDERAL ELECTRIC RAILWAYS COMMISSION. THE CITIES OR SYSTEMS FOR WHICH STATISTICS HAVE BEEN COMPILED HAVE BEEN DIVIDED INTO CLASSES, ACCORDING TO THE PERCENTAGE OF INCREASE IN THE AVERAGE FARE PAID DURING THE FIRST NINE MONTHS OF 1919 OVER THE FIRST NINE MONTHS OF 1917

(Table VI of Analysis of Effect of Fare Increases on Traffic and Revenue)

Class	Number of Cities or Systems in Class (1)	Number of Revenue Passengers Carried First Nine Months of 1917	Per Cent of Total Electric Railway Traffic of Country	Average Fare per Revenue Passenger First Nine Months of 1917, Cents	Number of Revenue Passengers Carried First Nine Months of 1919	Average Fare per Revenue Passenger First Nine Months of 1919, Cents	Per Cent Increase in Average Fare Paid First Nine Months of 1919 Over First Nine Months of 1917	Per Cent Increase in Number of Revenue Passengers Carried First Nine Months of 1919 Over First Nine Months of 1917 (D—Indicates Dec.)	Per Cent Increase in Passenger Revenue First Nine Months of 1919 Over First Nine Months of 1917
A (2)	13	2,465,440,094	29.16	4.93	2,837,238,677	4.95	0.41	15.08	15.65
B (3)	11	908,511,165	10.74	4.98	1,005,987,031	5.31	6.63	10.73	18.11
C (4)	29	1,583,795,790	18.73	5.28	1,689,085,597	6.22	17.80	6.65	25.63
D (5)	15	1,521,714,987	18.00	4.62	1,406,987,088	6.55	41.77	7.54 (D)	30.97
ALL........	68	6,479,462,026	76.63	4.95	6,939,298,393	5.64	13.97	7.10	21.96

(1) All systems operating in a transportation area where fares have not been substantially changed, or where fares have been changed uniformly, have been counted as a single system, as in New York City; where different systems in the same transportation area or different local divisions of the same system have had their fares raised in different proportions, so as to fall within different classes in Table IV and Table V, they have been counted as separate systems.

(2) Cities or systems upon which there was no increase of fare from the first nine months of 1917 to the first nine months of 1919, or upon which the increase in the average fare paid was less than 3 per cent.

(3) Cities or systems upon which the increase in the average rate of fare paid during the first nine months of 1919, as compared with the first nine months of 1917, was between 3 per cent and 10 per cent.

(4) Cities or systems upon which the increase in the average rate of fare paid during the first nine months of 1919, as compared with the first nine months of 1917, was between 10 per cent and 25 per cent.

(5) Cities or systems upon which the increase in the average rate of fare paid during the first nine months of 1919, as compared with the first nine months of 1917, was more than 25 per cent.

From the analysis of this letter it appears that with reference to the facts of the situation and circumstances surrounding the industry in its present status, Dr. Wilcox is in thorough accord with the findings of the commission. It is only with reference to conclusions and recommendations for the future that Dr. Wilcox differs from the commission in that he would have the only solution municipal ownership.

Starting from the same point of agreed fact as the commission, Dr. Wilcox argues toward municipal ownership as follows, in brief abstract:

1. Local transportation is affected with a public interest.

2. Heretofore under private ownership capital has assumed the management. Speculation has been an incentive. Divorced from management, capital would ask only a fair return.

3. The cost of labor has been determined by supply and demand. If labor ever entered into management in any degree it would demand something in addition to a fair return.

4. The public has so fundamental an interest in electric railway service that it cannot permit itself to be the victim of the vicissitudes of an unregulated struggle between capital and labor. Therefore, it is necessary that a direct relation between the public and labor be established.

5. With the establishment of these relations the responsibility of capital for management is undermined and its motive for efficiency in management weakened if not destroyed. With the assumption of direct responsibility for labor conditions and for continuity of service, the next step, logical and necessary, is assumption by the public of complete responsibility for management and the limitation of capital to its true function of supplying funds.

6. The problem of credit can most effectively be solved by public ownership undertaken through the acquisition of the existing electric railway properties at a fair price. Upon this basis capital will retire from the management and will assume the same subordinate but useful position that it already occupies in relation to municipal improvements generally.

7. The assumption of management by the public will involve the definite public recognition and guaranty of the rights of labor to a living wage, reasonable hours and just conditions of work, and will, at the same time, place electric railway employees in the position of civil servants with the advantages and responsibilities which are implied in that relationship. Labor is different from capital. One of the principal jobs of public management will be to work out a better relation to labor.

8. The imperative need of the present time is the acceptance of public ownership and operation as a policy. Any temporary relief granted to the electric railways and any temporary readjustment of their public relations under private ownership and management ought to be consistent with and preparatory for the early and effective consummation of public ownership and operation as the ultimate policy.

Opinions from the Industry

Federal Electric Railways Commission Report Elicits Favorable Comments as to Its Value as an Aid in the Solution of Railway Problems — Some Critical Remarks on Certain Features

IN THE short time available since the Federal Electric Railways Commission report was received by most railway men it has been possible to obtain only a few comments, but those received are published herewith. The invitation remains open to add to the discussion on this subject, both as to how the report may affect the railway problem and as to how the railways may make use of the report, and it is planned to publish additional comment in the next issue or two.

Thomas S. Wheelwright

President Virginia Railway & Power Company,
Richmond, Va.

I am satisfied that the very excellent report made by the commission has a decided educative value not only with the public but with the local authorities to whom appeal must be made for improvement of the present status.

William G. Bliss

Chairman of the Public Utilities Commission
of Rhode Island

The report is a very comprehensive summary of the electric railway situation. The conclusions, while presenting nothing of a novel character to those who have been compelled to follow the changing character of the problem, should carry great weight because of the high character of the Federal Electric Railways Commission and because of the complete nature of its investigation.

Arthur W. Brady

President Union Traction Company of Indiana,
Anderson, Ind.

The report of the Federal Electric Railways Commission represents the result of the most comprehensive and impartial investigation ever undertaken of the electric railway field. While every conclusion reached may not command unanimous support, the report as a whole is a document of the greatest value. It should do much to clarify the atmosphere and to aid in establishing better relations between the industry and the public and thereby to render it possible for the industry to increase its field of usefulness.

Paul Shoup

President Pacific Electric Railway,
Vice-President and Assistant to the President
Southern Pacific Company,
San Francisco, Cal.

The Federal Railways Commission, in its report, states the case thoroughly in saying that such conditions must be created controlling the electric railway industry as will restore the confidence of investors therein. I concur in nearly all of the conclusions expressed in the report:

1. That the fares shall be responsive to the investment and operating expenses of the property concerned.
2. That motor vehicles operated as public utilities in competition shall be subjected to as great taxation as are the electric railways and made to bear a share of maintaining the public highways equivalent to that which the electric railways would bear if they occupied them.
3. That where good electric railway service is given motor vehicle competition shall not be permitted, which is to the public interest in preventing the distruction of highways and keeping them from, in time, becoming private roadways for commercial uses.
4. A definite agreement with public regulating bodies as to the value of every electric railway property, whether determined by physical valuation or by conference, and a thorough understanding that thereafter rates will be such as to bring a fair return thereon, this being absolutely essential to the re-establishment of credit.
5. That electric railways shall not be called upon to bear extraordinary burdens in connection with public relations in the way of non-profitable investments such as grade separations, highly expensive paving, replacing wooden poles with metal and building unwarranted extensions under public direction.

To conclude, the relations between the public and the electric railways are local and must be so treated and established on such a permanent basis as will give a return on the investment in such properties.

John J. Stanley

President the Cleveland Railway Company,
Cleveland, Ohio

The report of the Federal Electric Railways Commission will help the industry if the country is sufficiently interested to heed it. It is too late to save those companies that are bankrupt or in the receiver's hands through public apathy. It will not help the industry now unless the public can be roused from its apathy on matters where public utilities are affected. Any community more interested in the rate of fare collected on its street railway than the development of the railway and the service given by it will be slow to follow the recommendations of the commission. Service-at-cost is not a panacea for all street railway ills. It can be effective only when a community knows what it wants in street railway transportation and is willing to pay for it. How the public generally is to be brought to a full realization of its transportation needs and costs I do not know, unless the complete breaking down of service throughout the country carries home the lesson.

C. L. S. Tingley

Second Vice-President American Railways,
Philadelphia, Pa.

I am in hearty agreement with the conclusions and recommendations, with the exception of those contained in Section 1, paragraph XVI, which, it would seem to me, would force the companies back into the realm of municipal politics, from which state regulation is intended to divorce them.

With respect to the uses to which the report can be put, it would seem to me that it should be given the widest publicity and should be referred to and made the basis of all public discussions of the question. It would have been desirable if they had placed more stress upon the necessity for the means of restoring credit.

It is quite apparent that the so-called universal 5-cent fare has in the past in many instances never provided a sufficient income to meet operating expenses, depreciation, taxes and security to the investor of the integrity of his investment and a fair rate of return thereon, for unless there be a reasonable margin over and above the fair rate of return, which not only need not but as a matter of fact should not be declared in dividends, there will not be that margin of safety which is necessary to insure the investor of the integrity of his property and attract new capital thereto. The lack of this margin in the past has compelled the electric railway to secure an undue proportion of the funds necessary for capital expenditure through the medium of bond issues, thus giving a distorted capital structure and inviting disaster in times of stress.

E. G. Connette

President United Gas & Electric Engineering Corporation,
New York, N. Y.

The report of the Federal Electric Railways Commission is more or less academic. It has no practical value except for reference.

The recommendations of the commission are not new. A service-at-cost plan might be acceptable with a fair valuation of the property and a rate of return allowed on invested capital, and for new capital, that would be attractive to investors.

The credit of street railroads is gone and can only be restored by recognition of public authorities that capital as well as labor is entitled to a proper wage. Capital cannot be coerced. It must be induced. Street railroads to give proper service must be able to provide for maintenance, renewals and replacements and for extensions of service. This requires capital.

Efficiency and initiative in operation and service should be recognized by making the rate of return flexible, as well as to take care of fluctuating interest rates.

Renewals and replacements must be made at the present day costs, and provision for a larger reserve on this account is necessary and to take care of accumulated wear and tear that must ultimately be replaced at the present high prices.

James P. Barnes

President Louisville Railway,
Louisville, Ky.

It is the best analysis of the country's street railway situation ever made, I believe. A glance at the personnel of the commission will show that it is peculiarly representative of the country in the wide variety of selections made for its membership. I think, therefore, that it is noteworthy that this commission agreed so exactly on the very thing which has been our program here in Louisville and is set forth briefly in paragraph 14 of the report:

"Unless the usefulness of the electric railways is to be sacrificed, public control must be flexible enough to enable them to secure sufficient revenues to pay the entire cost of the service rendered, including the necessary cost of both capital and labor."

W. Kesley Schoepf

President the Cincinnati Traction Company,
Cincinnati, Ohio

The report of the Federal Electric Railways Commission will be most beneficial to the public, the companies and employees, by having street railway problems and their solution presented so clearly by an impartial authority representing all interested parties. Recommendation of a service-at-cost plan is of particular interest to this company and Cincinnati because of the fact that this plan is in successful operation here. Consideration given to restoration of credit, relief from special assessment, non-paying extensions, jitney and private automobile business and an understanding and co-operation between the company, the public and the employees is especially valuable.

C. D. Emmons

President United Railways & Electric Company,
Baltimore, Md.

The committee has succeeded in stating in a very concise form its summation of a mass of testimony which, under the very nature of the testimony and the divergent sources from which it was ascertained, must have been more or less confusing and contradictory to it. On the whole, I feel the report should be very helpful to street railway interests throughout the country and it is to be hoped that wide publicity will be given to it.

Of particular interest to the writer is the treatment of the question of taxation, as in a great many cities, especially in Baltimore, the street railway company is to a large extent the collector of taxes for the city itself. Through our park tax, which is 9 per cent of our gross city revenues, we will collect for the Park Board of the city of Baltimore during the year 1920 more than $1,250,000; this in addition to all other forms of taxes known to the industry, including assessments for sprinkling and street paving.

The suggestions as to the regulations of competitive automobile, motor bus and jitney service and their being required to pay a tax comparable to the taxes paid by the street railway company are extremely timely and pertinent. Almost every one of the twenty-two conclusions and recommendations is interesting and will, no doubt, bring before the public at large some of the many interesting intricate problems that confront the industry.

J. H. Hanna

Vice-president the Capitol Traction Company,
Washington, D. C.

The report of the Federal Electric Railways Commission puts before the public fairly and definitely, and with official authority, the very facts concerning the industry which the companies, individually and through the American Electric Railway Association, have been endeavoring for many years to make known.

The fact that this report makes definite statements on conditions and recommendations for their improvement and is made unanimously by men chosen from every interest represented should assure it the serious consideration of regulatory bodies and do very much to bring about the cooperation of the public in electric railway matters, which, as the report itself states, is the most essential thing to be accomplished in remedying the situation.

A Model Traffic Law

SESSIONS of the annual meeting of the National Traffic Officers' Association, held at San Francisco, Aug. 23-27, were devoted largely to separate meetings of ten committees, each of which was instructed to prepare recommendations on how matters in its field should be covered in a model traffic law. An electric railway representative served on each committee. W. H. Maltbie, general counsel of the United Railways & Electric Company of Baltimore, Md., presented a proposed traffic ordinance which had been drafted by the committee on code of traffic principles of the American Electric Railway Traffic & Transportation Association. A full report of the meeting and a digest of the A. E. R. T. & T. A. ordinance will be presented in an early issue.

Coal Reports to Cease

THE Federal Trade Commission in a late bulletin on the bituminous coal situation threatens to suspend publication in the future as only about one-fourth of the operators are reporting operating figures to the commission. The reports would be useless or at least untrustworthy and misleading, if based on too small a number of operators reporting and there is no way to force reports to be made.

The figures from the 680 operators voluntarily reporting show an f.o.b. average mine cost per 2,000 lb. of $2.77 and an average sale price of $3.31 per ton. Of the cost $2.07 represents labor cost, 31 cents supplies and 39 cents overhead. The margin of 54 cents is not all profit, as other deductions or additions must be made. The margin for the first three months of 1920 was 38 cents, as compared to 54 cents for May.

If the operators in the West Virginia field report correctly coal should have been available f.o.b. cars at Hampton Roads at about $5.40 per net ton. The operators reporting mined about 20 per cent of the bituminous coal produced in May.

Track Evolution in Edmonton

A Description of Several Years' Experience with Various Types of Track Construction in Edmonton, Alta., Canada, Reviewing Factors Determining the Design of Paving Base, Track Drainage and Paving

EDMONTON, ALTA., is a young, vigorous Canadian frontier city in which electric traction history is short but instructive. As in many Canadian cities, the electric railway system is municipally owned and operated. The story of track development in this city is told in an article printed in the *Canadian Engineer*, April 22, 1920, and written by C. C. Sutherland, assistant roadways engineer of the city engineer's department of Edmonton. Mr. Sutherland's article is entitled "Street Railway Permanent Track Construction."

The article gives a review of matters of interest in connection with track drainage, paving base, paving, track construction and maintenance, covering several years' experience in the city of Edmonton with these important items. The following abstract of Mr. Sutherland's article should be of interest. After a résumé of the history of track design in general, the writer says that while there are many methods of transmitting the loading of the rail to the subgrade below, they may be divided, generally speaking, into (1) girder type, (2) slab construction, (3) ballast base construction and (4) monolithic concrete construction.

The girder type of trackwork carries its load on a continuous concrete girder underneath the rail, with a cross girder under each tie. The pavement base is poured at the same time as the girders, but where the rails are 7 in. or less it cannot be expected that this thin slab will carry a part of the loading. Steel ties are invariably used with the girder construction and are placed from 6 to 10 ft. apart. They serve only as tie rods in holding the rails to gage, taking very little part in supporting the load.

The slab construction carries its load on a 6-in. or 8-in. concrete base, extending the entire width of the track, which may be brought to grade by using a light sand cushion or by shimming up the ties with wooden wedges and pouring a weak concrete filler or placing a 4-in. or 5-in. layer of rock ballast around and under the ties.

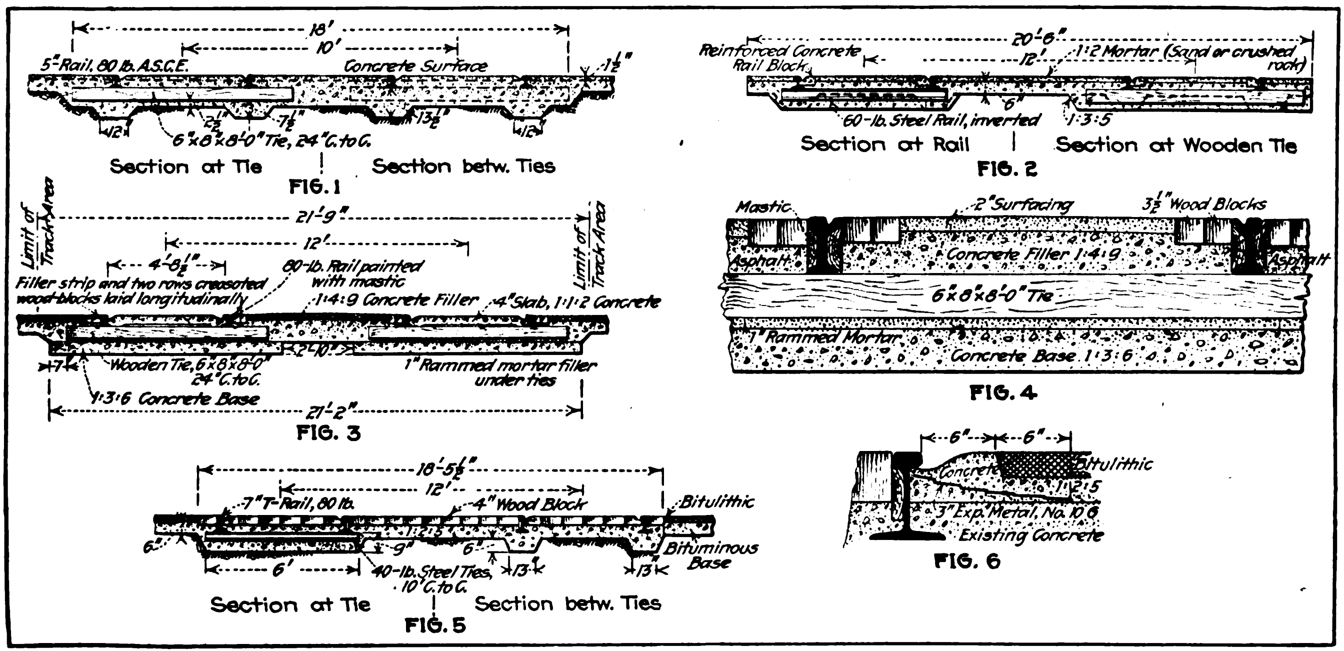
In the case of ballast base construction the load is carried on a 6-in. to 10-in. gravel or crushed rock base which extends well out at each end of the ties. Some railway companies lay a ballast base, but bring the concrete which supports the pavement down under the base of the rail, thus making a combination girder and ballast construction.

The monolithic concrete construction, as the name implies, is poured in one operation. It carries its load, however, in much the same way as the slab construction, the concrete under the slabs varying from 6 in. to 8 in. in depth.

VARIOUS TYPES OF PAVEMENT LAID

In Alberta, where local clay does not make a paving brick and where there is no granite to be obtained, the choice of a pavement is restricted to materials that may be shipped at a reasonable cost, or to local materials. The selection is limited to wood block, bituminous pavement, concrete or some combination of two or more of these materials. A description of each class of pavement will be included in the following résumé of the different types of trackwork laid in Edmonton.

The first permanent street railway track in Edmonton was laid on Jasper Avenue, between 101st Street and



18'
10'
5" Rail, 80 lb. A.S.C.E.
Concrete Surface
1½"
7½"
13½"
12
6"x8"x8'-0" Tie, 24" C. to C.
Section at Tie
Section betw. Ties
FIG. 1
Reinforced Concrete Rail Block
20'-6"
12'
1:2 Mortar (Sand or crushed rock)
6"
60-lb. Steel Rail, inverted
1:3:5
Section at Rail
Section at Wooden Tie
FIG. 2
Limit of Track Area
21'-9"
12'
4'-8½"
80-lb. Rail painted with mastic
Filler strip and two rows creosoted wood blocks laid longitudinally
1:4:9 Concrete Filler
4" Slab, 1:1:2 Concrete
Wooden Tie, 6x8x8'-0" 24" C. to C.
1:3:6 Concrete Base
1" Rammed mortar filler under ties
27'-2"
FIG. 3
Mastic
2" Surfacing
3½" Wood Blocks
Asphalt
Concrete Filler 1:4:9
6x8x8'-0" Tie
1" Rammed Mortar
Concrete Base 1:3:6
FIG. 4
18'-5½"
12'
7" T-Rail, 80 lb.
4" Wood Block
Bitulithic
6'
40-lb. Steel Ties, 10' C. to C.
13
Bituminous Base
Section at Tie
Section betw. Ties
FIG. 5
6"
6"
Bitulithic
Concrete
1:2:5
3" Exp. Metal, No. 10
Existing Concrete
FIG. 6

VARIOUS DESIGNS OF TRACK CONSTRUCTION IN EDMONTON, ALTA., CANADA

Fig. 1. Design for 1910 construction.
Fig. 2. Design for 1912 construction.
Fig. 3. Design for 1916 construction.
Fig. 4. Another design prepared in 1916 for future construction.
Fig. 5. Design for 1907 construction.
Fig. 6. Replaced 1907 design in 1910.

109th Street, in 1907. Fig. 5 is a cross-section through this construction. The section is a girder type, having a 13-in. bearing at the bottom of the girder, with a depth of 9 in. under the base of the rail. The rails are held together every 10 ft. with 40-lb. inverted steel ties, fastened to the rail flange with bolts and clips. Each cross-tie is supported by a cross-girder 6 in. deep. Sixty-foot 7-in. 80-lb. Lorain-section rails were used, and heavy Atlas joints, which were bolted to the web with sides well up under the head and with the lower part of the joint carried under the flange where it acts as a girder in supporting the rail ends.

Concrete was poured to within 4 in. of the top of the rail and allowed to set. A wood-block pavement was laid down between the gage lines and in the devil strip, the blocks next to the rails on the outside being kept vertical by the use of a treated wooden filler strip laid against the web, while the blocks laid on the gage side of the rail were notched to allow for the wheel flange clearance.

After two years of comparatively light traffic it became apparent that the wood blocks between the gage lines would not stay down. The flanges of the wheels first split the blocks, and as dirt and water were forced into the cut the blocks arched up until they caught on the fenders of the car.

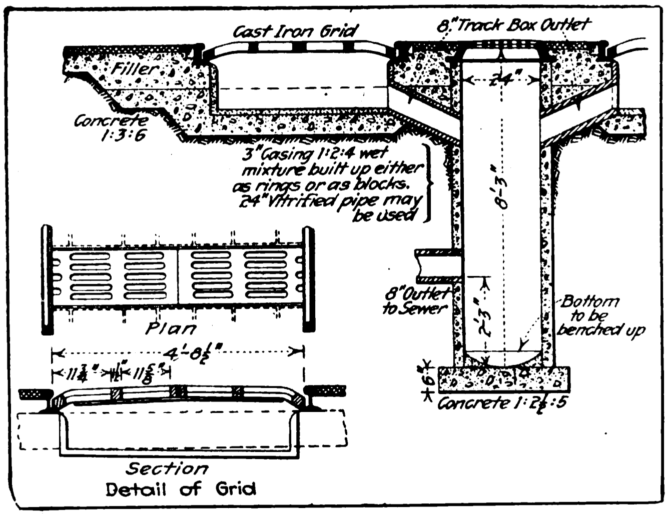


FIG. 7. DESIGN OF TRACK BOX PREVIOUS TO 1915

During 1910 all wood blocks were removed from between the gage lines and replaced by a reinforced concrete rail stretcher, with a 2-in. bituminous surface between the stretchers. Fig. 6 shows a detail of this reconstruction.

The surface of the existing concrete was fully cleaned off with steel brooms and a rich concrete rail block, 6 in. wide and 4 in. deep, was laid at the gage side of each rail. Before the initial set had taken place the intervening space was poured with concrete mixed in the proportion of one part cement, two parts sand and five parts washed gravel or crushed rock. Strips of expanded metal were placed in the rail block, with one end embedded in the pavement base. After sufficient time had elapsed for the concrete to set the 2-in. bituminous surface was laid.

When the track on Jasper Avenue had been subjected to heavy traffic for four years it had become evident that the girder would not hold. The joints settled first, followed by other portions, and in 1915 it was found necessary to replace several hundred feet of the worst parts by a later design. In 1916 most of the pavement was removed and the joints blocked up.

From the fact that this kind of construction carried a fairly heavy traffic for four or five years on a partially saturated subgrade it would seem reasonable to expect that for moderate traffic on a well-drained subsoil, such as gravel or coarse sand, this type would give satisfaction. In connection with the two rows of wood blocks, which insulated the bituminous pavement from the rail, it was a noticeable feature that the block next to the soil followed the rail down 2 in. or 3 in. as the girder sank, while the other block remained intact with the surface, the two blocks sliding on each other.

The next type to be constructed was on Namayo Avenue. The loading was carried on two concrete girders and the rails were held together by tamarac ties spaced at 2-ft. centers (see Fig. 1). The rails used were 5-in. 80-lb. A. S. C. E. sections, held together by continuous joints. After the trenches had been excavated the skeleton track was blocked up and the base poured. In this case the track pavement was a two-course concrete slab, and it was possible to pour the track base and paving base in one operation. The top surface was added before the base had taken its initial set.

The track was constructed in 1910, but did not carry traffic until two years later. After eight years of service the track is in good alignment and grade, but has a tendency toward raveling on the inside and outside of the rail, and in one or two places the slab between the gage lines has raised. It is thought that a great deal of the success of this type of construction lies in the fact that as operation did not commence until two years after construction the concrete had every opportunity to develop considerable strength.

NEW DESIGN OF CONSTRUCTION PREPARED IN 1912

In 1912 an extensive program of street railway track construction was planned and a new design was prepared, as shown in Fig. 2. The construction is somewhat similar to the Jasper Avenue type, but, in order to decrease the unit pressure on the subsoil, cross-ties and cross-girders were placed at 5-ft. instead of 10-ft. centers. It was planned to use 60-lb. steel rails alternately with wooden ties, but as the steel rails were not obtainable wooden ties were used throughout the construction. The specifications called for two bids, one for the completed 10 and 12-ft. center tracks with a pavement wearing surface of 1:2 mortar, and a second bid for the completed tracks ready to receive a 2-in. bituminous surfacing between the gage lines, in the devil strip and on the outside of the rails. In this latter construction reinforced concrete rail blocks were to be constructed to form the flange clearance and act as a shoulder for the bituminous surface. On certain streets work was started late in the fall, with the result that the concrete rail blocks were caught by the frost and had to be removed. They were replaced by a concrete slab 4 in. thick. Before this work had been down five years the surface was badly cracked and broken up at a number of places, especially at the joints. A slight settlement in the girders was followed by a breaking up of the concrete pavement.

In 1913 a radical change was made in the track design. It was thought that the track construction did not give sufficient bearing surface and, working toward that end, the old style of girder construction was abandoned and a 6-in. slab built completely across the track area. In case of a cut a burm 2 ft. 10 in. wide was usually left between the base slab in the 12-ft. center construction, but in fills the difficulty of forming this burm offset the saving of concrete. After this base had set the tracks were assembled and bonded. Fig. 3 shows the general cross-section of the 1913 construction, with the difference that a 1-in. sand cushion was placed under each tie instead of the mortar, as shown; the wood blocks were not laid on the outside of the rails, and the slab between the gage lines was reinforced.

Some of this construction showed signs of failure after four years' usage, and the most noticeable failure occurred on Alberta Avenue, where there had been constructed a double line of car tracks, built at different times. On the south track the joints were made of ordinary four-hole splice bars and with little or no attention paid to the spacing of the ties at the joints. On the north track the joints were made with four-hole continuous joints. Both tracks were subjected to the same traffic, yet the south track gave way at the joints, while the north track remained in good condition.

On other streets the results were more satisfactory excepting that in some places the bituminous surfacing at the outside of the rail broke away, and in a number of places the concrete slab between the gage lines raised, due to dirt and water finding their way under the slab, through a crack just inside the gage lines, where the slab sheared.

The cause of failure of the slab was thought to have been partly due to the giving of the sand cushion under the tie. It would seem better practice to construct a good sound support for the ties and depend on wooden ties for resilience.

CONSTRUCTION ACCEPTED AS STANDARD IN 1915

With the experience now obtained, the track design as shown in Fig. 3 was accepted as the standard construction for 1915 and 1916, when 2.8 miles were constructed. The 6-in. concrete base of the 1913 construction was retained, but the sand cushion was replaced by 1-in. of rammed mortar under the ties, which were shimmed up with wooden shims placed near the end of the ties.

Before the filler had time to set the concrete slab between the gage lines was poured, precaution being taken to paint the rail with an asphaltic compound to prevent the bonding of the concrete to the rail. On the outside of the rail were placed two rows of treated wood blocks with a treated wood filler strip to fill the web. In forming a base for the two blocks the rough filler was leveled with a mortar and painted with an asphaltic paint.

In this type of construction the ties are supported on a rigid bearing, but the wood blocks and mastic joints leave the rail free to move up and down to give a certain resilience to the track, but without affecting the adjoining pavement.

To review the condition of the various types of trackwork under operation: The girder type has not held up under Edmonton conditions, especially at the joints and at streets intersections. In the later design, where the bituminous surfaces were laid against the rail, it usually raveled, but this has been overcome by the wooden tail blocks. The biggest trouble has been caused by the flange of the wheel cracking the concrete slab just inside the gage line. These cracks soon became large and water found its way down under the slab, with the result that hundreds of feet of this slab had to be removed.

The results from operation on the various types of track construction described have certainly demonstrated the fact that it is almost impossible to construct a permanent pavement around the T-section of rail.

DETAILS OF EXCAVATION, CONCRETING AND DRAINAGE

In preparing the subgrade for a street railway track, ready to receive the concrete base, it may be possible under some conditions to take out most of the rough grade with drag scrapers, but under most conditions this dirt must be hauled off the streets to some suitable dumping place in dump wagons. After the rough grade is taken out the subgrade is trimmed, leaving the loose dirt from ¾ in. to 1¼ in. above the final grade, to allow for setting under the roller. All soft spots should be made firm with new material. This work may be paid for on a cubic yard basis, which will include "rough grade" and "fine grade" rolling and carting of all surplus materials.

In preparing to lay concrete, consideration should be given to the selection of material, methods of mixing, methods of placing and the care or "curing" of the green concrete.

The coarse aggregate may be obtained from well-graded gravel or a hard, tough material suitable for crushing and graded to pass a 2-in. ring. The fine aggregate may be any well-graded clean sand or crusher screening from a durable material. Experience at Edmonton has shown that "pit run" gravel—that is, a mixture of coarse and fine aggregate coming direct from the pit—has too great a variation between the percentage of fine and coarse aggregate to make good concrete, and the specifications require that "only segregated materials shall be used." The cement used should conform to the standard of the Engineering Institute of Canada, but may be released on passing the seven-day test.

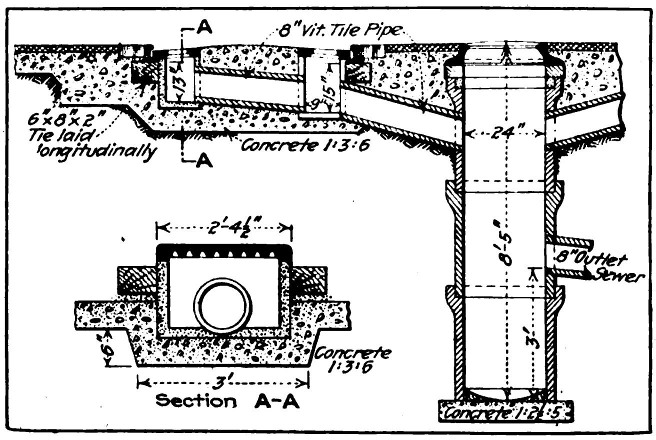


FIG. 8. DESIGN OF TRACK BOX IN 1915

The concrete should be mixed in some form of "batch" mixer where the materials are measured separately for each batch. It is not necessary actually to measure all the materials in a measure, but good results may be obtained by using small wheelbarrows. It is usually a good plan, however, to have a bottomless measure on hand to place over the wheelbarrow as an occasional guide to the laborer. Under no consideration should material be shoveled directly into the hopper. The mixing should continue long enough and with sufficient water to insure that all the particles have been coated with a cement film. Excess water should be avoided so that the concrete will leave the mixer in as stiff a condition as it can be conveniently handled.

In placing concrete on the subgrade some engineers recommend the use of "open chutes" or the "boom and bucket" method, but experience on street railway work in Edmonton has shown that good concrete can be laid with dump carts, provided the concrete is raked or shoveled into place after it has been dumped. In placing the filler concrete between the tracks in the 1916 standard construction a special gangway was built which enabled the carts to be backed out over the first track to fill in both tracks in one operation.

In hot weather the surface of the green concrete should be kept moist by sprinkling with a hose, and after a day or so covering with earth. The covering should be kept moist for at least two weeks. To get good concrete it must be protected from the drying out effect of the sun and wind, and more especially will this be true in countries of high altitude where the rate of evaporation is high.

Track drains, which are provided to catch the rain and melting snow that runs along the track allowance and carry it into the sewer system, should be placed at least every 800 ft. on a long grade and at the intersection of descending grades.

Fig. 7 shows the older type of track box built in Edmonton previous to 1915, in which the grill casting was made in two pieces, with the grills at right angles to the traffic. The water drops into a concrete box with an outlet pipe to the silt well, which is connected to the sewer.

The silt wells may be built of concrete blocks, brick or vitrified cull tile pipe. It has been found that excellent results may be obtained by using three pieces of 22-in. or 24-in. vitrified pipe standing on end in a concrete base. The casting of the top is usually a standard manhole frame and cover made to fit on the tile by corbeling up with brick.

This type of track box has given satisfaction with the exception of the grill, of which a large number of the old type were found with one or more bars broken off by the traffic. In making a new design it was decided to lay the grill lengthwise along the rail, thus greatly increasing the inlet capacity. Fig. 8 shows a section of the new type in use since 1915.

PRACTICE FOR PAVEMENT MAINTENANCE

The question of who should maintain the pavement on the street railway allowance has received a great deal of attention, and usually it is required that the street railway company should keep the pavement on the railway allowance in good repair. In the city of Strathcona, prior to its amalgamation with the city of Edmonton, the street railway department paved and maintained a strip 8 ft. wide over a single track, the remainder of the cost being assessed on the abutting property. In Edmonton abutting property is assessed for the pavement on the street railway allowance. The railway department usually constructs the completed permanent track and is reimbursed for the pavement at the same rate per square yard as the contract price of the adjoining pavement. The most common practice is to require the street railway company to construct and maintain a pavement equal to that on the adjoining roadway, the limits of the street railway allowance being defined by the area covered by the overhang of the cars or by some given distance such as 18 in. or 24 in., outside the outer rail.

During 1913, when a large program of permanent track construction was carried out, several miles of track were constructed on streets where the adjacent roadways were not paved. Traffic kept to the paved strip, with the result that from the mud and concentrated traffic the bituminous surface in the devil strip soon developed holes and ruts. In this case the city commissioners decided that the street railway department should pay one-third of the cost of maintenance and the street department the other two-thirds.

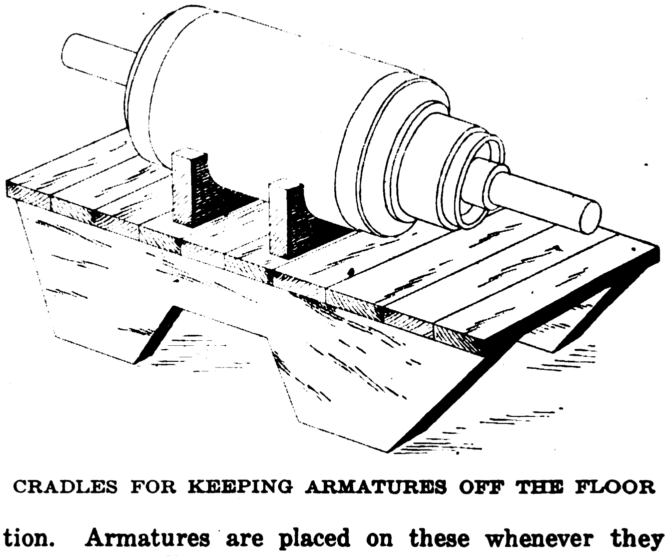
Pavement replacements or repairs may usually be carried out without interruption to traffic, but where the track base gives way considerable difficulty may be experienced in making repairs. The method that has been adopted in Edmonton is as follows:

Where a track has settled the pavement is first removed and piled in a convenient place and the rails and ties are cut free from the concrete base and jacked up on runners made of 6-in. x 6-in. timber of various lengths. The subgrade, having been cleared of the old base, is then refilled and tamped with a suitable material and the new concrete base is poured. When this has set sufficiently the track is shimmed up into the base and runners removed and concrete filled up to the pavement line.

Edmonton has taken up a large area of bituminous pavement in recent years, and it has been found that by heating this on a plate of sheet iron and mixing while hot the retempered material gives satisfaction as a new surface.

Supporting Cradles Reduce Damage to Armatures

THE officials of the Pittsburgh Railways believe it worth while to keep armatures in their repair shop off the floor, as any rolling is liable to damage the coils and there is danger of small particles of metal being picked up, which would result in a short circuit. They have made cradles of rough 2-in. lumber of the type shown in the accompanying illustration. Armatures are placed on these whenever they are not actually in machines or being worked on and before they are ready to be put in storage racks. The type of construction used permits of lifting the armature, together with its cradle, by a crane or hoist by passing the chain or rope used as a sling underneath the cradle and around the ends of the armature shaft. The resulting reduction of damaged armatures is said to have been considerable since this method has been put into practice.


CRADLES FOR KEEPING ARMATURES OFF THE FLOOR

"Omnibus Automobiles" in Rio de Janeiro

Storage Battery Bus Used by the Local Tramway, Light & Power Company on Chief Business and Pleasure Avenue of City

BY V. L. HAVENS
Editor *Ingeniería Internacional*

TO THOSE whose experience has been limited to the cities where omnibus service has been introduced only because of the congestion of the tramways it is a surprise to see the excellent public automobiles along the main avenue of Rio de Janeiro, but there is, as always, a reason for handling the traffic in a certain manner.

The tramway system of the capital of Brazil is excellent and the cost of passage, based on the zone system, is very reasonable. There is some satisfactory method of reaching every corner of the city by means of the coaches of the company, locally referred to as *bondes*, with the exception of the Avenida Rio Branco, the main artery of pleasure and commerce.

TRAMWAY COMPANY BUS ON AVENIDA RIO BRANCO, BEFORE FAMOUS MONROE PALACE, RIO DE JANEIRO

This avenue may well be compared with Fifth Avenue of New York, San Francisco of Mexico City, Prado or San Martín in Habana or Buenos Aires, but is much wider than any of the streets mentioned, and in addition to the pleasure seekers who throng the thoroughfare at certain hours of the day one also finds here the principal banks, newspapers, hotels, cafés and theaters, as well as some of the offices of the government.

The need of an adequate transportation system is obvious to any one, but the laying of street railway lines in this street has never been permitted because of the inflexibility of traffic along such lines, and also because of the opinion held by some people that the æsthetic qualities of the avenue might be damaged by such a procedure. The real and serious criticism directed toward the laying of tracks has of course been the *motif* for the introduction of the omnibus, and the possibility of a trackless trolley has received less consideration than it merits because of the natural tendency in one's mind to think of the track and the trolley simultaneously, although many European cities have found it possible so to construct the trackless trolley system as to make the overhead center pole type an adornment rather than a defect. There are many people in the city who feel that the time must come when a more rapid means of transit along the avenue will be necessary, but since the authorities prefer the omnibus system, for the present, the Rio de Janeiro Tramway, Light & Power Company, Ltd., has adapted its methods to that plan and offers a service, from 7 in the morning until 7 in the evening, which compares very favorably with that of any other part of world, having carried more than 1,250,000 passengers in 1919 without a serious accident. Of course there is competition from time to time, as many persons find an apparent opportunity to operate motor buses in competition with established systems, but the competition is not serious and the cars are small in comparison. The tendency of competition of the smaller lines is to assist in handling the peak loads, or the maximum which occurs at certain hours of the day, and in this sense they are beneficial to the city and work no serious harm to the principal system, although there is of course a marked advantage in any city to have the transportation facilities work in as close harmony as circumstances will permit. The smaller competing jitney buses mentioned only carry about ten passengers, are very light in construction and use gasoline for motive power. The regular omnibuses seat thirty-two passengers.

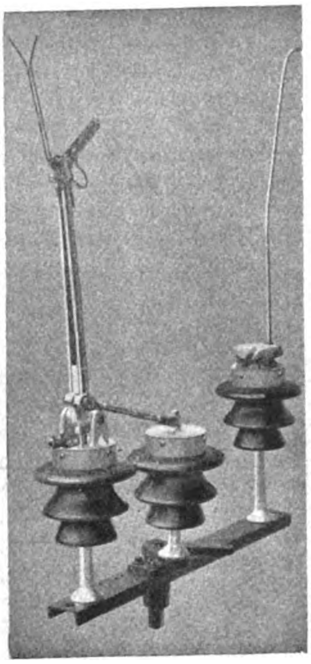
The route of travel of the auto omnibus line of the Rio de Janeiro Tramway, Light & Power Company is 2,100 meters (1.3 miles), from Praça Maua to Passeio Publico. The return distance traveled is the same and along the same route. There are seven coaches, each with a dead weight of about 15,000 lb., employed, having J. G. Brill Company bodies, with Edison or Oxide batteries and four-wheel drive, on chassis of the Commercial Truck Company of America. The maximum in service at one time is four, although all seven may be in service some time during the day.

The power consumed per bus-mile is approximately 2.328 kw.-hr. alternating current or 1.701 kw.-hr. direct current. The corresponding amounts per bus-kilometer would be approximately 1.46 kw.-hr. a.c. and 1.06 kw.-hr. d.c. The amount varies somewhat from month to month. The amount of power consumed is infinitesimal when compared with the total output of the generating plant, amounting to about 0.15 per cent. When charging the direct current is supplied from a 110/150-volt 760-amp. generator, this being driven by a 150-hp. motor. The charging rates are controlled by resistances, and the omnibuses may be brought in to have their batteries charged during the night.

The normal rate of fare on the tramway company omnibus is about 5 cents (United States currency equivalent) and on the private competing buses also about 5 cents; on the tramway itself the normal rate of fare is about 5 cents for the first zone and about 7½ cents for the second zone. These fares are relatively very low in a city where the first charge for one or two automobile passengers is 50 cents for the first kilometer and then 5 cents per 100 meters after that.

The fact that public carriages are practically unknown in the city is in itself a fair indication of the excellent service rendered by the tramways, omnibuses and taxicabs, each type of conveyance encountering very little competition from the other types. The accompanying illustration shows one of the omnibuses of the tramway company near the famous Monroe Palace at the foot of Avenida Rio Branco. It is notable that the so-called "imperial" or second floor so well known in London, Paris and New York is lacking here because of the comparatively short haul and the time lost in climbing up and down. Persons carrying bundles cannot ride in these omnibuses, and it is not permitted that any person ride in a first-class omnibus or tramway coach in Rio de Janeiro unless he is properly clad, with a collar, necktie, shoes and other habiliments generally worn by self-respecting people.

New Heavy Energy Air-Break Switch


HEAVY ENERGY AIR-BREAK SWITCH

A NEW air-break switch is now being placed on the market by the High-Voltage Equipment Company, Cleveland, Ohio. The switch is designed to break heavy energy loads or line charging currents and is so constructed that the arc is lifted by the horns as rapidly as the switch arm is raised in opening. Any part of the switch can be removed without removing the switch from the pole or substation structure. The insulators are fastened to forged steel pins by threaded steel thimbles cemented into the insulators. The insulators are securely locked or keyed to the pins and can be readily removed by disengaging the locks.

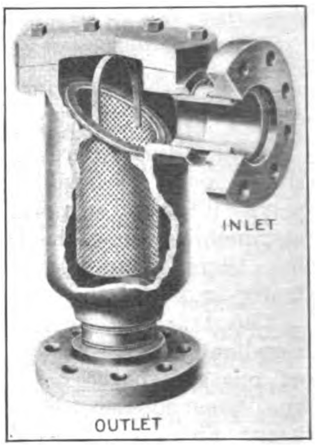
The contact is of the self-adjusting type, which aligns itself with the contact blade. It is covered by a sleet hood and protected against burning by auxiliary contact horns. Among the special features claimed for the design are the elimination of all torsional strains on the insulators and the provision for a great rupturing capacity and an absolute waterproof construction.

Using Up Broken Drills

A NOVEL form of tool holder designed by the Martin Tool Holder & Machine Company of Jackson, Tenn., permits of the use of drill bits and other short lengths of high speed steel as the cutting elements in lathe tools. The holder consists of a block of steel of suitable size in which is drilled a hole in a diagonal position and of a size corresponding to the size of the drill bit to be utilized. The holder being slotted in the axis of the drill allows sufficient flexibility to insert the cutting tool and firmly to clamp it in place by means of the tool post on the lathe. These holders are provided for carrying round bits up to $\frac{3}{4}$ in. in diameter, in addition to which other holders are made to accommodate bits of square sections of varying sizes.

Convenient Strainer Set

THE various oil discharge lines used in power houses as well as the intake for water supply reqiure strainers. To meet this demand the Griscom Russell Company, New York, N. Y., is marketing a strainer with the construction shown in the accompanying illustration. The body is made of cast iron and the strainer basket of perforated sheet steel and lined with wire mesh when the strainer is to be used on an oil line. This strainer may be installed either as a single unit or as a strainer set. The strainer set consists of two of these strainers connected complete with two three-way valves and necessary connecting elbows, unions and nipples. The set permits the cleaning of either of the two units without interruption of service.

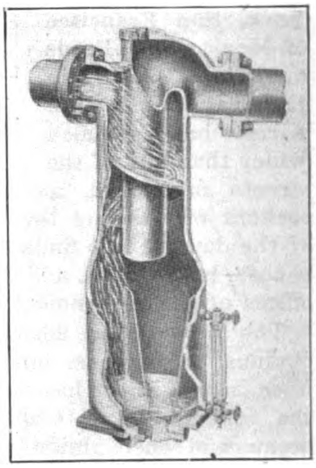


NEW TYPE STRAINER

Obtaining Dry Compressed Air

THE presence of water in compressed air is a source of much trouble, not only in connection with the operation of car equipment but also in the use of air in shops for blowing out and cleaning equipment parts and in operating pneumatic tools. In the usual installations cooling coils are installed between the compressors and reservoirs. These serve to condense the water vapor so that it will be deposited to a certain extent in the reservoir and can thus be drained off.

An air separator for use in freeing compressed air of water is being placed on the market by the Griscom-Russell Company of New York City. The general construction of this separator is shown in the accompanying illustration. The centrifugal force of the moving air is utilized as a means of freeing it from water; as the air and water pass through the separator they follow a helical path formed about a central core, which causes a swirling motion. As water is much heavier than air, it does not take the turns so readily and it is thrown out of the path of the air against the outer wall. From the wall it trickles down slowly and accumulates in a receiver.


CONSTRUCTION OF AIR SEPARATOR

This type of separator has been found particularly suitable for use in connection with sand blast machines. Electric railways that sand blast glass or castings have found that water in the air causes the sand to pack and thus prevent free operation.

The Griscom-Russell Company has just published a bulletin, No. 1111, which gives additional information regarding the separator, together with sizes available.

Letters to the Editors

Relation of Tie Life to Track

THE INTERNATIONAL STEEL TIE COMPANY
CLEVELAND, OHIO, Aug. 31, 1920.

To the Editors:

We are heartily in accord with the suggestion contained in your editorial on "Substitute Ties," in the JOURNAL of Aug. 21, that the relation of the tie, of whatever type, to the track as a whole needs to be considered in the light of information made available through the report of the American Railway Engineering Association. To further the tests and investigation along these lines, either by the American Railway Engineering Association or by individual companies, we will be glad to place at their disposal, without charge, our shop facilities and the assistance of our engineers.

For the more complete information of the readers of your editorial, particularly with reference to the Chicago study of results with steel ties, may we state that the steel twin ties were never used in that city?

T. L. LAVAN, Assistant General Manager.

Detroit Does Not Play with the Bus

NEW YORK, N. Y., Aug. 26, 1920.

To the Editors:

If the municipal agitators of the Hylan type, who harp on buses as the sole solution of our surface transportation problems, would pay heed to real economic considerations they would soon realize that the conducting of transportation *en masse* can best be accomplished only by means of vehicles, large in size, safely constructed and run upon rails.

Walter Jackson's recent report on Bridgeport's transportation problems, made to the Chamber of Commerce of that city, does not call for the elimination of the rails. On the contrary, it emphasizes the need for them, just as any sane analysis must do. But the city of Detroit has gone much further than Mr. Jackson in placing the rails where they properly belong in our scheme of transportation. While the Hylan busy buses buzz wherever the courts have not put them out of business, Detroit has gone in deeply for a municipally owned street railway system, tracks and all.

We wonder if Mr. Hylan has heard of this flouting of his pet theory of bus or bust by Mayor Couzens, who may be classed as one of the fathers of the automobile industry. If so, New York's Mayor must be making faces at Mayor Couzens for spoiling the bus propaganda as the best means for pursuing a policy of municipal ownership, down-with-the-street-railways program. This must hurt all the more because both Mayors appear to have the same general object in view—namely, municipal ownership at any cost. Certainly the records of both men make it clear that Mayor Couzens has the better of Mayor Hylan in successful business experience.

The foregoing comments are but a means of calling attention once more to the fact that adequate transportation in great cities must be conducted upon rails, whether in streets, subways or on elevated structures.

It is of interest, while speaking of the busy (?) Hylan bus, to call attention to the Mayor's most recent effort in this line over in Queensborough, where the buses are being run along a 5-cent trolley route (in absence of cars withdrawn because of exorbitant demands of the carmen for higher wages) with a charge of 10 cents for the bus ride. This is in territory where Mr. Hylan refuses to admit that street railways cannot be run at a profit at 5 cents! Where is your 5-cent bus fare slogan, Mr. Mayor?

Some day the people will realize that the way to secure adequate transportation lies in an insistence that our public officers shall cease agitation of impossible economic theories and get down to facts. It is time that the city of New York realized that the real interests of the people are the same as those of the investors in street railway enterprises, and the railways should have a chance to show what they can do with an adequate fare for the service rendered, just as the steam railroads are about to be permitted to do. "COMMENTATOR."

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Exhibit Committee's Report Encouraging

THE committee on exhibits for the association's convention to be held in Atlantic City the week beginning Oct. 11 met Wednesday, Sept. 1, at the association headquarters in New York City. Requests for space are coming in rapidly and 90 per cent as much space as was used in last year's convention has already been sold, which is far ahead of the amount sold at this date last year. Reports in regard to the co-operation with the freight departments of railroads and in regard to the haulage and handling of freight in Atlantic City give definite assurance that all exhibits will be handled and moved promptly and speedily.

The following manufacturers have engaged exhibit space, in addition to those listed in the ELECTRIC RAILWAY JOURNAL for Aug. 21: Bemis Car Truck Company, Differential Car Company, Economy Electric Devices Company, Hauck Manufacturing Company, Holden & White, Inc., International Motor Company, Johnson Fare Box Company, R. F. Johnston Paint Company, More-Jones Brass & Metal Company, Naugle Pole & Tie Company, Newark Cornice & Skylight Works, the Rail Joint Company, Safety Car Devices Company, Tool Steel Gear & Pinion Company, Tuco Products Company, Westinghouse Lamp Company, Westinghouse Traction Brake Company.

Additional Bulletins Now Ready

THE following bulletins have been prepared by the association's Bureau of Information and Service and may be had by member companies upon request:

MOTOR TRUCK OPERATING COSTS. This covers both passenger and commercial vehicles.

SUMMARY OF AUTOMOBILE ACCIDENTS. A classified, detailed list of accidents between street cars and automobiles.

FINANCIAL STATISTICS FOR A GROUP OF ELECTRIC RAILWAYS, compared for the first six months of 1920 and 1919.

THE PRESENT SITUATION ON SKIP STOPS.

LIST OF COMPANIES IN THE HANDS OF RECEIVERS; also those abandoned or junked, with details.

In addition to the above, the regular bulletins on fares, wages and cost of living have been brought up to date.

Recent Happenings in Great Britain

Higher Railway and Tramway Fares Considered—Glasgow Lifted to a Paying Basis—Dispute Over American Rail Purchases

(From Our Regular Correspondent)

Something approaching turmoil prevailed among a large section of the public in Britain during July over a proposal by the Government to make a further increase in railway fares. Tramways are not affected, though electric railways, apart from the London "tubes," are. The process of increasing tramway fares goes on in piecemeal fashion in the different localities under existing acts, but the proposal as regards railways was made wholesale for the country at large. It can be carried out in this way as the railways are under the control of the Ministry of Transport till August next year.

I THINK that the public generally recognized the necessity for raising railway fares in order to meet higher costs, but what brought about the storm was that the increase was timed for the beginning of August just when the holiday season was getting into full swing. People said that the change should have been made sooner or else later. The Government did not manage to make the change sooner, and they said that if it was made later the increases would have to be greater, as they are determined to put the railways into a solvent condition by August of next year when full control reverts to the companies.

It was while the Government awaited a report from the Railway Rates Advisory Committee that the agitation reached its hottest. At the end of July the Advisory Committee reported in favor of adding 2d. on the 1s. of all fares, raising the increase to 75 per cent above pre-war level. The previous increase was 50 per cent. The Government adopted the proposal and it came into operation on Aug. 6.

MINISTRY OF TRANSPORT'S GOOD WORK

A remarkable step was taken in July in connection with London passenger transportation authorities, and one that may lead to great benefits in the future. To see the point, it is necessary to bear in mind that the London County Council, as a municipal tramway authority, has always looked with a jealous if not a hostile eye on tramway and omnibus companies doing business in or near London, and has not been particularly cordial even to the underground railway companies. Of late the competition between the County Council tramways and the London General Omnibus Company's vehicles has become increasingly keen and the need for co-ordination more and more pronounced. Now the benefit of the new Ministry of Transport has made itself felt in the matter. The Minister arranged a conference between representatives of the County Council and of the underground group of companies (which includes the omnibus company) with the object of trying to arrive at an agreement for co-ordinating and improving transport facilities in London. As a result of the conference, it was decided to set up a committee on which representatives of both sides will sit with the object of discussing the subject in its widest aspect. Sir Alexander Gibb, of the Ministry of Transport, has been appointed chairman. Something of value should be achieved by this committee, and it may lead the Government to proceed with the scheme for constituting a Traffic Board for London.

HIGHER FARES PROPOSED FOR LONDON

The London County Council on July 27 determined to take the bull by the horns in the matter of preventing the realization of an estimated deficit of something like £1,000,000 on the current year's working of the tramways. They agreed to apply to the Ministry of Transport for sanction under the Tramways (Temporary Increase of Charges) Act to raise the fares to the following level: One section (0.6 of a mile), 1d.; two sections, 1½d.; three sections, 2d.; five sections, 3d.; eight sections, 4d.; twelve sections, 5d.; any further distance, 6d. At present 1.2 miles can be covered for 1d. and highest fare is 4d. Workmen's fares are to be: 2d. return for three sections (3.6 miles double journey); 4d. return for six sections; 6d. return for any further distance. Children's fares: 1d. for three sections, 2d. for eight sections, 3d. for any further distance. The twopenny midday fares for any distance beyond the penny stage are to be retained. It will be noted that the ratio of increase for the shorter distances is enormous.

The effect of the recent increase of fare on the Glasgow tramway system is strikingly shown by some figures issued by Mr. Dalrymple, the tramway manager. It may be recalled that from the beginning of June halfpenny fares were abolished and all other fares raised, though a concession was given by selling twelve vouchers for 9d. covering the old halfpenny stages. The results have been worked out for the months of June and July along with a comparison with the corresponding months of last year. It is found that if things continue as they are now all objects in view will be attained. That is to say, the revenue will increase sufficiently to cover all expenses, and the number of passengers will be sufficiently reduced to remove congestion.

GLASGOW LINES SHOW GAIN

There has been an enormous decrease in the number of short-distance passengers, while the longer-distance journeys have increased. The total traffic revenue for June and July this year was £368,938, compared with £273,473 in the corresponding months of last year. Passengers numbered 70,067,073, against 79,708,560. The miles run were 4,515,634, against 4,352,536. The receipts per car mile were 19.61d., compared with 15.08d., while the passengers per car mile numbered 15.52 against 18.31. Provided no further increases take place in wages and the cost of materials, the Glasgow tramways appear once more to be on a sound economic basis.

AMERICAN RAIL PURCHASE ATTACKED

The question of placing orders in the United States for tramway rails has again arisen in acute form in Glasgow. On July 29 the Tramways Committee brought before the Town Council a proposal to order from the United States Steel Products Company 10,000 tons of rail at £23 10s. a ton. The only British tender was £28. Much feeling was displayed against placing the order abroad. A labor member alleged that the American firm did not conform to trade union conditions and asked if a special guarantee as to those conditions required by the standing orders from foreign firms had been obtained. The chairman of the committee said that no special guarantee had been received, but the firm had signed the usual contract clause relating to standard rates of wages. The town clerk said that the contract was admittedly not in conformity with the standing orders. The Council unanimously agreed to send the recommendation back to the committee for further consideration. Early in August the committee resolved to reaffirm its recommendation, considering that the American company's statement as to conditions of labor was satisfactory and to proceed with the purchase.

TRACK EXTENSIONS COSTLY

The work of renewal of tramway track fell heavily into arrears during the war in other towns as well as Glasgow, and now the arrears have to be made up at heavy post-war prices. An example of what this means is given by the case of Liverpool. The city engineer has put forward a scheme of reconstruction to be spread over five years, and its estimated cost is £864,197. Over 60 miles of track are involved. There is a further estimate of £331,000 for renewal of rolling stock and overhead equipment.

The magnitude of the problem involved by the continued rise in wages is illustrated by the case of the London underground group of railways, which includes the General Omnibus Corporation. It is estimated that the wage bill for the current year will amount to more than £6,000,000. In 1913 it was only £2,000,000. As to taxation on the London omnibuses, the company pointed out that hitherto it has been £63 per annum per vehicle, while under the new finance proposals of the Government it will be £84. The tax hitherto on petrol is converted to a tax on engine power.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

St. Paul Strike Averted

Council Passes Fare Measure Which Is Expected to Provide Funds to Increase Wages

Through the passage of an emergency ordinance by the City Council of St. Paul, Minn., granting a 6-cent fare to the St. Paul City Railway, a threatened strike by trainmen was averted. The ordinance was drawn by E. W. Bemis, Chicago, and Corporation Counsel A. E. Nelson. The ordinance becomes effective on Sept. 13 if the company shall actually furnish the service as prescribed in the service ordinance. With the fare increase the trainmen get the wage increase of 10 cents an hour such as had already been granted in Minneapolis, retroactive to July 20. This will cost the company about $41,600.

Conditions of New Ordinance

The new ordinance provides that the railway shall add fifteen cars to those already in service before Sept. 13; that the company shall add four cars each week until a maximum has been reached that will provide for carrying all passengers from any point on the lines during the peak of the traffic and not average more than eighty-five persons to the car; that the average shall be computed on number of cars passing a given point in any fifteen-minute period of the day, and that except between 6 a.m. and 9 a.m. and 5 p.m. and 7 p.m. the company shall provide enough cars for every passenger to have a seat. The company must make reports before the first and fifteenth of each month showing revenue, expenses and net earnings.

In his preliminary report E. W. Bemis said that a 6-cent fare was necessary if the trainmen were to get an advance in wages and service were to be improved. Mr. Bemis is serving as utility expert for the city in making a valuation of the physical property of the company.

Back Pay for Minneapolis Men

Back pay for Minneapolis employees on the basis of the new schedule from July 16 to Aug. 16 is being figured for about 2,000 men, carrying out the recommendations of an arbitration committee, whose report averted a strike in Minneapolis. The distribution in Minneapolis will be about $65,000.

When Minneapolis allowed the Minneapolis Street Railway to advance its fare to 6 cents, for the first time in thirty years the systems of the Twin Cities were separated. An order was issued to make the city limits the fare limits, 10 cents being the fare between the two cities. Upon protest by the City Council this order was canceled as to change of fare limits, which now include a neutral zone in St. Paul permitting a passenger to ride for 6 cents from any point in the city of Minneapolis to Snelling Avenue, more than 2 miles.

Caring for Neutral Zone

The Council of St. Paul has been notified that an ordinance will be submitted abolishing that zone. Meanwhile business interests in the midway neutral zone are up in arms against the proposed change on the ground it will work a hardship on Minneapolis residents employed in the midway district, who now pay a 6-cent fare, but would have to pay 12 cents if the zone is abolished.

Board Reports to Governor on Labor Differences

Governor Alfred E. Smith has received the report of the State Labor Board, which made an investigation into the differences between the International Railway, Buffalo, N. Y., and its employees. After reviewing the report, Governor Smith is expected to name the third member of the board which is to adjust the grievances of the employees.

The board informs the Governor that the traction company is willing to have the arbitrators decide a scale of wages, but the scale should not be retroactive as to May 1, 1920, as demanded by the men. The company contends that if a schedule of wages higher than the maximum of 60 cents an hour granted by the International Railway is decided upon, the new pay schedule should not become effective until the Public Service Commission grants a higher fare to absorb the wage increase.

In a statement to the public, H. G. Tulley, president of the International Railway, says that if the board of arbitration decided that the men are entitled to a higher wage and no further increase in fares was authorized by the state utilities board, the company would be forced to curtail service. A similar statement was made by Elliott C. McDougal, chairman of the bondholders' protective committee, which is planning the financial reorganization of the company.

There has been a good deal of discussion over the mechanics of the settlement, but the negotiations have been conducted with the best of spirit prevailing.

New Orleans Hearings Close

Finding of Commission Inquiring Into Company's Affairs Likely to Go to City for Final Decision

The fourth week of the hearing before the special masters appointed by Judge Rufus E. Foster, of the Federal court, to solve the railway problems of New Orleans, gave promise of terminating with the Federal Judge himself on the stand. A peculiar incident of this new development in the controversy was the fact that Judge Foster has the final word in the Federal receivership of the New Orleans Railway & Light Company, and that the conclusion reached by the special masters, who have been hearing testimony in the matter, will have to be approved by Judge Foster himself before becoming effective.

Question of Employees Included

The question which the contending parties in the controversy desire Judge Foster to answer is whether or not, at a conference in the judge's office on June 28 between the officers of the railway union and those of the railway company, Judge Foster did or did not state that any contract entered into between the employer and employee would or would not include all the employees enrolled under the Amalgamated Association.

The company contends that under Judge Foster's instructions the contract was to include only platform and carhouse men and was to be exclusive of gas, track and other employees not operating street cars. It is expected Judge Foster himself will be asked to settle this point.

The prevailing opinion among those qualified to speak is that whatever finding is reached by the special masters and approved or amended by Judge Foster will have to be referred to the Commission Council, as it is not unlikely that an increase in fare will be recommended. Should this be done, final disposition of the matter will be left to the new Commission Council to be elected on Sept. 14. The present Commission Council is not disposed to act in view of the very bitter municipal election contest now pending.

Hearing Near Close

The hearing before the three special masters was expected to come to a close during the week ended Sept. 4. This is the fifth week since resumption of service by the trainmen under the "arbitration agreement." The five weeks during which the pay award will be retroactive expired on Sept. 2.

Brooklyn Men Strike

Quit Work on Wild Rumor Proved by Company to Be Unfounded—Surface Trainmen and Elevated Guards Out

Residents of Brooklyn were victims last week of an outlaw strike of the employees of the Brooklyn Rapid Transit Company. The strike became effective Sunday morning after two turbulent meetings of the employees had been held, at the second of which the men decided by acclamation to go out. At the early meeting order was preserved with great difficulty, and the men were urged by their officers and by Mayor Hylan to postpone action until further efforts toward an adjustment of the so-called grievances could be made. The Mayor retired from the meeting assured that the matter would go over. When the second group of employees convened, however, an unconfirmed report of a lock-out at one of the power stations had the effect of stampeding the meeting for a strike. Officials of the Amalgamated at a subsequent inquiry before the Public Service Commission admitted that the association's code of procedure provided for a secret ballot on the matter of a strike and that no effort had been made to confirm the lock-out story, but the organizer in charge at the meeting said that a secret ballot had not been necessary, as the members at the meeting had decided unanimously to go out. All of the Sunday newspapers contained stories to the effect that further negotiations would be carried on.

ON MONDAY afternoon the Public Service Commission began an inquiry into the strike situation under its powers of inquiry into situations in which service is curtailed or discontinued. The principal witnesses were Lindley M. Garrison, receiver of the railway, and Patrick Shea, organizer of the Amalgamated. Mr. Garrison reviewed the conditions existing previous to the strike of a year ago and cited from the text of the agreement of Dec. 16, 1919, between the company and the men. He said that in 1919 a committee which purported to represent the employees presented the demands of the men with regard to wages, reinstatement of the men who had been discharged, recognition of the union and an eight-hour day. He denied at the time that the committee which presented these demands represented the employees. A deadlock resulted and the men struck. The strike was settled under an agreement to the effect that if it appeared that the Amalgamated had enrolled more than 50 per cent of the men on the Brooklyn Rapid Transit System, Mr. Garrison would negotiate with them and settle by arbitration any differences that could not be adjusted in conference. As a result many new demands were added to the four presented originally by the men, but these were all disposed of in conference without resort to arbitration. Finally on Dec. 16 a written agreement was signed covering the settlement.

Mr. Garrison referred particularly to sections 2 and 3 of this agreement. They are as follows:

> The receiver will receive the committee presenting the grievances, and take the same up with such committee, and with such advisers or counsel as such committee selects.
>
> In the event that such grievances or any which may hereafter arise cannot be adjusted by and between the receiver and the committee, they will be arbitrated by a board to consist of P. J. Shea or his nominee, and Lindley M. Garrison or his nominee and if necessary by a third member to be mutally agreed upon by said Shea and said Garrison; and in the event of said Shea and Garrison being unable to agree upon a third member, and so stating to Mayor Hylan and Commissioner Nixon, the two gentlemen last named shall thereupon designate the third arbitrator.

Mr. Garrison pointed out that there is no provision in the contract for subsequent arbitration. He also quoted from paragraph 12, which is as follows:

> The terms and conditions of this agreement will remain in effect until July 28, 1920, and thereafter until terminated as herein provided. Any company or the receiver of any company, party of the first part to this agreement, may terminate the same so far as it affects such company or such receiver, by giving thirty days' notice in writing at any time after July 28, 1920, to the committee of such intention, and the committee, party of the second part, may terminate this agreement, by giving thirty days' notice written at any time after July 28, 1920, to each of the parties of the first part, of such intention, and this contract shall so terminate thirty days after the giving of such notice by either or any party. If either or any party shall desire to make changes in this agreement on or after July 28, 1920, during the continuance hereof it is understood that the party desiring such changes shall, on or after that date, give thirty days' previous written notice to the other party or parties, specifying the changes desired, and, if mutually agreed upon, such changes shall be incorporated in a new agreement.

What the B. R. T. Men Demand

For surface motormen and conductors, from 84 cents to 92 cents an hour. The present scale is from 52 to 62 cents an hour. For Sunday and holiday work, 10 cents extra an hour. A six-day week and a twelve-hour rest period after each day's work.

For elevated conductors, 87 cents to 90 cents an hour. The present rates are from 54 to 57 cents. For guards on the elevated and subway lines from 82 to 85 cents an hour. The present pay is from 49 to 52 cents an hour.

Mr. Garrison stressed the clause about the thirty-day notice. He said that on July 24 Mr. Smith of the committee requested an interview for July 27. Mr. Garrison's reply was that Mr. Smith was in error about the expiration of the contract, but said that if the committee would state its conditions he would consider them. According to Mr. Garrison new agreements were suggested by the men, not modifications of the present contract. Among the obnoxious requests was the closed shop and the collection by the company of union dues. Mr. Garrison wrote in substance that the conditions were not changes but were new documents. The men then appealed to the Mayor to ask Mr. Delaney, the Transit Construction Commissioner, to confer with Mr. Garrison. Mr. Garrison wrote Mr. Delaney that he could not, under instructions from the court, consider the closed shop, but he was willing to take under consideration other matters mentioned.

Later Mr. Garrison was asked by Mr. Delaney if he would make a tacit understanding with the men if section 55, which was repugnant to the receiver, were eliminated. To this Mr. Garrison replied that he would not enter into any tacit agreement. Mr. Delaney then informed the receiver that the men had withdrawn the objectionable clause. The correspondence clearly indicated, however, that the men had not abandoned hope of the closed shop.

Shortly thereafter the matter was taken up with Judge Mayer. The judge agreed to modify his stipulation that in any arbitration the third member of the board should be a jurist, but insisted upon his right to review the arbitration finding with respect to wages if the award of the arbitrators should be beyond the financial ability of the company.

Mr. Garrison then asked Mr. Shea if he would negotiate on the basis Judge Mayer laid down and Mr. Shea said that the matter would have to go to the men. That was Mr. Garrison's last real knowledge of the situation. After that the question was taken up by the men direct with Judge Mayer. As a result the judge reiterated his previous stand.

Mr. Garrison told Deputy Commissioner Barrett, who conducted the inquiry, that the men had broken their contracts by going out and had also broken their faith with him. He had no real notice of a desire on the part of the men for the termination of the contract—a contract that could be terminated at the wish of either party on thirty days' notice.

Counsel Fridiger for the union asked Mr. Garrison whether he did not know that there was no legal obstacle to entering into arbitration. Mr. Garrison's reply was the matter rested with Judge Mayer. He was testifying to facts. He insisted that he had kept his agreement. Mr. Fridiger quoted clause 3 of the agreement. Mr. Garrison insisted that this clause related only to the settlement agreement of last year. Mr. Fridiger insisted that clauses 2 and 3 of the agreement of Dec. 16 were still operative. Mr. Garrison said that changes in the contract of Dec. 16 had never been asked. There had been, however, insistence from the men upon the acceptance of three new agreements.

Mr. Shea for the union testified, as before related, to the events which took place at the meeting by which the strike was decided upon.

Mr. Barrett explained the peculiarity of the case at some length, the road being in receivership, and said that he felt Judge Mayer, by whom Mr. Garrison was made receiver, would not be likely to modify any findings of an arbitration board that were at all reasonable.

In the interest of everybody concerned, Judge Mayer, late on Aug. 31, restated his position with respect to the matter of arbitration. This he did as a result of the conference attended by the Mayor and other members of the Board of Estimate, the Corporation Counsel, Mr. Garrison, Mr. Garrison's counsel and the judge himself. In his own words the conditions as restated by Judge Mayer follow:

> In regard to working conditions, I am willing to have the receiver submit to arbitration the working conditions contained in the agreement proposed by the men, except those which the men have heretofore withdrawn.
>
> In regard to financial questions, my position is stated in my letter to Receiver Garrison, dated Aug. 25, as follows:
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> I am willing that there shall be a submission to a board of arbitrators of the financial question involved in the requested increases and that the fullest opportunity be accorded to such board to ascertain the financial condition of the receivership. It must be understood that any and every award must be within the financial ability of the particular receivership to meet, and for this purpose the court must retain the right to restrict any and every award within such limits.

On Sept. 1 the men voted to reject the court's proposal for returning to work. They did, however, empower their representatives to present to the court the following propositions:

> That Judge Mayer submit all questions, except those of a financial nature, to an arbitration board with the agreement to abide by the board's decisions.
>
> That Judge Mayer make the men an offer of a flat wage increase over the wage scale that the men were receiving last Saturday just before they went out.

Mr. Garrison regards the strike of the surface trainmen and the elevated conductors and guards as a revolt. This was his characterization of the situation to the newspaper men when he saw them on Sept. 1. He pointed out that all the public officials had told the men they were in the wrong. The men had run amuck. Good faith was the basis of American life. This the men were seeking to destroy. He said the public should realize that the present controversy in Brooklyn was more than a dispute between employer and employee.

As regards service a few two-car rapid transit trains were run on Sunday. On Monday more than forty two-car trains were run on various branches of the elevated and rapid transit lines. On Tuesday more than seventy three-car trains were in operation and there was some service on all the subway and rapid transit lines. On Wednesday morning the company resumed service on the surface lines with seventy cars and planned to increase both rapid transit and surface-car transportation just as fast as it was physically possible to do so.

Ceremonies Attend Municipal Construction

Active Construction of Detroit's New Lines Started When Mayor Drives First Spike

The first spike in Detroit's Municipal Street Railway was driven by Mayor Couzens on the afternoon of Aug. 23. Work was started on the south track on Harper Avenue, where the Detroit United Railway is also constructing a line on the private right-of-way which it owns on the north side of the street. Carhouse sites have been considered and specifications for cars are being studied. If electricity is used as motive power current for the city's lines will be supplied by the Detroit Edison Company.

PARALLELING the efforts of the Street Railway Commission to add to the railway facilities, the Detroit United Railway, according to its publicity department, has built since the first of the present year sixty-five new motor and trail cars in its Highland Park shops and added them to the service on the Detroit city lines. By Jan. 1, 1921, the company expects that at least thirty-five more new cars will have been completed and added to the service, making a total of 100 or more new cars than were in service at the beginning of 1920.

150 NEW CARS UNDER WAY

The company's car construction program for the coming year contemplates the construction of 150 new motor and trail cars in the company's shops. Other cars are to be purchased from outside manufacturers. Some of the new cars will be of the so-called Peter Witt center entrance type.

Petition has been filed by the Detroit United Railway in the United States Supreme Court for a permanent injunction restraining the city of Detroit from proceeding with its municipal lines. This appeal from the decision of the United States District Court is based upon the claim that the election authorizing the $15,000,000 bond issue to build city-owned lines was illegal. The company contends that the bond issue was invalid.

The judge in the District Court held that the city still had the right to oust the company from Fort Street, its franchise having expired, but it was admitted by city attorneys that under the ordinance of April 5 the city could only construct new lines with the $15,000,000 voted and not take over any of the Detroit United Railway's lines.

COURT PROCEDURE LIKELY

Legal steps are also expected in opposition to the city's order issued to the Detroit United Railway directing the removal of the tracks on St. Jean Avenue, where the company started construction a short time ago. In reply to the order that tracks be removed within ten days to allow the city to construct its own line, the Detroit United Railway officials stated that the matter had been referred to their attorneys for action. According to Corporation Counsel Wilcox, the city cannot be prevented by the Detroit United Railway from putting a municipal line on St. Jean Avenue. It is claimed that the line on St. Jean Avenue built by the company is not much used, it being only a relief line from the carhouse while the city is ready to construct its line over the same route.

The original proposal by the company was to build the loop, Elizabeth-Withual Street loop, and enter into an agreement that would protect the rights of the city. The Corporation Counsel maintains that the city has the right to go ahead with the work, but to allaw the Detroit United Railway to build it would give the company the chance to use the loop as a basis for claims of new rights in Woodward Avenue where its franchises south of Pallister Avenue have expired. Similar claims were set up by the Detroit United Railway in the case of the Fort Street line when the company argued in court that the permit to do repair work gave it new rights where franchises had expired.

The Corporation Counsel and the City Comptroller both hold that it is lawful for the city to use tax money for financing the municipal street railway line, but that it is not intended to do so. In the suit brought by the Detroit United Railway to enjoin the city from using the city sinking fund for the Municipal street railway bonds, the Comptroller stated that the larger part of the bonds bought by the sinking fund commission had been sold to the public. It was stated that the sale to the sinking fund commission was only tentative to ascertain just what interest it would be necessary for the city to pay under present conditions. Further argument of the case has been postponed.

COUNCIL LACKING IN AUTHORITY

That the Council lacks the authority to change the routes designated in the municipal street railway ordinance adopted on April 5 unless the substituted lines are constructed from sources other than the $15,000,000 voted, is the opinion of the Corporation Counsel, voiced in answer to protests against the construction of municipal lines in front of their houses, made by residents of streets along which it is planned to run one of the city lines. The fact was brought out by the Corporation Counsel that ample opportunity for protests had been allowed between Nov. 4, when the ordinance was introduced, and the election on April 5. It was stated that a provision whereby the Council was allowed to change the routes had been deliberately withdrawn from the final draft of the ordinance, in order to avoid criticism that the people were voting for a system which might be changed for some other system of lines when the actual time came for construction work.

Philadelphia Welfare Association Picnic

Mr. Mitten Encourages Thrift Program—Sees Universal Return to 5-Cent Fare and Lower Wages—Co-operative Program Successful

The second annual picnic of the Co-operative Welfare Association of the Philadelphia (Pa.) Rapid Transit Company was held at Willow Grove Park Aug. 31 and Sept. 1. It was followed by a dinner on the evening of Sept. 1 given by T. E. Mitten, president of the company, to all the Co-operative committeemen, representatives selected by the employees and a like number of representatives appointed by the company. Almost 500 guests sat down at the president's dinner in the large casino in the park.

PRACTICALLY all of the 11,000 employees of the company with their families participated in the festivities of the two days' picnic, the total attendance for the two days being estimated at 75,000. Well-organized picnic committees had arranged an interesting series of events, among which stood out prominently baseball games and other sporting events. Sousa's band, now at Willow Grove Park, added an especially enjoyable feature and Billy Sunday's Rodeheaver kept the crowd singing when there was nothing else to do, his favorite song, "Brighten the Corner Where You Are," being frequently heard. A nine-weeks-old band, organized among the employees, was a drawing card.

INTEREST IN "GET TOGETHER"

Great interest centered in the "get-together" meeting late in the afternoon of Sept. 1, when President Smith of the Co-operative Welfare Association, President Jackel of the Co-operative Saving Fund and President Mitten of the company all addressed the assembled members and their families. President Smith announced that more than 99 per cent of the employees of the company were members of the association. President Jackel announced that the employees' savings were going into the Saving Fund at the rate of more than $1,000,000 a year. Eighty-five per cent of the employees are Saving Fund depositors, and it developed that of the other 15 per cent 14.2 are so heavily loaded with building and loan association obligations that they cannot carry both, leaving some 0.8 per cent of the employees of the company who may be said not to be following any organized or systematic saving scheme. A description of the Saving Fund scheme was given in last week's issue, page 421.

STOTESBURY CUPS AWARDED

President Smith awarded the Stotesbury cups to the departments having the highest percentages of employees enrolled as members in the association, the first prize going to the transportation department and the second to the electrical department. A large number of prize banners were awarded to various divisions.

Mr. Mitten directed his remarks of the afternoon largely to the wives of the employees, urging them to maintain their record for thrift. He urged the families to plan to save the 7½-cent differential, current payments of which the employees have consented to have deferred, and not to establish a 72½-cent scale of living; rather to maintain the present 65-cent scale of living and saving. He predicted that there will be a drop in fares and wages in other cities, automatically returning the Philadelphia men's 65 cents under their agreement, for which they would be prepared, and in addition would have a nest egg for the future.

In his evening address Mr. Mitten referred to this again, saying:

> I don't see how fares can stay up the country over. We have built up a 65-cent-an-hour wage by hard work and without raising our fares, while in other cities, when they get back to the 5-cent fare, their wages based on a fare higher than 5 cents will have to drop accordingly. In the meanwhile we shall be able to hold the 65-cent wage on the nickel rate.

He then touched on the money due the men in the deferred wage increase, which is retroactive to June 1.

> We are waiting for that money, and we are going to get it, because no community, after it once recognizes what this organization of men means; when it compares what we are giving Philadelphia in peace, in good service; when it compares that with the things that are happening in our neighboring cities, and which have been happening ever since the war began; when they take time to think that their cars ran in wartimes, while the cars of other cities were being held up because of disagreements between men and management; when they see that we are the one city that has doubled the rides in the last ten years—doubled the rides that each person in the population takes each year—do you get that?—will refuse to pay the cost.

ZONE SYSTEM COMING

Indications of the application of a zone system in Philadelphia were made by Mr. Mitten in referring to the necessity and ability of the company to obtain more revenue. He spoke as follows in this connection:

> We don't care what anybody else did and failed; that is no mark for us; if it is right we will do it, and there is no such word as fail.
>
> We have set a mark in co-operation. We may yet set a mark in our method of properly collecting from our passengers what they should pay for what they get. If any man knows that he is paying for what he gets proportionately with every other man, while he may kick and object at the outset, he knows full well that it is right and that he properly should pay just in proportion to what the other fellow pays.
>
> Therefore, having established that principle, if we do, and made it practical of operation, I haven't any doubt in the world that you men can make it comfortably effective to the people you carry, no matter what failures there are anywhere else.
>
> What other people do is no measure for us at all in our method of operation any more than the degree of co-operation between men and management here can be measured by what we see elsewhere. When the method has been determined it will be made known to you; it will be explained to you, and then we will say, "Its right, let's show America how perfect this machine can be made to work."

Mr. Mitten praised the "smiling program" which the men are now carrying out 100 per cent. He said he credited the increased riding habit in Philadelphia to the attitude of the men.

Mr. Mitten was followed by various chairmen of the committees, who without exception gave praise to Mr. Mitten's management and to the co-operative spirit and resultant fine feeling among all the employees of the system. Other features of the evening were the rousing welcome given to H. G. Tulley, now of Buffalo, and musical numbers, including some more singing under Rodeheaver's leadership. One of these numbers was the following song, sung to the tune of "Oh, What a Pal Was Mary":

Oh, what a pal is Mitten,
Oh, what a pal is he,
He came from the West,
And gave his best
In handling the P. R. T.
"Keep down the fares," his motto;
Improve all along the line,
This is his pride,
Five cents a ride,
Oh, Mitten, a pal of mine

Denver Strike a Memory

Strike Breakers All Leave Denver—Old Men Make Overtures to Return to Work

All strike breakers on the lines of the Denver, (Col.) Tramway were replaced on Aug. 31 with new, permanent employees. Except for a few men, every strike breaker has left town. F. W. Hild, general manager of the tramway, who has been out of town on a vacation after a strenuous month, has not yet received the latest proposal of the union. This plan is that the men return in a body with full seniority rights.

Labor leaders are in a row over repeated assertions that they have proposed that the City Council grant a 7-cent fare, provided the strikers are taken back in a body and given a slight wage increase. A City Councilman stated that the president of the State Federation had asked him if he would favor a 7-cent fare on condition that the strikers be reinstated with their seniority rights.

The free jitneys started by the Amalgamated to compete with the Denver Tramway were discontinued on Sept. 1, and the union men were told that they could once more ride the street cars. William J. Lynch, who had charge of the bus lines, said:

> We find we were hauling about 25,000 persons daily, mostly during the tramway rush hours. This was a great help to the Denver Tramway in the effort to give what it claims to be giving, namely, normal service.

The Union took in $5,500 during the eighteen days it operated the buses and paid out $2,800 for oil and gas, $3,000 for tire repairs and $3,800 in wages. Mr. Lynch insists that bus lines would make money on a 5-cent fare in spite of the fact they lost money while getting gratuities of 10 cents to 50 cents from each of their union passengers. The discontinuance of jitney service was due to the need of money for strike benefits and was coincident with the removal of all strikebreakers from the city.

Col. C. C. Ballou, military commander of Denver, is conducting an investigation of the termination of jitney operation, intimating there might be more behind the cessation of service than appears on the surface. He states that a more careful guard will therefore be maintained over cars in operation.

Major General Wood returned to Denver on Aug. 27 and conferred with city and state officials and Col. C. C. Ballou, military commander of Denver. General Wood stated that he would make no further effort to settle the strike "since the situation has apparently passed the talking stage; both sides in the controversy seemed to have settled down with the determination to settle the thing in their own way, and there doesn't seem to be much that we can do in the way of settlement."

In spite of the protests of the State Federation of Labor, soldiers continued to ride the cars as guards.

Waiving the question of wages and the working agreement at this time, strikers on Aug. 29 decided to offer to return to work on the same basis as of July 31, 1920. The offer was placed in the hands of G. Y. Harry, federal mediator, to present to General Manager Hild. Inasmuch as the company now has more than 800 of the 1,150 men needed to operate the system and is holding firm in its previous decision to refuse to discharge any new, permanent employees to make room for strikers, the strike situation remains deadlocked.

The action of the mass meeting on Aug. 29 was the first modification of the strikers' demands. The wage question and the working agreement demands have been dropped.

Arrangements are being made by Gov. Oliver H. Shoup to revive the state constabulary, on recommendation of General Wood. This body will be used to assist the largely augmented police force for riot duty and maintaining order. It was expected that the federal troops will be removed from Denver some time after Labor Day.

On Aug. 31 the last of the temporary employees were sent out of town. Central Division, the most important of the four divisions of the company, is in charge of permanent employees. New men are now operating the entire tramway system and giving about 75 per cent normal service in morning rush hour, through the day, and at night.

Wants Special Legislative Session to Consider Trolleys

Lucius S. Storrs, president of the Connecticut Company, visited Marcus H. Holcomb, Governor of the State, on Aug. 31, requesting the Governor to have the special session of the Legislature which convenes Sept. 14 consider the plight of the trolley companies. The Governor did not announce his decision in the matter, but those close to him said that it was probable that the trolley situation would not be considered by the Legislature, which is called for the purpose of making the women of the State eligible to vote in the November elections, in accordance with the provisions of the suffrage amendment.

Des Moines Strike Settled

Temporary Six-Cent Fare Ordered, With Additional Revenue to Go to Employees

Following the strike order of Monday morning Aug. 23 the employees of the Des Moines (Ia.) City Railway turned their cars into the carhouses at 1 o'clock Tuesday morning and not a wheel turned until the following Thursday morning. An agreement to return to work was reached at a conference of several hours between attorneys and officials of the railway with the executive committee of the striking employees. The settlement was made on the basis of Judge Wade's order of Saturday that a 6-cent fare be charged for a period of not to exceed ninety days, the additional revenue to the company to be applied to the 70-cent wage scale and the remainder to paying the back wages which result from the arbitration award dating back to March 1.

UPON receiving word that the men had gone on strike Judge Wade hurried to Des Moines from his summer home in Minnesota and issued an order which abrogated the present working agreement between the company and the men, and authorized the receivers for the Des Moines City Railway to cease attempts at operation and to release all men except those necessary to care for the property.

STATE FAIR WEEK

Judge Wade's order specified that no strikebreaker would be brought to Des Moines to operate the cars and put it directly up to the city and the men to come to terms if Des Moines was to have service. The regular afternoon editions of the city newspaper on Wednesday came out with stories to the effect that Des Moines would apparently be without railway service indefinitely, but extras appeared on the streets shortly after five o'clock bearing the cheering news that an agreement providing for the settlement of the matter had been reached.

Des Moines faced the strike at a most inopportune time as the Iowa State Fair opened Friday, and it is the mecca for thousands of Iowans for a week. As soon as the strike was declared, however, hundreds of jitneys were on the streets and for two days business was practically at normal.

Upon arriving at an agreement with the railway officials the executive committee of the union waited upon Judge Wade and asked that they be allowed to reconsider their action in striking. They were advised that if they could arrive at an agreement with their employers which would meet with his approval he would order them being placed back on the cars.

NO REAL OPPOSITION

The strike demands were entirely upon the basis of the back pay, and upon the assurance from the company that they would be paid as rapidly as the 6-cent fare would produce the necessary funds, the men agreed to return. It is understood that the back pay will be paid in monthly installments. Officials of the company have stated that unless the 6-cent fare is enjoined the back wages should be cleared up by Jan. 1.

While there have been numerous anonymous rumblings from so-called protectors of the city's rights, as yet no real effort has been made toward interfering with the 6-cent fare ordered by Judge Wade.

Boston "L" Adopts Pension Plan

The Boston (Mass.) Elevated Railway has recently adopted a pension plan for the benefit of faithful employees. The company will appropriate money for this purpose, but no contribution will be accepted from any employee. There are three classes eligible for the pension as follows:

Class A includes all employees whose age is sixty-five or over (females sixty or more) and whose term of employment has been twenty years or more.

Class B includes all employees whose age is sixty to sixty-four (females fifty-five to fifty-nine) and whose term of employment has been twenty-five years or more.

Class C includes employees whose age is less than sixty (females less than fifty-five) and whose term of employment has been thirty years or more.

The term of employment in each case means continuous service with the Boston Elevated Railway or predecessor companies with no break except through illness which cannot exceed six months to be credited.

Employees in Class A may retire at their own request or at the discretion of the committee on pension, but employees in Classes B and C can only retire at the discretion of the committee.

The annual amount of the pension is not to exceed $2,000 or be less than $300 a year. The amount is to be arrived at by taking 1 per cent of the average yearly earnings for the ten years prior to retirement, times the number of years continuously employed.

A general provision is made that the board shall have the right to annul, alter or amend in any way any and all of the provisions contained in this plan.

Investment Bankers Meet

The ninth annual convention of the Investment Bankers Association of America will be held at Copley-Plaza Hotel, Boston, Mass., on Oct. 4 to 6, inclusive. There will be two sessions each day, the second session on Oct. 4 and Oct. 6 being held in the afternoon and that on Oct. 5 in the evening.

The report of the public service securities committee will be presented on the evening of Oct. 5.

News Notes

Cloudburst Stops Operation of Cars.—As a result of a cloudburst on the evening of Aug. 22 the power house of the local line at Springfield, Ohio, was flooded and the operation of all cars stopped. About 1,000 ft. of the Ohio Electric Railway track was washed out.

Fifteen per Cent Wage Increase.—Employees of the Toledo, Bowling Green & Southern Traction Company, Toledo, Ohio, have been granted a 15 per cent increase in wages under new contracts signed up recently. The men had asked for a 40 per cent increase and threatened to tie up the lines.

Winnipeg Men Join O. B. U.—At a meeting on Aug. 27 the employees of the Winnipeg (Man.) Street Railway decided to cease existence as an independent organization, and voted for direct affiliation with the One Big Union. The latter body is a merger of practically all working trades unions in the city of Winnipeg.

Wage Settlement Negotiations Continue.—The motormen and conductors in the employ of the Berkshire Street Railway, Pittsfield, Mass., have rejected the two offers of C. Q. Richmond, general manager, on the settlement of the wage dispute. Mr. Richmond offered a flat 15 per cent wage increase on arbitration with the Berkshire district court judges as arbitrators. Conferences looking toward a settlement will continue.

Ninety-five Cents an Hour Wanted.—The employees of the Boston-Worcester Street Railway have presented a new wage demand asking for 95 cents an hour for conductors and motormen. They are paid 52 cents an hour now. A year ago last June the men struck and were out a day in a demonstration against what they termed "the delay of the War Board." That strike was ended by advancing the pay to 52 cents an hour from 47 cents.

Ten-Cent Increase in Wages. — Employees of the Hartford & Springfield Street Railway, Warehouse Point, Conn., will hereafter receive 55 cents an hour for their services, it is announced by Harrison B. Freeman, receiver for the company. The men were formerly paid 45 cents an hour. In order to prevent friction with the Hartford men, the pay of the employees who run the cars from East Windsor Hill to the town line at Windsor will be paid 60 cents an hour.

City and Suburban Men Want More.—The trainmen of the Cincinnati, Newport & Covington Railway, Cincinnati, Ohio, are seeking an increase in wages. The old contract provided for a wage scale of 45 cents an hour for the first three months; 48 cents an hour for the next nine months and 50 cents an hour thereafter. The scale under the proposed contract is 85 cents for the first three months, 88 cents for the next nine months and 90 cents thereafter. The men also put in a request for straight day work.

Five per Cent Wage Increase.—An increase of 5 per cent in wages to the employees of the Newport County Electric Street Railway, Boston, Mass., has been announced by the Board of Arbitration, composed of Robert S. Goff, Henry Lloyd Rooney and Patrick H. Forgan. The men will hereafter receive a minimum of 48.4 cents and a maximum of 53.3 an hour. These lines were separated from the rest of the Bay State Street Railway System when the public trustees took control of the property.

Increase for Municipal Employees.—Conductors and motormen employed on the municipal street railway lines of the city of Tacoma, Wash., have been granted wage increases, giving them a wage equal to that of the trainmen of the Tacoma Railway & Power Company. The new scale provides a 5-cent raise for beginners, or from 55 cents to 59 cents; an increase of 4 cents for those employed six months, and for those who have worked two years a 3-cent increase, or 63 cents. Commissioner H. Roy Harrison states that he will try one-man cars on the line.

Mr. Damon Presents Terminal Plan for Los Angeles.—George A. Damon, in behalf of the City Planning Association of Los Angeles, Cal., has presented to the California Railroad Commission a substitute plan for a rapid transit and trunk line terminal. Other plans under consideration by the commission include those of its engineer, Mr. Sachse, and of the railway companies themselves. Mr. Damon's plan would include the combining of the Southern Pacific and Salt Lake passenger business in the present Arcade Station and the construction of the proposed Pacific Electric viaducts and elevated tracks toward Long Beach, the shore resort, as well as preparation of plans for a completely unified and electrified railroad terminal.

Ohio Electric Railway Men Get Increase.—An agreement was signed on Aug. 15 by the Ohio Electric Railway and representatives of the Amalgamated Association through which the men are granted an increase of practically 10 cents an hour in their wages. The new scale for interurban men will be 46, 52 and 60 cents an hour in place of the present scale, which provides wages of 41 to 50 cents an hour. Trainmen on the city lines in Newark and Zanesville will receive 44, 49 and 57 cents an hour in place of the present scale of 38 to 47 cents an hour. Freight brakemen will receive 44 cents an hour, an increase of 9 cents. The union had asked 75, 77 and 80 cents an hour for men employed on both the interurban and the city lines.

Programs of Meetings

Illuminating Engineering Society

The fourteenth annual convention of the Illuminating Engineering Society will be held at the Hotel Statler, Cleveland, Ohio, from Oct. 4 to Oct. 7. Among the various divisions of illuminating engineering papers to be discussed will be automobile lighting, design and characteristics; reflectors, shape and intensity of light; illumination problems, such as store lighting and theaters. Many other topics related to illumination will also be considered.

Iowa Electric Railway Association

As announced last week, the mid-year meeting of the Iowa Electric Railway Association will be held at the Fontanelle Hotel, Omaha, Neb., Sept. 16 and 17. John Sutherland, master mechanic of the Tri-City Railway, Davenport, Iowa, is chairman of the program committee, and if Scotch ingenuity and vigor mean anything, it is that this meeting will be one that no operating man in Iowa or neighboring states can afford to miss. The ELECTRIC RAILWAY JOURNAL has been "let in" on some of the secret planning for this program, planning which does not appear in the program as outlined below, but which contemplates that some highly interesting features will be "sprung" on the members. This paper is authorized to extend a cordial invitation to all the master mechanics and other operating officials in the neighboring states to attend at Omaha.

The program as announced includes a transportation paper by Edgar G. Anderson, assistant general manager and traffic manager of the Clinton, Davenport & Muscatine Railway, Davenport, Iowa; a paper on storekeeping by Thomas L. Kennedy of the People's Power Company, Davenport, Iowa; one on modern maintenance practices by Charles M. Feist, master mechanic of the Sioux City (Iowa) Service Company, and one on overhead construction and maintenance, by K. J. Keith of the Des Moines City Railway. In addition there will be two reels of motion pictures pertaining to the electrical industry and another reel showing how a claim agent won a $20,000 suit. There will also be "certain" entertainment features.

The paper as noted above will occupy the attention of the convention on the first morning, Thursday, Sept. 16. The afternoon of the first day will be devoted to inspection trips over the property of the Omaha & Council Bluffs Street Railway. This inspection will be arranged in sections and directed by the several department heads of the local company. The morning of the second day will be devoted to a discussion of the papers presented Thursday morning and of the points observed during the inspection trips of the preceding afternoon. Nothing has been arranged for the afternoon of the second day. Delegates are urged to make hotel reservations early.

Financial and Corporate

Abandonment Approved

Court Sustains Decision of Public Service Commission with Respect to Reno Company's Plea

The Supreme Court of Nevada recently sustained the order of the Public Service Commission of that State permitting the Reno Traction Company to abandon its cross city lines. Among other things, the railway agreed with the city to remove the rails and overhead wires of the abandoned lines at an early date, to pay the cost of repairing all streets that are injured in tearing up the rails, to put the Sparks line in first class condition, and to establish a transfer system with any bus line that may be established in Reno.

The decision by the commission which has been sustained by the court was rendered Dec. 22, 1919. It followed hearings before the commission held on March 22, 1919; May 17, 1919; Sept. 24, 1919; Oct. 8, 1919, and Oct. 24, 1919. From the testimony introduced it was shown that the total earnings of the Reno city lines for the year 1918 were $9,714, while the operating expenses of the city lines alone were $17,834.

COMMISSION FAVORS ABANDONMENT

With taxes, interest on indebtedness, etc., of $3,489 added to the expenses, it became obvious that it was impracticable from the point of view of either the interest of the public or that of the company to continue operation of the city lines. Furthermore, the cost of putting the existing system of city lines into a safe and proper condition appeared to be absolutely prohibitive, even if the fares and patronage were increased sufficiently to pay the normal operating expenses. In consequence Commissioners Simmons and Scrugham decided to allow the petition of the company for the discontinuance of city lines effective on Jan. 15, 1920, as follows:

1. Commencing at the intersection of Second and Sierra Streets in said City of Reno, and running thence westerly on Second Street to the westerly limits of the City of Reno.
2. Commencing at the intersection of Fourth and Sierra Streets, running thence northerly on Sierra Street to Ninth Street; thence easterly on Ninth Street to Center Street (the present terminal of said line) at the main entrance gate of the State University grounds.
3. Commencing at the intersection of Second and Virginia Streets running thence southerly on Virginia Street to Moran Street, thence easterly on Moran Street to Wells Avenue; thence southerly on Wells Avenue to Cheney Street (the present terminal of said line).
4. Commencing at the intersection of South Virginia Street and California Avenue, and running thence westerly to Plumas Street; thence southerly on Plumas Street to Reno Avenue.

Chairman Shaughnessy dissented. He said:

> I am unable to agree with the majority opinion for the reason primarily that I am not wiling to authorize the company to discontinue operation of its Reno city lines, until it has been shown beyond a reasonable doubt that the public, after being fully informed, will not adequately support the road. The company undertakes to save itself in so far as it can by proposing that it be permitted to abandon the operation of its Reno city lines, but, generally speaking, I feel that a line having been built, equipped and put into operation between points where it is rendering an essential public service, should not be abandoned until after the people have been given an opportunity to make operation successful through the medium of increased rates and patronage if necessary, and the company has been required to rehabilitate and modernize its facilities where by so doing substantial economies in operation can be effected; and this is especially true if, by such co-operative action, an essential public service can, for the future, be maintained and improved.

Mr. Shaughnessy suggested cash fares of 10 cents with two tickets for 15 cents.

The line of railway operated by the company comprises approximately 7 miles of track, 3 miles of which may be credited to the Reno service and the balance to the Reno-Sparks interurban service.

The injunction proceedings brought to prevent the abandonment did not hold. In other words, as stated at the outset, the railway won out and the case was dismissed. It was reported on Aug. 20 that the tracks were then being torn up. The company will in the future operate only the interurban line which runs out to Sparks.

Receiver Hopeful of Better Things

In a recent hearing on the matter of foreclosure of the property of the New York (N. Y.) Railways before Federal Judge Mayer, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL, the court stated that in seeking a foreclosure of the property of the railway the security holders were well within their rights, but that there appeared to be no reason for instant action. It was disclosed that the receiver of the company and his counsel were hopeful that time would cure many of the company's financial ills. Special reference was made to the Lexington Avenue line, which, like all the long lines embraced within the system, is not meeting expenses. It was pointed out, however, that a marked improvement in the income of this line might reasonably be expected within a short time due to recent changes in the district.

There was much talk in court concerning proposed reorganization plans, and it was said that any decree authorizing a sale of the property under foreclosure must be accompanied with some plan indicating measures to follow a sale of the property so as to guarantee the continued operation of the car lines.

The question of foreclosure will come before the court again for settlement before Nov. 1.

Back to the Owners

Court Permits New Haven Railroad to Abrogate Leases of Certain Rhode Island Trolleys

The trustees appointed under the dissolution decree against the New York, New Haven & Hartford Railroad obtained from Federal Judge Mayer at New York on Aug. 28 authority to abrogate the leases of certain electric railway lines held by the Rhode Island Company and to return the lines to the owners on Sept. 7 next. The court was also asked to instruct the trustees concerning 96,885 shares of the company and 9,132 shares of the stock and bonds, valued at $600,000, of the Providence & Danielson Railway, which were transferred to the trustees by the New Haven & New England Navigation Companies, and which were ordered to be sold July 1, 1921.

JITNEYS DECREASE EARNINGS

The earnings of the Rhode Island Company, which operates the electric railways in Rhode Island, the trustees explained, decreased steadily during 1918 and 1919 because of the competition of jitneys and increases in wages and materials. A default was made by the company in the payment of its franchise taxes, and it was unable to meet some of its current obligations. Finally, the property was placed in the hands of receivers, who have reported that the receipts were less than the operating costs.

The trustees said that they have no money to operate the lines, or to pay the cost of their upkeep. They stated that the stock of the company, in their opinion, could not be sold now or in the future for any substantial amount and that it appeared to be certain that the company will never again be able to operate them. Therefore there is no reason to believe that the sale of the property in July next will bring any price much above that which could be obtained for the lines as scrap.

Until next July, the trustees explained, they will be left in possession of the properties of the Providence & Danielson Railway and the Sea View Railroad without funds to pay for their operation. It was pointed out that the securities in the possession of the trustees belong to the New Haven Company, and that this company should be required to assume the cost and responsibility of their disposition. The continuance of their control by the trustees, it was said, could be nothing but a hindrance and a detriment to all of the parties in interest.

WANTS TO RETURN LINES

The court was asked to give the trustees permission to return the stock of the lines to the New Haven Company. The situation of the Rhode Island Company, it was said, was less critical than that of the other companies in the State of Rhode Island because the receivers are operating the company's lines.

New Haven Merger Approved

Federal Judge Mayer at New York signed an order on Aug. 26 modifying the decree of dissolution against the New York, New Haven & Hartford Railroad, made Oct. 17, 1914, which permits the company, if the necessary consents can be obtained from the Federal and State authorities, to merge with the Harlem River & Port Chester Railroad and the Central New England Railway. The purpose of the merger is to enable the New Haven Company to vote the 400,000 shares of stock of the Connecticut Company, which controls the Connecticut trolley lines, to the end that the latter company may execute a mortgage of its property so that outstanding debentures of the Consolidated Railway, a subsidiary of the New Haven Company, to the amount of $10,884,000 may be secured.

The Connecticut Company, it was explained, owes the New Haven Company $4,071,038, of which $1,000,000 is upon debentures and the remainder on notes for advances made up to Dec. 31, 1919.

In its application to the court the New Haven Company said that on March 1 last it was indebted to the United States Government for substantially $66,000,000, including its short term indebtedness amounting to $43,000,000, which was spent for betterments and improvements. The company stated that it was arranging for a new loan from the Government of $13,500,000 with which to buy needed locomotives and to make necessary improvements. It said that it expected to be able to meet all of its financial obligations by taking advantage of the transportation act of Feb. 28 last until the return of normal conditions, when it hopes to be able to take care of its own financing.

The application says that the Consolidated Railroad was merged with the New Haven Company on Feb. 28, 1910. The New Haven Company assured the court that the merger of the New Haven with the Harlem River & Port Chester and Central New England Companies would conserve the interests of all the many companies that are involved.

Net Loss Increases

The net loss of the Pacific Electric Railway, Los Angeles, Cal., for the month of May was $147,671. This makes a total loss for the first five months of 1920 of $625,298. The interest on its funded debt alone is greater than the gross income for the period considered. Total railway operating revenues for May were $1,223,684 and the total railway operating expenses $898,112. The operating ratio was 73.3 per cent. Taxes were slightly more than $50,000. The company had a non-operating income of $2,000, which made the gross income $277,585. The interest on the funded debt amounted to $368,116, and taking the rents and depreciation reserve into account also, the total deduction from the gross income was $425,256.

The company handles a large freight traffic. In 1905, 886 carloads of freight were handled, while in 1919, 108,460 carloads were handled. The company has applied for increased rates and a hearing is now going on.

INCOME STATEMENT—PACIFIC ELECTRIC RAILWAY

MONTH—MAY, 1920

Passenger revenues	$ 873,052
Freight and switching revenues	298,073
Other revenues	52,559
Total railway operating revenue	$1,223,684
Way and structures	$ 99,943
Equipment	176,676
Power	148,636
Conducting transportation	370 248
Traffic	11,672
General and miscellaneous	92,597
Transportation for investment—credit	1,660
Total railway operating expenses	$ 898,112
Net operating revenue	$ 325,572
Taxes assignable to railway operations	50,007
Operating income	$ 275,565
Non-operating income	2,020
Gross income	$ 277,585
DEDUCTIONS FROM GROSS INCOME	
Interest on bonds and other debt	$ 368,116
Rents and miscellaneous income debentures	37,327
Depreciation	19,813
Total deductions from gross income	$ 425,256
Net income transferred to profit and loss	$ *147,671
Net loss for five months ended May 31, 1920	$ *625,298

*Deficit.

Effect of Fare Increases

An increase from a 5-cent to a 7-cent fare was made by the Chicago & Joliet Electric Railway in Joliet in August, 1918, and an increase from a 7-cent to a 10-cent fare was made effective in August, 1919. The four months remaining in 1919 showed a decrease in traffic of 1.4 per cent. The accompanying table shows statistics for the first six months of the years 1918, 1919 and 1920.

Jan. 1 to June 30	Fare (Cents)	Revenue Passengers Carried	Revenue From Passengers
1918	5	2,916,691	$146,961
1919	7	2,485,638	174,005
1920	10	2,574,901	248,442

The 7-cent-fare period compared with the 5-cent-fare period shows a decrease in traffic of 16 per cent and an increase of 18.4 per cent in revenue with an increase of 40 per cent in fare. The 10-cent-fare period compared with the 7-cent-fare period shows an increase of 3.6 per cent in traffic and an increase of 42.8 per cent in revenue with an increase in fare of 42.7 per cent. The 10-cent-fare period compared with the 5-cent-fare period shows that with an increase of 100 per cent in fare the traffic decreased 13 per cent, while the revenue increased 69.2 per cent. It has been estimated that if the fares had remained at 5 cents there would have been natural increase in traffic and revenue of at least 12 per cent. It is firmly believed that the 100 per cent increase in rate of fare has resulted in increasing the revenue at least 50 per cent.

Financial News Notes

Certificate of Dissolution Filed.—The Trenton (N. J.) Traction Company, an old holdings corporation which has not functioned for several years has been finally dissolved. A certificate of dissolution has been filed with Secretary of State Martin. The directors of the old company were John A. Rigg, Richmond L. Jones and Walter A. Rigg, Reading, Pa.; and F. W. Roebling, Jr., and Dr. Edwin H. Ginnelly, Trenton, N. J.

Vote to Reopen Lines.—The citizens of Randolph, Mass., have voted to appropriate $4,000 for the reopening of the Braintree-Randolph line of the Eastern Massachusetts Street Railway. Braintree has already appropriated $4,000 and the public trustees of the company have announced that they intend to restore service as soon as possible. Considerable rehabilitation work will be necessary to place the line in operation, since it has now been idle for several months.

Separate Receiver Likely.—Justice Alonzo Hinkley in Supreme Court at Buffalo will appoint a receiver for the Hamburg (N. Y.) Railway in a foreclosure suit brought by the Bank of Buffalo in behalf of the bondholders under a first mortgage for $750,000. The proceedings will come up early this month. The Hamburg Railway is part of the Buffalo & Lake Erie Traction Company's system which will be abandoned under a decision of the court. John F. Burke of Buffalo is suggested by the bondholders for receiver. Bondholders believe the line can be successfully operated if separated from the Buffalo & Lake Erie system.

Smaller Grand Rapids Deficit.—In spite of the fact that the Grand Rapids (Mich.) Railway raised its fare from 6 cents to 7 cents on June 24 the report of the company's operations for July showed a deficit. Although fewer passengers were carried in July, 1920, than in July, 1919, the losses were not as great, the deficit for July, 1919, having been $19,323, while the deficit for July last was $5,446. Passengers carried decreased 64,321. Total earnings of the company from all sources in July were $158,052, an increase of $37,869 over the earnings for the same month last year. The net income after deducting expenditures was $45,581, from which is to be deducted $51,027. Power cost the company $26,602 less in July, 1920, than it did in the same month of 1919. An appraisal of the property of the company is now being made under the auspices of engineers selected by the city.

Traffic and Transportation

Jitneys Must Go

Connecticut Company Holds Out for Reenactment of Old Bridgeport Ordinance Properly Drawn

The trustees of the Connecticut Company feel they cannot resume service in Bridgeport under an ordinance such as the committee appointed by the Mayor to consider transportation matters recommended, but are prepared to resume service under a measure along the lines indicated by the ordinance of July 12. This is the substance of a reply made by Arthur M. Marsh, attorney for the company, to the question put to him at an open meeting called by the Mayor and held in Bridgeport on Aug. 30. More than 600 people attended the meeting.

COUNCIL FAILS TO ACT

The Council took no action on the trolley-jitney controversy at the meeting on Aug. 30, but called another meeting for the latter part of the week, at which it was proposed to have jitney officials, members of the ordinance committee of the Commission Council, the Mayor's special commission and representatives of the railway confer in the hope that some middle-of-way procedure might be found toward a settlement of the matter.

Mr. Marsh represented the Connecticut Company in the absence of Mr. Storrs. He said that the company's attitude was not a question of fairness or of unfairness, but of what was best for the city of Bridgeport. He is quoted as follows:

> I think it is only fair to the Connecticut Company and only reasonable that arguments should be directed to the powers which the Aldermen have. The board is not responsible for things left undone which only the General Assembly can do. I think they are only responsible for what Judge Banks said they might do. We have been pretty well down financially as a public service corporation for some days. We say it is impossible as a business proposition to go on with the service unless the city desires to make some change in the situation. The Board of Aldermen has powers to establish routes as it may see fit within certain limitations. I do not suppose the Council can make routes for the jitneys. I suppose they must be somewhat reasonably adjusted in a way that none of us lawyers know at present. They cannot be entirely excluded, but if the city sees fit they certainly can be excluded from certain streets and make routes where they shall run, even from the standpoint of safety, if necessary.

COMPANY LEFT IN DARK

A letter was read from Mr. Storrs dated Aug. 30 noting his inability to be present at the meeting. Mr. Storrs said that the decision by Judge Banks on the jitney regulatory measure passed by the Council on July 12 pointed out definitely the form of an ordinance which would be valid, but he said that the company had not been advised that any steps had been taken to adopt an ordinance in pursuance of the court's ruling. The attitude of the company is summarized in the last paragraph of the letter of Mr. Storrs. It is as follows:

> I am directed to advise you the company is prepared, as it has been at all times, to resume service as soon as an ordinance corresponding substantially to the July 12 ordinance, but following Judge Banks' ruling, is enacted and made effective.

The directors of the Chamber of Commerce have written the Mayor and the Board of Aldermen that they indorse the report of the traffic commission as the best solution of the transportation problem that has been submitted, but that they believe, so far as it is possible, no jitney should be routed on the streets occupied by the trolleys except as it is necessary to cross the down-town district, or to connect one or two blocks from one non-trolley bearing street to another non-trolley bearing street. This report was summarized in the ELECTRIC RAILWAY JOURNAL for Aug. 28.

Eight-Cent Fare Allowed

The Public Service Commission for the Second District of New York has fixed the maximum fare to be charged in Johnstown, Gloversville and Amsterdam by the Florida, Johnstown & Gloversville Railroad at 8 cents.

On July 14 the company applied to the commission for permission to increase fares on three days' notice as follows:

> Gloversville—From 6 to 8 cents in Gloversville and outside territory where a 6-cent fare now applies.
>
> Johnstown—From 6 to 8 cents in Johnstown and outside territory where a 6-cent fare now applies.
>
> Between Gloversville and Johnstown—From 10 to 12 cents.
>
> Amsterdam—From 5 to 8 cents and from 6 to 8 cents in Amsterdam and outside territory where 5 and 6 cent fares now apply.
>
> Commutation fares—General increase of 15 per cent on all fifty-four-trip, twenty-four-trip commutation, and forty-six and 100 strip school tickets.
>
> Five strip tickets—From 35 to 40 cents.

The company has been operating under a 6-cent fare, except on certain parts of its system in Amsterdam where there is a 5-cent fare restriction in a franchise since Nov. 27, 1918, and under this operation, the company alleged, there has not been a yield in net revenue anticipated on the application for the 6-cent fare. Operating expenses, it was claimed, have been constantly growing since 1917 and 1918 with the result that for 1919 under a 6-cent fare the company's city lines have had a deficit of $42,746, without charges for depreciation. It also stated that there was pending a demand for an increase of 30 cents an hour to its electric division employees. The increased rate of fare, the company says, is necessary to meet wage increases.

Voters O. K. Fare Rise

Good-Will Policy Wins Sioux City Company Right to Charge 6 Cents—Improvements Planned

Sioux City, Iowa, went to the polls on Aug. 17. It went there to record its opinion of the Sioux City Service Company. This opinion, as expressed in its votes, was clear-cut and, from the standpoint of the railway management, gratifying. To the company it said, "You need more revenue; go ahead and raise the fare."

As a result of the action of the Sioux City voters a 6-cent fare will take effect on the company's lines on Sept. 7 or as soon thereafter as the necessary legal steps have been taken by the City Council. In return for the higher fare the company plans to improve the service. While few if any extensions can be made at this time, faster headway is to be maintained and equipment will be put in first-class shape. The carmen will also receive a raise in wages. The new fare will continue for three years.

Approval of the higher rate came as the reward of a policy of good-will on the part of the company management. Some time ago the city authorities, moved by the plight of the railway, took steps to obtain the voters' judgment on the question of an increased fare. The company opened its books to the public and asked for a thorough investigation of its statement that it could not raise the carmen's wages under the 5-cent rate. Business men of high standing in the community found the facts to be as the company represented them.

GOOD-WILL POLICY WINS

A majority of three to one was recorded in favor of the fare increase. While only a small proportion of the city's voting strength was polled, every precinct went on record as favoring the higher rate. There was little opposition on the part of laboring men. The attitude of the city at large is summed up in the following extract from an editorial from the Sioux City *Journal* of Aug. 18:

> The overwhelming majority of the votes cast by the people of Sioux City in favor of a just and reasonable increase proves that the public is willing to be fair with public service corporations which are fair with the people. The service company did not act arbitrarily. It opened its books to the public and asked that an investigation be made to verify its statement that it could not, under the 5-cent fare, grant the increase in wages asked by its employees. The investigators, composed of experienced business men in whose ability and integrity the people had implicit confidence, found the facts supported in every particular the contention of the company. The people accepted the findings of the investigators and granted the increase by a vote of more than two and a half to one. The public will do the same in any city and with any public service corporation which deals fairly and openly with it. That policy is better for the corporation than litigation, even when the courts decide in favor of them.

The contract with the carmen provides for 50 cents an hour for the first year, dating from May 1, 1920, to May 1, 1921; 52½ cents the second year, 55 cents the third year, 57½ the fourth year and 60 the fifth year.

Six Cents in Cleveland

New Rate Effective Probably Sept. 15—Company Wants Increase in Operating Allowances

At the meeting of the City Council of Cleveland, Ohio, Aug. 29, notice was received from John J. Stanley, president of the Cleveland Railway, that the interest fund would drop below the minimum of $300,000 the following day and that the rate of fare would automatically increase to the maximum provided in the franchise, 6 cents or nine tickets for 50 cents, with a charge of 1 cent for transfers. This will take place about Sept. 15, when the operating report for August is issued.

HIGHER OPERATING ALLOWANCE ASKED

At the same time Mr. Stanley asked for an increase of 4 cents per car mile in the operating allowance, increasing it to 32 cents, and to enable the company to create a reserve fund and take care of renewals, he asked for an increase of 2 cents per car mile in the maintenance allowance, which would make it 12 cents per car mile. He stated that the company has been operating at a deficit of 2 cents per car mile since the last increase was allowed. Mr. Stanley's letter follows:

> From March 1 to the end of August, the first half of the current ordinance year, our operating expenses have exceeded the allowance by 2 cents per car mile. The deficiency will be as great during the second half of the year unless the allowance is increased.
>
> To enable us to make good within the current year, that is by the end of February, 1921, this deficit of twelve months we ask that the operating expense allowance be increased 4 cents per car mile, or to 32 cents. This will make the average for the twelve months 30 cents per car mile.
>
> We ask also that the maintenance allowance be raised 2 cents per car mile so as to make the allowance from this time on 12 cents per car mile. This will enable us to begin to accumulate a reserve for depreciation. The franchise provides for such a reserve.
>
> The interest fund will be below $300,000 at the end of August—tomorrow—even on the present allowances, and the rate of fare must go to the maximum.
>
> The situation is a very serious one, the most serious that has confronted the stockholders of the company or the car riders of the city since the passage of the Tayler franchise in 1909. It calls for immediate relief. I beg earnestly that you act promptly and wisely upon this our petition.
>
> On June 1 we asked you to increase the maintenance allowance 2 cents and the operating allowance 8 cents. The commissioner recommended an increase of 1 cent for maintenance and 5 cents for operating expenses. That request of ours was based on estimates. So was the commissioner's recommendation. This request is based upon history.

FARE RISE AUTOMATIC

Should the interest fund drop below the minimum the company has the right to increase the rate of fare without action on the part of Council. It is difficult to say, however, what action will be taken on the request for an increase in the allowances.

Street Railway Commissioner Fielder Sanders said that it would be impossible to tell whether the fund will be below the minimum until the monthly statement is completed. He hopes that it will not be.

Some members of Council said that an attempt would be made to recover about $75,000, which was paid out as a dividend above the regular 6 per cent some time ago, as the courts have ruled that the ordinance granting an increase from 6 to 7 per cent had been defeated in a referendum vote. This, they believe, would increase the interest fund sufficiently to prevent an increase in the rate of fare at present.

Citizens Propose Louisville Solution

The "Round Table," a body of representatives of the civic and welfare clubs of Louisville, Ky., has come forward with a plan for the solution of the problems of the Louisville Railway. After several sessions the organization has made the following proposition:

> The Louisville Railway to surrender its present perpetual franchises and to be given twenty-year franchises in compliance with State laws.
>
> Fares for all city passengers to be raised to 7 cents for a period of two years, excepting for school children and teachers, whose fare during the school term will remain at 2½ cents.
>
> Creation of a street railway commission, composed of three members appointed by the Louisville Railway and three members appointed by the Board of Trade, all appointments subject to the approval of the City Council.
>
> Transfers to be unchanged unless changed by this commission.
>
> The commission to adjust fares every six months on Jan. 1 and July 1 at the expiration of the two-year period during which the 7-cent fare will be in force, the adjustments to be based on the "service-at-cost" plan.
>
> Majority vote of the commission to decide all matters that come before it, and in case of a tie the commission to select an umpire to decide, the umpire's fees to be paid half by the city and half by the company, and in case the commission is unable to agree on an umpire after thirty days, the Mayor to appoint one.

The "Round Table" proposes in its plan that the company shall pay the city $100,000 a year for street repairs. The Mayor has contended that this payment should be $168,000, or $1,000 a mile of track.

Rochester Fares Advanced

Seven cents is now the fare charged by the New York State Railways on its lines in Rochester, N. Y. The fare increase was made under the terms of the service-at-cost franchise recently granted the company. Charles R. Barnes, city street railway commissioner, ordered a 7-cent fare with four tickets for 26 cents to be put in effect on Aug. 28, in accordance with an order of the State Public Service Commission for the Second District.

The commission's order followed proceedings which went to the Court of Appeals in the Quinby case, wherein the commission was prohibited from permitting an increase in fare because of provisions restricting rates in Rochester to 5 cents. The city franchise was later modified, the city waiving the franchise restriction and permitting the commission to determine a reasonable rate of fare. Under the order issued by the commission, the company proposes to increase its service in Rochester by about 20 per cent and to make other improvements.

Five Cents Not Enough

San Francisco Municipal Lines May Charge 6 Cents to Meet Employees' Demands for More Pay

Another city-owned traction system is on the verge of a fare increase. Five cents is not enough for the Municipal Railway of San Francisco. Riders on Mayor Rolph's railway lines will consequently soon be paying a fare of at least 6 cents. This is the word which comes from the Board of Supervisors, to which is entrusted the task of financing the municipal system.

The Supervisors are sorely puzzled. What with the H. C. L. and the San Francisco dog days they were having enough to worry about anyway. Then the employees of the city lines came along and threw a sledge-hammer, not to mention a couple of wrenches, into the works. In short, the carmen asked for higher pay—much higher. Five dollars is not enough for a day's work, said they, so they asked for a daily wage of six dollars.

MONTHLY DEFICIT SHOWN

A six-dollar wage and a five-cent fare don't hitch, say the Supervisors. The finances of the city-owned lines are already sadly depleted. Payment of the present wages has been resulting in a deficit, which it has been necessary to meet from the depreciation fund. Each month the board by resolution has been appropriating more than $11,000 from this fund to care for this deficiency of revenue. The board cannot continue to draw upon the fund indefinitely, especially if the monthly deficit is to be increased by paying $1 a day more to each carman.

Of course the carmen are entitled to an increase of some sort, say the Supervisors. The men who work for the city must be taken care of, because, if for no other reason, each one of them can deliver at least one vote. But if the men are given more pay the fare must be raised. That would antagonize many thousands of car riders, who are also voters. So the Supervisors are in a dilemma.

Indications point to the granting of the men's demands. The Supervisors are only human. Since they must take a definite stand on wages they will probably satisfy the men now and take their chances with the car riders later. It may be hard to make a 6-cent fare popular, but that is easier, in the minds of many, than hurting the feelings of the faithful.

Six Cents in Des Moines

The strike of the employees of the Des Moines (Ia.) City Railway has been settled on the basis of an order made by Judge Wade of the Federal Court that a 6-cent fare shall be charged for a period not to exceed ninety days, the additional revenue to be applied to the 70-cent wage scale and the remainder to paying the back wages which result from the arbitration award dating back to March 1

Transportation News Notes

Six Cents in Sandusky.—Six-cent cash fares will become effective on the Sandusky, Ohio, lines of the Ohio Electric Railway, Springfield, Ohio, on Sept. 9. The increase from the present 5-cent rate has been approved by vote of the City Commission.

Bluecoats Carried Free.—Members of the New York City Police and Fire Departments, even when not in uniform, are now being carried free by the Interborough Rapid Transit Company. Frank Hedley, president of the I. R. T., recently issued an order which permits policemen and firemen to pass ticket choppers merely by displaying their badges.

Ohio Freight Rates Raised.—The Ohio Public Utilities Commission on Aug. 20 authorized all interurban railways operating in the state to increase freight rates 40 per cent, effective Sept. 1. Applications for 20 per cent increase in passenger rates are to be decided by the commission on the merits of each application. The commission recently refused to permit increase in intra-state rates for steam roads.

Bus Service to Stockyards.—In accordance with an agreement between the city of St. Boniface and the Winnipeg (Man.) Electric Railway, a motor bus service has been established to the stockyards near the former city. A seven-minute service is given between 6 and 9 a.m. and 4 and 6.30 p.m., and a fifteen-minute service from 9 a.m. to 4 p.m., and 4.30 to 12 p.m. Free transfers are given.

City Fights One-Man Cars.—The City Council of Berkeley, Cal., has put itself on record as opposed to the introduction of one-man safety cars on the local electric railway lines. The San Francisco-Oakland Terminal Railways, which operates in Berkeley, has announced that it will install a number of such cars on its city lines. At a recent meeting the Council adopted resolutions declaring that the installation of "safeties" would be considered "undesirable, impracticable, and unsafe."

Seven Cents in Belleville.—The East St. Louis & Suburban Railway, East St. Louis, Ill., has raised its fare on its line between East St. Louis and Belleville from 6 cents to 7 cents. The company is also charging a 7-cent fare on its Belleville city line. The increase was made necessary by the recent advance in wages granted the company's employees. The East St. Louis Railway was recently authorized by the State Public Utilities Commission to charge an 8-cent fare on its East St. Louis city lines. The fare was formerly 6 cents.

Denies Long Island Rise.—The Public Service Commission for the First District has denied the application of the Long Island Railroad, New York, N. Y., to put into effect the 20 per cent passenger rate increase promulgated by the Interstate Commerce Commission. The company filed an application with the commission subsequent to withdrawing a previous request for a 10 per cent increase. The company has announced that it will appeal to the Interstate Commerce Commission from the decision of the Public Service Commission.

Asks More Time on Car Order.—Because of manufacturing and transportation difficulties the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has found it impossible to comply with the order of the State Railroad Commission requiring it to install fifty new cars by Sept. 1. The company has asked the commission to extend the time limit within which the cars may be placed in service. The cars have all been contracted for and construction is progressing as rapidly as possible. John I. Beggs, president of the company, recently stated that the cars should begin arriving in Milwaukee about Nov. 1.

Three Cents a Mile Asked.—The Auburn & Syracuse Electric Railroad, Auburn, N. Y., operating between these two cities, proposes on Sept. 20 to increase its single trip ticket fares for interurban travel between the Auburn and Syracuse city lines, for distances over three miles, from 2.75 to 3 cents a mile. Other changes are: Fifty-trip commutation fares between interurban points increased from $4 to $5 for distance of five miles or less; from $13.75 to $14.25 for nineteen miles; from $13.75 to $15 for twenty miles; from $13.75 to $15.75 for twenty-one miles; and from $13.75 to $16.50 for twenty-two miles.

Commission Probes Fare Plea.—The Public Service Commission for the First District has begun an investigation, upon the application of the Manhattan & Queens Traction Corporation, New York, N. Y., for an increase in its rates of fare. The employees of the company went on strike recently demanding a material increase in wages. This increase the company was unable to meet, for the reason that it is in the hands of receivers and has been losing money over a period of several years. It seeks an increased fare between Manhattan and Jamaica to 8 cents, making the total fare for the two zones 13 cents, instead of 5 cents as at present.

Tickets Popular in Savannah.—Since fares were raised from 6 cents to 7 cents in Savannah, Ga., on July 15, the use of tickets by riders on the cars of the Savannah Electric Company has shown a marked increase. The ticket sales for July amounted to $16,654, and those for June to $4,571. Fifteen tickets are sold for $1. The company's revenue also shows a substantial gain, although the cash fares showed a decrease for the month of July as compared with June. The cash fare receipts for July totaled $77,314, while in June they amounted to $79,609. The net increase in revenue for July as compared with June was $9,788.

Ottumwa Increase Waits.—Although the Supreme Court of Iowa ruled recently in the Ottumwa Railway & Light Company case that it was possible for city councils to change public utility fares that company will not get an increased fare immediately. The company last week filed a petition with the Supreme Court for a *procedendo* to the District Court of Wapello County, in which Ottumwa is located, to give effect to the ruling of the Supreme Court. As the rules of the Supreme Court prevent the issuance of such an order before thirty days from the date the opinion is filed with the clerk of the Supreme Court it will be at least the middle of September before relief can be secured.

Slight Rise in Montreal Fares.—To meet the wage increase recently awarded its employees by a board of arbitration the Montreal (Que.) Tramways has been authorized by Montreal Tramways Commission to make a slight advance in its fare. The cash fare will continue to be 7 cents. Tickets will be sold at the rate of four for 25 cents, instead of five for 30 cents, either on the cars or at a company's ticket office, the increase being one-quarter of a cent on each ticket. Tickets by the book will be sold at the rate of fifty for $3 at ticket offices only, instead of at the rate of forty-four for $2.50. The latter price worked out at the rate of 5.7 cents a ticket, and the new rate at 6 cents even.

Another Rise in Cincinnati.—Fare increases are quite the order of the day in Cincinnati, Ohio. A short time ago Cincinnatians were told that the Cincinnati Traction Company must have more revenue and that under the terms of the cost-of-service franchise the fare would be raised to 7½ cents by ticket or 8 cents cash. Now the rate has again been increased, this time to a straight 8-cent basis. The new schedule of fares became effective on Sept. 1 and provides for the sale of five tickets for 40 cents. Children's tickets are sold at the rate of five for 20 cents. Free transfers are continued. Tickets good under the former schedules are not to be accepted for fare, but are redeemed at the company's office.

Injunction Sought on 10-Cent Fare.—The validity of a 10-cent fare recently granted the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, by the Findlay City Council, has been attacked in Common Pleas Court by George H. Phelps, a Findlay attorney, who has asked an injunction against collection of the fare, which is double the present rate. Council's action in granting a 10-cent fare was in violation of the 1915 twenty-five-year franchise granted the company, according to Mr. Phelps. That franchise fixed the 5-cent fare charge. The company was granted the 10-cent fare after it had filed application with the City Council for the discontinuance of local car service on the grounds that it was unprofitable.

Nine-Cent Fare in Davenport.—The Tri-City Railway & Light Company, Davenport, Ia., won a victory last week when the District Court of Scott County (Iowa) granted the railway the right to charge a 9-cent fare in Davenport. The temporary writ was issued by Judge House. According to the ruling of Judge House the company will have to give a receipt when each 9-cent fare is paid, and if upon the final hearing a lower rate is established the passengers will be entitled to a rebate, the amount to be the difference between the 9-cent fare and the fare which is finally ordered. The new rate became effective with the order and no date has been set for the final hearing. Up to the date of the order the Tri-City Railway & Light Company had been receiving a 7-cent fare in Davenport.

Asks 7 Cents in Plattsburg.—Application has been made to the Public Service Commission for the Second District by the Plattsburg (N. Y.) Traction Company for permission to raise its fare from 5 cents to 7 cents. The Plattsburg Common Council has waived a provision of the company's franchise limiting its fare to 5 cents. The closing of the Government reservation at Plattsburg caused a decline in the company's revenue for the first seven months of 1920, compared with a corresponding period in 1919, of $5,400. Operating expenses have increased $1,639 over the 1919 period, resulting in a deficit of $3,145 on July 31 last, as compared to a surplus of $3,531 on July 31, 1919. Wages of conductors and motormen were raised on June 15 from 25 cents to 30 cents an hour.

City Fights Fare Rise.—The city of Steubenville, Ohio, has entered formal protest with the Ohio Public Utilities Commission against the proposed new schedule of rates effective on the local lines of the Wheeling (W. Va.) Traction Company on Sept. 1. The city contends that the new rates sought by the company are excessive and that any increase in fares is a violation of the franchise and contract which the company accepted some years ago. The company is seeking to increase its fares between Steubenville, Mingo and Brilliant, the advance through the establishment of fare zones being approximately 100 per cent. The city some time ago offered a 7-cent cash fare and a 6-cent ticket fare. The company seeks an 8-cent cash fare and a 7-cent ticket fare, with two new fare zones added.

Interstate Line Asks Rise. — The Pennsylvania-New Jersey Railway, Trenton, N. J., has petitioned the Interstate Commerce Commission for permission to increase its passenger fares and freight rates. The new schedule provides for an increase of 1 cent in each zone, making the rate 8 cents instead of 7, as now exists. Application for the increased tariff affects the lines of the company running out of Trenton to all points in Bucks County, Pa. The routes that would carry new rates are those between Trenton and Morrisville; Trenton, Yardley and Newtown; Trenton and Bristol; Bristol and Doylestown, and Trenton and Lambertville. The new schedule of rates would become operative on Sept. 17. The New Jersey & Pennsylvania Traction Company, Trenton, has applied to the State Board of Public Utility Commissioners for a similar increase.

Thousands Walk as Buses Quit.—City-owned buses operating on Staten Island, New York City, were ordered to discontinue service on Aug. 26. This step compelled between 10,000 and 15,000 persons who live in the interior of the island to walk several miles to reach trolley lines. The buses have been operating since the shutdown of the Staten Island Midland Railway, early this year, because of failure to obtain permission for a higher fare. The city appropriated funds to purchase more buses, but this step was stopped by a suit of a holder of traction securities. The bus operation in some places paralleled the service of the Richmond Light & Railroad Company. Captain Kuhn, receiver of the latter company, obtained an injunction in June restraining the continuance of operation of buses on lines paralleling the electric lines.

Would Arbitrate Rate Dispute.—Arbitration of a dispute between the Meridian Light & Railway Company and the city of Meridian, Miss., over the rate of fare to be charged by the company, was proposed in a letter recently submitted by the railway management to the City Council. The company several months ago moved to raise the fare from 5 to 7 cents but was restrained from doing so by Federal Judge Holmes, who ruled that under the franchise provisions the company had no right to raise its rates. The proposition presented to the Council provides for the appointment of a board of arbitration composed of three citizens, one selected by the city, one by the company and the third by two others. This board would go into all details of the controversy and recommend a fair rate. It is proposed that all existing franchises be modified or voided to conform to the adjustment made.

"Safeties" on Racine Lines.—One-man safety cars are now carrying many of the citizens of Racine, Wis., to and from their daily work. Thirty of the cars have been ordered by the Milwaukee Electric Railway & Light Company for use on its Racine lines. The first batch was placed in service on Aug. 26. The introduction of "safeties" was preceded by a publicity campaign designed to educate the public to the advantages of this type of equipment. One of the cars was placed on exhibition on Aug. 25 in the center of the city and the public was invited to inspect it and have its special features explained by competent men placed in charge. This exhibit was supplemented by a series of newspaper advertisements in all the local papers and designed to further explain and emphasize the "safety" features of the car and its advantages. Racine is a city of approximately 50,000 population. The safety cars have apparently been received with marked approval by both the railway company's employees and the riding public.

Eight Cents Cash in Wilmington.—An 8-cent cash fare became effective on the lines of the Wilmington & Philadelphia Traction Company, Wilmington, Del., on Aug. 17. The increase was made under authority of an order issued by the Board of Public Utility Commissioners. The company was directed to sell four tickets for 30 cents. The fare was formerly 7 cents. The commission based its order upon a valuation of the company's property made by A. L. Drum & Company, Chicago, Ill. The board declared that the sum of $2,361,278 in the appraisal could not be allowed as it did not represent property utilized for railway service only, but was also used for lighting purposes. After this amount was deducted the total of $6,814,100 remained as the property value allowed. To this the commission added $170,000, 85 per cent of the amount spent for improvements and betterments, making a grand total of $6,984,100, upon which an 8 per cent return was allowed. The company was permitted to abandon the 5-cent fare about two years ago. At that time it was authorized to charge a 7-cent fare but contented itself with a charge of 6 cents. The rate was raised to 7 cents a year ago.

Asks More on "Traction Division."—The San Francisco-Oakland Terminal Railways, Oakland, Cal., has applied to the State Railroad Commission for an increase in fare on its "Traction Division." The company operates in Berkeley, Alameda, Oakland, Piedmont, Emeryville, Richmond and San Leandro. The present fare is 6 cents. It recently applied to the commission for an increase in fares on its "Key Division." The present application does not ask for a specified amount but requests the commission to establish a reasonable rate of fare based on the sum of $20,889,000, which is given by the company as the fair value of its property devoted to the public service in its "Traction Division." The company says that immediately following the rate readjustment in August, 1918, when the fare was raised to 6 cents, the company's gross operating revenue increased more rapidly than its actual operating expenses. This condition, the company says, was reversed beginning with the six months' period ended Dec. 31, 1919, when actual operating expenses increased at a much faster rate than the gross operating revenue. The company says that during the entire period the rate readjustment has been in effect, actual operating expenses, plus the cash set aside for depreciation and the state tax on the increased revenue, have exceeded the increase in operating revenues by $285,723.

Personal Mention

Toronto Transportation Commission Organizes

At the first meeting of the new Transportation Commission recently appointed by the City Council of Toronto, Ont., P. W. Ellis was unanimously chosen chairman. Mr. Ellis is also chairman of the Toronto Hydro-Electric Power Commission.

E. M. Ashworth, secretary and assistant general manager of the Hydro Commission, was temporarily appointed as secretary.

The other two members of the Transportation Commission in addition to Mr. Ellis are George Wright and Frederick Miller. The commission has been appointed in view of the city's intention to take over the Toronto Railway system upon the expiration of the present franchise in September, 1921.

A. C. Colby has resigned as mechanical engineer of the Connecticut Company, New Haven, Conn., to become superintendent of equipment of the Detroit (Mich.) Municipal Railway. Mr. Colby has been in railway equipment work since 1905, when he was with the Rhode Island Company. He has served as master mechanic of the Birmingham, Ensley & Bessemer Railway, Birmingham, Ala., the Berkshire Street Railway, Pittsfield, Mass., and the Bridgeport division of the Connecticut Company.

E. M. Haas, formerly Western editor of the ELECTRIC RAILWAY JOURNAL, has been appointed manager of the railroad department of the H. K. Ferguson Company, Cleveland, Ohio. Mr. Haas is well known in the electric railway industry. For eight years following his graduation from Purdue University in 1905, he was engaged in maintenance and construction work for the Illinois Traction System and the Chicago & Eastern Illinois Railway. He joined the staff of this paper in 1912, resigning three years ago to accept a position as manager of sales of the International Steel Tie Company.

H. M. Gould, who has been supervisor of overhead lines for the Connecticut Company, New Haven, Conn., has resigned from that position to accept the appointment as electrical engineer for the Street Railway Commission, Detroit, Mich. Mr. Gould is a graduate of the electrical engineering course of the Sheffield Scientific School, Yale University. He spent the two years following graduation in 1907 in the electrical department of the Long Island Railroad. The next year he spent as a student engineer with the Metropolitan Street Railway, New York City. He then spent some time in miscellaneous electrical work and in January, 1912, entered the city engineers department in Bridgeport, Conn. He left this position later that year to go with the Connecticut Company, with which he has been continuously since that time.

Engineer Now Operator

Martin Schreiber, Chief Engineer of the Public Service Railway, Made Division Manager

Friends of Martin Schreiber, chief engineer of the Public Service Railway of New Jersey, will be interested to learn of Mr. Schreiber's recent appointment as manager of the company's Southern Division. Mr. Schreiber's new work will take him for the first time from the engineering to the managerial field. He will remain in close touch with the engineering department of the railway through his retention of the title of chief engineer, although most of his time will be devoted to the operating end of the business. His headquarters will be in Camden, N. J., where, as announced in last week's issue, he succeeds William B. Graham, whose position as division superintendent has been abolished.

MARTIN SCHREIBER

Mr. Schreiber is known throughout the country for his work as an engineer. For many years he has been actively identified with the American Electric Railway Association and various technical societies. During 1912 he served as president of the American Electric Railway Engineering Association, and later as a member of the committee on electrolysis. He has been chief engineer of the Public Service Railway since 1917.

Mr. Schreiber was born in Ironton, Ohio. He obtained his early education in civil engineering through association with his father, who was a general contractor. Graduating from Ohio State University in 1899, with the degree of mechanical engineer, he served for four years with the Cleveland (Ohio) Electric Railway, first as an electrician, then as draftsman and chief draftsman, and later as engineer on powerhouse design and construction. In 1903 he went to the Public Service Corporation of New Jersey, continuing with that company and its subsidiary, the Public Service Railway, ever since.

F. J. Tew has accepted a position with the Sacramento Northern Railroad, Sacramento, Cal., as superintendent of shops and equipment. Mr. Tew recently returned to the United States after spending seven years in Manila, P. I., as master mechanic of the Manila Electric Railroad & Light Corporation. His headquarters will be at Chico, Cal.

George Buttrick has been promoted from assistant supervisor of lines of the Connecticut Company, New Haven, Conn., to be supervisor of overhead lines, succeeding H. M. Gould, who has resigned to go to Detroit, Mich. Mr. Buttrick has been with the company several years, having been superintendent of lines for the Bridgeport Division previous to 1917, when he was given the position from which he has just been promoted.

Michio Izawa, assistant traffic manager for the Japanese Government Railroad of Tokio, and Kujiro Hirayama, railway engineer of the Imperial Lines of the same city, are now in the United States studying modern railway methods. They are giving special attention to a study of the electrified lines now in operation in this country, as Japan's fuel supply can only last about fifty years more, and the mountainous districts have great possibilities for hydro-electric development. That Japan is seriously considering the possibility of electrifying its railroads is indicated by the fact that a bill has been introduced in the Japanese Parliament creating the Imperial Electric Railway. The aim of this measure is to establish electric power supplies for railroads and gradually to convert roads to electricity.

W. E. Blodgett, whose appointment as comptroller of the Winnipeg (Man.) Electric Railway was announced in last week's issue, is a native of Wisconsin. Mr. Blodgett gained his first accounting experience there and in Minnesota. He was accountant for the Twin City Rapid Transit Company, Minneapolis, prior to 1907, at which time he became associated with the Utah Light & Railway Company, Salt Lake City. He successively filled the positions of paymaster, statistician, chief clerk, assistant secretary and chief clerk to the general manager. After the consolidation in 1914 of the Salt Lake Light & Railway Company to form the present Utah Light & Traction Company, Mr. Blodgett became chief clerk to the general manager and to the secretary and treasurer. Four years ago he was elected secretary and treasurer of the company.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Demand for Track Supplies Exceeds Output

Long Deliveries Ruling and Prices of Bolts, Nuts and Spikes Have Advanced

Considerable scarcity is experienced in track supplies, such as bolts, nuts and spikes, and this, together with the increased freight rates, has resulted in prices being recently increased all along the line. One of the large producers who was quoting a base price of 6 to 7½ cents a pound on track bolts and nuts on Aug. 1 has increased the price of the smaller material, ⅝ in. and less, to 8 cents a pound. Bolts that are ¾ in. in diameter or larger still remain at 6 cents per pound, these prices referring to quantities of 200 kegs. On the same date this manufacturer was quoting railroad spikes at from 4 to 5¾ cents base, but on spikes ½ in. and smaller the price is now 6 cents a pound, and 4½ cents for larger sizes, with the usual extras added.

Demand does not seem to have suffered materially from the price increases, as it is extremely heavy and still in excess of the present output. Railroads are preparing their equipment for the winter, and though orders are large a still heavier buying movement is expected from the steam roads as a result of the recent rate increases. Electric railways are beginning to buy more heavily now, and demand from foreign countries for railroad spikes is also very large. Manufacturers are sold ahead on both large and small spikes. While inquiries are large, the present actual buying is relatively small compared to the call for bolts and nuts, though it is expected to expand. No deliveries on spikes of any size are promised under two to three months, it is reported. On bolts and nuts some producers are booked solidly for three or four months and cannot make shipment on small sizes under six months' time, though larger bolts, as ¾ x 6 in., can be shipped in from four to eight weeks. Producers see no immediate relief in sight as they are running to capacity now and are still several months behind on filling orders.

Stocks of finished goods are about non-existent both at the mills and in jobbers' hands. The situation would be more acute were it not for the slack building demand and the cancellations from certain quarters, as in the automobile industry, which have helped to ease the pressure on the supply of bars and rods.

Production has been greatly impeded by the car shortage, strikes and an inadequate supply of coal. Raw material has also been causing much concern as shipments of steel from the mills are very slow and manufacturers have been having difficulty in securing supplies of rods and bars. New orders are consequently not encouraged and it seems doubtful in some cases if books will be opened for general business during the fourth quarter, as the needs of old customers will probably take care of the available output during that period.

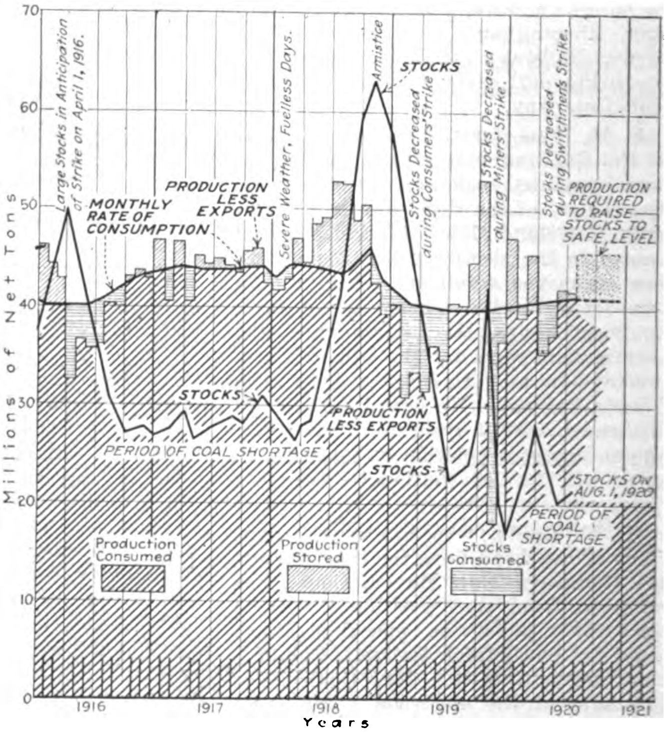
Reserve Coal Stocks Depleted

Consumer Is Held to Blame for Shortage—Relief Said to Depend on Railroads

Stocks of bituminous coal are below the safety level and consumers are aware of this, in the opinion of C. E. Lesher, editor of *Coal Age*, in an article published in the Aug. 26 issue. Production, though gaining, is at too low a rate to assure reaching a safe level of reserves before winter and there is at present an actual shortage of coal. The article states that the coal market will not fall to reasonable levels this winter unless stocks of bituminous coal mount to 40,000,000 tons by Dec. 1, which would be a gain of 18,000,000 tons over stocks on hand Aug. 1. Consumption is estimated at 41,000,000 tons per month and exports about 3,500,000 tons per month for July and August. In order to obtain the needed reserves, production must reach a figure of 46,000,000 net tons per month, which has been reached only during January and March this year The Geological Survey has just completed a survey of all coal stocks, with the results indicated by accompanying illustration.

When the armistice was signed coal stocks had reached the unprecedented figure of 63,000,000 tons. After the armistice consumers refused to buy and instead depleted the reserve stocks, while workmen at the mines remained idle, until about 41,000,000 tons of reserve stock were consumed by June, 1919. The mine workers' strikes then occurred, so on Jan. 1 available reserves were reduced to about 17,000,000 tons. The switchmen's strike in the spring reduced coal distribution so that the present problem is to add to the 22,000,000 tons of reserve stocks until they have reached a figure of 40,000,000 tons within the next four months and at the same time care for the current consumption of coal. This is possible, in the opinion of Mr. Lesher, as it has been done in previous years, and whether it can be accomplished again depends largely on the ability of the railroads to move the coal to the consumers. Recent developments also indicate a reduction in production due to strikes brought about by the failure of the mine wage adjustment board to agree on a wage scale.

In summing up, Mr. Lesher thinks the consumer is to blame for the coal shortage and that it depends on the railroads as to whether the situation will be relieved. Apparently there needs to be a stabilizer in the coal industry whereby all-year capacity production of the mines may be obtained and fluctuation eliminated.



PRODUCTION, CONSUMPTION AND STOCKS OF BITUMINOUS COAL IN UNITED STATES FROM JAN. 1, 1916, TO AUG. 1, 1920

Asbestos Wire Outlook Better

Stocks of Wire Are Low and Deliveries Long, but the Conditions Are Improving

Long deliveries, nominal stocks and firm prices characterize the market for asbestos-insulated wire. Leading manufacturers are very busy trying to fill back orders and factory stocks are practically cleaned out. The supply of asbestos is reported ample, but the smaller sizes of copper wire are not obtainable in the desired quantities, chiefly as a result of recent prolonged strikes in the wire mills. Interruptions to copper wire production lasting about six weeks in one case and about twelve weeks in another cost the purchaser dear as well as the wire drawer. With increasing production in the wire mills following the return of steadier labor conditions the outlook is much improved for the smaller sizes of wire.

Deliveries quoted by representative manufacturers on magnet wire range from eight to twelve weeks. If producers did not take another order before 1921 there would be little trouble in keeping the plants running. One manufacturer who had about fifty-six weeks' work on hand last June 1 now has orders enough on his books to keep his employees busy until about July 1 of next year, barring cancellations. A few of these have been received, but no general disposition to retrench is evident.

MANUFACTURERS PUSHING PRODUCTION

Just now all makers of asbestos wire are not pushing sales at the normal rate, and more effort is being placed upon production and plans for the enlargement of manufacturing facilities than upon getting new business. This is of course not equally true of all competing houses, but until production begins to overtake demand, less "missionary work" will be seen in the trade. Users of asbestos-insulated wire for railway motor service would do well to order their anticipated winter requirements within the next few weeks, and it is generally held in manufacturing circles that the recent firm price levels will continue for some time to come. Labor conditions are showing some improvement, and since the recent advance in wages registered last spring no great difficulty has been encountered in obtaining enough employees for this class of material.

Representative factory prices of asbestos-insulated magnet wire start from 45 cents base on lots of 200 pounds or over, from No. 0000 to No. 4 B & S gage, inclusive, and extras are added per pound for the finer sizes ranging from 1 cent per pound on No. 5 to $3.85 per pound on No. 28. A 250-lb. order of No. 18 would be quoted in a typical case at 72 cents per pound. The dielectric thickness of the insulation in this material is equivalent to double cotton. Lots less than 200 lb. carry 2 cents per pound additional price, and a 1 per cent discount is given for payment within ten days. The outlook is good for increased facilities for production of asbestos wire during the next year or two, and with improved labor conditions and good supplies of asbestos and wire, record outputs may be expected from manufacturers.

Short Supply of Insulating Paper

Raw Materials Are Scarce, but Manufacturers Expect Conditions to Improve Soon

Makers of electrical products which require insulating paper in their manufacture are confronted with a marked scarcity of this paper, chiefly on account of the difficulty in securing raw material, though it seems that the situation will soon improve. The demand for insulating paper is especially heavy at present because of the large orders being placed for power and telephone cables and condensers. Power-cable manufacturers report that their orders have about doubled, but they are paying prices varying from 23 to 30 cents a pound for paper which cost them 19 to 22 cents last January.

SCARCITY OF SCRAP ROPE AND RAGS

Old manila rope and rags, the two bases from which the best paper is made, are very hard to obtain. The principal source of supply of scrap rope is the shipping industry, and as there has been a falling off in transportation by water due to strikes and other causes a shortage has resulted. Another factor which is active in diminishing the junking of rope is the high price of new rope, which is due to the great cost of raw hemp and the excessive demand from new ships being built. Rags are also scarce because the importation from foreign countries, which was formerly the chief source of supply, has been cut off. Quite lately, however, shipments from abroad have been resumed to some extent. As a substitute for these raw materials, wood pulp has been experimented with but has not yet been accepted by insulation manufacturers as a basis for the best papers. Moreover, wood pulp itself is difficult to obtain.

The very thin "glassine" all-linen paper, imported before the war chiefly for use in condensers, has been practically cut off from importation. American manufacturers have recently developed a paper said to be as good as the imported material, however, although it contains a large proportion of cotton. Another reason for the scarcity of insulating paper has been that the best grade of whiting, which is used in its manufacture, formerly came from England and the supply from that source was cut off until a month ago

Manufacturers express a hopeful view of the situation, however, because they seem to expect that the foregoing causes of shortage will soon disappear. Furthermore, European countries, including Norway, Sweden, Finland and Italy, are beginning to produce again.

Rail Bonds Increase in Price

Freight Rates Said to Cause Advance —Demand Is Light and Stocks Are Good

Representative manufacturers of rail bonds report a fair demand, but sales are lighter at present than for some time past. Orders are being received in somewhat spasmodic fashion and almost all of the buying is for maintenance purposes. A trend toward the use of arc weld bonds is also evident. Producers state that traction companies are making few extensions and are purchasing supplies only as absolutely needed, consequently the demand from that source is not a very heavy factor. Electrified railroads, on the other hand, are ordering more rails since the rate increase was granted them, and consequently more bonds are needed on their part. This increase in demand has only barely started, however, and is expected to become much heavier later on. Orders for rail bonds from abroad are also coming through in slightly better volume, and with the growing electrification of foreign roads a promising market is looked for in that quarter.

General price increases amounting to approximately 2½ per cent on the finished product were announced the latter part of August. This advance is said to be the direct result of the recent increased transportation cost, as otherwise manufacturing conditions have undergone little change. Production is reported about normal, and raw material is causing no difficulty other than the fact that embargoes and the shortage of cars have in many cases greatly delayed the arrival of material. The labor situation, too, is improved, compared with conditions in the past.

Stocks of rail bonds at the mills are reported in good supply by several manufacturers, and in some cases small orders are filled from stock. In general, however, deliveries require from ten days up to four weeks.

Sweden Favoring Electrification of Federal Railways

The Second Chamber of the Riksdag of Sweden has adopted the resolution previously acted upon favorably by the First Chamber, appropriating 23,000,000 crowns ($6,164,000) for the electrification of the railroad line Stockholm-Goteborg, the amount to be expended during the year 1921, according to Consul-General Dominic I. Murphy at Stockholm, Sweden.

The action of the Riksdag may be taken as a sure indication of the purpose of the Government to bring about the electrification of the entire system of the state railroad in Sweden. The bill now only awaits the royal approval, which will no doubt be given.

There ought to be good opportunity for American electric companies to present bids for the work, and it is suggested that they write to "Kungliga Järnvägsstyrelsen," Stockholm, Sweden.

Franchises

Ohio Electric Railway, Springfield, Ohio.—Application has been made by the Ohio Electric Railway for a renewal of its franchise along the Lincoln highway between the Columbus city line and the county line. Franklin County Commissioners say the company is seeking this renewal before undertaking improvements on its roadbed estimated at $75,000. The present franchise has four years to run.

Power Houses, Shops and Buildings

Municipal Street Railway, Seattle, Wash.—Contract has been let by the Board of Public Works to the United States Steel Company for furnishing three cables for the municipal street railway department. The company bid $14,584. The Yesler Way cable will be 22,500 ft. long, the Madison Street cable 14,150 ft., and the James Street cable 8,250 ft. The latter line will be 1$\frac{3}{16}$ in. in diameter and the two others 1¼-in. steel rope. The three cables will weigh 114,399 lb.

Track and Roadway

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway has applied to the Los Angeles Railroad Commission for permission to construct a spur track on Santa Monica Boulevard and Orange Avenue.

Wisconsin Railway, Light & Power Company, Winona, Minn.—The La Crosse division of the Wisconsin Railway, Light & Power Company will complete its new line in Badger Street, La Crosse, by the middle of September.

Eastern Massachusetts Street Railway, Boston, Mass.—Plans for extending the Eastern Massachusetts Street Railway from Swansea to Swansea Center have been under discussion. Just what the status of the Seekonk-Swansea franchise was and how the Eastern Massachusetts Street Railway can present a petition for a franchise will be considered at a conference with the company's attorneys in Boston.

Phillipsburg (N. J.) Transit Company.—The Warren County Board of Freeholders has requested the Phillipsburg Transit Company to move its tracks from the side to the middle of South Main Street, where a new cement road will be laid.

New York State Railways, Syracuse, N. Y.—The Public Service Commission for the Second District has directed the New York State Railways to move as soon as practicable its track along Main Street in New York Mills between Campbell Avenue and the town line of New Hartford eastward wherever necessary in order to leave at all points at least 22 ft. available for paving Main Street west of the railroad track.

Syracuse & Suburban Railroad, Syracuse, N. Y.—Action is being taken by the trustees of Fayetteville, New York, to compel the Syracuse & Suburban Railroad to change the location and rebuild its tracks in Genesee Street in Fayetteville. The railroad through its attorney has explained that it cannot possibly finance the work at this time, but the attorney for the village claims that the railroad must comply with its franchise. Chairman Hill said that it seemed as if it would be necessary for the commission to order the work and to take steps for later proceedings in the event of a default.

Portland, Ore.—The Commission of Public Docks of Portland has awarded to Nelson & Brown, contractors, a contract for construction of the roadbed for municipal railway terminal No. 4, the work to be completed within forty days. The road will be one mile long, and the roadbed will cost $25,020.

New Advertising Literature

Indexes.—The General Electric Company, Schenectady, N. Y., has issued indexes to its descriptive bulletins and sheets and supply-parts bulletins, both dated July, 1920.

Insulating Fabrics and Link Insulators.—The General Electric Company, Schenectady, N. Y., has published bulletins Nos. 48715 and 49400, describing respectively the G-E insulating fabrics and the Hewlett link insulator.

Electric Drills. — The Independent Pneumatic Tool Company, 600 West Jackson Boulevard, Chicago, is distributing circular No. 33, describing its "Thor" universal electric drills, grinders, etc.

Fuel-Saving Devices.—Bulletin 111, issued by the Uehling Instrument Company, 71 Broadway, New York City, describes and illustrates the standard Uehling CO$_2$ meters, both single and multiple units.

Insulating Compounds.—"G-E Insulating Compounds" is the title of bulletin No. 48704A, published by the General Electric Company, Schenectady, N. Y., covering its insulating compounds, including insulating varnishes, japan oils, etc.

The Stromberg Electric Company, 200 West Jackson Boulevard, Chicago, manufacturers of time-recording systems, announces that it has opened an office at 803 Lexington Building, Baltimore, Md., with C. F. Ressiguie in charge.

Adjustable-Speed Motors.—The General Electric Company, Schenectady, N. Y., has issued a second edition of bulletin No. 41921A, superseding bulletin No. 41021 and describing the latest design of RF form A, direct-current, adjustable-speed motors, rated from 2 to 50 intermittent horsepower.

Trade Notes

The Safety Car Heating & Lighting Company has awarded contract for alterations in the former plant of the Marlin-Rockwell Company, New Haven, Conn., recently taken over by the company.

The Crane Company, 836 South Michigan Avenue, Chicago, recently celebrated the sixty-fifth anniversary of the founding of the company by R. T. Crane in 1855. Today the company has a total working space of 13,856,042 sq. ft. devoted to manufacturing and its employees number 15,304.

The Greenfield Tap & Die Corporation, Greenfield, Mass., has completed plans for enlarging its forge shop at Turners Falls, consisting of two new buildings, on which work will be started at once. The proposed new five-story plant of the company at Greenfield is held up for the time being.

The M. B. Austin Company, 700 West Jackson Boulevard, Chicago, manufacturer of electrical supplies, has acquired a site at 108-116 South Des Plaines Street, 91 ft. x 118 ft., on which it proposes to erect a two-story plant, to cost about $100,000.

The National Carbon Company, Cleveland, Ohio, has recently issued its No. 35 carbon-brush catalog, which supersedes catalog No. 34. Some grades of carbon brushes previously listed have been eliminated and others added. The number of types of shunts used has been reduced.

The Chase-Shawmut Company, Newburyport, Mass., has taken over the Chase-Shawmut Department of the Condit Electrical Manufacturing Company, with Sears B. Condit, Jr., president and treasurer, and Frank D. Masterson, vice-president and general manager. Mr. Masterson has been associated with the Shawmut fuse business for twenty-one years.

The Uehling Instrument Company, 71 Broadway, New York City, manufacturer of fuel economy equipment, announces that it is now represented in New England States by the Smith Engineering & Supply Company, 89 State Street, Boston, Mass., manufacturers' agents and engineers, specializing in power-plant equipment. S. W. Smith, president of the latter company, was until recently associated with the Uehling Instrument Company, with headquarters in the New York office.

The Ackley Brake & Supply Corporation, 50 Church Street, New York City, announces the appointment of E. A. Thornwell, Atlanta Trust Building, Atlanta, Ga., as general Southeastern agent for the sale of the Ackley brakes and G. & B. paint in the states of Georgia, Florida, Alabama, Mississippi, Louisiana and Tennessee. Mr. Thornwell was formerly manager of the railway division of the Westinghouse Electric & Manufacturing Company.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
L. W. W. MORROW, Special Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Is the Engineer Coming Into His Own?

THE engineer is at last a factor in politics. The two leading presidential candidates have not only condescended to reply to a questionnaire submitted by a group of engineers but have also violated their own stated rules in so doing. To all but the engineers, questionnaires to candidates are taboo.

We rejoice that, at last, the engineer is a weight on the political scales. The engineer has been broadened and cultivated by the civic duties thrust upon him by the war, and may peace only enhance his civic and political influence. We need trained men, men with analytical minds, in the nation's politics, so "all hail" to the new era in American politics presaged by the questionnaire.

Standardization of Branch-Off Frogs Means Economy

WE HAVE commented more than once upon the advantages to be gained through the adoption of a standard system of track spirals. The committee on way matters presented the basis of such a system at the Atlantic City convention last year, and the discussion on the floor seemed most favorable to the proposition. The present committee has been charged with the completion of the subject and it is very probable that a uniform system of spirals will be recommended in its forthcoming report.

If this should be the case and the report should be approved the way will be paved for the prompt consideration of the co-related subject of standardization of branch-off frogs, which a uniform system of spirals would make possible. Some railway companies have already done this for their own systems and have found the scheme not only workable but also economical.

With a single system of spirals available, the matter may be approached with confidence in an attempt to standardize branch-off frogs generally. However, this cannot be done until an agreement can be reached in the standardization of double-track center distances through the special trackwork layouts. Even with a uniform spiral having a limited number of radii and with the rather large number of varying track center distances now prevailing it is possible to have more than 5,000 different branch-off frogs. A reduction in this number of frogs is dependent upon the reduction of the number of variable center distances, and it is believed that these can be reduced one-half without causing any serious trouble. Such records as we have seen indicate that these distances might be reduced to ten fixed standards without requiring any company to vary its standards more than 2 in., while in the majority of cases the variation would not be more than ½ in. Such small variations could hardly be objected to either by the railway companies or by the municipal engineers, particularly in view of the fact that the variations from tangent track center distance standards need only be made through the special trackwork layouts.

Further study shows that it would be possible to reduce the 5,000 or more branch-off frogs to less than 80 per cent of that number through limiting the number of variable track center distances. Such a prospective saving is worth trying for and we hope that the Engineering Association can see its way clear to give the subject the attention which it seems to merit.

Illumination—A Power Plant Aid

IN THESE days of operating economies every agent for reducing costs is welcomed and few realize the importance of good lighting as an aid to efficient operation. We pointed out in our editorial of April 17 the fact that it takes time for a man to visualize an object and that good illumination enables a workman to do more work in a given time in car shops. Good illumination now means 10 or 12 foot-candles and not 2 or 3 in order to speed up production.

The power house of a railway company also affords an opportunity for the application of good illumination. New power houses are designed to afford ample light in the firing aisle and other parts of the boiler room, but the older plants require extreme care in movement, even in daylight, because of inadequate lighting. The old dirty, dark boiler room can never be made to operate efficiently by simply adding stokers, meters and draft and other regulating devices. Efficient operation requires every instant that intelligent attention be given to the devices added to aid power production, and unless proper illumination is afforded this attention will not be obtained. In order to see instruments and control levers and to produce the proper psychological and physiological condition in power plant operators good illumination is necessary.

The old boiler rooms should no longer be dirty and inefficient if costs are to be kept down, and illumination is one of the cheapest auxiliaries available to aid in maintaining operating efficiency. The indirect benefits will more than offset the cost of the required system and power plant operators will find it profitable to study their plants with the object of redesigning the illumination system to obtain better results.

The Brooklyn Strike Is Petering Out

ACCORDING to all the evidence so far, the strike on the Brooklyn Rapid Transit System was brought about by the radical element to obtain control over a large industrial organization in that city and one essential to its business and civic progress. The triumph of such an effort would mean the domination of the operation of the system by the same element which caused the strike, accompanied by an enormous increase in operating expenses. This, in turn, would have been reflected in greatly increased fares or correspondingly reduced service.

Fortunately for Brooklyn, the radicals seem to have over-reached themselves. The large body of employees are realizing that they have been forced by a trick into a strike which they did not want, and they are rapidly becoming still further disgusted by the sporadic attacks on trains and cars and other extremes in which the violent element among the strikers is indulging. The return of the men to common sense, to which indications point as this paper goes to press, is a subject of congratulation to the management, the public and the employees themselves. Wages cannot go on increasing in the railway industry and in other industries without still further adding to the high cost of living and perpetuating the vicious circle of continually higher prices which benefit nobody.

This statement of the Brooklyn strike would not be complete without a word of commendation for the police of Greater New York. While not taking sides, they seem to have been promptly on the spot when injury to life or property was threatened and showed energy and courage in repressing disorder.

Lawyers' Strategy in Iowa?

A RECENT decision of the Iowa Supreme Court set aside the right of municipalities to contract with street railway companies as to the rate of fare. On a liberal interpretation of this decision several companies promptly announced that on their own authority a higher rate of fare would be installed. Apparently these companies expect by this procedure to throw the burden of proof upon the municipal authorities if the latter choose to oppose the action of the company by appeal to the courts. The railway companies are setting up a rate of fare which in their own opinion is not unreasonable and which will meet adequately operating and maintenance costs, interest charges and a rate of return on the investment that will attract new money. From a lawyer's standpoint they have placed themselves in a strategic position.

Perhaps Iowa companies cannot be blamed for "taking the bull by the horns" after the starvation treatment most of them have received at the hands of the city authorities, who have heretofore held control. The companies are now apparently acting within their legal rights, but it seems to us that, from the standpoint of public policy, their action is fraught with dangerous possibilities. Going completely over the heads of local authorities and in absolute disregard of one of the terms of a franchise made in good faith, though it seems in bad law, is very likely to invite antagonism and to embitter the people against the corporation for what is sure to be termed its high-handed methods. It seems to us that the same end could have been accomplished, though of course not so readily, by appealing to local authorities to grant a reasonable increase in fare, which they would then be practically bound to do in the face of the Supreme Court decision. This would show that the company wanted to keep faith with the municipality so long as the latter would act within reason. The company could then reserve its action of increasing fares on its own account as a last resort when local authorities had refused to acquiesce in an adjustment that was equitable.

But even if the present action of the companies is justifiable, who is to be the judge as to what is not an unreasonable fare? We doubt that it was the intent of the Supreme Court to lay wide open to the initiative of the street railway companies the setting up of the rate of fare. And while the decision neither sanctions nor prohibits such free action of the corporations, it seems to us that the latter are likely to have prejudiced their case by so doing when the matter comes up for further court ruling, as it surely will.

Transit Anaemia at Bridgeport

WHEN an experienced practitioner is examining a patient for anæmia he will not permit himself to be deceived by such indications as fleshiness. He proceeds to a blood test. In the case of a transportation system that blood test is the amount of business done at the downtown shopping center, assuming that there has been a change only in the method of transportation and not in the industrial or weather conditions. Paradoxically enough, what goes on during the ordinary peak hours is less indicative, because the traffic during those hours is compulsory traffic. People must get to and from their work somehow or other, whether they walk, are bumped along on motor trucks or squeezed into a dirty, odoriferous conveyance. But the mid-day shopper is largely a voluntary rider. She can do part of her purchasing at the neighborhood shop, use the telephone for other items or put off some—and these the biggest—purchases for weeks if need be. Then, too, there is the mail order house, but that is more remote as a factor because the mail order habit is not built up quite so readily in a large city with good stores.

What, then, does the blood test disclose at Bridgeport after six to seven weeks of all-jitney, no-railway operation? That the business men of the city are simply frantic at losses in revenue equivalent to 25 to 50 per cent of their usual summer-day earnings; they want the cars back at any price, realizing as never before that there is a great difference between even tolerable trolley service which is clean and dependable and individualistic jitney bus operation which offers no attraction to the very people who do most of the family buying. Possibly the merchants would have brought their influence to bear earlier were it not for the fact that when both services were available at least half of the riders chose the jitney. The merchants did not appreciate the fact that a great many of the finer class of women would not ride in these nondescript vehicles under any consideration and that these women feel the same way regarding the use of such vehicles by their children. It may be said, however, that if the store owners needed a lesson as to the difference between a responsible company and hundreds of come-and-go jitney drivers, they have paid an exorbitant price for it by this time.

But to come back to our figure of speech as regards anæmia. It is not merely the ragamuffin character of the service that has been injuring the business and social life of car-less Bridgeport. It is the gradual degradation and thinning out of the transportation service, the circulatory medium of the town. During the first jitney week operators came pouring in from the adjacent communities in the hope of an extraordinary harvest. When these men found that they would have to stick to the 5-cent fare instead of profiteering—*á la* Toledo—

they, in the famous phrase of Mark Twain, "went away from there." It seems, also, that there has been a large increase in the number of operators who run buses during the fat hours and engage in other work during the lean hours. Furthermore, quarrels among the jitney operators themselves have revealed that many are cutting back, thus leaving the people at the outer ends of the routes with little or no service. Hence as the weeks passed the tendency has been for the quality of the city transportation medium to become poorer and poorer.

The merchants were first to recognize this, but the amusement men were next, and then even the realty men, who are always so keen for duplicate methods of transportation so long as the other fellow pays for it. The manufacturers and the general working class public were probably the last to feel the withdrawal of trolley service, for their needs are of the "must" variety. Indeed, although Bridgeport has just now passed a jitney restricting ordinance, it is quite probable that the bulk of the voting population would have been willing to let things run until the discomforts of winter travel were upon them before exerting much pressure on the councilmen. Even with the trolleys returned and the jitneys restricted, the public will not forget that the latter did give one permanent advantage—speed. Therefore, unless the railway is prepared to furnish an equivalent in the way of service, there may be a demand for a recall of the jitneys when their sins are forgotten but their virtues remembered. No electric railway can afford to have so potentially powerful a competitor in the background for use as a club whenever the community sees fit. On the other hand, there are many places where a railway company could well do a little "busing" of its own as a supplementary and auxiliary service. Once the railway itself uses the bus in a community welfare way, that no individual operator could think of doing, the possibility of competitive bus operation is reduced almost to the vanishing point.

"We Can't Write Articles"

RECENTLY one of the executives in a large railway company remarked to a member of our editorial staff with respect to a matter under discussion, "We can't write articles." He was undertaking to explain why he did not feel able to pass on his very valuable experience to other railway men in the form of a technical report. Our representative promptly expressed his disagreement with this conclusion, for he knew very well that this engineer could have prepared a most acceptable and effective article on the matter under consideration.

This little incident would not be worthy of record here if it were not an instance altogether too frequently typical of the experience of our staff. It is a variety of stage fright from which railway engineers and executives suffer and against which they should fight.

We do not believe that the average engineer will compose a technical article with the poetic beauty of a Shakespeare or a Milton, nor do we hope for the elegance and the formality of style of Ruskin. Thank goodness we do not get such a result; it would not be acceptable to a technical paper as regular diet even if it were available. We do get straightforward statements and plain readable English that says something valuable to our readers. The same style which a man uses in his every-day business correspondence serves admirably for a technical article. It "puts across" his idea in the most effective way.

In this connection it should be emphasized that the technical man who has achieved satisfactory results by novel means or developed a new device has a certain duty to the industry as a whole. He owes it to his fellow workers in the railway field to share with them his achievement just as they, through technical literature, continually share their advances with the industry. No one likes to be a slacker in such a common cause and it is, therefore, important to get rid of this feeling that you cannot write, for any man who writes an effective business letter can write a good technical article as well.

Fun? Yes, but Not at the Expense of Serious Discussion

THERE was a time when the national conventions of street railway men were junkets more than anything else. These undoubtedly served a useful purpose in getting and keeping traction men acquainted. The operating problems in the early days were simple; there was not much necessity for going into detail. They were rather individual problems anyway; at least they were so considered.

Now we have in the annual convention of the American Electric Railway Association and its satellites a highly organized mechanism which requires the concentrated attention of railway men and manufacturers if it is to function properly. Each year there is more reason why the delegates should be carefully selected and charged with a reasonable weight of responsibility to make the time and expense account investment a profitable one. A compelling reason now is that the convention has become a school where the latest in intelligent railway management is taught. It constitutes, in fact, a short (very short) fall course in that vital subject, with general lectures for all, and more specific discussions for the specialists. The degree given at the end of the course is B. N. I. (Bachelor of New Ideas). If any attendant goes home without his degree he may be considered as having failed, or "busted," as they say in some schools.

Another thing this year is the increase in transportation rates. It will cost more to get to Atlantic City, and hence increased value must be extracted from the sessions.

At the same time we would not minimize the importance of the entertainment features of the convention, which should be a complement and not a detriment to the meetings. At our conventions, however, as at others which might be mentioned, the ratio of attendance at the sessions to the total registration is not what it might be; in other words, the "convention operating ratio" is low. That this fact is appreciated by many is illustrated by the informal talk at a recent committee meeting attended by men who themselves thoroughly enjoy the "good time" features of the conventions. They agreed that one of the best ways to attract and hold membership is to prove by performance that the meetings are held primarily for the good of the electric railways and not for the personal entertainment of the lucky ones who are delegated by the company members to represent them. Let each attendant this year resolve to carry back from the convention as many new and helpful ideas as possible.

This Is Number Seven of a Series of Articles on Salient Phases of the Electric Railway Situation

California and Her Tractions—Part II

By Edward Hungerford

MR. HUNGERFORD found an optimistic spirit among the railway men in California—a feeling that the electric railways have seen their hardest days. Traffic is increasing and automobile competition shows signs of diminishing. Interesting comment is made on the electric roads in southern California and in the Oakland district.

That the traction systems of California have seen their hardest days is the firm belief of Paul Shoup, president of the Pacific Electric Railway, the largest single system in the country, and vice-president of the Southern Pacific Company. Mr. Shoup backs up this statement by figures. He is further substantiated by William Von Phul, president of the United Railroads of San Francisco, who said to me that in the past year the revenues of the property which he heads had been increased by $1,118,000. Unfortunately, increases in both operating cost and taxes had gone ahead a little more than proportionately, about $1,200,000 for the twelvemonth. So in the long run the company had nothing whatsoever to show for its greatly increased business.

Similar reports were made by the officers of the Municipal Railroad. The California Street Cable Railroad undoubtedly would have reported likewise. Yet whence was this flood of traffic coming? On the surface of things, at least, San Francisco was enjoying no great business boom. Automobile kings were not setting up great factories by the dozens—as in Flint or Detroit or St. Louis. Nevertheless, a more careful examination of the situation there at the Golden Gate did show a large resumption of building activities, many of which had been deferred until after the conclusion of the war. While the gradual cessation of the local popularity of the jitneys was unquestionably another real factor in the increased street railroad earnings.

From Los Angeles too came similar reports; both from the local street railway system and from the big Pacific Electric, which has its head and front in that thriving city. In six months to April first the earnings of the Pacific Electric have increased to $6,378,907 from $5,343,063; incidentally, once again its expenses to $4,956,486.76. The Los Angeles Railway makes a like showing. Then it was that I asked Mr. Shoup, as the person best informed on the entire traction situation in California, for the real translation of these figures.

"They mean that the peak of the competition of the automobile,

This is a typical view in downtown Los Angeles. It shows Broadway taken from the corner of Sixth Street. The well-paved streets and equable climate of southern California encourage the use of all kinds of vehicles, and the view shows horse-drawn vehicles and bicycles as well as automobiles and electric cars.

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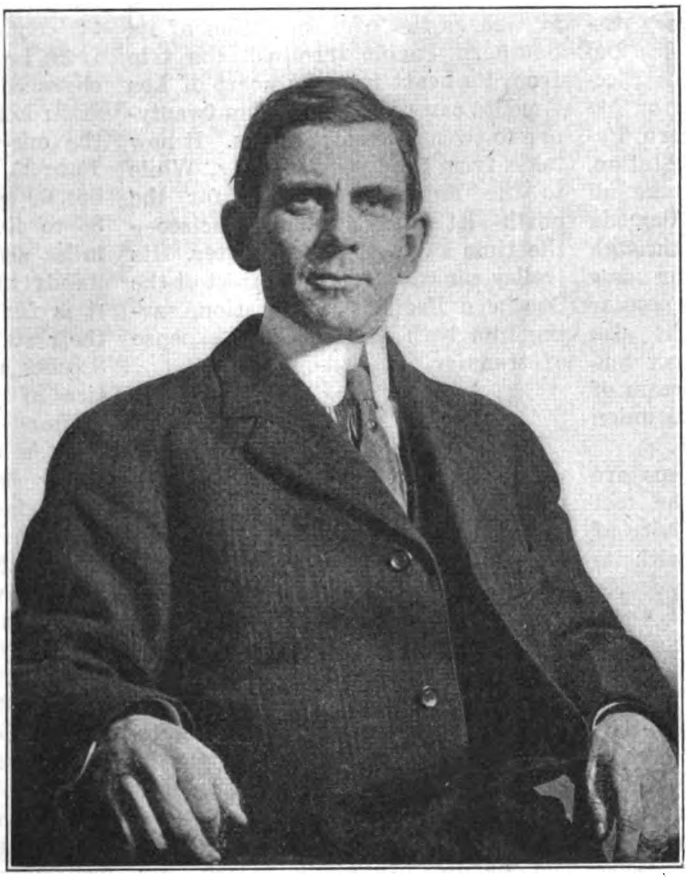
publicly or privately owned or operated, has been reached out here—and passed," was his reply. "Not only is the rapidly rising cost of cars and tires and gasoline and oil beginning to deter the overenthusiastic motorists, but I think that the novelty of excessive motor riding also is rather wearing off. The hazards of driving on crowded highways are becoming more apparent and parking space in towns and cities more a question of doubt. In addition to our great numbers of motor stage routes in every direction, we now have some 500,000 automobiles in California licensed for pleasure purposes, to which should be added the cars owned and operated by the 100,000 Easterners who come out here every winter. The competitive effect of all these cars has been, and still is, vast indeed. But we already can see in it a declining curve."

I think that I can follow Mr. Shoup perfectly. On a glorious California Sunday in May we drove together out from San Francisco in the Santa Clara Valley toward San José. The excellent highroads were thronged with cars. Yet driving that day was not without its perplexities. Not only was gasoline very high priced—for California—but there was precious little to be obtained at any price. One drove from service station to service station, and occasionally when he was known or favored was grudgingly doled out two or three gallons of the precious fluid. There was not an ounce of it to be spared. While from the more remote counties of the northern part of the State came tragic reports of "gas" tanks completely emptied; not a drop of it in whole townships even for emergency purposes. The gasoline famine was upon the land; a tragedy which traction men at least were enabled to regard with complete equanimity.

I felt, even myself, that I could perceive a distinct lessening of that traffic upon the highway and the gain upon the steel road. On the preceding afternoon I had ridden from Marysville through to Oakland—140 miles—upon two extremely well-operated interurbans, the Sacramento Northern and the San Francisco-Sacramento, and had found their three-car trains well filled. And at 3 cents a mile. It looked like good business. It *was* good business.



PAUL SHOUP
President of the Pacific Electric Railway and vice-president of the Southern Pacific Company, who sees better times ahead for the electric railways of California. Mr. Shoup's views on automobile competition are given by Mr. Hungerford in this article.

And yet do not under-rate the volume of that motor bus and motor truck and private motor car competition today or tomorrow. Even if our national supply of gasoline runs low and fails utterly to keep pace with our very great national increase of self-propelled vehicles upon our highways, the automobile manufacturers will proceed promptly to develop a substitute fuel. Do not forget that, Mr. Street Railwayman. The highway is bound to be a real competitor of yours for many a year to come. Yet not necessarily a competitor, with everything in its own favor.

IMPROVEMENTS PLANNED AT LOS ANGELES

It is another phase of this very press of competitive traffic, however, that has led Mr. Street Railwayman Shoup, who harbors no delusions as to the strength of his automobile adversaries, to look forward toward the eradication of many of the grade lines and grade crossings that have slowed up the operation of his Pacific Electric lines. From the beginning these lines have been well built—the important main stems to Long Beach and to Pasadena being entirely on private rights-of-way from the points where they leave the Los Angeles streets, just outside of the heart of that thriving city. It is this interior radius, however—between the private rights-of-way and the P. E.'s great main station at Sixth and Main Streets—that the troublesome delays occur. It matters not that all the way from the Los Angeles River, near the old business center, up to South Pasadena, 6 miles, there is not a single grade crossing—except one, little used now—and so no interruption whatsoever from the heavy automobile traffic of Southern California. It is the eight or ten blocks of congested Main, San Pedro and Aliso Streets, Los Angeles, through which every one of the two hundred cars or more that run between that city and Pasadena pass, that slows so greatly the passage of the great red interurbans.

So Shoup has planned to eliminate these delays, not only to the Pasadena and San Bernardino cars but also to those running to Long Beach and other ocean-shore communities to the south and west of Los Angeles. With typical thoroughness and energy he has planned an elevated structure leading out from the great terminal station of the Pacific Electric there at Sixth and Main Streets and, a short distance from there, branching to the north and to the south until it reaches these same private rights-of-way of which we were just speaking. There would be some 2½ miles of this structure all told, and it would carry all the way from two to four tracks. Moreover, as now planned it would pass and have physical connection with the new Arcade Station of the Southern Pacific lines in Los Angeles and the sole interchange point of their vast traffic through that city.

Nor is this all: The plan provides that a part of the connection of the proposed elevated railway to the Pasadena main stem of the Pacific Electric shall pass over and upon a portion of the right-of-way of the Los Angeles & Salt Lake Railroad. By adopting the construction plans in the right fashion it then would be easily possible for the Salt Lake route to abandon its present badly located and somewhat temporary passenger terminal in Los Angeles and by a line adjoining the Pacific Electric's new elevated lines bring its trains right into the Southern Pacific's commodious Arcade Station, which tracks in turn will take all Southern Pacific trains off Alameda Street, a busy thoroughfare through the city, which it has used for some forty years or more. In a similar fashion the Santa Fé might also abandon its own present depot and so help to achieve that pet dream of some of the Angelenos, a real union station for all their railroads.

But whether these last steps are ever accomplished or not, the fact remains that by the simple device of tapping the Arcade Station, with its projected elevated line, the Pacific Electric could and would be of great help to a large percentage of the tourists who annually visit Southern California, to say nothing of the great volume of the steady all-the-year traffic. Already it has been a real factor in the upbuilding of those two great suburban cities just outside of Los Angeles: Pasadena, with 45,000 population today, and Long Beach, with 55,000. A goodly proportion of the steam railroad travel bound in and out of Los Angeles is destined to or from these two communities. Some years ago the Southern Pacific folk saw the wisdom in abandoning for passenger service their 12-mile branch up to Pasadena and letting the Pacific Electric collect and distribute this form of traffic. The new plan as suggested will render such interchange far easier. And a scheme will soon be effected which will transform the present comfortable Southern Pacific station in Maryland Avenue, Pasadena, into a complete terminal for Pacific Electric cars and so relieve in turn the streets of that rapidly growing suburb, which themselves some time ago began to reflect in no small degree the increase in automobile traffic and congestion.

Here then is quickly established that correlation between the long-distance and the short-distance electric train or car that broadminded and far-seeing students of transportation conditions in the United States have long desired to see come into effect. In far too many cases have there been differences or misunderstandings or long-existent feuds to delay such sane and logical progress. At Pasadena there is neither. Simply a sensible understanding of the fact that with the new elevated completed, as well as the transformation of its Southern Pacific terminal, the trip from its heart into the heart of Los Angeles can be made in from twenty-five to twenty-seven minutes. It now takes from thirty-five to forty. While to the Pasadenian bound for the north—let us say to San Francisco—the time saving is far greater. His trolley car will drop him direct at the Southern Pacific's new station, saving him both the time and expense of transfer.

HIGHER FARES ARE NEEDED

With so simple a relief plan all worked out one wonders why it has not long since been put into effect. The answer is simple: The improvement work as at present laid out by the engineers is far from a cheap job; their estimates for it run all the way from $2,000,000 to $5,000,000. One speaks quite easily in millions these days, yet one does not obtain those selfsame millions quite so easily. Particularly when one is engaged in conducting a property whose operating costs have climbed from 30 to 40 per cent since 1914, and whose wage-rolls alone—for from 4,500 to 5,000 people—have gone up 78 per cent just since 1916. Cross-ties today cost just twice what they cost five years ago, while rail is up from $28 or $30 a ton to $47—at the rolling mills. At the Pacific Electric's receiving station transportation across the continent brings this figure close to $70. At this writing I am advised that the money has been found and only the consents of the State Railroad Commission and Los Angeles city are necessary.

Against these great increases in cost, increases in fare have as yet been but slight. Local fares in Los Angeles still stand at 5 cents. Yet that city, like San Francisco, will in all probability be forced to face the necessity of at least a 6-cent fare. Six-cent fares already have begun to creep into California, which, seemingly, has been far slower to feel increased living costs than most of her sister states in the East. Oakland, San José, Fresno and Stockton already have them, with Sacramento soon to follow, while in San Diego local fares, with the exception of a limited zone in the heart of the city where a 5-cent fare still prevails, have been placed at 7½ cents, with a slight reduction when tickets are purchased in quantities.

The Pacific Electric's fare increases have been correspondingly slight. The flat round-trip fare of 50 cents which formerly prevailed from Los Angeles to any of the seashore communities roundabout here from Long Beach to Santa Monica—the one-way distance varying from 15 to 25 miles—has been increased to but 60 cents; the one-way fare from 35 to 40. Sixty cents for 30 to 50 miles seems cheap enough. In the minds of the Pacific Electric folk it is far too cheap. They feel that their standard long-distance rate of 3 cents a mile, based upon the practice of their steam railroad competitors, is none too high.

It is not to be denied that the motor bus competitors also are a large factor in the regulation of single-trip fares in some directions and possibly round-trip fares. Shoup himself would be the last to deny such a factor. He has a way of taking direct hold of questions such as these. It is fairly characteristic of him.

"Yet I cannot but believe," he says, "that these motor buses are now bound to come more and more under public control. They are going to be taxed, fairly but certainly. They are going to have to pay their fair share for the renewal and maintenance of the very pavements for which the street railway companies paid in the beginning, and the tax is going to be based in some way in proportion to the weight of the vehicle and the consequent destruction that it does to the pavement. All of which means of course competition on terms nearer equality. And which, combined with the steady increase in cost of operating a gasoline-vehicle of any sort, is already beginning to give us a fairer chance in California. As I said at the beginning we have, in my opinion, reached the peak of the situation and are already come to a slightly easier point."

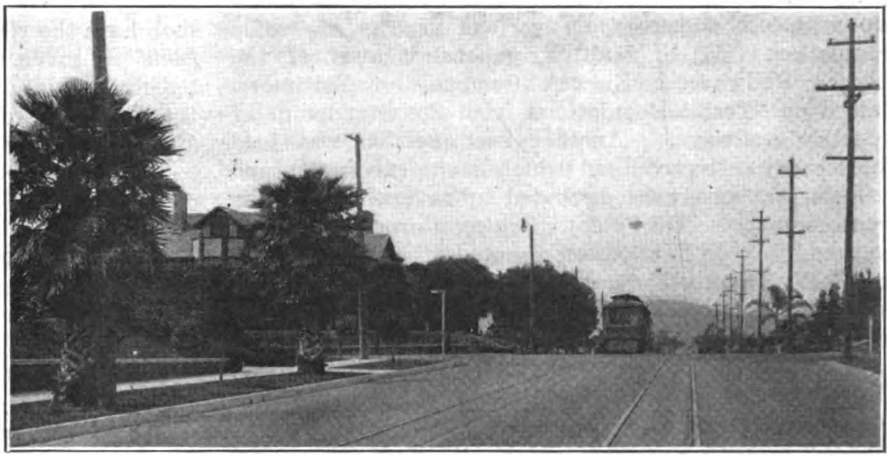
RAPID TRANSIT LINE IN OAKLAND ALSO

In Part I of this article I spoke of the peculiar problems and perplexities confronting the street railways in San Francisco today. I omitted taking cognizance of the two rival systems in the three large communities on the far side of San Francisco Bay until after I had mentioned the head of the Southern Pacific electric properties. For, remember, if you will, that all of Shoup's activities are not concerned with the huge Pacific Electric property, although that is of itself a man-sized job, with its more than 1,000 miles of track and its 2,000 cars. He also operates the Fresno, Stockton and San José local systems, which are S. P. properties, as well as the Peninsular Railway, connecting the last of these systems with Los Gatos and Palo Alto, and the Visalia Electric Railway—some 200 miles of track in all. The direct suburban lines of the Southern Pacific up at Portland and at Oakland, Berkeley branch and one or two edge of San Francisco Bay are electrified. This last is a really remarkable system, built up of the Berkeley branch and one or two other small feeders of the parent Southern Pacific system. From these, and some other brand-new routes, was built up a suburban system, operated by overhead pantagraph trolley and in and out of the main Southern Pacific ferry terminal at Oakland Mole as well as a secondary ferry terminal on Alameda Mole. Its trains of bright cherry-colored steel coaches, each seating 120 passengers, are absolute models in electric traction. They long have been the admiration of trolleymen from afar when they come to the Golden Gate.

Yet even this is an unprofitable system. That it was overbuilded even the Southern Pacific people would probably be willing to concede today. That it could last thirty days without the strength and support of the parent system no one is willing to admit. In some earlier paragraphs I called attention to the hotly competitive conditions in San Francisco and the excellent service that ensued as a result and said that here was a regular argument for the man who says that transportation efficiency may only come under conditions of real competition.

Oakland and Berkeley are quite as competitive in their street railway service as is San Francisco. While the Southern Pacific was transforming and expanding its suburban lines at the east side of the bay, a shrewd resident of the first of these towns had purchased its local street railway system and was preparing to develop it into a real rapid transit system that would also serve Berkeley. The man had plenty of that thing we Americans like to call vision, plenty of capital, too, and out of it all was evolved the so-called Key Route, whose bright new yellow cars were hooked together in trains and were quite the pride of the communities which they served. They ran out to a brand-new ferry terminal or "mole" and from it a fleet of ferryboats ran to and from the great union ferry house in San Francisco.

The yellow cars are not so bright as they were in those days. The Key Route has fallen into days of adversity. If it were not for the ownership of the Oakland local street railway lines its days would be even harder than they already are. True it is that it has had some slight revenue relief in the fact that it shared with the Southern Pacific's electric lines the recent general increase in the flat fares from San Francisco to Oakland, Berkeley or Alameda from 10 cents to 15, and engages in some slight advantage over its big steam competitor in the fact that the Southern Pacific is forced to pay even its electric train operators the steam train wages, a schedule considerably higher than that of the average traction company. But even these advantages do not seem enough to spell a permanent opportunity for the Key Route.


The suburbs of Los Angeles are noted for their large number of handsome residences, well-kept lawns and attractive surroundings. This view, with its palms, is characteristic.

CONSOLIDATION IN OAKLAND AND BERKELEY DESIRABLE

The eventual solution of its pressing problems, like that of the competing street railways of San Francisco, seems to be consolidation. There are suburban electric lines of the Southern Pacific in the Oakland district that could and, in all probability, eventually will be abandoned and pulled up. There are lines of the Key Route too that in the event of consolidation would become equally superfluous and would suffer a like fate. And in all probability the ferry house and "mole" would disappear—as far as the Key Route is concerned at any rate. It has been suggested as a likely terminal for the Southern Pacific's long-distance competitors into San Francisco—the Santa Fé and the interurban systems to Stockton, to Sacramento and the north. But whether this last step be ever taken or not, I think that I shall not have to live many years to see the day when the rapid transit services at the east side of San Francisco Bay shall be permanently and securely merged.

Such a day cannot, in my opinion, come too quickly. To one who has preached, and he hopes consistently, transportation efficiency gained by consolidation and correlation, there are plenty of texts in the metropolitan district of San Francisco. We have just seen how good planning and good old common sense may effect such efficient correlation in Los Angeles. The opportunities in the great communities to the north are quite as great, if indeed not greater. The economies which they may accomplish are not alone those of money, not merely benefits to the companies which establish them. They are to be written in the service to each of the 35,000 commuters who cross daily from Oakland ferry houses to San Francisco and cross back again at night. They are economies at wholesale. And so almost bound to accomplish wholesale results.

A Model Traffic Ordinance Considered

Tentative Ordinance Presented for Discussion—Rigid Specifications on Right of Way, Speed Control and Parking—Discussion by National Traffic Officers' Association

THE third annual convention of the National Traffic Officers' Association was held in San Francisco, August 23-27. The convention devoted its efforts toward perfecting a motor vehicle act which would be uniform for all states and discussed a tentative model traffic ordinance presented under the auspices of the A. E. R. T. & T. A.

The convention was addressed by Mayor Rolfe of San Francisco and by Governor Stephens of California on Monday, after which the president of the association, Daniel A. Sylvester, gave his annual address. On Tuesday the morning was devoted to committee hearings and the open session in the afternoon was taken up with six addresses on various aspects of traffic regulation. W. H. Maltbie, general counsel of the United Railways & Electric Company of Baltimore, talked on "Traffic Regulations from the Standpoint of Electric Railways." Another open session was held Wednesday afternoon, at which technical traffic and vehicle problems were discussed by several automobile representatives. On Friday morning a proposed "International Vehicle Law" was presented at an open session by E. W. Braun. The association desires uniformity in state and city traffic regulations and the proposed law covered all phases of transportation. The morning sessions were taken up with committee discussions.

The electric railways committee spent a great deal of time in discussing a proposed "Model Traffic Ordinance," presented by its chairman, W. H. Maltbie. Mr. Maltbie served on the committee on code of traffic principles of the American Electric Railway Transportation & Traffic Association.

ABSTRACT OF PROPOSED ORDINANCE

Section 1 of the proposed ordinance deals with definitions and departs from the conventional ordinance in defining only two terms. "Main Thoroughfare" is defined as "any street or part of a street upon which street cars are operated and also any street or part of a street so signed." "Delivery District" is defined as "the area of traffic congestion officially designated as such." The ordinance also calls every traffic agency a vehicle except a street car.

The ordinance is unique in that Section 2 specifies no definite speed limit, but simply states "Every driver shall keep his vehicle under such control as will enable him, by the exercise of ordinary care and diligence, to avoid collision or other interference with other vehicles or pedestrians who are proceeding in accordance with traffic regulations."

In the event of accidents the ordinance specifies that a presumption of negligence shall lie upon the vehicle violating traffic rules, and as between a vehicle or street car proceeding under a traffic officer's direction and a pedestrian, upon the pedestrian.

The section specifies right-hand curb stops in all two-way streets and states that no vehicle shall cross a foot way at any point other than a street or alley crossing without coming to a full stop. The usual signal and lighting rules are specified and the section prohibits any vehicle passing a stopped or stopping street car, unless the car is at a safety zone, and all vehicles, except on one-way streets, must pass a street car on the right-hand side, but must pass other vehicles on the left-hand side. The police department is given authority to establish safety zones and all vehicles are prohibited from driving through or over any safety zone.

In regard to right of way the section specifies that a "despatched" vehicle (proceeding at the direction of a traffic officer) or street car shall have the right of way, but that subject to the right of way of emergency vehicles and despatched vehicles, the street car shall have the right of way. Traffic on "main thoroughfares" is given the right of way over traffic on other streets, and all drivers of vehicles approaching a "main thoroughfare" must slow down and enter and cross such a thoroughfare at a rate of speed that will permit them to stop their vehicles within their lengths. Unless otherwise specified the "right and left" rule is applied to all traffic.

Section 3 deals with pedestrians and prohibits stepping on or off a moving street car and provides for movement under traffic officer direction at despatched crossings.

No building or heavy object whose movement may obstruct traffic can be moved along or across street railway tracks except under a special permit, is one of the miscellaneous provisions of Section 4.

Section 5 specifies the use of mufflers and prohibits noisy loads, operation with a flat wheel or flat tire or other defects that may interfere with private or public comfort.

The ordinance is unique in dealing with "delivery districts" in that Section 6 states that "the authorities shall have the power to designate, wherever traffic congestion shall in their judgment warrant such designation, certain special areas which shall collectively be known as the "delivery district." This section also gives the proper authorities the power to specify hours as the morning and evening traffic peak hours and defines slow, medium and fast-moving vehicles.

Section 7 deals with general regulations covering deliveries, stopping at curbs, licenses, etc., and Section 8 provides that no parade shall pass through a delivery district without a permit and that no parades may be held during traffic peak hours or block any street car line for longer than five minutes.

Parking provisions are covered by Section 9 and are specific as regards parking in delivery districts, near fire plugs, public buildings, etc. Section 10 covers traffic in one-way streets and Section 11 deals with special regulations in the delivery district. It states that vehicles shall not stop for delivery or loading of goods during peak hours and limits the size of vehicles which may operate in the delivery district.

Section 12 deals with street car regulations and states that cars shall be kept in good operating condition, be equipped with head and tail lights, visible at certain unstated distances front and rear, be provided with life guard, fender or other approved protective device and make fixed stops for passengers and such other stops as may be determined. Violation of the ordinance is considered a misdemeanor, but the penalty for conviction is left blank.

The ordinance is well drawn and shows that the committee has studied traffic conditions in detail. The provision regarding main thoroughfares and their crossings should expedite street car schedules, and giving the street car the right of way, other things being equal, should also aid car movement.

W. H. Maltbie in discussing the ordinance pointed out that the present traffic problem grows out of the development of the automobile, which has increased the speed of traffic movement and the number of traffic vehicles, and that the modern office building has increased the concentration of traffic in the delivery districts. He stated that regulation is essential which must provide safety at every point, expedite traffic and afford protection to individual rights to the street, such as the access of property owners to their property, drivers, riders, pedestrians and freight movers to passage through the streets, and all classes of emergency traffic.

The solution of the problem must be a compromise based on give and take, the rights of the few yielding to those of the many and the normal service to the emergency service, but no right must be entirely denied.

Mr. Maltbie continued by saying that traffic conditions differ in the various localities of a city so that district traffic regulations and rules are essential; that conditions vary from hour to hour in the districts so that peak and off-peak rules and regulations must be provided, and finally that the nature of the rules and regulations depend on the character of the traffic, which necessitates a classification of traffic with individual rules and regulations for each class.

ELECTRIC RAILWAYS WELL REPRESENTED

Ten committees were appointed to make recommendations for a model traffic law, each committee to cover its respective field. The railway industry was well represented on the committees, as is indicated by the following list of committees and the names of the railway representatives: Arrests and penalties, J. H. Handlon, general claim agent United Railroads of San Francisco; auto and truck transportation, W. V. Hill, manager California E. R. A.; electric railways, W. H. Maltbie, general counsel United Railways, Baltimore, and W. R. Alberger, vice-president San Francisco-Oakland Terminal Railways and president California E. R. A.; general laws, F. E. Chapin, general manager Peninsular Railway and San Josè Railroads; headlights, E. M. Maggard, general manager Petaluma & Santa Rosa Railway; municipalities, E. L. Lewis, assistant general manager Los Angeles Railway Corporation; organization, W. M. Abbott, chief counsel United Railroads of San Francisco; rules of road, F. W. Webster, general manager Visalia Electric Railroad, Fresno Traction Company, Stockton Electric Railroad and Central California Traction Company; safety first and safety appliances, C. E. Brown, general manager San Francisco, Napa & Calistoga Railway; steam railroads, H. A. Mitchell, general manager San Francisco, Sacramento Railroad.

On the last day of the convention the executive committee of the association decided to put the committee reports in the hands of a special committee which would have time fully to digest the various recommendations and prepare the desired model traffic law in time to submit it to the Dec. 2 meeting of the executive committee. On this committee for framing the law the following men were named: David Farres, Automobile Club of Southern California, Los Angeles, chairman; W. H. Maltbie, counsel for United Railways & Electric Company, Baltimore; Robert W. Martland, secretary California Auto Trades Association, San Francisco, David Von Schaak, National Safety Council, New York; E. W. Braun, Associated Chambers of Commerce, Elgin, Ill.; Percy E. Towne, American Automobile Association, San Francisco; J. B. Monahan, Southern Pacific Railroad, San Francisco; J. E. McCurdy, Peninsula Rapid Transit Company, San Mateo, Cal., and Dr. Clayton H. Sharp, Illuminating Engineering Society, New York.

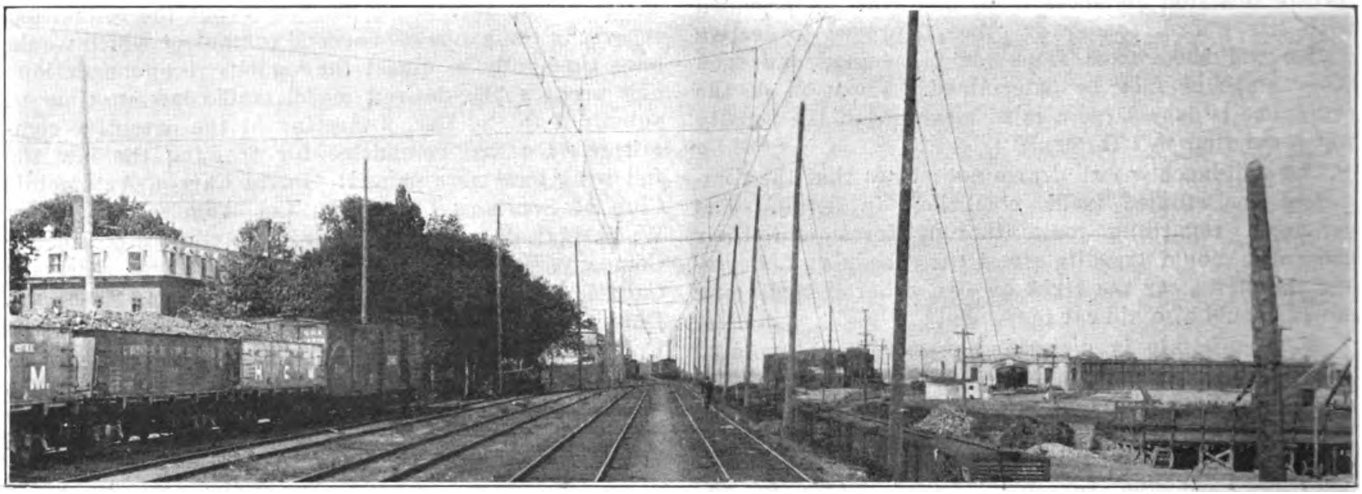
While the recommendations of all the committees are to be considered in framing the proposed model law where they can then be studied as a whole, it may be of interest nevertheless to mention here some of the provisions recommended. The electric railways committee approved specifically many sections of the "model traffic ordinance," which was printed and circulated at the convention by a committee of the American Electric Railway Transportation & Traffic Association. The general laws committee approved the provision that all motor vehicles must come to a full stop before crossing steam or interurban electric railways. The auto truck and transportation committee recommended that motor vehicles for passengers and freight-carrying purposes be considered as common carriers and that their control should be vested in utility commissions of the states in which they operate.

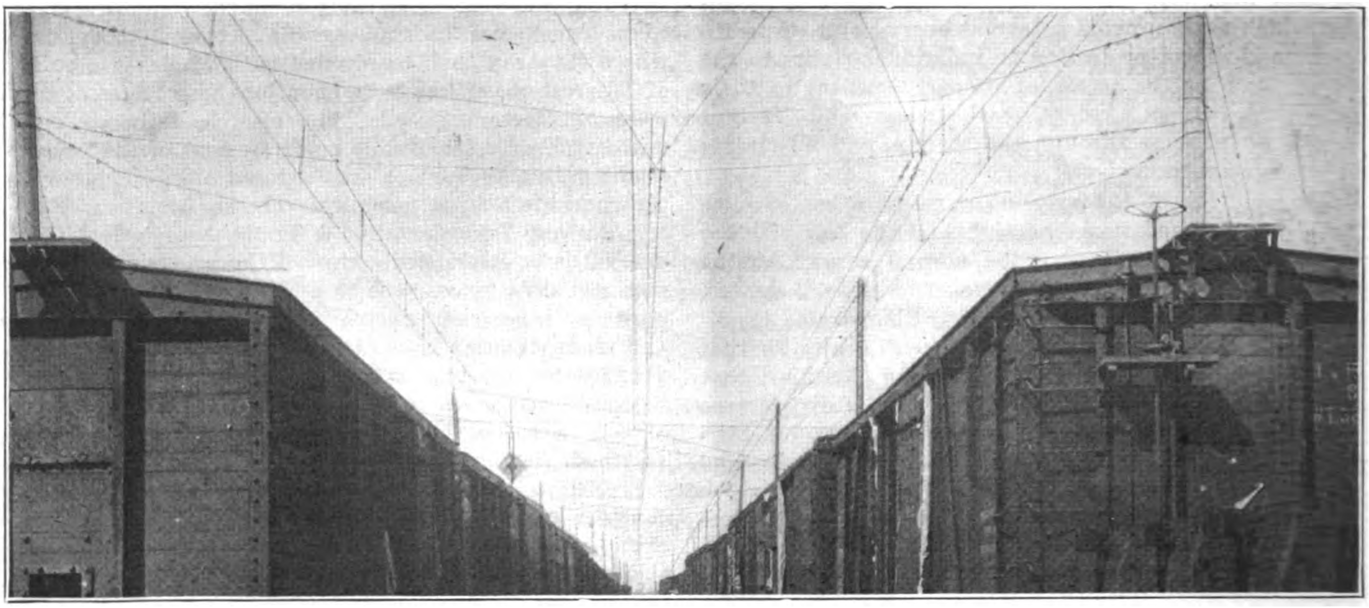
Mr. Maltbie is to write that part of the proposed law that deals with city traffic, while Mr. Farres will write the portion that deals with the highways, after which the committee as a whole will pass on the material presented.

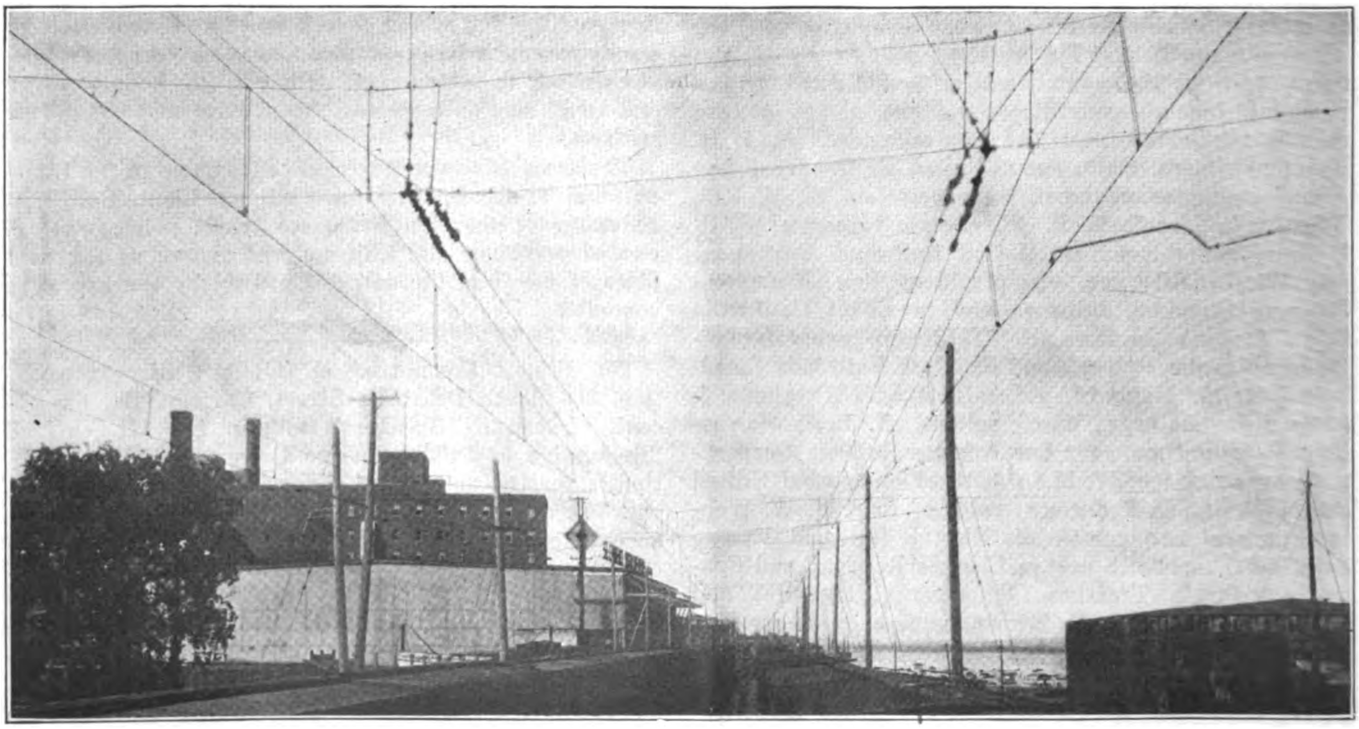
The meetings were held in the San Francisco Municipal Auditorium, where ample space was available for the display of a large number and variety of safety devices under the same roof, with meeting halls of large and small size suitable for the general and committee sessions.

The association voted to change its name to the International Traffic Officers' Association. Lieut. Daniel A. Sylvester of the San Francisco traffic police was reelected president and Chicago was chosen as the next place of meeting, the date to be fixed by the executive committee.

The Illinois Committee on Public Utility Information, 203 South Dearborn Street, Chicago, Ill., has recently issued its Speakers' Bulletin No. III, entitled "Regulation of Public Service Companies." This bulletion is for the purpose of suggesting ideas to speakers who are called upon to express themselves with reference to public utility problems. The present bulletin endeavors to assemble opinions of experts on fundamental questions concerning regulation and furnishes information about law and practice which have drawn around regulatory commissions. It emphasizes the spirit of regulation which governmental bodies are exercising the country over to give fair dealings both to the public and to the public utilities.







THE TOP VIEW SHOWS THE STANDARD OVERHEAD CONSTRUCTION ON TANGENT OF THE MONTREAL HARBOR COMMISSION. THE LOWER VIEWS ILLUSTRATE THE CONSTRUCTION AT CURVES AND SWITCHES

PORTION OF THE UNELECTRIFIED WATERFRONT OF MONTREAL, SHOWING PIERS, TERMINAL RAILWAY, ETC.

Electrification in Montreal

Montreal Harbor Commission Is Installing 2,400 Volts on 58 Miles of Terminal Track—Work Decided on Before War, but Now Being Carried Out

UNDER the direction of the Montreal Harbor Commission, at the head of which is a former electric railway manager, William G. Ross, Montreal harbor has become the second in North and South America and the seventh in the world as to the value of foreign commerce passing through it. The harbor may be considered to extend a distance of about 17 miles on both sides of the St. Lawrence River, and as it is at the head of ocean navigation on the St. Lawrence River and at the foot of inland navigation of the Great Lakes it seems certain to increase in importance still further. The large supply of electric power in the vicinity of Montreal will be an important feature in the development of that port.

It is not, however, with the shipping features of the port that this article will treat, but in regard to the terminal railway, which is now being electrically equipped under the direction of the commission. This railway comprises some 58 miles of track extending along the waterfront and connected with the piers, as well as with the steam railroads which enter Montreal. Regularly during the summer season the shunting on this harbor railway amounts to from 1,000 to 1,800 cars daily.

Decision to electrify this line was made in 1914, after the commission had determined that an electric locomotive could handle at least 25 per cent more traffic than a steam locomotive and that its operation was much more under control, but owing to financial conditions caused by the war construction was deferred. During the summer season of 1918 nine locomotives were in operation, and it was decided that if the service was to be maintained at its highest efficiency additional locomotives would be required. In July, 1919, plans and specifications were issued for the electrical equipment of the lines, and a start was made in September of last year. About half of the overhead lines are now electric.

In view of the climatic conditions and the very successful operation of the Canadian National Railway lines through the Montreal tunnel terminals, which have a 2,400-volt direct current overhead system in use, a similar system was adopted for the Montreal harbor terminal.

OVERHEAD EQUIPMENT

The overhead equipment, which is illustrated in several accompanying views, consists of cross-span catenary construction. The main messenger is a 7/16-in. extra-galvanized Siemens-Martin steel cable, anchored at half mile sections. The anchor poles are heavily guyed in all directions. The cross-spans are supported by wooden and steel poles at spacings of 150 ft. on tangent double track and 120 ft. or 105 ft., as conditions require, on curves and in yards. The cross-span wire is a 5/16-in. high-strength galvanized steel cable, the tension on the messenger and span being maintained at approximately 2,300 lb. The working conductor is No. 0000 grooved hard-drawn copper wire, suspended by the loop hangers at a uniform height of 23 ft. above the top of the rail.

Wooden poles are being used where the development is not completed, these being western cedar timber, varying in length from 40 ft. to 65 ft. as conditions demand. The poles are butt treated with hot carbolineum as a preservative. Steel poles are being used when permanent conditions exist, the poles being set in concrete carried well above the ground level. Welded 7-in. No. 0000 bonds are used.

At present two electric locomotives, built originally for the Canadian Northern Railway, are being used to shunt cars on the finished portion of this line. A substation, built for an ultimate capacity of three 1,000-kw. motor-generator sets, is being erected.

Take Your Choice

SENATOR Harding and Governor Cox have replied to a questionnaire presented to them by the American Association of Engineers. Governor Cox gives an unequivocal "yes" as his reply to each of the five questions presented. Senator Harding does not say no to any question and does say yes to some, but reserves his decision on one main "important and far-reaching" question until he has given it "the very fullest study."

The questions submitted were: (1) Do you favor a Department of Public Works, for the purpose of reducing and co-ordinating the present number of bureaus and commissions and reducing the useless expenditure of money incidental thereto? (2) Are you in favor of putting all engineering and construction enterprises (excepting purely military work) in such a department to obtain economy and efficiency? (3) Do you favor an engineer as member of the Interstate Commerce Commission? (4) Do you favor a progressive and constructive program of conservation and development of our natural resources? (5) Do you favor a budget system for appropriating public funds? (6) Do you favor the reclamation of waste lands and giving the settler the advantage of procuring such lands by a sound financial system such as is provided by a rotating fund?

Governor Cox replied:

"My reply to every one of the questions you ask is unequivocally 'Yes.'"

Senator Harding replied:

"I have had up the matter of the Department of Public Works. . . . I fear I should be unworthy of public confidence if I ventured to decide so important and far reaching a question without the very fullest study. It involves the reorganization of several departments. Undoubtedly, there is necessity for this, but I should be very reluctant to commit myself unalterably to it without the very fullest of understanding. . . . I have already sent for the congressional hearings on the particular question.

"I may say, in a general way, that I think very well of the appointment of an engineer on the Interstate Commerce Commission and I have always spoken heartily in favor of a progressive and constructive program of conservation. I am sure you know I favor the budget system and a very forward policy relating to reclamation and irrigation."

Appeal to Encourage Research

ENGINEERING FOUNDATION, administered under the auspices of United Engineering Society and the four "founder societies," A. S. C. E., A. I. M. & M. E., A. S. M. E. and A. I. E. E., is supported only by voluntary endowment and now finds itself in need of approximately $500,000 additional endowment immediately, to add to the present $300,000 and the assured $250,000 more. It appeals, in a bulletin issued Aug. 23 from its headquarters, 29 West Thirty-ninth Street, New York, to the engineering profession and industries based on engineering for the necessary endowment.

Engineering Foundation is organized to support researches in engineering and to aid in applying the results to engineering industries. It exists largely on account of the need of research, other than that carried on by the Government and large corporations, beyond the means of industrial engineers, small companies and separate societies. Its method of operation is to support researches by individuals and organizations and to co-operate with, but not duplicate the work of, other research organizations which now exist and operate in limited or restricted fields. It also purposes eventually to establish a research institute and laboratory, the latter probably partly self-sustaining.

The bulletin records the past history and accomplishments of Engineering Foundation and indicates its usefulness to the industries dependent upon engineering and applied science. It shows the need of the foundation and the reasons why engineering industries should make an effort to add to its endowment.

San Francisco Rail Jointing Methods

IN THE last ten years the United Railroads of San Francisco has made more than 11,000 rail joints on the tracks of its system, and although joints laid previous to 1910 have given some trouble, to date there have been no cases of loosening or cupping in track laid since the present installation methods were adopted. No welded joints have been put in and with the present record for joints that stand up under long service engineers of the company do not consider that welding is necessary under conditions in San Francisco.

The policy followed is to allow rail joining to be done by only one crew and to keep the work of this crew up to a very strict high standard. This crew, which also does the bonding, consists of one foreman and two to four men. Two additional men are required for operating the planer when that is required. The crew is kept as nearly intact as labor conditions permit.

When a rail joint is to be made the track laying gang leaves it after simply putting the plates in place with two bolts to hold them together. When the bonding crew comes along the plates are removed and a very careful job of fitting and finishing all parts of the joint is done. The secret of the company's success with rail joints is believed to be a tight fit all around. Inspectors make sure that this is secured even if the crew has to come back to the joint several times; in fact, this is not an unusual occurrence.

An important part of the work is the filing off of the rail heads until both are exactly on the same level. This is done with a vixen file held in a two-man machine. The file is worked back and forth along the joint until both rail heads show bright for their full widths. The theory is that if the rail heads are exactly level and if the joint is tight cupping cannot occur. It has sometimes been noted that a rail joint on which no difference of level can be seen or felt with the fingers, nevertheless will, when the file is put on it, show that there is a slight difference in elevation. This is at once apparent after a few strokes of the file, as low places will not show bright. The elimination of this slight difference is believed to prevent the beginning of the destruction of the joint by preventing "cupping" from starting.

All the joints referred to above are on 106-lb. rail and use bridge type, twelve-bolt hole, Loraine Steel Company plates. The custom is to buy plates and rails at the same time and to specify that the plates shall be of the same metal and of the same hardness as the rails. The engineers of this company believe that plates made of material softer than the rail itself are less likely to keep the joint permanently tight.

Electrification of the Prussian Railways in Silesia*

Single-Phase Power with 15,000 Volts on the Contact Line Is Used—Interconnected Water Power Plants with Steam Auxiliary Furnish Power—Several Types of Locomotive Are Required to Cover All Classes of Requirements

THE railroads of the Silesian mountains extend along the frontier of Bohemia between Görlitz and Glatz, as indicated in Fig. 1. They serve several industrial districts, of which Waldenberg is the most important. There is a very important traffic of both passengers and merchandise, especially coal, the development of which should be facilitated by the electrification of the railway lines.

This electrification was authorized by a law dated June 30. 1911. It is intended to include all the lines of the district of Breslau. In order to minimize the expense of installation and to profit from existing facilities, power will be purchased from a private company founded by the Allegemeine-Elektricitäts-Gesellschaft and the Siemens-Schuckert-Werke, which have undertaken the construction of the central stations and the high-tension transmission lines joining them, the administration of the system retaining to itself the title to the equipment of the lines. The company obligates itself to deliver 40,000,000 kw.-hr. per year at a price of 2.75 pfennigs, with a rebate of 1 pfennig per kilowatt-hour not used. The maintenance of the high-tension line and substations devolves upon the railroads.

Fig. 2 gives a simplified profile of the principal line, which extends from Lauban to Königszelt. Heavy grades are encountered, and the train weights are up to 550 net tons for the expresses and 1,300 tons for the freight trains. With steam operation the use of two very heavy locomotives for each five cars was necessary. Aside from this the proximity of important hydraulic power permitted with electrification a large saving in coal. Hydraulic stations are located at Mauer with 5,500 kw., Marklissa with 2,600 kw. and Weistritz with 1,300 kw.

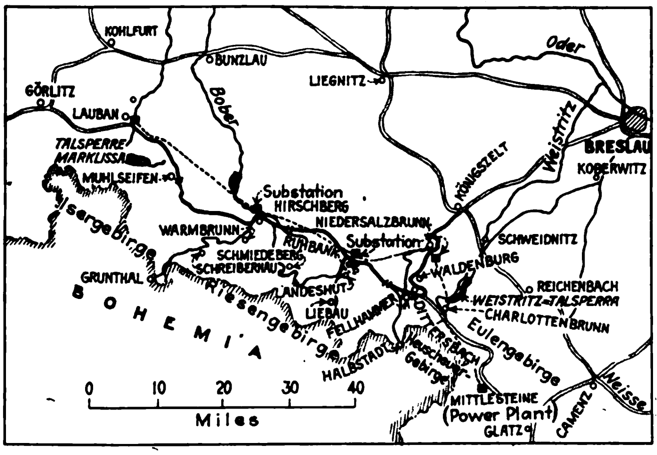

KOHLFURT
BUNZLAU
LIEGNITZ
Oder
GÖRLITZ
LAUBAN
Bober
TALSPERRE MARKLISSA
MUHLSEIFEN
Isergebirge
Substation HIRSCHBERG
NIEDERSALZBRUNN
WARMBRUNN
RUHBANK
Substation
SCHMIEDEBERG
SCHREIBERHAU
GRUNTHAL
LANDESHUT
LIEBAU
BOHEMIA
Riesengebirge
FELLHAMMER
DITTERSBACH
HALBSTADT
Heuscheuer-Gebirge
KÖNIGSZELT
Weistritz
BRESLAU
KOBERWITZ
SCHWEIDNITZ
WALDENBURG
REICHENBACH
WEISTRITZ-TALSPERRA
CHARLOTTENBRUNN
Eulengebirge
MITTLESTEINE (Power Plant)
GLATZ
CAMENZ
Weisse
0 10 20 30 40
Miles

FIG. 1. MAP OF SILESIAN MOUNTAIN ELECTRIFICATION

The complete system includes the following lines: Double-track line from Lauban to Königszelt, 80 miles; single-track line from Nieder-Salzbrünn to Halbstadt, 21.8 miles; double-track line from Ruhbank to Landeshut, 3.7 miles, with branch line from Landeshut to Liebau, 16.8 miles; line from Hirschberg to Warmbrünn, Schreiberhau and Grünthal, 33 miles; line from Hirschberg to Schmiedeberg and Landeshut, 25 miles. These total a route mileage of 170, comprising 310 miles of single track. All of the other lines have profiles similar to that of the principal line. The maximum grade is 2 per cent between Freiburg and Nieder-Salzbrünn; the other grades are 1½ and 1 per cent, and the difference in elevation is 1,080 ft. On the double-track line from Hirschberg to Grünthal the difference in elevation is 1,800 ft., with a grade of 2½ per cent. The curves are likewise very numerous and their radius is sometimes as low as 620 ft.

Coal of a mediocre grade, peat and coal dust will

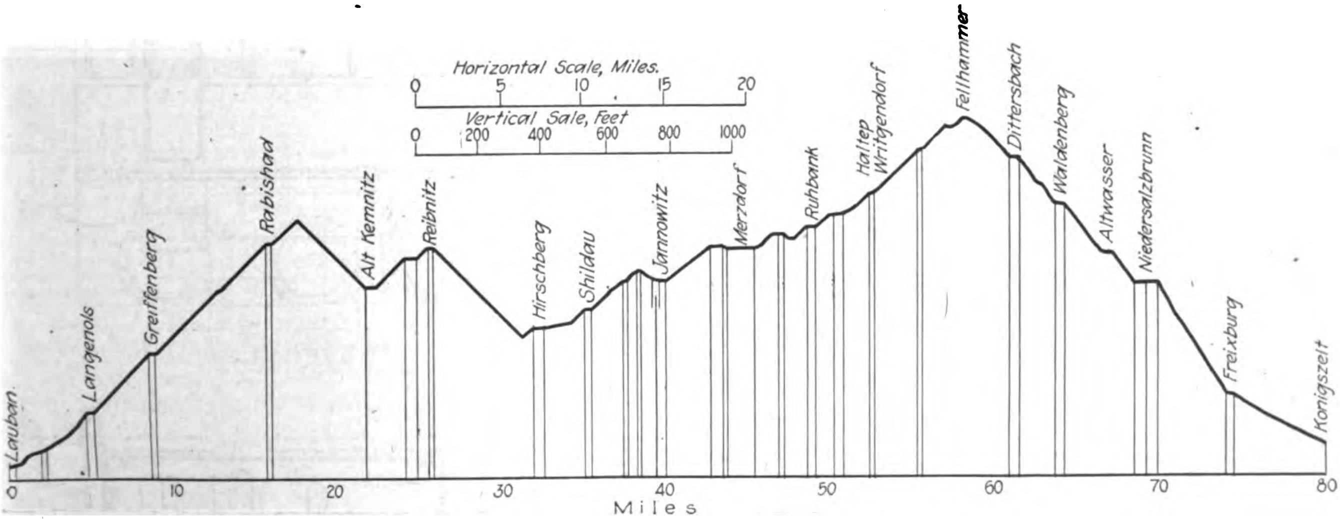


FIG. 2. PROFILE OF THE MAIN LINE

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*Based on article in *Revue Générale de l'Electricité*, Jan. 31, 1920. Original long article by E. C. Zehme appeared in *Elektrotechnische Zeitschrift*, July 17, 24 and 31, 1919.

be made to furnish the auxiliary power supply. Stations to utilize these will be constructed near the mines to save freight. A voltage of 15,000 was chosen for the contact line, using 16-cycle, single-phase current.

The principal steam plant has been constructed about 1.25 miles from the Mittlesteine station, 40.7 miles from Lauban. The price of coal at this point was 6.4 marks per ton before the war. Its calorific value was 11,000 B.t.u. per pound, on the average, with 17 to 20 per cent ash.

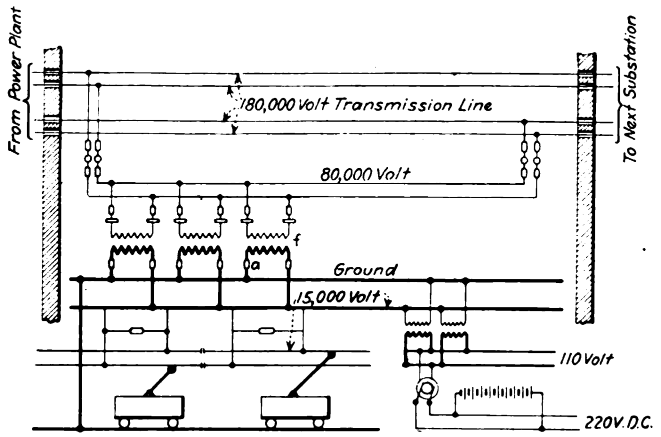


FIG. 3. CONNECTION DIAGRAM FOR NIEDER-SALZBRÜNN SUBSTATION

This station was designed for twenty-four trains, of which one-half, when climbing grades, would require 9,000 kw., the other half 3,000 kw. Four 5,000-kva. turbo-generators were installed operating at 1,000 r.p.m. and producing 3,500 volts at 16.6 cycles. The ultimate plan calls for six units. The station also contains three other turbo-generators of 2,500-kva. capacity each, operating at 3,000 r.p.m., 2,000 volts and 50 cycles. These will serve neighboring localities with power.

The single-phase voltage is raised from 3,500 to 80,000 by means of six 5,000-kva. transformers. The oil circuit breakers are of the remote-control type and the instruments and circuit breakers are on the low-tension side. To take care of sudden changes in load, the generators are furnished with Tirrill regulators and overcompounded fields which provide constant potential at all substations. The 80,000-volt buses with their protective apparatus are immediately behind the transformers.

The boiler room is planned for fourteen boilers with inclined tubes having 4,900 sq.ft. heating surface, designed for a pressure of 230 lb. per sq.in. Of these ten have been installed. The large boiler capacity provides for large variations of load. The furnaces are automatically fired, the Plut stoker system being used with forced draft. Ash removal is accomplished by the use of 600-lb. carts, pushed by man-power. The boilers are equipped with superheaters and feed-water heaters.

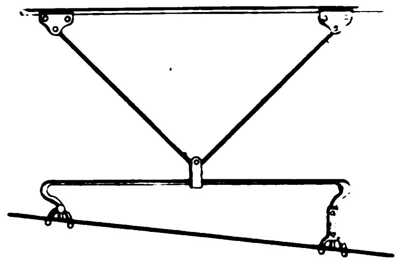


FIG. 4. CONTACT LINE SUPPORT PROVIDING FOR LONGITUDINAL MOVEMENT OF WIRE

The distances along the 80,000-volt transmission lines from the central station to the substations are respectively Nieder-Salzbrünn, 23.6 miles; Ruhbank, 35.5 miles; Hirschberg, 52.1 miles, and Lauban 77 miles. The substations are so located as to minimize line losses.

The voltage is transformed from 80,000 to 16,000 in the substations by means of air-cooled transformers. There are five of these at Nieder-Salzbrünn, four at Ruhbank, five at Hirschberg and three at Lauban, all rated at 1,600 kva. Fig. 3 gives the scheme of distribution. The high-tension line enters and leaves at the second floor level and the low-tension at the first floor.

The high-tension line, in duplicate, is composed of four wires suspended by string insulators containing five units each. The span varies from 330 to 660 ft. The line is of 185,000 circ.mil copper cables to Nieder-Salzbrünn, 130,000 circ.mil to Hirschberg, and 60,000 circ.mil to Lauban. The contact wire is of hard-drawn copper with "figure 8" section, 200,000 circ.mil area and with a tensile strength of 53,000 lb. per sq.in.

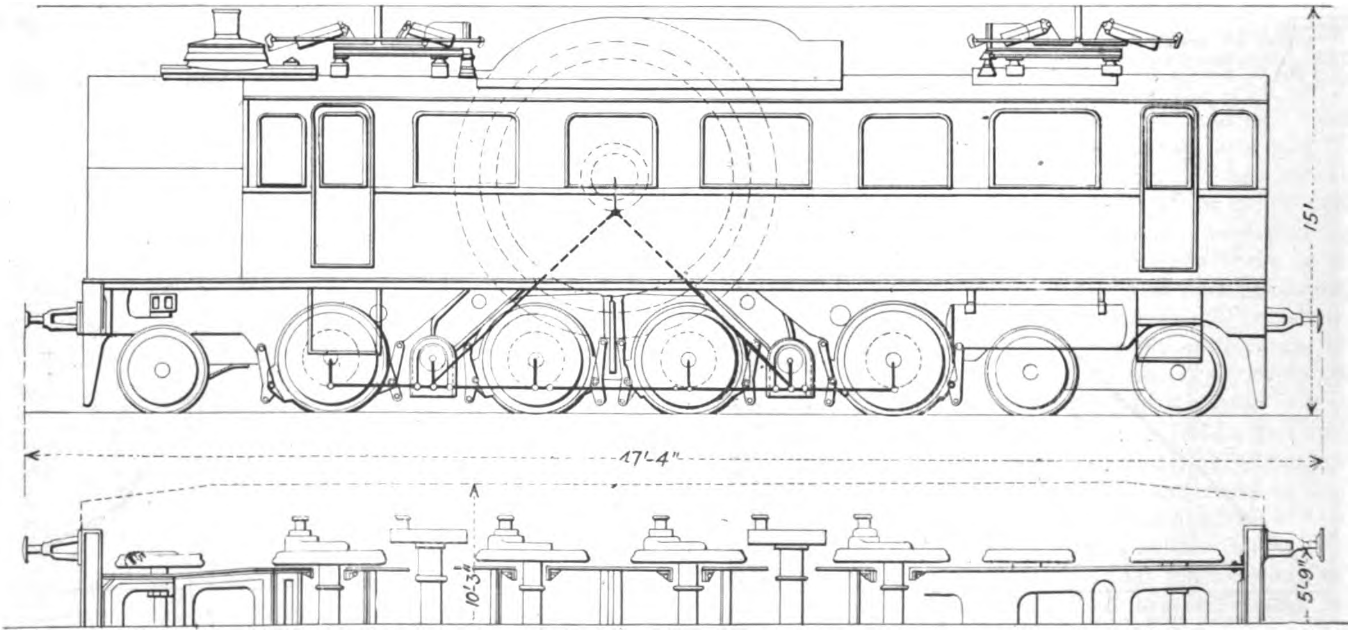


FIG. 5. DIAGRAM OF THE BERGMANN LOCOMOTIVE

The contact system is supported by catenary suspension. On part of it an auxiliary cable suspended from the messenger carries the contact wire, which alone is insulated. On another part two contact wires are suspended from the same cable. A special arrangement has been adopted to allow for longitudinal displacement of the contact wire as shown in Fig. 4.

The electric locomotives were required to comply with the following requirements: Haul 440-ton express trains, 400-ton passenger trains or 485-ton freight trains on the 2 per cent grade with curves of 580 ft. radius, and 1,100-ton freight trains on grades of 1 per cent with curves of 2,500 ft. radius, with varying intermediate conditions. The equipment includes twenty locomotives for heavy express and passenger service, thirty-five locomotives for freight service, seven locomotives for light trains, thirteen locomotives for mixed trains and six motor cars. The war greatly delayed the delivery of the locomotives.

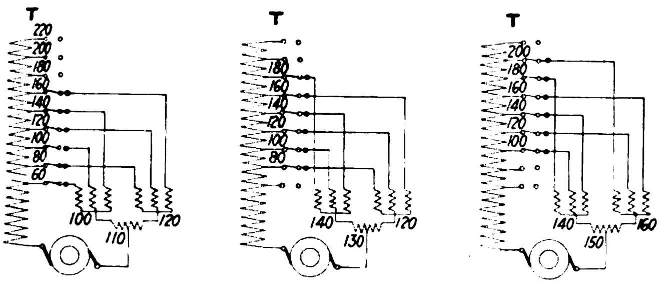

T
220
200
180
160
140
120
100
80
60
100
110
120
T
180
160
140
120
100
80
140
130
120
T
200
180
160
140
120
100
140
150
160

FIG. 6. CONNECTION DIAGRAM, BERGMANN LOCOMOTIVE

The side-rod locomotive built by the Bergmann-Electricitäts-Werke is shown in Fig. 5. There is one motor rated at 2,250 kw. It delivers its power by means of cranks set at 90 deg. and with intermediate jackshafts to which the wheels are coupled. The locomotive has a very regular torque.

The rear axle has no end play, but that of the center axles is 0.5 in. and that of the forward axle is 1 in. on each side. The pony axle under the boiler has over 2 in. play.

The torque corresponding to the rated power is 65,000 lb.-ft. at 240 r.p.m. The maximum speed is 380 r.p.m. Provision has been made for shifting the brushes by which means 2,250 kw. can be developed at 380 r.p.m. For this reason commutating poles are not used, but the poles have been designed so that the induction will be sufficient in the zone of commutation, whatever be the position of the brushes.

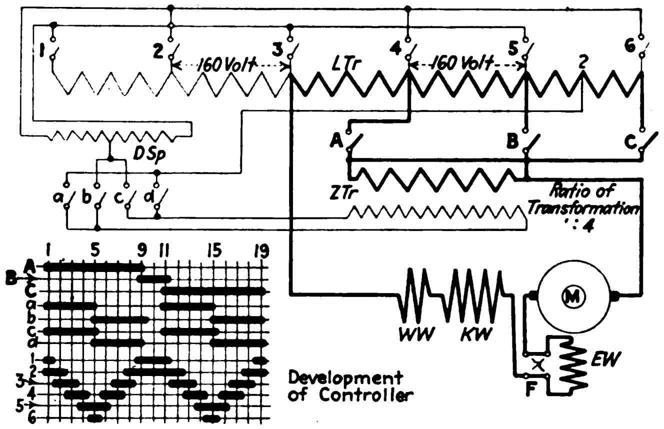

1
2
160 Volt
3
LTr
4
160 Volt
5
2
6
A
B
C
DSp
a
b
c
d
ZTr
Ratio of Transformation 1:4
1
5
9
11
15
19
A
B
C
a
b
c
d
1
2
3
4
5
6
Development of Controller
WW
KW
M
EW
X
F

FIG. 7. CONNECTION DIAGRAM, MAFFEI-SCHWARZKOPF LOCOMOTIVE

The motor is cooled by a fan driven by a 23-kw. motor. A similar fan cools the transformer.

The driving wheels of the locomotive have been made as small as the speed of the motor would permit, the diameter being 4 ft. 1.2 in. At 380 r.p.m. this produces a speed of 56 m.p.h. The diameter of the frame of the motor is 11 ft. 5.8 in.; that of the rotor, 8 ft. 10.4 in., and that of the commutator 6 ft. 10 in. There are twenty-six poles and the total weight of the motor is about 24 tons. Regulation is accomplished by varying the electromotive force applied and by changing the brush position. The commutator for the transformer connections is operated by compressed air and operates as is shown diagrammatically in Fig. 6 herewith.

The operator controls the potential and the brush position by means of two controllers. On starting, the pantograph is raised by compressed air and the oil circuit breaker is closed. At this point the brushes are in their extreme position.

SWITCH STEPS	CONTACTORS 1	2	3	4	5	6	7	8	9	10
1	o o	o o	o o							
2	o	o o	o o	o						
3		o o	o o	o o						
4		o	o o	o o	o					
5			o o	o o	o o					
6			o	o o	o o	o				
7				o o	o o	o o				
8				o	o o	o o	o			
9					o o	o o	o o			
10					o	o o	o o	o		
11						o o	o o	o o		
12						o	o o	o o	o	
13							o o	o o	o o	
14							o	o o	o o	o
15								o o	o o	o o

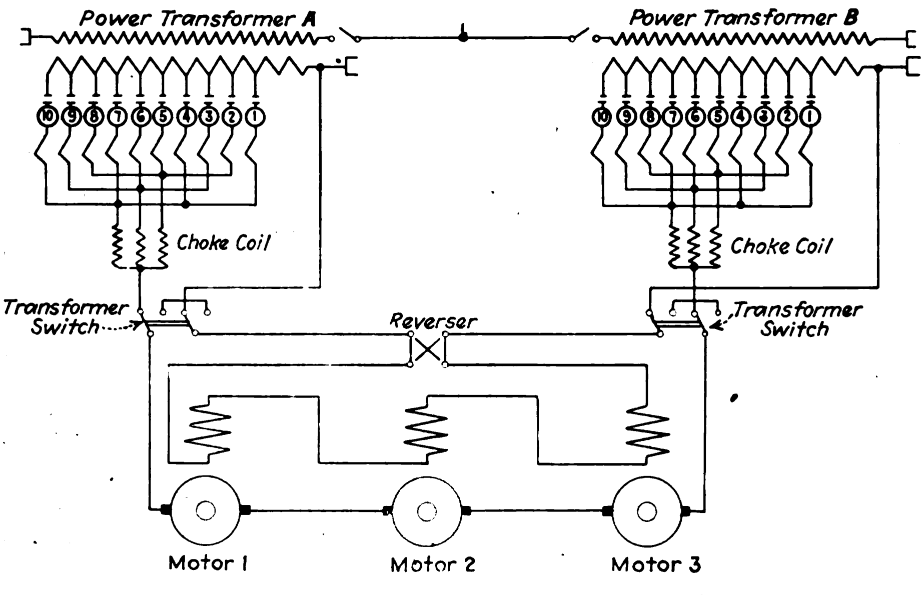

Power Transformer A
Power Transformer B
⑩⑨⑧⑦⑥⑤④③②①
⑩⑨⑧⑦⑥⑤④③②①
Choke Coil
Choke Coil
Transformer Switch
Reverser
Transformer Switch
Motor 1
Motor 2
Motor 3

FIG. 8. CONNECTION DIAGRAM, SIEMENS-SCHUCKERT LOCOMOTIVE

In addition to the apparatus described above, mention should be made of the boiler, fired with coke burned under forced draft furnished by electrically driven fans, which is used to heat the trains.

The weight of the locomotive on the track is 119 tons, divided 18.2 tons on each driving axle and 15.4 tons on each idle axle.

A modification of the above locomotive was built with two 760-kw. motors each and a reduction of the speed by a single gear acted upon by each of the motors, the gear being on an intermediate axle placed between two driving motors. The motor speed is 900 r.p.m.

For the express trains a type of locomotive with a 900-kw. motor (1,300 kw. on the hourly rating) is used. These locomotives were built by the Maffei-Schwarzkopf-Werke and are for trains of 265 to 375 tons. They have three coupled axles spaced respectively 5 ft. 3.2 in. and 7 ft. 7.1 in. The mean speed is 28 m.p.h. and the maximum 56 m.p.h. The weight is 91.5 tons, of which 40.5 tons is for electrical equipment.

The motor is placed slightly above the axles and crank-connected through intermediate beams to the three driving axles. The motor is of the series compensating type without auxiliary resistance and without any special commutation devices. The voltage in the field coils and in the short circuit of the rotor is so low that it can be compensated with normal resistance of the commutating circuit. There are nineteen steps in the speed control, which is accomplished with the aid of an auxiliary transformer as indicated in Fig. 7. This transformer raises or lowers the secondary voltage furnished by the several windings of the main transformer.

The locomotives for freight trains carry three motors, each driving two axles by means of a counter-weighted crankshaft. The tractive effort is 35,400 lb. at 6.4 m.p.h., 16,500 lb. at 12.4 m.p.h. and 15,400 lb. at 18.7 m.p.h. The maximum speed is 31 m.p.h. These locomotives carry two pantographs and two transformers, of which the primaries are connected in parallel and the secondaries in series, insuring uniform distribution of the load.

The stators have a reversible winding to change the direction of rotation, a compensating winding and a commutating winding, the latter two being in series with the rotor. The two transformers have ten windings and the connections are so made as to obtain fifteen speed steps as indicated in Fig. 8. All of the control is electric. The ventilating and pump motors are 90-volt, the lighting is at 20 volts and the heating at 200 volts, the circuits being tapped in on the various windings of the transformers. The locomotive is operated from the extreme end, the center serving as a baggage compartment.

Motor cars have been provided for light traffic. The trains are composed of three cars. Each has a capacity of 150 persons and 3.3 tons of baggage, and can besides haul one 22-ton trailer. The motor car is placed between the two trailers; it carries one motor with two rotors, geared to an intermediate jackshaft which is crank-connected to two driving axles.

The St. Gothard Railway in Switzerland was on July 1 operated for the first time by power from the Lake Riton hydro-electric power plant.

Emmet Mercury Boiler

A Device Which Promises Increased Efficiency in Power Generation by Increasing the Working Temperature Range of Vapors Employed

THE war interrupted the development of the mercury boiler, but its inventor, W. L. R. Emmet, has obtained valuable data during the interim and it is understood that a commercial installation is to be made in the near future. Supplementing the article in the issue of this paper for March 14, 1914, page 575, the following will be of interest.

The efficiency of any heat engine can be increased by increasing the temperature range through which it works. The supply temperature can be raised or the exhaust temperature lowered to obtain the desired results. The supply temperature is limited by the combustion temperature and the heat properties of the element used in the boiler as well as by the materials from which the boiler is made. The exhaust temperature is limited by the properties of the element used and the vacuum that can be obtained.

Steam pressure becomes very great when high temperatures are obtained, so Mr. Emmet has taken mercury as his primary agent and steam as his secondary agent in a binary-vapor process. Mercury, at atmospheric pressure, boils at 677 deg. F. and condenses in a 28-in. vacuum at 455 deg. F., while corresponding temperatures of water are 212 and 101 deg. F. respectively.

In the Emmet process mercury is vaporized in a coal-fired boiler at 10-lb. pressure, the mercury vapor is passed to a single stage turbo-generator and then exhausted into a surface condenser at low vacuum and condensed by circulating water. The circulating water becomes steam in the condenser due to the high temperature of the exhaust mercury vapor and the steam is used to drive another turbo-generator, after which it is exhausted into a second surface condenser and condensed. The plant thus operates on a temperature range of from about 900 deg. F. to 101 deg. F. and uses two heat transferring agencies, mercury and water, in two separate turbo-generators.

The principle is sound and Mr. Emmet has devised practical apparatus for applying the principle. A newly designed boiler for the mercury had to be made to keep the mercury charge to minimum volume due to excessive cost of mercury. The temperatures were very high and fittings had to be obtained to withstand them. Mercury vapor is poisonous, has a bad habit of amalgamating and leaking through bearings so that materials and packing were important items. Mercury has a high density and low spouting velocity, so Mr. Emmet was forced to design a single stage turbine for the mercury vapor. The high density of mercury eliminates a feed pump for the mercury boiler as the condenser is fed by gravity to the boiler.

Inventive skill has overcome all difficulties and reports indicate an early commercial application of the process. A low pressure, highly efficient thermo-dynamic process will be very welcome in these days of high power costs. An attractive schematic layout of the Emmet plant, with the different portions shown in colors, can be found in the August 3 issue of *Power*.

The chief difficulties encountered in the commercial application of the process are connected with the selection of suitable materials to withstand the action of the mercury for long periods of time.

Coal Storage*

Factors Entering Into Spontaneous Combustion Are Numerous and Complex—A Preventive Formula Is Difficult to Find

By O. P. Hood
Chief Mechanical Engineer U. S. Bureau of Mines

THE spontaneous combustion of coal lies at the bottom of the subject of storage. The main interest in the subject lies in the large piles needed for reserve by public service utilities and the industries. Every one desires to have a perfectly simple direction for storage which will insure against loss, but, unfortunately, the matter is too complicated for a simple solution. Many of the factors involved are difficult to determine, as we have no practical means of quantitative measurement. These factors involve chemistry, physics and engineering, and the man who is in close contact with the problem of stored coal is not always a good observer in these several lines.

The heating of coal is believed to be a surface phenomenon. If a ton of bituminous coal could be delivered in a single cube each dimension would be about 2.8 ft. If the coal heats, it is due to something that goes on with respect to the surface and not something that happens inside of the piece. If the size is reduced to something about 16-mesh screen, there is an acre of exposed coal surface. It is perfectly obvious from this why it is that trouble from spontaneous combustion originates in fine coal, because the great increase in extent of surface does not begin until we get below 1¼ nut. If fine coal is kept out of the pile the heating surface is relatively so small as to remove the cause of spontaneous combustion.

A unit of area of this coal surface generates a certain amount of heat, provided it can find combining material. The amount of heat generated depends upon the temperature of the piece of coal. That is to say, coal put into storage at a temperature of 80 deg. will generate very much more heat per unit of surface than if put into storage at the temperature of 60 deg.

Another most important factor is the freshness of the broken surface. A freshly broken surface of coal has a rate of heat generation that is a function of the kind of coal. It is practically zero with anthracite and is largest with the younger coals. The quantity of oxygen contained in the coals seems to be the fairest measure of this rate, although by no means reliable. The high-oxygen coals of the Middle West and the sub-bituminous coals and lignites of the West show increasingly active rates of heating.

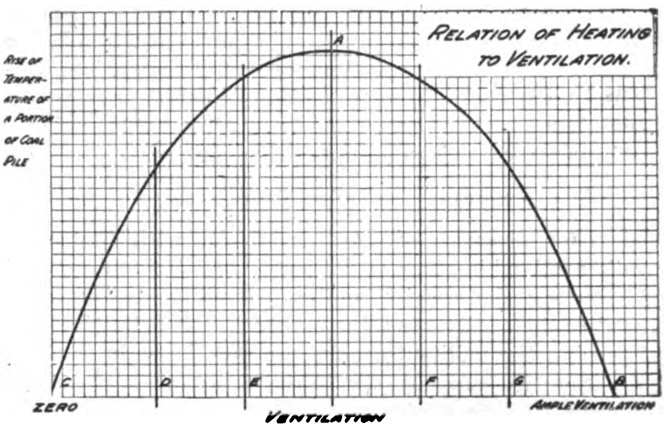
The coal surface apparently becomes satisfied in time and the heat produced falls to practically zero. This means that for the first few days or weeks a freshly broken surface is very much more active than after a few weeks or months. Fires rarely occur after surfaces have been exposed for three months.

A Problem of Ventilation

Since the rate of heating increases with the temperature, it is evident that if the heat generated is not removed the process becomes a self-aggravating one, in which case the rate of heat generation, instead of falling, may rise with time. If the temperature of the pile reaches 140 deg. or 150 deg. and continues to rise there is a very considerable probability that within a few days or a few weeks a destructive temperature will be reached and the coal must be moved. Immediately the question of getting rid of the heat is presented.

A coal pile is cooled by radiation and by movement of air through the pile. In many cases the natural changes or breathing of air is enough to carry away the heat generated. Some observers have stated that, in general, fires in large coal piles are found in the region from 5 to 8 ft. below the surface on the flanks of the pile.

We know that if coal can be sealed tight, as in a glass jar, the oxygen soon disappears and the coal cannot continue to heat because of lack of oxygen.



RELATION OF HEATING TO VENTILATION

In the accompanying graph horizontal distances represent the amount of ventilation of any portion of a coal pile and vertical distances represent rise in temperature. With no ventilation there will be no rise in temperature and the zero point will represent the condition of coal sealed from the air or so densely packed that air cannot circulate. If, on the other hand, there is sufficient ventilation, the heat is all carried away as fast as generated and some point, as at "B" on the zero line, must represent this condition, in the case of coarse coal. At some point, as at "A," between these two extremes there may be a condition of ventilation which will supply just oxygen enough to provide for a maximum rise in temperature. What sort of a curve represents all of the intermediate conditions between "C," "A" and "B" we do not know, but that the curve must first ascend and then descend is perfectly evident. This curve teaches that if we have a condition of ventilation, as at "D," an increase in the ventilation to "E" will produce a more favorable condition for a temperature rise. On the other hand, if the original condition is as "F" and we increase the ventilation to "G" we can expect a reduction of temperature. Since we have no means of knowing just what the ventilation is in any given portion of a pile, there is great hesitancy in advocating ventilating schemes for coal piles, as we are as likely to make trouble as to prevent it unless extreme and uniform ventilation is assured.

There are many more minor factors in dealing with coal storage. One of the troubles has been that undue attention has often been given to these minor factors, such as sulphur, height of pile, volatile matter, etc., while main factors, such as initial temperature, breakage in handling, freshness of coal and coal screening before storage, have been overlooked and minimized.

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*Abstract of a paper presented before the Pennsylvania Electric Association, Bedford Springs, Pa., Sept. 10, 1920.

Engineers Commend Commission

Western Society of Engineers Passes Resolutions to Controvert Agitation for Return to Local Control of Utilities

THERE is a great deal of agitation in Illinois at the present time which seeks to abolish the Public Utilities Commission in order that the control of utilities may be left to the communities in which they operate. The board of directors of the Western Society of Engineers at its meeting Aug. 25, 1920, drew up a set of resolutions commending the commission and urging its retention. The resolutions point out that the membership of the Western Society of Engineers is fitted both by training and experience to observe, study and form an intelligent opinion as to the relative merits of the present system of state regulation contrasted with the old and practically obsolete system of city control as an agent in discerning the non-functioning or the inadequacy of utility service.

SUBSTANCE OF THE RESOLUTIONS

A brief abstract of the resolutions with the main points outlined is given as follows: (1) The old method of securing the service and establishing the rates of a utility in a city was the natural but primitive one of forcing the utility to make the best bargain it could with the City Council, the bargain being expressed in the form of a franchise or contract ordinance; (2) the old system, like any commercial bargain not based on costs, resulted in poor service where rates were too low, extravagance and corruption where they were too high, and the worst kind of local politics and practices; (3) the citizens elected the City Council to represent them in the bargain. The owners of the utility company similarly elected directors and officers to represent them. This method was obviously unfair, since a square deal required a third party as judge to whom each side could present its argument for an impartial decision; (4) the old system has proved a failure after long trial, not only for reasons suggested above but also because it left the service-using public helpless against either poor, inadequate service or unjust rates during the contract period; (5) the new system of state regulation of service and rates by a commission is a natural and logical outgrowth of the attempt to remedy the obvious and unvariable faults of the old system; (6) home rule, so called, as now proposed is but a proposition to popularize the old system by giving it a good name; (7) in our opinion the only thing which has saved any semblance of adequate utility service in Chicago under present cost conditions is the fact that the contract ordinances, established by the City Council under the old system, and still fought for by the city administration, could easily be broken and overruled by the action of the state commission under the working of the new system; (8) the public might benefit under the old system except for two important facts; first, good service is more important than a low fixed rate in any city; second, no utility company can be forced to do the impossible, that is, to give good service, or service at all adequate, after its receipts cease to meet its expenses; (9) opposition to control of utilities through a state commision seldom, if ever, takes the form of objection to any feature of the regulatory law under which the commission acts. There is opposition to having a commission at all and opposition to its personnel, but no acts performed by the commission under the law and under its oath of office are pointed out as against public interest or as being unfair and unjust. The public is safeguarded from illegal or unjust acts of the commission by the fact that such acts are always subject to court review; (10) there are forty-two state commissions in the United States and five commissions in Canada and they have found it necessary and to the public interest to raise utility rates since the war. It is not a local issue, nor can the Illinois commission be pointed at as a special offender in this regard, as some are trying to make it appear. The old rates are now as impossible with the utilities as with other necessities; (11) the basis of old-time rates has changed with the tremendous changes in wages and other costs. This fact seems to us self-evident and to dispose of most of the argument to restore so-called home rule in order to get back the old 5-cent fare. It cannot be done under the old system any sooner than under the new. Service, the really important factor to the people, will be jeopardized by such a reactionary change; (12) the commission has performed its proper duty in increasing rates to meet present conditions and will be an equally effective agent in decreasing them should conditions warrant reductions in the future; (13) any attempt to impair the usefulness of the commission, to abridge its powers, and especially to go back to the old era of political control of utilities, in vogue prior to the time when commission regulation became the law, would be a distinct step backward and would constitute a grave menace to the industries of the state and to its people.

Flowability of Concrete

Apparatus Has Been Devised for Determining Important Characteristics by Means of a Simple Test

IN A recent issue of *Concrete*, G. M. Williams, associate engineer United States Bureau of Standards, gives the result of some investigations made in its concrete laboratory. These showed that the consistency or "flowability" which should characterize the concrete for any particular case is dependent upon the nature of the work, upon the type and arrangement of the forms and the reinforcing steel. For any given condition there is a minimum flowability which must be attained to result in good workmanship and in economy and also to cause the proper progress in the process of concreting.

For measuring the consistency of concrete a flow table has been developed. This consists of a metal-covered table top, which can be raised and dropped by means of a cam working at the end of a vertical post to which the top is attached. The height of drop can be adjusted by means of a bolt at the lower end of the shaft.

A mass of concrete or mortar is molded at the center of the table in a sheet-metal mold which has the shape of a hollow frustrum of a cone. For aggregates up to 2 in. maximum size, this cone has a height of 6 in. and upper and lower diameters respectively of 8 in. and 12 in. For smaller aggregates, when made up in small quantities, a cone having a height of 3 in. and upper and lower diameters of 4 in. and

6 in. is used. The mass of concrete is tamped just sufficiently to fill the form completely. The form is withdrawn and the table top is dropped fifteen times through a distance of ½ in. Two diameters, at right angles to each other, are measured—the long and the short if difference is apparent—by means of a self-reading caliper, which is so graduated that the sum of the two readings is the value for flowability. This may also be calculated by dividing the new diameter by the old and multiplying by one hundred.

Although this flow table was first employed as a means of measuring consistency of concrete, it may also be of value in the control and measurement of segregation, the time of set and the normal consistency and also in the selection of concretes to be used for steel.

Knowing in advance the type of construction, experience will permit the minimum usable flowability to be estimated, and for any required strength value the necessary ratios of cement to aggregate may be selected. The selections may be checked by the results of field tests of concrete and a few trials will indicate strength variations, which may result for the degree of thoroughness of field inspection employed, and permit a proper allowance for unavoidable variations in cement, aggregate and curing conditions.

Winnipeg Railway Uses One-Man Buses

THE Winnipeg Electric Railway uses a number of buses on two routes. A type of bus has been developed by the company's engineers which seems well adapted to the local conditions, and the buses have been built by the Sterling Body & Carriage Company of Winnipeg. The general features of the bus are clearly indicated in the accompanying illustrations.

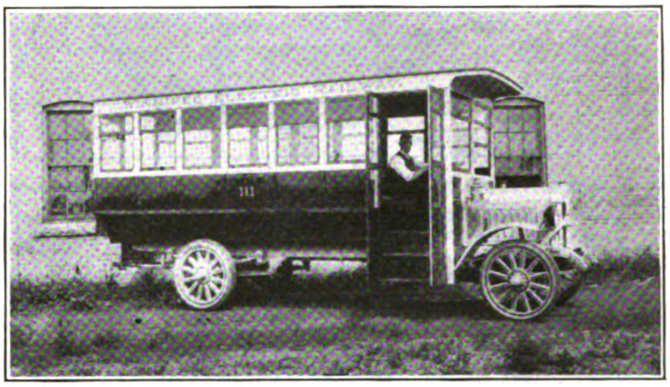
The chassis is a 1½-ton Sterling truck and the body has a capacity of twenty seated and fifteen standing passengers, a total of thirty-five. The bus is operated by one man, who controls the entrance and exit doors, located at his right.

A novel feature of the design is the auxiliary rear exit, which is for use only in emergencies. The door is interlocked with a step which slides in and out on tubular guides. The door is opened and the step pushed outward by means of a strong spring which is released by a trigger at the driver's left hand. The manual closing of the door automatically returns the step to its normal place under the body. Not only is this device installed on the new buses that have recently been completed but the older ones have been equipped with it also.

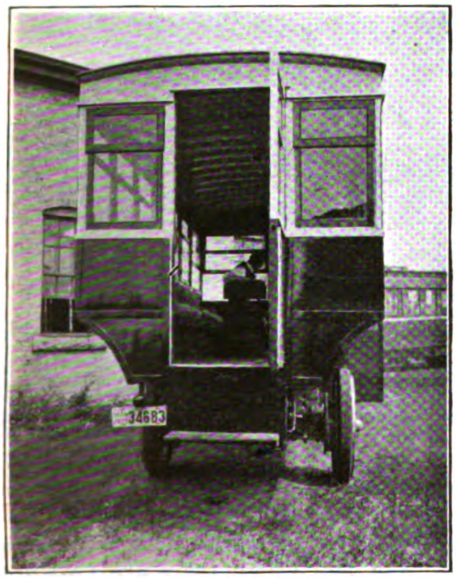
This bus is heated by means of the exhaust gases from the engine.

WINNIPEG ELECTRIC RAILWAY
ONE-HALF MILLION
113

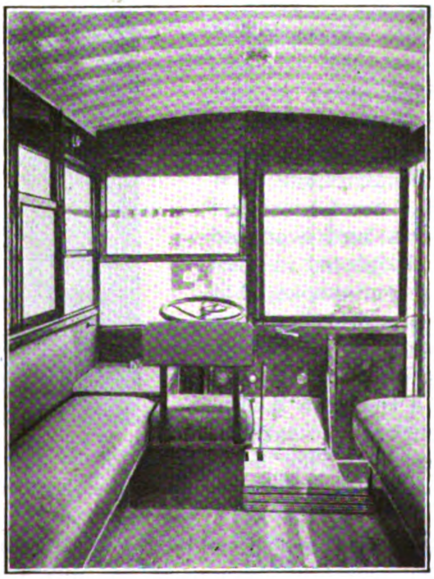
THIS BUS SUPPLEMENTS THE RAILWAY SERVICE IN WINNIPEG



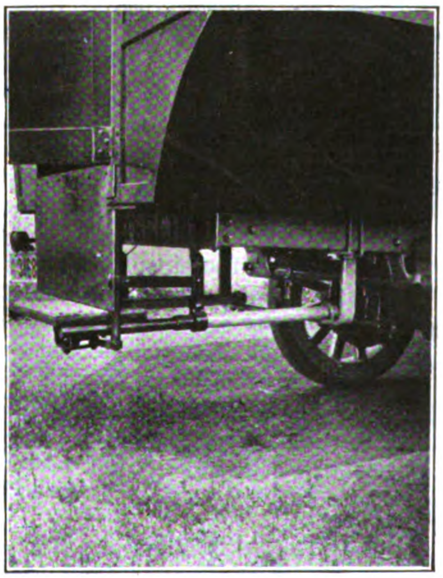
THESE DOORS FURNISH INGRESS AND EGRESS EXCEPT IN EMERGENCY



THE REAR DOOR IS FOR EMERGENCY USE ONLY. IT IS CLOSED BY HAND



VIEW LOOKING FORWARD IN THE WINNIPEG BUS, SHOWING OPERATOR'S SEAT



STRONG SPRING OPENS DOOR AND PUSHES OUT STEP WHEN RELEASED BY TRIGGER

Overhead Contact System Records

A RECENT paper of Sir Philip Dawson before the Institution of Electrical Engineers gives some concrete results of operation in connection with the overhead contact system of the London, Brighton & South Coast Railway, one of the oldest electrifications in England. The Brighton electrification employs single catenary construction with 6,700-volt single-phase trolley. Mr. Dawson says that the principles adopted in laying out the overhead system in 1907 were: That the conductor wire should be flexible with no hard spots, that double insulation was essential, that the mechanical and electrical factors of safety in insulators and overhead must be ample, that insulators should be placed in such a position as to get minimum moisture and smoke, that lines should be sectionalized, that insulators should be used only under compression and that elastic substances should always be placed between the insulator and its support and between the insulator and the wire it supported. The system was installed with great care as it was an original attempt at electrification. The "overhead" has proved to be durable and has not been changed since 1908.

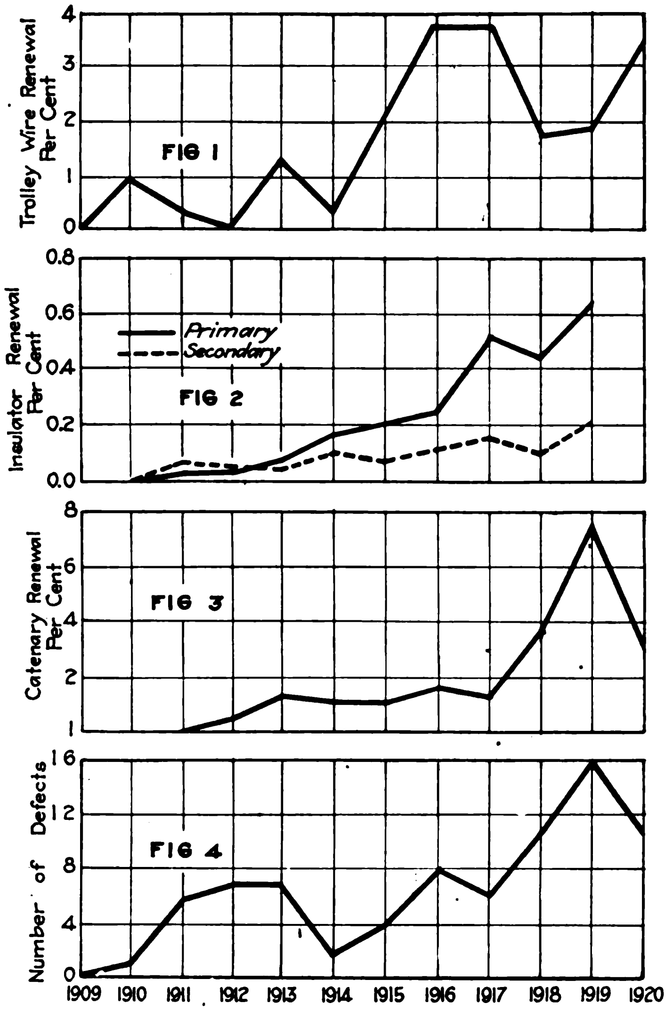


FIG. 1—CONTACT WIRE RENEWAL, IN PER CENT PER ANNUM. FIG. 2.—INSULATOR RENEWALS. FIG. 3—CATENARY (MESSENGER) WIRE RENEWAL. FIG. 4—OVERHEAD DEFECTS CAUSING MORE THAN THREE MINUTES' DELAY TO TRAFFIC.

A decided difference in overhead maintenance is noticeable on the section that uses only electric trains as compared to the sections using both steam and electric. The hot gases and smoke from the steam engines cause a much heavier maintenance expense on the divisions having the dual traffic. Not a single primary or secondary insulator, out of 7,000 primary and 14,000 secondary, has been renewed on the divisions using electric trains only. The accompanying graphs show the insulator renewals and traffic delays due to overhead defects since the system was installed.

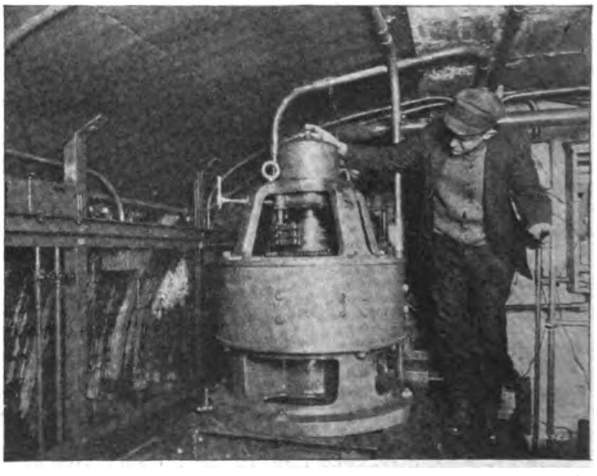
The wear of the trolley wire was found to be proportional to the current collected by the bow collectors and was inappreciable for light currents. The system uses about 120 amp. per collector-bow strip at starting and 35 or 40 amp. at full speed. The renewals in trolley and catenary wires were very much greater on the steam-electric divisions than on the electric only, where not a single catenary wire in 150 miles has been renewed. The increased percentage in renewals on the system are shown on the charts for 1916-1917, when wartime traffic caused an increased use of steam locomotives.

The author, in conclusion, states that the Brighton experience has shown that much cheaper and simpler overhead construction can be used with satisfactory results.

Keeping the Subway Dry

ONE of the problems of subway construction is to get rid of the water that invariably drains into underground structures. In the deep tunnels of the New York Municipal Railway, operated by the Brooklyn Rapid Transit Company, which run from Brooklyn through Manhattan and into Queensborough, this problem is particularly serious. An accompanying illustration shows a pumping installation that is typical of the twenty-five stations draining this system. It is located 70 ft. underground and is designed for emergency work in connection with the tunnel under the East River.

There are two pumps, one a 4-in. x 6-in. Gould Triplex plunger type, with capacity of 50 gal. per minute, driven by a 2-hp. direct-current Westinghouse motor, and the other a Morris centrifugal, with a capacity of 1,000 gal. per minute driven by a vertical 100-hp. direct-current motor of the same make. Under normal conditions, the small pump has ample capacity to take care of the seepage, but in case of emergency the large pump can be used.



VERTICAL MOTOR DRIVING CENTRIFUGAL PUMP IN SUBWAY. FLOAT SWITCHES AND SUMP AT LEFT

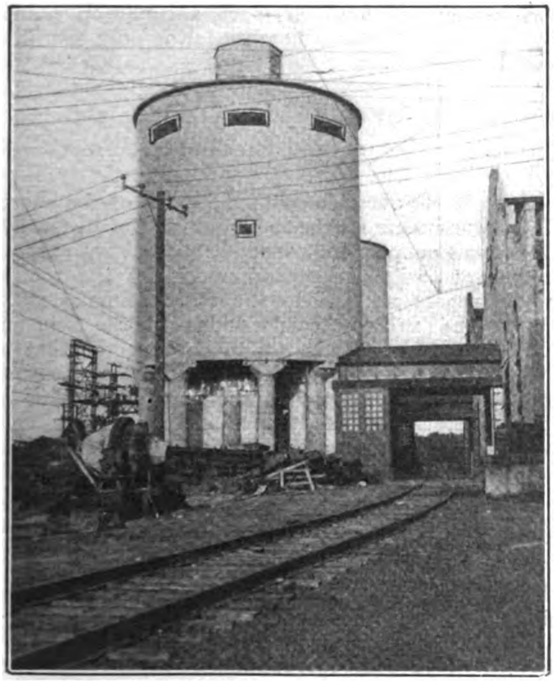
Both pumps are arranged for automatic control. The water collects in a sump in which there are two float switches, one for each motor. When the water level rises to a predetermined point the float switch of the smaller motor closes. This energizes an automatic contactor which starts the pump. When the water in the sump is brought down to the proper level the float switch opens and stops the pump. Should the smaller pump be unable to handle the flow and the water continue to rise the large pump is automatically started by the second float. A noteworthy feature of the installation is that all equipment occupies a floor space of only 12 x 15 ft.

Industrial Conference Board Moves

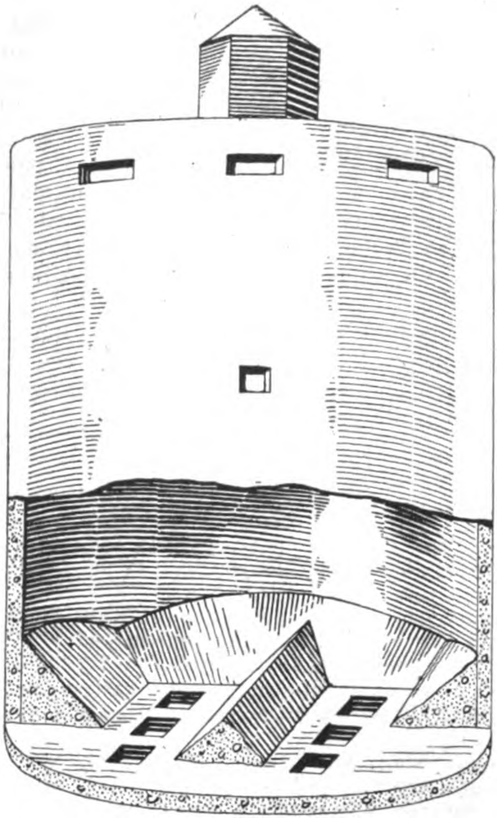
THE National Industrial Conference Board, whose headquarters heretofore have been in Boston, has moved its main office to 10 East Thirty-ninth Street, New York. A great deal of attention has been given to a study of industrial-economic problems and many data on these subjects are constantly being collected and analyzed. The board invites business executives, economists and others interested to visit these headquarters and utilize the information which it has. Among recent publications of the board is a small eight-page folder which explains the principal features of the Constitution of the United States. It is issued primarily for the use of employers and others who wish copies for distribution on Sept. 17, the anniversary of the completion by the Federal Convention in 1787 of the draft of the present Constitution.

Coal Heats in Silo Bunkers

A NEW type of concrete bunker for the Cos Cob station of the New York, New Haven & Hartford Railroad was described in the ELECTRIC RAILWAY JOURNAL for Jan. 17, 1920. Two of them were installed and have proven successful with the exception that trouble has occurred due to heating caused by the coal packing in the bunker. The bunkers have bottom gates, through which the coal drops to the conveying apparatus. Experience has shown that coal gets pocketed in certain parts of the bunker, and this pocketed coal heats to such an extent as to render conditions dangerous, due to a possibility of the explosion of the generated gases. This heating and packing of the coal (Pennsylvania mine run) is accentuated if it is wet or damp when placed in the bunker.



BUNKER WITH VENTILATING OPENINGS



SKETCH TO SHOW CHANGES MADE IN BUNKER

These bunkers are cylindrical, 40 ft. in diameter and 46 ft. high, and hold 1,000 tons of coal each.

To try to eliminate the trouble large ventilating windows, 18 x 36 in., have been cut at intervals around the top of each bunker, through which gases may escape and air circulate. Also, about 20 ft. from the bottom, an 18 x 18 in. poke hole has been made, by which, from a platform, not shown in the photograph, an operator can dislodge the packed coal in the bunker at certain intervals. Another remedy was a reshaping of the concrete around the sides at the bottom of the bunkers to form a 45-deg. slope and the erection of a concrete prism in the center with sloping sides so as to facilitate the flow of the coal to the exit doors and to prevent any space for coal to pack.

These concrete deflector walls have not been entirely successful and plans are formed to use 60-deg. deflecting walls, made from metal. It is expected that the changes, when complete, will entirely eliminate the difficulties which have been encountered.

A survey of the power situation in New England by the power section of the War Industries Board indicated that by 1924 the annual energy production by central stations would reach 5,000,000,000 kw.-hr., about one-half of the total. An increase of 1,400,000 kw. in generating capacity between 1919 and 1924 was estimated. The 1920 output for electric railways' steam plants was estimated at 630,000,000 kw.-hr. and for railroads 77,000,000 kw.-hr. The figure for electric railway hydro plants was 12,000,000; none for the railroads.

More Opinions from the Industry

Intrinsic Value of Federal Electric Railways Commission Report Is Recognized, Although Authorities Differ on Details

IN THE ISSUE of this paper for Sept. 4, page 461, the opinions of a number of railway men and public utility commissioners regarding the recently issued report of the Federal Electric Railways Commission were given. A supplementary group is printed this week.

These comments should be of great value to the railways which will have occasion to cite the findings of the report and readers are invited to contribute further to the discussion.

John H. Pardee

President American Electric Railway Association
President the J. G. White Management Corporation,
New York, N. Y.

The report of the Federal Electric Railways Commission, considering the various interests represented by the personnel of the commission, is remarkable in that it is unanimous and in so many of its recommendations meets and pronounces the views and principles of those engaged in the industry.

The points which are so essential and which stand out pre-eminently are:

1. The electric railway "is an *essential public utility.*" This has previously been questioned in some quarters.
2. There is nothing in the experience thus far obtained that indicates that municipal ownership "will result in better or cheaper service than privately operated utilities could afford if properly regulated."
3. "That private ownership and operation must as a general rule be continued for an extended period."
4. "Public control must be flexible enough to enable" electric railways "to secure sufficient revenues to pay the entire cost of the service rendered, including the necessary cost of both *capital* and *labor.*"
5. "The electric railway industry as it now exists is without financial credit."
6. "Restoration of credit involves a readjustment of relations which will remove public antagonism, provide public co-operation and insure to the investor the *integrity* of his investment and a fair rate of return thereon."

I believe the report will have great influence in promoting action, and proper action, in the solution of our problems by regulatory bodies except in localities where petty politics prevent.

R. T. Higgins

Chairman Connecticut Public Utilities Commission,
Hartford, Conn.

The report of the Federal Electric Railways Commission is exceedingly commendable for its plain and concise statement pertaining to a large, intricate problem involving so many special and local conditions and considerations. Its brevity in a thorough analysis of street railway problems warrants its careful perusal by all students of, and all persons interested in, the street railway industry.

While there can be no arbitrary enforcement of the reforms suggested by the commission, I believe the thorough investigation and report of the Federal commission will have a beneficial effect on the street railway industry as a whole.

The service-at-cost theory suggested by the commission is, theoretically, the principle upon which all utility companies are operated, under public regulation, but when put into actual practice under contract, involving the payment of a specified dividend as one of the fixed charges, I fear that the immediate translation of a near bankrupt or a non-dividend-paying company into a 6 or 8 per cent dividend-paying company will be liable to cause a violent shock to the industry itself.

The revenues of a street railway company are collected in comparatively small amounts, in cash, by a large number of unbonded and frequently short term employees, upon whose accuracy and honesty the company must depend. Whether justified or otherwise, the traveling public feels that there is not collected for the company's needs the full amount of revenue that the actual travel would indicate. I regret that the commission did not discuss or suggest reforms in the collection system pertaining to the street railway industry.

Joseph K. Choate

Vice-president the J. G. White Management Corporation.
New York, N. Y.

The report of this commission in my opinion clearly states the pertinent condition of the electric railways of the United States frankly and fairly. I agree with the general recommendations of the commission with the exception that I never have been a believer in the service-at-cost plan of operation of utilities. The service-at-cost plan is simply a modification of municipal ownership.

I am still a believer that private ownership and operation will prove the most satisfactory to all concerned, provided the public and the officers of municipalities are willing to concede that the company should earn a fair return upon a fair valuation; if, however, such a condition cannot be brought about municipal ownership is the only solution left for electric railways.

Clarence M. Clark

President the E. W. Clark Management Corporation,
Philadelphia

There can be no question as to the value of the enormous amount of work done by the members of the Federal Electric Railways Commission. Whether or not we agree with all of the conclusions, we must recognize the assistance which this report will be to the state commissions, municipalities and railway corporations in the solution of the railway problem. It is not to be expected that satisfactory results will follow in all cases throughout the country, but this report points the way and makes many valuable suggestions. If I were inclined to be critical, which I am not, I would call attention to the fact that the railways of this country, like the steam railroads and the industries of the country, have been built up and developed by the opportunities offered to investors to make money. Under the stimulus of that incentive the best and most extensive service has been given to the people by the electric railway industry. In recent years there has been no such incentive and the service has declined, and it will be impossible to secure the same quality of service and progress in the art by any other incentive than that of making money. This feature of the case is not adequately covered by the report of the commission. It is, of course, not impossible to work out a service-at-cost plan which will give the owners and investors in the property an opportunity to make more than a mere fair return upon a fair value of their property, but the necessity therefor has not been properly recognized or covered, and the tendency is the other way.

Letters to the Editors

Accident Reduction by Safety Car Operation

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY
TERRE HAUTE, IND., Sept. 7, 1920.

To the Editors:

The article on the lessening of accidents by safety cars by W. H. Burke, which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 4, page 457, is very timely. Our experience in Terre Haute confirms the results cited by him. We have compiled the following data which will be of interest by way of comparison with those given by Mr. Burke:

COMPARATIVE ACCIDENT RECORDS OF SAFETY AND TWO-MAN CARS, DEC. 1, 1918, TO AUG. 31, 1920, 21 MONTHS.

	Safety Cars	Two-man Cars
Total accidents reported prior to August, 1920	639	270
Accidents reported during August	47	0
Total accidents reported	686	270
Deduct accidents causing no damage to persons or property	496	111
Accidents involving expense	190	159
Total cost of accidents	$27,135	$22,181
Average cost per accident (of all accidents reported)	$39.55	$82.15
Average cost per accident (of the accidents involving expense)	$142.81	$139.49
Total car-miles operated, thousands	3,236	1,405
Accidents of all kinds per 100,000 car-miles	21.1	19.2
Accidents involving expense per 100,000 car-miles	5.87	11.31
Car-miles per accident involving expense	17,305	8,841
Accident cost per 100,000 car-miles	$8.38	$15.78
Average number of cars operated at beginning of period	15	16
Average number of cars operated at end of period	48	3

The rapid increase in the number of automobiles in use in the city is reflected in the number of accidents occurring monthly, but it is a noticeable fact that the percentage of those causing expense is proportionately much greater with the two-man cars than with the safety cars. It is noticeable also that in spite of the much greater average number of safety cars in service the total number of accidents of any degree of seriousness is only slightly greater. But after all the significant thing is the accident record reduced to unit terms, which shows that while the total reported accidents number about the same per 100,000 car-miles, the accidents involving expense are but slightly more than one-half for the safety cars. If it were possible to allow for the effect of increasing automobile traffic density the showing for the safety cars would be even better.

E. M. WALKER,
General Manager Terre Haute Division.

More Rides May Occur with Fewer Car-Miles

NEW YORK, Sept. 6, 1920.

To the Editors:

Your editorial of Sept. 4 entitled "Fare Is Not the Only Factor Which Affects Riding" is very much to the point in setting forth that there are at least a dozen factors that alter the riding, be it in rides taken by a stationary population or by a growing population within the same transport area. However, the whole problem is so diversified that it is not safe to assume that traffic will show no large increase despite failure to increase trackage and service. The British tramways are certainly a conspicuous example of increased traffic and even of increased riding habit in the face of decreased mileage. Without going into detail figures, it is a fact that for the greater part of the World War and for months following the Armistice the street railways of the United Kingdom gave less car-miles than just before the war. This did not in any way prevent an increase in patronage and riding habit. The traffic density figures show as much as a 50 per cent increase in passengers per car-mile over a four- or five-year period, this being the joint result of more riders and fewer car-miles.

There is no space in a communication like this to go into the reasons for this increase in traffic, but one curious difference with America may be pointed out: In this country the enlistment of men for the army, with a consequent increase in female workers, was given as a cause for decreases in traffic. In Great Britain, where the proportion of men enlisted in war and of women enlisted in industry far exceeded the drain in the United States, the advent of women workers was given as one reason for increases in traffic! Without wishing to dogmatize too much, I feel that the upsets in our unit fare system did much more to discourage traffic than the earlier increases in Great Britain, for these being on the zone system caused much less disturbance of fare-paying habits. The much heavier increases which are being made today as the result of a 200 per cent (not 100 per cent) increase in operating expenses are cutting into British traffic for the first time since 1914.

WALTER JACKSON.

Manual Versus Automatic Block Signals

NACHOD SIGNAL COMPANY, INC.
LOUISVILLE, KY., Sept. 3, 1920.

To the Editors:

In your issue of Aug. 14, page 321, C. A. Elliott of the Pacific Electric Railway describes a manual system of so-called "dual control signals" as evolved and used on the Pacific Electric. As manufacturers of automatic signals, we cannot indorse this system as heartily as does Mr. Elliott, who describes it as a satisfactory substitute for the complete automatic block signal for light traffic. It is a hand or manual system, operated by a conscious act of the motorman or conductor, both to set and to clear the signals. It is a matter of fact, which the writer regrets to observe, that the usual electric railway hand signals will be operated or not, at the fancy of the car crews, in spite of all rules to the contrary. He has seen such signals deliberately left untouched by the car crews and on questioning them was told there was no car coming the other way against which the signals were designed to afford protection. How did they know this? The very object of the signal is to give warning against a possible and unknown opposing movement. It is human nature for the motorman, who sets and clears the signals so many times, needlessly (?) to fail to do eventually what looks like unnecessary work. This is the very time, however, the unexpected may occur, and if the motorman of an opposing car should be in the same frame of mind, conditions would be highly favorable for a collision.

In other words, no hand signal, no matter how perfect, is a check on all other safeguards. An automatic signal, on the other hand, which is operated regardless of any special act on the part of the motorman more than driving his car, will show the presence of his car in the block at all times, whether there be an opposing car to observe this indication or not.

The system of indications described by Mr. Elliott is not a consistent one, since the same end of the block may show red and green at the same time; also the motorman must observe the signals on one side of the right-of-way for proceeding and on the other side of the right-of-way for stopping, another illogical arrangement. I note, moreover, that the manual switch was made from a relay by stripping its coils, all of which seems to prove to us that the designer went considerably out of his way to avoid simple automatic signals of the trolley contact, non-counting type, which would have real advantages of safety. Such signals cost but little more than these hand signals, have perfectly logical indications and could have an auxiliary control incorporated where steam trains occasionally traverse the same territory.

The writer has seen hand signals similar to these described in use on the York (Pa.) Railways.

CARL P. NACHOD, President.

Comments on Wilcox Statement

Secretary Edward F. Sweet Explains the Publication of the Federal Commission Report

IN AN interview published in the Washington *Times* of Sept. 3 Edward F. Sweet, Assistant Secretary of Commerce and vice-chairman of the Federal Electric Railways Commission, comments on the statement recently issued by Dr. Wilcox in regard to the Federal commission report, particularly his remark that "funds for printing the testimony and the commission's own report are being supplied by the American Electric Railway Association." Mr. Sweet is quoted, in part:

> If Dr. Delos F. Wilcox, the municipal ownership advocate, seeks to imply that the Federal Electric Railways Commission, which recently reported to the President, was in any way influenced or dominated by the electric railway companies his inference is insulting.
>
> The proceedings of the commission are being published through the executive secretary, the commission having ceased to exist after submitting its report. The work is being done by the Government Printing Office. It is true, I learn on inquiry, that the superintendent of documents has received orders for a sufficient number of copies of these proceedings to pay for the entire cost of publishing it. This, however, is something the commission had nothing to do with and it had nothing to do with our decision to have the testimony printed.
>
> In employing Dr. Wilcox to analyze the testimony for our convenience, we did not enter into any engagement to adopt his conclusions, which his testimony showed to be enthusiastically inclined toward municipal ownership. We intended to have an eminent traction expert also to make an analysis and use the two for our guidance, but were forced to depend entirely upon Dr. Wilcox's analysis. Eight men looking at the question from different angles formed the commission, and the report which they did make was unanimously approved by them.
>
> Dr. Wilcox's conclusions are all contained in his testimony, which will be published in the proceedings and made available to any one who is interested.
>
> Personally, I am in favor of municipal ownership of some public utilities, such as public water works, and possibly lighting plants, but when it comes to an enterprise with as many employees as an electric railway there are other questions to be considered. Mayor Ole Hanson of Seattle told us he had favored municipal ownership to keep railways out of politics, but later found that it simply placed them in.
>
> We were in no way bound to accept Dr. Wilcox's recommendation. If he seeks to discredit the commission by leaving the public to infer that an association of interested corporations had any part in the report to the public he goes far afield.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Convention Program Progressing

DETAILS of the American Association convention program are rapidly taking form. George M. Graham, vice-president Pierce-Arrow Motor Car Company, will speak on the topic "The Motor Truck—Competitor or Ally?" The place of the motor bus as a feeder and supplement to the electric railway will be made the subject of a comprehensive discussion also.

On the problems of fuel supply, Eugene McAuliffe, president Union Colliery Company, St. Louis, Mo., and formerly manager of the fuel conservation section United States Railroad Administration, will speak.

The names of other speakers are not yet available, but negotiations are under way with men of national reputation to discuss the following topics: Freight and express traffic, labor, training of electric railway personnel, an outside view of the electric railway industry. Reports of the committees on valuation, fare systems, publicity and national relations will also be made the basis of special discussion.

Committee Meets on Yacht

THE American Association committee on company membership held a meeting on Aug. 31 on board the 120-ft. steam yacht *Tilicum*, loaned by E. H. Close, a real estate operator of Toledo, Ohio. The yacht left Toledo at 10 a.m. and cruised on Lake Erie, Lake St. Clair and connecting waters until midnight. The members of the committee in attendance were: Frank R. Coates, Toledo, chairman; E. M. Walker, Terre Haute, Ind.; L. E. Gould, Chicago, Ill.; E. F. Wickwire, Mansfield, Ohio, and H. H. Norris, ELECTRIC RAILWAY JOURNAL. A number of officials of the Toledo Railways & Light Company accompanied the committee.

The committee went over reports received from representatives in several states as to the results of a canvass of non-members and prepared a revised list of prospects. A report from Secretary E. B. Burritt indicated an encouraging number of accessions to the membership this year, both railways and manufacturers, with good prospects of additional ones in the near future. The committee outlined its report, which will be completed at once and filed for publication in advance of the convention.

Association Can Supply Copies of F. E. R. C. Report

COPIES of the report of the Federal Electric Railways Commission, which was printed in full in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 28, can be had on application to the office of the American Electric Railway Association, 8 West Fortieth Street, New York City. The association's office has notified the ELECTRIC RAILWAY JOURNAL that Chairman Elmquist of the commission and other members are being overrun with requests for copies of the report, hence the attention of persons desiring copies should be directed to the above-mentioned source of supply.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Toledo Plans Take Shape

Both Sides Preparing for Referendum on Traction Measures—Women Voters to Be Heard From

With the vote on Toledo's two plans of electric railway settlement only six weeks away and with the enfranchisement of nearly 75,000 women voters who have never before expressed their opinion at the polls on municipal questions, the campaign for "enlightenment" of the public has barely got under way.

CITY EXPLAINS MEASURES

The Toledo *City Journal*, which is the mouthpiece of the city administration, has explained the two measures and printed the complete text of both plans—the cost-of-service ordinance and the twin bond issues appropriating $7,000,000 for Council to provide a city-owned "transportation system." The newspaper says the choice is between "city ownership and city regulation."

City officials declare that it is too early to start an active campaign for the cost-of-service franchise ordinance. They are counting on the four weeks previous to the actual day of election to suffice for "instruction" of voters.

The labor unions which have united in favor of the municipal-ownership ordinances have had difficulty in obtaining members of a committee to head their campaign against the cost-of-service plan and in favor of the public-ownership plan.

The organized platform workers and electrical men employed by the Toledo Railways & Light Company worked for the defeat of the twin ordinances before and they are determined to do so again. The service-at-cost measure has apparently satisfied them that labor will receive fair treatment under its provisions.

POLITICS TO BE ELIMINATED

The elimination of "politics" from Toledo street railway matters is considered the big question in the settlement which will come before the people on Nov. 2.

The city-ownership plan for bonding the city and handing the $7,000,000 over to the council for expenditure is considered a return to the political football tactics of the last twenty-five years in Toledo traction history. On the other hand the service-at-cost measure has been safe-guarded to eliminate politics for good.

Under the latter plan a board of street railway control to consist of three persons would be appointed by the Mayor, one for a term of two years, one for four years and one for six years. This is designed to take the control of the appointment out of any one administration. The members of the board shall serve without compensation so that the offices shall not become political "plums." The members shall not be charged with any other part of the government of the city, shall not be in the employ of any interested parties, shall not be shareholders or bondholders of the traction company, and shall not be members of the General Assembly of Ohio.

The board is to recommend the nomination of a Street Railway Commissioner who shall be appointed by the Mayor. This commissioner will have the active charge of all the transportation questions, check all books, and look after the city's interest in the economical operation of the street railway system.

It is believed that the effect of these politics-proof provisions and the bringing in of big improvements to the system will have a vote-getting power in the coming election. The results of the last vote on the twin municipal-ownership bond ordinances indicated that the people of Toledo for the first time in street railway history had begun to think in figures. This is the most hopeful sign for the cost-of-service ordinance, officials of the Rail-Light believe.

Wage Settlement Basis Reached.

The Kentucky Traction & Terminal Company, Lexington, Ky., and its union employees, who are demanding an increase of 20 cents an hour, have reached "a practical basis of agreement," according to the union's representative. A federal conciliator who interceded in the case has gone to Washington to procure statistics on the increase in the cost of living and when the data are sent to Lexington the company and its men will try to reach an agreement.

City Plans Equipment Purchase

The Board of Estimate of New York at a special meeting on Aug. 31 unanimously authorized the issuance of revenue bonds in the amount of $300,000 from the sale of which electric railway cars and equipment are to be purchased. The cars are to be used in sections where cessation of transportation service has been caused by either strikes or lockouts. While no definite statement has been made, it is presumed that the city has in mind using some of the equipment on the Staten Island Midland Railway, service over which has been suspended for several months.

Denver Men Clamorous

No Members of New Working Force to Be Replaced by Strikers—Few Men Needed

Failure greeted the efforts of Governor Oliver H. Shoup of Colorado to effect a setlement of the Denver Tramway controversy with company and labor leaders on Sept. 3. F. W. Hild, general manager of the company, refused to negotiate further with the striking trainmen, flatly rejected the proposal of the men that they be taken back in a body and with full seniority rights as of July 31 and declined to discharge any members of the new working force which has been hired to replace former employees.

MR. HILD REJECTS OVERTURES

After the conference in his office Mr. Hild said:

> As far as we are concerned the strike is over absolutely. We informed union representatives that the new proposal of the men was entirely out of the question; they requested that we meet with a committee from the union in another conference and we refused the request. We told them we had held the door open for the former employees as long as we possibly could.

One of the points which was taken up at the conference was the ten new sections of a working agreement which the Amalgamated officials, in meetings with the company held prior to the calling of the strike, had endeavored to have included. President J. C. Bulger of the Colorado State Federation of Labor professed ignorance of these ten sections and asserted that three of the sections were contrary to union principles.

In a mass meeting held on Sept. 5 the strikers voted to have no more dealings with Mr. Hild. No new plan was formulated for presentation to the company although the discussion lasted three hours. This action is considered to be in retaliation for Mr. Hild's refusal to meet with the union committee.

On Sept. 8 martial law was declared ended and 250 troops returned to Camp Funston. The remaining 300 men will be held until the new state constabulary is firmly established.

Following charges of misappropriation of funds contributed by union labor to the relief of the striking carmen, the president of the Trades & Labor Assembly appointed a committee to audit the accounts of Amalgamated Local 746. Sensational charges have been made to the effect that needy strikers were not given relief and that money remained unaccounted for.

On Sept. 9, 709 trainmen and 51 students were on the cars. Only 125 to 150 more men are needed to give the company its full quota.

Brooklyn Organization Being Rebuilt

Service Gradually Being Restored by Management, Hard at Work Replacing Strikers with Permanent Employees

Service on the lines of the Brooklyn Rapid Transit System is being restored to normal just as fast as possible under existing conditions. An entirely new train service organization is being built up. The energies of Mr. Garrison as receiver have been bent, first, to giving the maximum service on the rapid transit and elevated lines, and second, to the surface railways. Mid-day service on the rapid transit and elevated lines had been normal for several days previous to last Thursday, but the rush-hour service up to that time had not been fully restored. The motormen on the rapid transit lines are affiliated with the Brotherhood of Locomotive Engineers. They have a separate contract with the company and did not go out. So far as the surface lines are concerned fifty-one out of sixty-seven lines were in operation on Thursday during the day time and it was anticipated that service at night would be resumed very shortly. To the company the strike is a thing of the past except so far as the officials are called upon to rebuild their operating organization depleted by failure of the strikers to return. The time limit for old employees to return to work expired on Wednesday.

AS REGARDS the strike settlement the final word for the company appears to have been said by Judge Mayer on Sept. 2, when he issued a statement giving five terms upon which the strike might be ended. In this statement the court did reply to the men in regard to the wage question by offering an 8 per cent advance. The terms were:

1. That the men shall return to work.
2. That on their return to work their seniority and other privileges shall be restored to them.
3. That the pay increase sought—10 per cent over that of August, 1919, or 8 per cent over the current wage—shall immediately apply.
4. That the employees shall have the right to collective bargaining fully assured to them.
5. That the employees shall be assured of free and full opportunity to select representatives of their own choice to deal directly with the management.

These conditions were stated in a letter to Mayor Hylan in which the court said:

> I would be recreant to my obvious duty to the people of this community if I should again place their vital interests, involved, as they are in this transportation system, at the mercy of an association that has proved itself faithless to its obligations and irresponsible in its conduct. I cannot, therefore, consistently with my firm conviction of my duty, permit negotiations or agreements, directly or indirectly, now or hereafter, with this association; and, of course, I cannot bargain with this association as to terms upon which the strike may be ended.

A meeting of the men was called to consider the matter. Mr. Fridiger, counsel for the union, after reading the court's letter said:

> This proposition will never be put before you for a vote, unless it is put to you as members of the Amalgamated Association. I read this because I wanted the news to go out to the world that we had read the proposition, but refused to put it to you.

An emphatic "No!" was the answer to Mr. Fridiger's inquiry as to whether those at the meeting wanted to hear any proposal from Judge Mayer unless it was addressed to the Amalgamated.

In spite of the very plain statement made by the court, William D. Mahon, international president of the Amalgamated, who arrived in New York on Sept. 5, continued his effort through an appeal to public officials to seek a settlement. In a strict sense the strike was not an outlaw strike, because the Amalgamated, through Mr. Mahon, cast its lot with the men, although he did rebuke those on his side who had injured their own cause by criticising the court. In many respects Mr. Mahon's statement is very unusual. It follows substantially in full:

> My coming to New York at this time is to see if it not possible to bring together the contending forces and secure a settlement of the strike now in force upon the Brooklyn Rapid Transit lines. It was impossible for me to reach this situation sooner on account of the meeting of the general executive board of our association and the work it placed in my hands.
>
> This I sincerely regret, as it is most difficult for one to assume charge of a matter of this kind, especially after much bitterness has been engendered by actions and words spoken by those who do not understand the circumstances or represent the policies of our association. But the creation of this unpleasant condition was not with my consent or of my making.
>
> Therefore it is my hope that after the matter has been fully gone over we may be able to reach an honorable and satisfactory adjustment.
>
> I am advised that the railway company is represented by Judge Julius M. Mayer and Receiver Lindley M. Garrison. They are both broadminded and men of large affairs.
>
> Then I am advised that Governor Smith and Mayor Hylan have been working hard to bring out an honorable adjustment. It seems to me that with all these big public spirited men we ought to be able to gain a speedy settlement of this unpleasant affair. So far as the Amalgamated Association is concerned we only want justice and a fair deal.
>
> We are not here to villify Judge Mayer or to abuse the receiver, the authorities or the newspapers. I fully appreciate Judge Mayer's position. He represents the court, which always has my respect. My years of experience with electric railway affairs have taught me to know of the many difficulties and trying positions that both the court and the receiver must face in handling roads under such circumstances.
>
> The court necessarily must represent all parties and you can rest assured that those who have criticised the court in this case were not speaking for me or the Amalgamated Association.
>
> In such negotiations, if any, that will take place I shall personally represent the Amalgamated Association and its policy.
>
> This is no time to permit anything foreign to the issue at stake to interfere with a just and speedy settlement, and I take this means of appealing to the court, the receiver, the press and the public to unite in bringing the interested parties together and establishing permanent peace.
>
> It is my intention to call tomorrow on Mayor Hylan and take up the work through him with the hope of bringing about a settlement as above suggested.

So far as the matter of wages of the men who struck is concerned they compare very favorably with those paid for similar work elsewhere. Under the demands made by the men the company would have been called upon to pay out in wages more than its gross receipts. It was because of the peculiar relationship which existed under the receivership that the court insisted it should retain the right to review the arbitration findings with respect to wages. Taking the classes of employees which struck, namely the trainmen on the subway, elevated and surface, excepting the motormen on the subway and elevated, the company has pointed out the facts as follows:

> The minimum pay of a guard on the elevated and subway is $1,450 a year, and his maximum, obtained after eighteen months of service, is $1,560 per annum. Similar figures for the conductors on the elevated and subway are $1,750 minimum and $1,840 maximum.
>
> The conductors and motormen on the surface are paid a minimum of $1,650 a year and after three years a maximum of $1,950 per annum.
>
> All of these, of course, are for men working full time, which means six days a week.
>
> It is the identical wage paid to the following number of men in similar lines of employment by the following companies:
>
> 4558 by the Interborough Rapid Transit.
> 1494 by the New York Railways.
> 2044 by the Third Avenue Railway.
>
> The other surface railroad companies in the greater city either pay their numerous employees similar wages or less.
>
> Taking other lines of employment and without emphasizing the greater physical and mental requirements thereof, we find that the wages paid by us contrast very favorably therewith.
>
> The 12,467 hard working and faithful letter-carriers and post office clerks in Manhattan, Brooklyn and the Bronx receive a minimum of $1,400 a year, and after five years a maximum of $1,800 a year.
>
> The 3,758 firemen of our exceptionally fine fire department receive a minimum of $1,769 per year and after three years a maximum of $2,280, and our unexcelled police department pays its 9,229 patrolmen a minimum of $1,769 per annum, and after five years a maximum of $2,280.
>
> Hundreds of thousands of men and women doing clerical or physical work receive no more and in very many cases less than are paid by us as above set forth.

The attitude of the company with respect to the strike was made plain in a statement made by Mr. Garrison on Sept. 9. Except for the comparison of wages which it included this statement follows in full:

> The first phase of the strike is over. It ended with the final position taken by Mr. Mahon, international president of the Amalgamated Association. This association has a great stake in this situation. If its spokesmen are accurate, it had 12,000 members in the Brooklyn locals paying dues to the association of $1 a month each, making a total of $144,000 a year income to the association.
>
> If upon his arrival from the headquarters of this organization in Detroit, Mr. Mahon had thrust aside the radical leadership, repudiated the unwarranted breach of contract, disciplined the locals for violating the essential laws of their organization and ordered the men—who never should have left their work—to return to their work, he would have gone a long way toward showing that it was a body fit to be trusted.
>
> Instead of pursuing such a course, he contented himself with rebuking those of his subordinates who had injured their own cause in public esteem by general vilification and abuse—expressing regret at what he termed the "impatience" of these radical leaders and then casting his lot with them, making their cause his and that of his organization, and thereupon advising the former employees to refuse to return to work. With the disappearance of Mr. Mahon as a possible factor for good the first phase came to an end.
>
> The second phase is now being entered. It is the slow and laborious process of obtaining and training new men as a permanent force, for the proper and efficient operation of the system. This calls for much hard work on behalf of the management and much patience on behalf of the public.
>
> The work of obtaining the new men will be difficult, but the outlook is very hopeful. Despite whatever has been said upon the subject this employment is by no means ill paid, and considering the ratio of income to outgo is very well paid. And it must be borne in mind that the base of income is strictly limited by law while the necessary expenses are not.
>
> The court and the receiver have no personal or private interests to serve and therefore have every reason to be perfectly fair, reasonable and frank in all their dealings with the employees, and have always been fair and square with them and intend so to continue.

Maine's Municipal Marvel

Town of Turner Runs One-Car Line for Benefit of Summer Folks —Freight Handled

"Good service—clean cars," is the slogan of a little town in Maine, which has the distinction of being the first municipal owner and operator of an electric railway in the entire State and the second in all New England. Turner, a town of 2,000 people, won't be relegated to the woods, but wants to be in direct communication with Auburn and Lewiston and so enjoy the benefits of modern utilities.

The history of the Turner railway route though very brief is interesting in so far as it reflects the life of a townspeople who want to know and be known. The electric line in this section has been a "goat-getter" for years because of the inability to make it a paying investment. The old Auburn-Turner line was abandoned by an operating company and A. L. Kavanaugh of Lewiston as receiver, operated it for a while with a fairly successful showing. Later it was sold to the A. L. & W., now defunct, and up to last October, "intermittent" service was maintained. Then for the second time operation was abandoned, but even this failure didn't bring discouragement. In other words, you couldn't Turn-er down. Generally speaking, "nothing succeeds like success," but in Turner's case nothing succeeded like failure. With courage and determination the townspeople applied to the Legislature in November, 1919, and through their representative permission was granted to Turner to own and operate its own railway.

And now for several months Turner has been railroading—and enjoying the profits (profits, they really are, according to the manager). The only cloud to mar the happiness of the sturdy New Englanders is the thought of next winter when nature in the role of "Frankenstein," sends a monster who with ice and snow plays havoc and brings destruction to railway properties. Then the solitary car may get snowed under. Meanwhile, the tune is "In the Good Old Summer Time."

Right to Dismiss Union Men Upheld

A decision which is expected to have a far-reaching effect has been handed down by the Supreme Court of the District of Columbia in denying an injunction to members of the Brotherhood of Railroad Trainmen against the Washington & Old Dominion Interurban Railway. The injunction sought to prevent the discharge of employees who affiliated with the union. An extract from the opinion is as follows:

> Strikes that are conducted in an orderly manner and do not involve a violation of property rights or the production of public disorder are but the exercise of a right to work.
>
> The right to labor is a personal right which inheres in the individual and, as a corollary to that, the right not to work must be equally recognized. But with the recognition of these rights, there is another right which belongs to the employer and that right is one to impose conditions upon those who seek employment from a given employer, be that employer an individual or a corporation.
>
> It may be asked what becomes of the right of the employees to organize if, as a consequence of doing so, the employer may exercise his right as recognized by the United States Supreme Court. The answer may not be as easy to formulate, but this court is not called upon to answer the question. Its duty is to give effect to the authoritative opinions and decisions of the supreme tribunal, which give the company the right to dismiss its employees if they join a labor union.

Ontario Board Approves One-Man Cars

Discussing the one-man cars for electric railways, Vice Chairman A. B. Ingram, of the Ontario Railway Board at Toronto, Ont., on Aug. 13, stated that the cars had the unqualified approval of the board as an efficient means of eliminating expense in connection with railway operations. He is quoted as follows:

> They have been found very satisfactory and in several small places have gone far in cutting operating deficits. One-man cars of the approved type are now running in St. Thomas, Cornwall, Guelph, Port Arthur and Calgary. They are giving much more frequent service and in addition to the lessened cost of operating, they are much easier on the rail.
>
> The board approves of the one-man cars for the Toronto civic line and believes that they will be a success. If they were forced to cross railway tracks precautionary measures against accidents would have to be taken.
>
> Almost every one of the lines in the smaller cities is operated at a deficit. The Guelph line, which is municipally owned, had a deficit of something like $12,000. The one-man car in such places cuts the operating expenses almost in half.

Nashville Strike Broken

For the purpose of discussing the differences between striking trainmen and officials of the Nashville Railway & Light Company, Nashville, Tenn., union leaders and workmen conferred on Aug. 27 with Governor Roberts and Mayor William Gupton. No officials of the company attended the meeting.

The conference was held at the request of Fred L. Feick, of Washington, D. C., who is said to have represented himself as being from the Department of Labor. During the conference the strikers submitted their proposed contract as a basis for negotiations with the railway officials. Later during the afternoon B. C. Edgar, vice-president of the Nashville Railway & Light Company, consulted with the Governor.

Mr. Edgar stated that the strike had been called by the employees without notice to the company and without previous effort to arbitrate their differences. He further told the Governor that the company had the situation well in hand, that the men were returning to work, and that the company was satisfied with conditions. He said:

> Many of the striking employees have already come back to the company, and many of them have been reemployed at their old rates of pay. The company will continue to reemploy the good men who apply at their old rates of wages until 6 p.m. Sept. 2, after which all men employed will be employed as new men at the rate of wages applying to new men.

For the first time since the strike began, cars were operated in Nashville after 6 p.m., on Aug. 30.

Governor May Act

Buffalo Labor Situation Appears Deadlocked Over Retroactive Pay Features

Governor Alfred E. Smith probably will have to act personally if he hopes to establish a basis for arbitration of the wage question which is in dispute between the International Railway, Buffalo, N. Y., and its employees. This became evident on Sept. 4 when Herbert G. Tulley, president of the railway, failed to submit the proposition which Lieutenant Governor Harry C. Walker said had been agreed upon after a long conference on Sept. 3.

Lieutenant Governor Walker is chairman of the Governor's labor board which made a searching inquiry into the finances of the company and the grievances between the employees and the company. Concessions were made at the conference by the company's employees as represented by the Amalgamated and President Tulley on behalf of the company made concessions and it was believed an agreement would be reached.

The proposition in question involves the solution of the problem as to when a wage award granted by arbitration should become effective. Lieutenant Governor Walker worked out a plan which, he said, should meet with the satisfaction of both factions. Failure on the part of President Tulley to continue his part in the negotiations is characterized by the Governor's representative as "dodging the issue."

In a letter to Mr. Walker, President Tulley says the company agrees to let the Governor name the third arbitrator, but with the expressed condition that any further increase in wages can only be effective when a further increase in fares is granted. President Tulley says the men are receiving the same scale of wages as in Rochester and Syracuse where living conditions are comparable. Henry W. Killeen, of counsel for the International, says no further wage increases will be granted until after the state utilities board acts favorably upon a higher fare for the Buffalo traction lines.

Kansas City Railway's Champions

Looked at from the standpoint of promoting good fellowship among the employees and a spirit of co-operation the new ball park of the Kansas City (Mo.) Railways at Thirty-first and Askew Streets has already paid for itself twice over. The games are played Tuesdays, Thursdays and Saturdays in the Railways League, made up of six teams from the employees. On Sundays the "Tramways," the railway team in the Inter-City League, has challenged all comers with great success, leading the league now with six games won and one lost. E. B. Sanders of the company said:

> The majority of our employees are young men and much interested in baseball and the results have been wonderful for the company. The crowds on Sundays run between 500 and 1,000. The receipts go

to the league. In addition to this the Employees' Brotherhood publishes a weekly newspaper known as the *Railway Athlete*, which gives the news of all the games as well as the standings of teams and batting averages. We feel that the very great success that has attended the undertaking more than compensates for the amount of money expended to put it on its feet and makes it a practical investment, paying weekly dividends in increased efficiency and interest.

The "Yankees," composed of employees from the Ninth and Brighton roundhouse, are leading the Railways League at present. There is a shop team and a power plant team in the league. The entrance of men from these fields engenders a considerable amount of healthy competition.

D. U. R. Denied Injunction

Railway Company May Carry Appeal Against City to the Supreme Court

Two suits brought by the Detroit (Mich.) United Railway to determine to what extent the city can legally use taxpayers' money in the construction of street railway lines have been dismissed by Judge Mandell in the Circuit Court. The Judge declined to issue injunctions asked by the D. U. R. restraining the city from using the Sinking Fund Commission's funds for purchasing municipal railway bonds, and restraining John A. Mercier, contractor for the Charlevoix Avenue line foundations, from building with the money obtained from the sale of the bonds thus sold.

In dismissing the suits Judge Mandell upheld the city's actions and sustained the opinion of Corporation Counsel Wilcox that it was not only the Sinking Fund Commission's right but its duty to buy such bonds, adding that if it had not been the proper course to follow, such action relative to the buying of Water Board bonds for the past fourteen years would have been stopped long ago. It is reported that the company will appeal the case to the higher courts.

The company contends that the Sinking Fund and the unexpended balances have not been the only funds used by the city to pay the bills of the municipal ownership project. It is stated that back in 1919 there was an appropriation of $100,000 out of the taxes for the use of the Street Railway Commission, then engaged in investigating the local traction problem, making appraisals of the company's property, studying subway possibilities, etc. On the witness stand the Comptroller testified that more than $8,000 of this appropriation collected in the July, 1919, taxes, was available for the present plans of the commission.

Corporation Counsel Wilcox has furnished the commission with an opinion that the City Council or the commission cannot change the routings of the municipal system from those voted on when the $15,000,000 bond issue was passed. At the same time he declared that the commission could build the Elizabeth-Witheral loop on the theory that it would be a turnout for the Woodward line also mentioned in the bonding proposition although the loop itself is not specified.

Mr. McCulloch Exonerated

Charges Against United Railways Head Growing Out of Loss of Referendum Petitions Dismissed

Richard McCulloch, president of the United Railways of St. Louis and first vice-president of the American Electric Railway Association, has been exonerated of all charges growing out of the loss more than two years ago of referendum petitions on a city ordinance affecting the United Railways. The case of Bruce Cameron, formerly superintendent of transportation of the company, has not yet been called, but it is understood that the Circuit Attorney will ask that it be dismissed.

HISTORY OF CASE

The case against Mr. McCulloch was sent to Springfield, Mo., for trial. On Aug. 30 it was called and, a severance being taken, the Circuit Attorney elected to try Mr. McCulloch first. The State put in all its evidence, and on Sept. 7 the Judge sustained a demurrer and ordered the jury to bring in a verdict for the defendant. All the better element of the city of St. Louis has been with Mr. McCulloch in what they considered persecution by corporation baiters, and since his vindication he has been in receipt of hundreds of letters, telegrams and messages of congratulation.

In June, 1918, referendum petitions on an ordinance affecting the United Railways were stolen from a safe in the Cigarmakers' Union, where they were temporarily stored before being filed. The theft was traced to a former employee of the company by the name of Jackson, who had worked as special agent under the superintendent of transportation. After about two weeks, Jackson returned to St. Louis, gave himself up, and offered to turn State's evidence on a promise of immunity from prosecution. He stated that he had been instructed to steal the referendum petitions by Mr. Cameron, under whom he had formerly worked, and on his testimony and that of another special agent by the name of Brady, and under strong pressure from newspapers hostile to the company, Mr. Cameron was indicted for burglary in July, 1918.

MR. CAMERON'S CASE STILL PENDING

It was thought at the time that the theft of the petitions was due to overzealousness on the part of Jackson in his capacity as special agent, but it has since been pretty thoroughly proved that the theft was a scheme of Jackson and others to extort money from the officials of the railway. Conditions were further accentuated by the fact that the Mayor and the Board of Aldermen who had passed the ordinance were Republican in politics, while the Circuit Attorney was a Democrat and was backed by two newspapers which had bitterly opposed the passage of the new franchise ordinance.

Mr. Cameron's case was sent out of the city on a change of venue and was still pending when the United Railways went into the hands of a receiver on April 11, 1919. In testimony before the Special Master in the receivership case in June, 1919, one of the attorneys used Jackson and Brady as witnesses to prove mismanagement, and this time a year after their former statements, Jackson and Brady testified that Mr. McCulloch, as well as Mr. Cameron, had told them to get the petitions at any cost. This testimony created great public excitement and although it was well known that the testimony of Jackson and Brady differed from that given a year previous, the Circuit Attorney, with the help of hostile newspapers, was able to procure an indictment for burglary against Mr. McCulloch. He also took advantage of the opportunity to re-indict Mr. Cameron.

In order not to embarass the receiver, Mr. McCulloch immediately resigned as manager for the receiver, but has continued to serve as president of the company, as the board of directors refused to accept his resignation.

Place of Bus Recognized

Public Service Commissioner Returning from Abroad Believes Buses May Replace Some Railways

Lewis Nixon, Public Service Commissioner for the First District of New York, is convinced that buses are a good thing, but that they should not be run on highways already occupied by electric railways. Mr. Nixon has recently returned from abroad where he went to inquire into the question of bus transportation and to acquire first hand information relative to the advisability of such service in New York City.

BUSES A GOOD THING

His ideas with respect to buses were expressed to the ELECTRIC RAILWAY JOURNAL through confirmation by him of general statements made by the daily newspapers on Mr. Nixon's return. He said:

> One of the strongest impressions I got abroad is that hit or miss legislation must be avoided. I am convinced that buses are a good thing, but they should not be run on highways already occupied by street railways. In many ways buses can do good work. But if they are to be permitted to enter seriously as a factor of transportation, it should be under the most definite regulations and not under a guerilla system as they are running now. The bus drivers in this city are doing about as they please.
>
> Recently there was a report on traffic made in the House of Commons. I read it carefully and noted that the very flexibility which permits omnibuses to run out from stopping places out of their proper order and to meander and move sideways on the roads and to be driven two abreast, is in many cases a material element in road congestion. Flexibility implies taking advantage of chances of passing other vehicles, and though it may be an advantage for speed as against other competitors it is not without its element of danger.
>
> However, I am not and never have been against buses, and I believe they may eventually take the places of some street railways. But we cannot scrap a street railway line because some one considers a bus service superior.

Financial and Corporate

Rhode Island Securities Sold

New Haven Railroad's Investment of $24,000,000 Brought $2,200 Under the Hammer

Stock of the Rhode Island Company, Providence, R. I., and the stock and bonds of the Sea View Railroad were sold at public auction on Sept. 3 under orders of the Federal receivers by authority of a decree of the United States District Court for the Southern District of New York. Harry Parsons Cross bought all the stock of the Rhode Island Company, 96,855 shares, for $2,200. Mr. Cross also bid in for $200 the 7,000 shares of stock of the Sea View Railroad. Nathaniel Terry Bacon of Peace Dale, president of the Narragansett Pier Railroad, bought the $600,000 gold bonds of the Sea View for $1,400. It is understood that after the auction Mr. Bacon purchased from Mr. Cross the Sea View stock he had bid in for $200.

MR. SHERMAN A PURCHASER

Duff F. Sherman bought the Providence & Danielson Railway at private sale for $100,000. By agreement, the receivers will operate the road until Oct. 2, Mr. Sherman guaranteeing any deficit.

The 96,855 shares of Rhode Island Company stock which Mr. Cross bought for $2,200 represent an original investment by the New York, New Haven & Hartford Railroad of $19,000,000, which was further increased to $24,000,000. In addition the New Haven loaned $4,000,000 to the Rhode Island Company for improvements and other requirements, against which it took notes of the Rhode Island Company. These notes are still held by the New Haven Company.

RHODE ISLAND ASSETS STATED

Among the assets of the Rhode Island Company are the Woonsocket and Burrillville roads, which with other property holdings are in the hands of receivers. Another asset is over $2,000,000 stock of the United Traction Company, which stock was pledged by the Rhode Island Company to secure bank loans. There are also parcels of real estate, cars and other items, the value of all its physical assets being estimated at about $5,000,000. Against all assets are claims said to aggregate $10,000,000, which accounts for the nominal price brought at the sale of the stock.

No information as to the outlook of the Sea View, the Danielson and the Chepachet lines could be obtained from the successful bidders, except that Mr. Sherman expects to run his properties until Oct. 2 by agreement with the receivers, a guarantee covering deficits being given. As to the Sea View, the purchasers have nothing whatever to say.

The properties sold are subject to liens, which are in some instances problematical and must be adjudicated by the courts.

The stock and bonds of the roads involved were sold, and not the physical properties. The sale in no way affects the several lines leased by the Rhode Island Company, including the Rhode Island Suburban, Union Railroad lines in this city, Pawtucket, East Providence, Buttonwoods, East Greenwich, Pawtucket Valley, Cumberland Hill and lines to Attleboro.

Philadelphia Appraisal to Continue

An order to continue the appraisal of the property of the Philadelphia Rapid Transit Company has been made by the Public Service Commission meeting in special executive session at the City Hall. The commission allowed the withdrawal of the no-transfer higher fare tariff presented by the company on June 1 and in doing so reaffirmed its order of July 26, that there could be no fare increase until the company had completed the valuation of its property and presented it to the city and commission.

Evidence produced at hearings in July failed to convince the commission that the proposed increase was warranted and the order declared imperative until a valuation had been submitted by the company. Recently the company asked the commission for permission to withdraw the no-transfer tariff. The city, while assenting to the withdrawal plan, asked the commission to order the valuation proceedings continued. An appropriation of $50,000 was voted by Council for the employment of experts by the city, to check up the appraisal when it should be presented to the commission.

The text of the order drawn by James S. Benn, Philadelphia member of the commission, follows:

> The petition of the Philadelphia Rapid Transit Company to withdraw Tariff P. S. C. Pa. No. 68, and the petition of the city of Philadelphia waiving objection to the withdrawal of said tariff are hereby granted. This permission is without prejudice to the pending complaints of the Cliveden Improvement Association et al. against the rates and service of the respondent company, which were in part merged with the complaint against said tariff schedule, and the same are hereby restored to their former status on the docket of the commission.
>
> The order of the commission of July 26, 1920, in so far as it relates to the preparation and submission of an inventory and appraisal of the respondent is hereby affirmed, a copy of said inventory and appraisal to be furnished to the city of Philadelphia and every opportunity given it to check up the same and present such evidence in relation thereto as it may deem proper.

Another Buffalo Committee

Appeal to Security Holders to Oppose Plan of Committee Headed by McDougal Interests

Bondholders of the International Traction Company, Buffalo, N. Y., have organized a new committee in opposition to the proposed plan of reorganization of the Buffalo traction system submitted last month by Elliott C. McDougal, chairman of the bondholders' protective committee. The protesting bondholders charge the arrangement is not equitable. Before the objections to the adoption of the reorganization agreement can become effective, proxies or co-operation of persons owning 30 per cent or about $17,000,000 in securities must be obtained. To date the committee represents $1,534,000 in deposited bonds.

PHILADELPHIANS ON COMMITTEE

Three Philadelphia men who organized the committee are George K. Reilly, a banker; J. M. Johnston and R. M. Stinson, dealers in investment bonds. One of the reasons enumerated why holders of the certificates of deposit for collateral 4 per cent trust bonds of the International Railway should object to the plan promulgated by Mr. McDougal is that the voting trust proposed would perpetuate for its term of five years "the management which declined to put in operation a fare increase from 5 to 7 cents for five months after it was granted to the company." It also is claimed that the company has $1,500,000 in its treasury and that the protective committee has $400,000 on hand. The objecting boldholders say:

> The $1,800,000 cash planned to be raised by forcing you to purchase 9½ shares of voting trust certificates to provide for capital expenditures over 1921 is extremely drastic and premature.

It also is charged that the International Railway is not at present on the verge of bankruptcy, "but we are advised," the committee says, "the company will earn during 1920 over and above all fixed charges at the rate of $400,000 a year, and such figures are arrived at after setting aside $2,700,000 for maintenance and accident claims."

The Guaranty Trust Company, New York, N. Y., is the depository for the bonds of the protesting committee.

REASONS FOR OBJECTIONS SUMMARIZED

The committee, of which George K. Reilly, of Reilly, Brock & Company, Philadelphia, is a member, in addressing the security holders, has summarized its reasons why holders should object to the plan of Aug. 17 as follows:

1. The company has $1,500,000 cash in its treasury. The protective committee has $400,000 cash on hand.
2. The bonds of the International Railway bought in for you have an estimated value of nearly $2,700,000.
3. You are asked to give up title and rights in $640,500 of underlying bonds, and $200,000 of 7 per cent notes (including the values mentioned in paragraph 2).
4. The International Railway common stock is your property.
5. The 7-cent fare put in operation

April-May, 1920, should continue to yield additional revenues.

6. The $1,800,000 cash planned to be raised by forcing you to purchase 9½ shares of voting trust certificates to provide for capital expenditures over 1921 is extremely drastic and premature.

7. A voting trust such as is proposed would perpetuate for its term the management which declined to put in operation a fare increase from 5 cents to 7 cents for five months after it was granted the company.

8. The plan is unjust to bondholders who are unable or unwilling to subscribe, since they lose their entire investment.

Experts Criticise P. R. T. Depreciation Plan

Lybrand, Ross Brothers & Montgomery, public accountants, have reported for 1919 to the city of Philadelphia on the finances of the Philadelphia Rapid Transit Company under the terms of the operating agreement of 1907. Unofficial summaries of the report indicate that the company on Jan. 1, 1919, abandoned its practice of deducting annually from its gross revenues 15 per cent for renewals and upkeep.

As of Jan. 1, 1920, the renewal reserve appears to have dwindled to $574,470. Out of the surplus in the reserve renewal fund of $1,127,320, the company applied $552,200 for maintenance of way and structures and for equipment and cars. In commenting on the report the Philadelphia *Record* says that "had proper deductions been made from gross earnings by the Rapid Transit Company for renewals during 1919, the company would not have been able to show a net profit sufficient to pay the annual dividend of 5 per cent or $1,500,000 on its $30,000,000 capital. Not until June of this year did the company pass up a dividend, and that was for the first six months of 1920."

The report comments as follows:

> Previous to Jan. 1, 1919, the accounting officers of the company maintained that the charge against operation of 15 per cent of the gross revenues was sufficient to cover current maintenance and to provide a reserve from which replacements, necessitated by depreciation and obsolescence, could be made. The officers now state that the company has entered upon an era of operation, by which the property is maintained at a high standard of efficiency, which makes unnecessary, in a cycle of years, any provisions for depreciation or obsolescence.
>
> It is our opinion that the cost of renewals, which are inevitable, should be provided for from the operations of the years during which the property is in use, and not be borne by the years subsequent to its retirement or replacement. Furthermore, the policy adopted by the company is liable to abuse and is only defensible if the principle of keeping the road up to its greatest efficiency is rigidly adhered to.

Washington Lines Go Behind

It is reported that the rate of 8 cents for cash fares or four tickets for 30 cents which was put into effect last May on the lines of the Washington Railway & Electric Company, Washington, D. C., is not providing a fair return on the valuation of the company. Indications are now that on the current year the revenues of the company will fall short by $450,000 of the amount necessary to allow a 6 per cent return on the property. The higher rate was authorized by the Public Utilities Commission of the District of Columbia.

Glasgow Has First Deficit

Previous Years of Profit, Which Allowed $997,238 to Be Paid to the Common Good, Now Changed to Deficit

After having completed the repayment of its capital in 1917, thereby eliminating interest and sinking fund charges, the accounts of the Glasgow Corporation Tramway for the year ended May 31, 1920, show a deficit—the first in the history of the tramway under municipal control. The working expenses have been continually rising and this year overtook the receipts, leaving a deficit of £108,531. One of the reasons for this decrease in the last two years has been the increase in 1919 from £400 to £700 per mile of single track in the rate of depreciation of the permanent way. This railway is noted for its ability to allow such a large percentage of its passengers to travel for the equivalent of 1 cent.

THE results for the year show that the ordinary income amounted to £1,721,578 and the working expenses, including payments to dependents of employees serving with his Majesty's forces, to £1,558,161, thus leaving a net revenue of £163,417. The ordinary income of the previous year was £1,531,320 and the working expenses £1,249,989, leaving a net revenue of £281,331. The decrease of 1920 over 1919 was £117,914, or 42 per cent. After paying the Paisley District Tramways Company, Ltd., income tax, parliamentary expenses, interest and sinking fund, and carrying a definite amount to the depreciation and permanent way renewals fund, there was a deficit for the year of £108,531. It will be noticed from the income statement that the gross

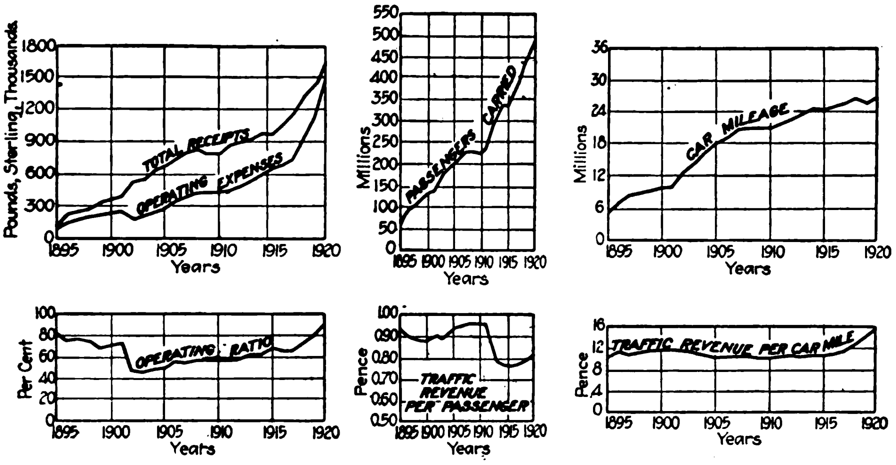
INCOME STATEMENT—GLASGOW CORPORATION TRAMWAYS

Year ended May 31:	1920	1919	Percentage Change
Revenue from transportation	£1,716,490	£1,527,487	+12.4
Revenue from other railway operations	5,087	3,832	+32.8
Total railway revenue	£1,721,577	£1,531,319	+12.4
Traffic expenses	856,111	674,167	+26.0
General expenses	225,872	175,005	+29.1
General repairs and maintenance	317,521	219,509	+44.7
Power expenses	152,742	106,686	+43.2
Clydebank bridges	2,314	1,752	+32.1
Total railway expenses (excluding depreciation)	£1,554,560	£1,177,119	+32.0
Net operating revenue	£167,017	£354,200	—52.8
Payment to dependents of employees serving with his Majesty's forces	3,601	72,869	—95.0
Balance carried to net revenue account	£163,416	£281,331	—42.0
Non-operating income	13,345	10,565	+26.3
Gross income	£176,761	£291,896	—39.5
Deductions from gross income:			
Proportion of traffic receipts due Paisley District Tramways Company, Ltd	110,092	9,755	+13.7
Interest on capital	3,892	......	.....
Sinking fund	1,715	......	.....
Property and income tax	81,296	83,702	— 2.9
Parliamentary expenses	1,056	123	.....
Depreciation fund	48,943	46,149	+ 6.1
Permanent way renewals fund	137,299	137,394	.....
Total deductions from gross income	£285,293	£277,123	+ 3.0
Net income transferred to profit and loss	*£108,531	£14,772	—835.0

* Deficit.

STATISTICAL INFORMATION—GLASGOW CORPORATION TRAMWAYS

Year ended May 31:	1920	1919	Percentage Change
Miles of single track	198.12	198.25	.....
Total revenue car-miles	26,459,015	25,581,547	+ 3.4
Total revenue car-hours	3,528,207	3,413,371	+ 3.4
Ratio C.M. to C.H. (speed m.p.h.)	7.47	7.49	.....
Revenue passengers, total	509,339,886	464,246,677	+ 9.7
Traffic revenue	£1,716,491	£1,527,488	+12.4
Average fare paid per passenger (pence)	0.809	0.790	+ 1.4
Traffic revenue per mile of single track	£8,664	£7,704	+12.5
Kw.-hr. (traction load and car lighting)	42,942,868	39,984,597	+ 7.4
Estimated population served (city and suburbs)	1,338,811	1,150,000	+16.4
Population served per mile of single track	6,757	5,800	+16.5
Average distance paid for per passenger (miles)	1.839	1.795	+ 2.5
Average traffic revenue per passenger (pence)	0.81	0.79	+ 2.5
Statistics per car-mile:			
Average traffic revenue (pence)	15.57	14.33	+ 8.7
Average total working expenses (pence)	15.71	11.40	+37.8
Average number of passengers	19.25	18.15	+ 6.1
Kw.-hr. (traction and car-lighting)	1.62	1.56	+ 3.8
Car-miles per revenue passengers	0.052	0.055	— 5.4
Car-miles per mile of single track	133,547	129,030	+ 3.5
Statistics per car-hour:			
Average traffic revenue (shillings)	9.72	8.96	+ 8.5
Average total working expenses	8.82	6.90	+27.8
Average number of passengers	144.0	136.0	+ 5.9
Operating ratio—per cent	90.3	76.8	+13.5
Rolling stock:			
Top covered cars	865	828	+ 4.5
Standard cars	30	30	.....
Converted horse cars	1	7	—86.0
Training car	1	1	.....
Total cars in stock	897	866	+ 3.6
Average number of cars in use per day	741.53	667.98	+11.0



SIX CHARTS SHOWING STATISTICAL INFORMATION OF SEVEN ITEMS BETWEEN YEARS 1895 TO 1920 INCLUSIVE

Fare	Passengers Carried		Traffic Receipts	
	Number	Per Cent	Amount	Per Cent
½ d.	304,865,756	59.86	£635,137	37.00
1 d	142,076,326	27.89	591,985	34.49
1½ d.	37,989,011	7.46	237,431	13.83
2 d.	12,394,898	2.43	103,291	6.02
2½ d.	5,596,692	1.10	58,299	3.40
3 d. and upwards	6,417,203	1.26	90,047	5.24
Sundries	....	......	301	0.02
Totals	509,339,886	100.00	£1,716,491	100.00

revenue for the year shows an increase of £193,038 compared with 1919, and that the average traffic revenue per car-mile increased from 14.33 pence to 15.57 pence. This is very high considering that about 60 per cent of the total passengers carried pay only 1 cent per ride. The working expenses, excluding expenditure incurred on account of the war, showed an increase of £377,441, or 32 per cent.

TRAMWAY DEBT PAID

The total tramway debt of the company was paid off in 1917. Since that date new capital expenditure amounting to £45,143 has been incurred. The amount at the credit of the depreciation and permanent way renewals fund on May 31, 1919, was £449,006. A sum of £163,663 was deducted during the year to be expended on track renewal, etc. The amount added to the fund was £186,242, leaving the balance standing at £471,585.

Rates of depreciation and permanent way renewal as they now stand are: Permanent way allowed £700 per mile of single track, or £137,299; power station and substations plant, 3 per cent; cars, 5 per cent; electric equipment of cars, 5 per cent; other rolling stock, 15 per cent; Clydebank bridge, 5 per cent.

The total rolling stock for 1920 was 897 cars, as compared with 866 in 1919. Of this number, 429 are now fitted with vestibules. The work of building new cars is being pushed. During the year thirty-seven new cars were put into service.

LARGE PERCENTAGE PAY ONE CENT

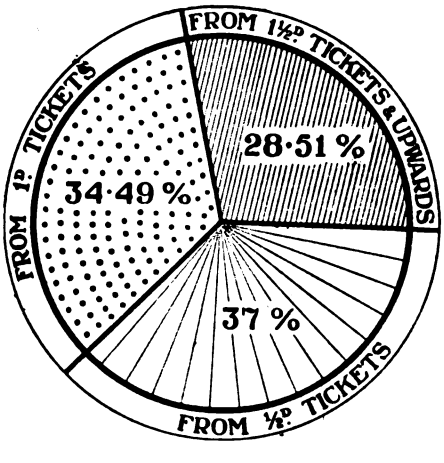
As noted before, the company charges about ½ penny (1 cent) as the fare of about 60 per cent of the passengers. The accompanying table gives the number of passengers carried during the year at each fare and the revenue from each fare, with percentages in each case. There were 304,865,756 passengers paying only ½ penny and the traffic receipts from this group amounted to 37 per cent of the total receipts.

On an eighth of a mile less of track and with a thirteen-hour day instead of fourteen hours both the car-miles and the car-hours increased 3.4 per cent.

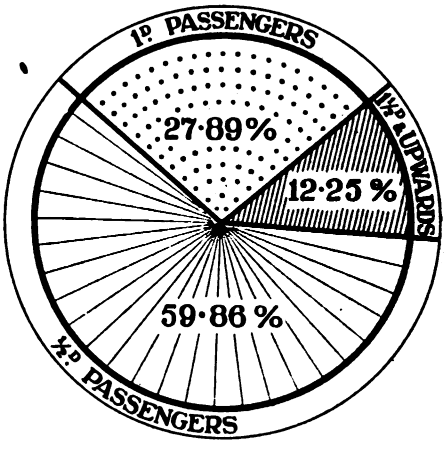
The company has to pay taxes the same as a private corporation and gives its profits to the common good. The total number of employees was 7,195 in 1920, an increase over 1919 of 540. Of this total for 1920, there were 1,784 motormen, 1,464 conductors and 467 conductresses. The change back from women to men operators may be noted by the fact that the conductors in 1919 were 800, while the conductresses were 1,087. The total payroll for the year 1920 was £1,129,909.

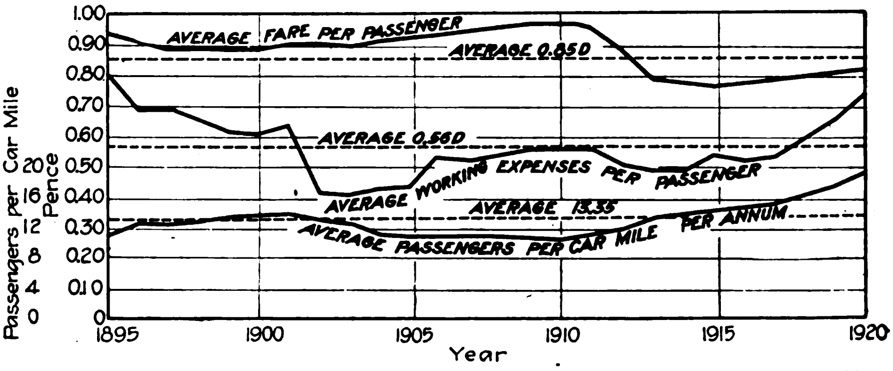
In the accompanying charts everything seems to be advancing at a tremendous pace. The operating expenses are nearly overtaking the total receipts, as seen by the fact that the operating ratio is now more than 90 per cent. But at the same time the passengers carried have increased, as has the traffic revenue per passenger. Car mileage, although decreased in 1919 by 679,684 over the previous year, shows an increase in 1920 over 1918 of 197,784, making the total car-miles 26,459,015 for the year. Traffic revenue per car-mile has increased uniformly since 1917. The average passengers per car-mile since 1895 were 13.35, but the last few years the number has been higher, reaching 19.25 in 1920. The average fare per passenger had a drop between 1911 and 1915, but is gradually gaining again. The maximum average on this curve was in 1910 with .96 pence and the minimum was in 1915 with .76 pence. For 1920 the average was .81 pence. At the same time the average working expenses per passenger are increasing at a more rapid rate. For 1920, the average working expenses per passenger was .73 pence.

TRAFFIC REVENUE



PASSENGERS CARRIED





AVERAGES OF THREE ITEMS FOR TWENTY-FIVE-YEAR PERIOD, 1895-1920

Ocean Shore Ceases Operation

The Ocean Shore Railroad, San Francisco, Cal., has ceased to operate. The road was never completed, there being a gap in the middle almost as long as the completed part of the road. Construction of the road was very expensive. The traffic was never sufficient to make the road pay, and recently the automobile and motor truck have cut into the road's revenues. Finally the 100 employees made demands for an increase in wages. At this point the officials threw up their hands in despair and discontinued operation.

Ten million dollars was spent in the effort to build and operate the road. After the stockholders had been wiped out a committee of bondholders struggled unvailingly for nine years to make the road pay. Yet the situation is not entirely without hope. The San Francisco terminals of the company are electrically operated. Rapid general development of the territory through which the road runs and the extension of electric propulsion to the entire line may possibly afford a way out.

Financial Plan Declared Operative

The protective committee representing the holders of the 4-6 per cent bonds of the National Properties Company, Philadelphia, Pa., of which Evan Randolph is chairman, has declared the amended plan operative. The time for the deposit of bonds, which expired on Aug. 16, has been extended to Sept. 20.

A second protective committee with V. Gilpin Robinson as chairman has taken this position:

1. That full information as to all operations of the American Railways and the National Properties Company since Jan. 1, 1916, shall be given to all bondholders.
2. That the present condition of their property as to resources and earning power shall be made clear.
3. That the provisions in the deed of trust securing the bondholders shall faithfully be carried out.
4. That all claims that may be justly found to lie against the National Properties Company, any other company, or any individuals shall be prosecuted to the full extent of the law for the benefit of the National Properties-American Railways bondholders.
5. That the plan which is finally presented to the bondholders be a plan that gives those bondholders who pay any assessment that may be necessary, the best possible security for their money, and a plan whereby those bondholders who cannot pay an assessment get a square deal.

Bondholders are requested to deposit their bonds with the Provident Life & Trust Company, Philadelphia, on or before Sept. 8. If deposited with the original protective committee, holders are asked, if they so wish, to withdraw their bonds and redeposit them.

The plan as originally proposed was intended to supply the company with additional cash and to take care of obligations which are in default. It was devised principally because it had become impossible satisfactorily to market the securities of the subsidiaries owing to the changed money conditions, especially as to interest rates. The details were referred to in the ELECTRIC RAILWAY JOURNAL for July 17, page 147, and Aug. 14, page 334.

City Opposes Renewal Fund Use

The special traction counsel for the city of Chicago, Chester E. Cleveland, has notified the Board of Supervising Engineers that it should not approve any certificates of expenditure for new equipment, which are to be covered by surplus money in the 1907 contract ordinance renewal fund. The use of such money for buying new cars was authorized by the Illinois Public Utilities Commission as explained in full in ELECTRIC RAILWAY JOURNAL of Aug. 14, page 337, and commented on editorially in the issue of Aug. 21, page 348. The city, in its notice, reminds the board members that they are bound by a contract between the traction companies and the city and that the use of the renewal fund money for buying new cars would be contrary to the provision of that contract. There is also an intimation that the city will resort to court action if the fund should be used in this manner.

Financial News Notes

Receiver's Certificates Retired.—Judge Faris in the United States District Court has issued an order permitting Rolla Wells, receiver of the United Railways, St. Louis, Mo., to pay out $2,300,000 of the company's general funds to retire $2,300,000 of 6 per cent receiver's certificates which fell due on Sept. 2, 1920. The order disclosed that the receiver had been unable to sell any of the $4,200,000 of receiver's certificates authorized by the court about six weeks ago, because the bids were too low.

Car Trust Certificates Offered.—Hambleton & Company and the Fidelity Trust Company of Baltimore, Md., recently offered at prices to yield 8 per cent $280,000 of 8 per cent car trust gold certificates, Series of 1920, of the Dallas (Tex.) Railway. The certificates are dated Sept. 1, 1920, and are due serially March 1, 1921, to Sept. 1, 1923. They are in the denomination of $1,000. Interest is payable May and September at the office of the Fidelity Trust Company, trustee. The certificates are redeemable as a whole on thirty days' notice at 101½ and interest. They are secured by fifty specially equipped new Birney safety cars built by the J. G. Brill Company, upon which the company will make an initial payment of about 20 per cent of the total cost.

Vote on Reorganization on Oct. 18.—With a view to consummating the amended plan of reorganization of the United Railroads, San Francisco, the stockholders of the Market Street Railway will vote on Oct. 18 on authorizing the new stock and bonds called for by the plan, thus increasing the total capital stock to $32,150,000 and the authorized debt to $22,700,000. The capital stock will be advanced from $18,750,000, all common, to $32,150,000, consisting of $11,750,000 of prior preference stock; $5,000,000 of preferred stock; $4,700,000 of second preferred stock and $10,700,000 of common stock. The stockholders will also vote on increasing the authorized bonded debt from $17,500,000 to $22,700,000 by authorizing the issuance of $5,200,000 of five year 6 per cent notes to be secured among other ways, by pledge of $5,200,000 of the present authorized bonds. The meeting will also act on increasing the number of directors of the corporation from five to eleven.

Dallas Still Far Behind.—The Dallas (Texas) Railway carried fewer passengers during July under the 6-cent fare than during May under the 5-cent fare, according to statistics given out recently by Richard Meriwether, vice-president and general manager of the company. During May 5,682,705 passengers were carried while during July only 4,976,398 passengers rode on the cars, a decrease of 706,307. The company, even with the 6-cent fare, is not earning the return authorized under the terms of the franchise granted on April 3, 1917. The shortage for the month of July amounted to $19,566. Mr. Meriwether's report shows a total valuation of $8,863,005 on which a return of 7 per cent is authorized by the franchise, thus giving a net return of $51,700. The gross income from all sources for July was $275,391, and the operating expenses $243,257, leaving net earnings of $32,134. This gives an accumulated shortage for the thirty-four months' operation under this franchise amounting to $566,790.

Receiver Named for Hamburg Railway.—John F. Burke, Buffalo, N. Y., was named receiver on Aug. 31 by Justice Alonzo Hinkley in Supreme Court for the Hamburg Railway Company, Buffalo, under $10,000 bond. The receivership order requires that the Public Service Commission be asked to determine what sum the company will be required to pay for power to operate its cars to the Buffalo & Lake Erie Traction Company's terminal at Bay View, N. Y., and what sum the Buffalo & Lake Erie Traction Company shall be required to pay for the use of 2 miles of the Hamburg line's tracks. Mr. Burke was the choice of the majority bondholders for receiver. He is a large bondholder. With the appointment of a receiver for the Hamburg Railway, which has been operated as part of the Buffalo & Lake Erie Traction Company system, the Buffalo & Lake Erie Traction Company was compelled on Sept. 1 to suspend local service over the Hamburg line. The receiver for the Hamburg line prohibits the Buffalo & Lake Erie Traction Company from making local stops between Buffalo and Bay View. The Buffalo & Lake Erie Traction Company operates between Buffalo and Erie, Pa.

Traffic and Transportation

Iowa Lines Raise Fares

Cedar Rapids and Mason City Companies Raise Rates Under Terms of Supreme Court Decision

Acting under the terms of a recent decision of the Iowa Supreme Court, two electric railways operating within the State have raised their fares. They are the Cedar Rapids & Marion City Railway, Cedar Rapids, whose rates are now 8 cents, and the Mason City & Clear Lake Railroad, Mason City, which is also charging an 8-cent cash fare.

The opinion of the Supreme Court was rendered in the case of the appeal of the Ottumwa Railway & Light Company, Ottumwa, from a ruling of the lower court which denied the company an injunction restraining the City of Ottumwa from reducing the fare from 6 cents to 5 cents. The higher court ruled that a contract between a city and a railway which fixes a permanent fare has never been sanctioned by the Legislature of Iowa, and that, therefore, rates fixed in such a contract may be changed. The court further held that it is against public policy to contract for unchanging rates and that there must be no such contract because its enforcement might fasten an exorbitant charge on the patrons, or on the other hand a rate that will confiscate the property of the utility.

COMPANIES QUICK TO ACT

This ruling of the court has been interpreted by the managements of several Iowa properties to mean that inasmuch as the rate of fare specified in a franchise is not binding, the companies have the right to put in force a rate of fare which is not unreasonably high. The order is further interpreted to mean that the rate of fare need not be one which just misses being confiscatory, but one which is reasonable, taking into account the cost of money to utilities. The decision is therefore regarded as of considerable importance to the electric railways of the State, since it apparently means that the companies will be able to maintain their properties and render adequate service.

The rate increases at Cedar Rapids and Mason City were made upon the companies' own initiative. It is reported that the higher fare went into effect in both cities without any friction or complaint from the public. The Cedar Rapids company announced that the wages of its 200 employees would immediately be advanced. The Iowa Railway & Light Company, which operates a few cars in local service in Cedar Rapids, also increased the fare to 8 cents.

A feature of the new Mason City rate is the sale by the company of a monthly ticket by the use of which it is possible to make each ride at a cost of as low as 6 cents. The tickets, or passes, are sold for $1 each and each is good for one month only. The plan is designed to take care of the steady rider. Each time the holder of a pass boards a car he shows the card and gives the conductor a nickel. At forty rides a month his fare is 7½ cents; at fifty rides, 7 cents; at sixty rides, 6⅔ cents; at seventy rides, 6.4 cents; at eighty rides, 6.2 cents; at ninety rides, 6.1 cents, and at 100 rides, 6 cents. The cards are issued to individuals and are not transferable. They are not issued to companies. Each card is stamped with the date of issuance and the holder's name.

Seven Cents in Oklahoma City

A 7-cent fare with four tickets for 25 cents took effect on the local lines of the Oklahoma Railway, Oklahoma City, Okla., on Sept. 10. The fare was formerly 5 cents. The new rates were authorized by the State Corporation Commission.

Some four or five months ago the officers of the Oklahoma (Okla.) Railway took up with the Mayor and City Commission of Oklahoma City in an informal way the matter of increased fares on the city lines. The situation was explained fully and about the middle of June a formal petition was presented to the commission asking for a 7-cent fare, four tickets for 25 cents.

The Mayor suggested that a committee of five men be appointed and an independent auditor be retained at the expense of the railway to investigate the finances of the company and report to the commission. This plan was agreed to by the railway and the committee and the auditor were appointed by the Mayor. The auditor went into the affairs of the railway very thoroughly and submitted a report early in August to the committee to the effect that the company was unable to function properly under the 5-cent fare with the universal transfers in effect since the company was organized.

After a thorough study of the report the committee voted to recommend the increase which had been requested. On the committee was a representative of the labor unions. This member voted under instructions from the labor council and was the only member of the committee to go on record against the increase. The Mayor and the City Commission, after going over the report, passed an ordinance permitting the provisions of the franchise which requires a 5-cent fare to be waived for three years and decided in favor of an increase in fares in accordance with the recommendations of the committee subject to the approval of the State Corporation Commission.

Losing $2,772 Daily

Kansas City Railways Tells Municipal Authorities It Must Have More Revenue—Asks Higher Rate

Service is being furnished by the Kansas City (Mo.) Railways at a daily loss of $2,772. This fact is brought out by the company in a letter which it has addressed to Mayor Cowgill and other municipal officials as well as to the Chamber of Commerce and the daily newspapers. In this communication the railway management outlines the reasons for its recent application to the State Public Service Commission for authority to raise its fare.

FLEXIBLE FARE PROPOSED

To meet the present situation the company proposes to install a flexible-fare system under which the rate, based on present prices, would advance from 8 cents to 9 cents, with six tickets for 50 cents. This would mean a rate of approximately 8.5 cents a passenger. The average fare is now 7.42 cents, while the cost of furnishing service is 8.23 cents for each revenue passenger.

Increases in wages and in the cost of fuel have been largely responsible for its present predicament, says the company. During the past year wages have risen by approximately $1,000,000, while the price of coal has advanced from $3.43 to $4.46 a ton. The company points out that for the period of March, April and May it operated at a loss of $255,056.

The company's letter follows in part:

The street railway business is bottomed upon the theory that it will have a monopoly of the community's transportation. Upon this theory it is regulated and controlled by law, both as to its operation and its earnings. Upon this theory it is required to operate development service upon lines and in districts where present traffic does not pay the actual cost of operation. It is required to operate owl cars which are non-paying; to maintain certain service standards regardless of whether they pay.

JITNEYS ADD TO COST

We, of course, feel that the best interests of the Kansas Cities are not served by permitting the operation of jitneys. We do feel that the transportation of a city covering eighty-nine square miles, with a population of 450,000, and now served by 315 miles of street railway, can never be adequately furnished by this form of transportation. In the first place, if automobile transportation should attempt to furnish the service now given by the Kansas City Railways it would be an economic impossibility. . . .

DIVIDENDS NOT ASKED

In view of the facts as above set forth, and which are established by exhibits, or which can readily be ascertained from the city's representative on the Board of Control, we are asking for a fare that will make possible the present high grade of service; to pay adequate wages to our employees; and to pay a legal rate of return to those whose money is invested in Kansas City's street railway facilities. We are not asking for profits or dividends, nor do we expect them.

We regret the necessity for this step and would welcome any condition that would make possible a reduction in car fares. We submit for your consideration the fact that the removal of jitney competition and the reestablishment of the transportation business of Kansas City upon the proper basis would make possible a reduction under what will otherwise have to be charged. Wo do not believe that it is just or for the best interests of Kansas City that the 350,000 people who daily avail themselves of our service should be required to pay a penalty of approximately 1 cent a car ride in order to supply jitney service to a small minority.

Bridgeport Cars to Run Again

Connecticut Company Plans to Restore Service on Its Lines There on Sept. 20, Following Council's Action in Restricting Buses

Bridgeport's electric cars are "coming back." Service will be restored by the Connecticut Company on its Bridgeport city division on Sept. 20. Announcement to this effect was made by Lucius S. Storrs, president of the railway, on Sept. 8 following the action of the Bridgeport Common Council the evening before in passing a new ordinance ruling motor buses off the principal streets served by the railway. The resumption of trolley operation will end a "vacation" lasting nearly two months, during which Bridgeporters have been dependent for transportation upon jitneys or private automobiles.

THE measure passed by the Council on Sept. 7 restricts jitney operation to certain designated streets and to districts for the most part entirely without electric railway facilities. Bus competition with the railway is halted through the elimination of the "jits" from the central section of the city. There is, however, no attempt to do away with the buses entirely. In the future the jitneys are to furnish a service complementary to the railway.

ENDS EIGHT WEEKS TIEUP

The resumption of trolley service in Bridgeport will come just eight weeks after the cars were taken off the streets because of the Council's failure to regulate the buses. A previous ordinance, which would have meant the elimination of all jitney operation, was declared invalid by Judge Banks on July 22 because it delegated the Council's power to fix routes to the board of police commissioners. The Council took no action to enact a new ordinance along the lines indicated by Judge Banks. The company therefore ceased operation on Aug. 2.

Under the provisions of the new law five routes are specified which the buses will be required to follow. Several of these routes traverse the city from east to west, largely through streets not having trolley tracks. A penalty of $100 is provided for each violation of the ordinance. Those sections of the measure with "teeth" follow:

> Section 2: No person, firm or corporation shall operate a public service motor vehicle along any other streets than those established and fixed in this ordinance as traffic routes.
>
> Section 3: Any person, firm or corporation violating any of the provisions of this ordinance shall pay a fine of not more than $100 for each offense.
>
> This ordinance shall take effect September 20, 1920.

PRESIDENT STORRS SATISFIED

After studying the ordinance as passed, President Storrs announced that it was satisfactory to the company and that the company would resume operation in Bridgeport on Sept. 20, the day on which the new statute will take effect. In a letter to Mayor Wilson of Bridgeport on Sept. 8 Mr. Storrs outlined the railway's position as follows:

> I have before me a copy of an ordinance passed by the Common Council last night regulating the jitneys within the city of Bridgeport, under which the operation of the buses is confined to certain specific streets. The most important of these routes are limited to areas within the city not supplied with any other means of public transportation and in two cases along streets where we have been unable to comply with the desires of the city for an extension of tracks due to our inability to obtain the necessary funds. Other routes have been defined operating from the city line on the west to the city line on the east, largely through streets not having railway tracks. * * *
>
> Now that the city of Bridgeport has expressed its preference for the electric railway operation with buses mainly regulated to a complementary service, we will be prepared to resume service on Sept. 20, and will give the people of Bridgeport the best service that can be produced with the facilities which the company controls. We feel confident that we will be able to satisfy the public in this regard and trust that in the future the relations between the city and the company may always be upon a co-operative basis.

Mayor Wilson, speaking in behalf of the Bridgeport public, expressed satisfaction with the Council's action. The Mayor issued a statement on Sept. 7, prior to the passage of the measure, in which he said:

> The conclusion reached by the Ordinance Committee of the Common Council, in their consideration of the problems of bus and trolley traffic, and which have been embodied in the ordinance reported to the Council this evening, will, in my opinion, receive the cordial endorsement of the public as they are based upon a full knowledge of the situation.
>
> Throughout the hearings and conferences with both the bus and trolley interests there has at all times been evident the utmost harmony, and it is gratifying to note that in the final outcome the interests involved have gracefully concurred with the Ordinance Committee in their efforts to provide transportation facilities which will meet the requirements of the community as a whole
>
> The bus routes have been planned with a view of providing adequate service of that nature without undue interference or competition with the operation of cars over the established routes while, at the same time, providing free choice and opportunity for the use of either or both by the riding public, and at the same time to provide transportation facilities to many sections of the city not now enjoying the same.

The jitney drivers, while dissatisfied with the regulations, are prepared to continue operation over the designated routes pending a thorough trial of the new plan. A formal statement issued on Sept. 8 in behalf of the jitneymen's association said in part:

> Jitney officials feel that the ordinance passed last night by the Board of Aldermen will prove wholly unsatisfactory to the public. With this particular factor in view we could not reasonably agree with the ordinance as indicated. The report of the Mayor's commission met with our approval, but for some reason or other which has not yet been explained to us, this same committee, after working for weeks to complete the work assigned to it, over night seems to evince a complete change of attitude. Those on the committee who might possibly have taken our view of the situation were wholly eliminiated from the joint discussions.

An ordinance similar to that approved in Bridgeport has been recommended to the Board of Aldermen of New Haven and probably will be passed at the meeting of the board next Monday night. New Haven had been notified that trolley service probably would be suspended there as in Bridgeport if ruinous jitney competition was not restricted.

Indiana Lines Urge Raise

Charles L. Henry and R. I. Todd Appear in Interests of Interurban Railways

Declaring that Indiana must take steps to prevent confiscation of coal by railroads in times of emergency, Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, appeared before the Public Service Commission on Aug. 31 in behalf of that company's petition for increases in freight and passenger rates.

Mr. Henry stated to the commission that during the recent serious coal shortage, when the company was daily facing curtailment of service through lack of fuel, the railroads held several carloads of coal, bought in the open market at a high price, and gave the traction company no information as to the whereabouts of the coal until the crisis had passed. This coal, he said, was valued at $15,899, bought at a price of from $8.75 to $10.75 a ton.

SLIGHT RISE IN REVENUE

Mr. Henry presented figures to the commission showing that for the first twenty-six days in August of the present year, revenue from passenger service increased 6.96 per cent over the corresponding period in 1919. Passenger business increased 1.3 per cent in a corresponding period, he said, making an average increase of 38½ passengers hauled a day. The business of the company in July of this year increased 17.5 per cent over July, 1919, his figures showed.

Mr. Henry said the company is now facing the necessity of paying about $4.85 a ton for contract coal, as against the price of $3.20 under its last contract. The company was unable to lay in a reserve supply of coal, and was forced to buy most of its coal on the open market.

A hearing on the petitions of the Union Traction Company of Indiana and the Gary & Southern Railway were to be held in the afternoon.

Requesting that if the Public Service Commission sees fit to deny an increase of rates for the Terre Haute, Indianapolis & Eastern Traction Company, the order be held in abeyance pending the granting of increased rates to steam roads, representatives of that company presented a petition to the commission to increase rates to 3.6 cents a mile for passenger service and a 40 per cent increase for freight rates. R. I. Todd, president of the company, testified that at present the company is merely meeting operating expenses, but a deficit appears when the interest on borrowed money is paid. Based on a 3.6-cent fare and a 40 per cent increase in freight rates to cover the increased cost of coal and other items, the net income for the ensuing twelve months would amount to $872,000, or approximately 6.77 per cent on the original investment, on a valuation basis of $32,000 a mile for the road.

Mail Pay Advanced

I. C. C. Hands Down Long-Expected Finding, Defining "Fair and Reasonable" Rates and Conditions

The Interstate Commerce Commission has announced its decision in the electric railway mail pay case. The commission has approved the space-basis system as fair and reasonable and has stipulated that the Post Office Department shall assume side, terminal and transfer service or pay for such service on ascertainment of its cost. The findings are to become effective on or before Dec. 6, 1920.

The commission set a rate for transportation of closed-pouch mail on a car constructed and run primarily for passenger service, with no separate compartment for mail, baggage and express, at 4 cents per mile of authorized car run, for ten pouches, sacks or parcels, or less. Where more than this number are regularly tendered at least 60 cu.ft. of space is to be authorized and the rate for the first 60 cu.ft. is to be 5 cents per mile run. For each additional 30 cu.ft. or fraction 1 cent per mile is to be allowed.

The rate for space in baggage or express cars or in baggage and express compartments of passenger cars is to be 3 cents per mile for the first 30 cu.ft. and 1 cent per mile for each additional 30 cu.ft. or fraction.

RATES FOR INDEPENDENT CARS

The rate for independent cars devoted to the transportation of the mails, on which railroad employees handle the mails, is to be 1½ cent per linear foot per mile for cars 20 ft. or less in length, inside measurement, and for larger cars 1½ cent per foot for the first 20 ft. and ¾ cent per foot for the additional length. When the postal employees handle the mail in railway post office cars the respective rates are 1¼ cent, and 1¼ and ¾ cent.

The minimum annual rate on any electric railway mail route is to be $175.

When the railway companies are required by the Department to perform side, terminal or transfer service they are to be separately compensated on the basis of cost plus 3 per cent, whether the service is furnished by contracting or by the railways' employees. Cost in the latter case will include value of employees' time.

At least once in two years the Postmaster-General is to conduct tests to determine the number of pouches, sacks and outside packages that will fill 30 cu.ft. of space in a car or compartment thereof.

All of the existing postal regulation provisions with respect to the carriage of mails by electric railways are to continue in force, except as modified by the present ruling.

Nine-Cent Fare in Davenport

Court Permits This Rate to Take Effect After Proof That Seven-Cent Fare Was Inadequate—Settles Long Controversy

Inability of the Tri-City Railway, Davenport, Iowa, to secure relief from the socialist city administration led the traction lines to apply to the court and to the raising of fare in Davenport from 7 cents to 9 cents. With the 9-cent fare is a provision for three tickets for a quarter. This has been well accepted by the public. The 9-cent fare was put into effect on Aug. 28 by order of Judge A. J. House in the District Court when the traction lines introduced a sworn statement of earnings showing the 7-cent fare to be confiscatory.

THE 7-cent fare was also collected on a temporary injunction issued by the same judge. This order was secured on May 28 on the petition of a score of leading Davenport merchants. By it the city was enjoined from enforcing the old franchise rate of 5 cents. But this 7-cent fare proved inadequate and the company petitioned on Aug. 19 for a modification of the existing injunction. Basing its plea on the charge that the 7-cent fare was "unreasonable, unjust and confiscatory," and supporting this charge with a statement that the existing deficit on the company's books was $119,371, the company asked for a 10-cent fare.

BIG INCREASE IN WAGES

Increased labor cost was also cited by the company. When the 7-cent fare became effective the wage scale had a 60-cent maximum. Shortly afterward the trainmen's demands were settled by a board of arbitration with an advance of the maximum scale to 70 cents an hour.

With this advanced wage the net loss in June and July of 1920 was $11,412. This, if continued for a year, would amount to $68,816. It was estimated that even a 10-cent fare, with an approximate return of $159,098 annually, would fall $96,901 short of an 8 per cent return on the investment.

The company was able to cite the recent notable decision of the Iowa Supreme Court in the Ottumwa case in which it was held in substance that a franchise rate was not binding if it could be shown that the franchise rate was confiscatory.

CITY'S ARGUMENTS WEAK

Against this legal argument, backed with operating figures, the socialist city administration was able to offer but a weak opposition. The city had no contradicting facts to offer. An attempt was made to prove that the Iowa Supreme Court decision did not apply to the Tri-City Railway because it operated in other incorporated towns in Iowa and was therefore an interurban road. Another argument of the opposition was that the company's valuation figures were wrong because they did not coincide with assessed valuation figures on the tax books. The city's representatives also made other charges, mostly of a general nature, which they were unable to substantiate.

Judge House, after hearing both arguments, granted a temporary modification in his previous temporary injunction and raised the rate from 7 cents to the following schedule:

Adult cash fares, 9 cents.
Adult ticket fares, 8⅓ cents.
Children, 7-12 years, 5 cents.
Tri-city commutation tickets, 16 cents.

On the latter ticket a continuous ride is given from any Davenport, Ia., to any Rock Island or Moline, Ill., line. Bridge line tickets, taking a passenger from Davenport across the river to Rock Island, are 8 cents.

TICKET RATE POPULAR

The three tickets for a quarter provision has made the advanced rate popular. These tickets have been placed on sale at banks, department stores, cigar stands and many other stores and have enjoyed a heavy sale. With each three tickets a serial numbered receipt is attached. On cash fares a separate receipt is given. Both receipts entitle the holder to a refund if the present rate is not upheld by a permanent injunction.

Under the increased fare riding has fallen off but to what an extent the Tri-City Railway is not ready to make an official statement. Weather has been exceptionally fine, and traffic on short haul lines has been lighter than expected. While the percentage of decrease is greater than the company estimated, President B. J. Denman expects it to return near to normal as weather conditions become less favorable to walking.

WANTS MORE IN ILLINOIS

Within a week the company will take steps for an increase in Illinois, where the present fare, set by the Public Utility Commission, is 8 cents. Ten cents has already been asked and a hearing is expected in September. The commission has not yet set a date for this hearing.

Although the trainmen received a 10-cent increase through the board of arbitration last June, they have presented demands for a still further increase. Their present demand is time and a half pay for overtime. They now receive straight time, or 70 cents an hour maximum, for overtime. This demand has been referred to the old arbitration board and consideration of it or refusal to take up the matter is expected soon.

The action of Judge House in allowing the higher rate to take effect marks the end of a long struggle on the part of the company to secure financial relief. The city may appeal the case to the higher courts.

Jitney Law Valid

Court Upholds Regulatory Measure Passed by Waterbury Aldermen—Operators Denied Injunction

Judge George E. Hinman of the Superior Court has found that the action of the Aldermen of Waterbury in adopting the jitney regulatory ordinance was not so unreasonable as to render the measure invalid or to open its validity to such extent that its enforcement should now be enjoined. The court says that the suspension of the enforcement of the ordinance pending final hearing and the determination of the action are not warranted by the situation presented. The application for a temporary injunction was therefore denied. The ordinance sought to be enjoined designates as traffic routes for public service motor vehicles all except certain streets and portions of streets mentioned in the ordinance. Counsel for the jitney men claimed the ordinance to be void on the ground of unreasonableness.

JITNEYS UNDER CONTROL

Thomas F. Moore, secretary of the Chamber of Commerce of Waterbury, Conn., recently proposed that the city rely solely upon the trolley. That body, though its transportation committee, filed an elaborate survey of the local situation with the Board of Aldermen, who adopted the recommendations and passed an ordinance restricting the jitneys from operating on streets now served by the electric railway. In concluding his report Mr. Moore said:

> The solution of the present problem must be through regulation of the motor vehicle and establishment of a fair basis of competition. It is impossible to define without an actual traffic survey just what combination of trolley and jitney will be ideal. It must be learned by experiment and experience. The number of trolleys operating in Waterbury varies from thirty-three in the slow hours to eighty-two in the rush hours of the day. During the month of June, a daily average of 46,852 passengers carried shows the seriousness of the problem.
>
> A study has been made of the number of cars in service, their capacity, their schedule, routes, etc., and it is only after such investigation that the immensity of the passenger transportation situation can be grasped. According to public service operators, there are approximately 100 motor vehicles in public service use, including about thirty-eight large buses, and about forty smaller cars operating on the Naugatuck-Waterbury route. It is evident that large numbers of people are served by both vehicles and that to continue this service, careful action must be taken. The following procedure would seem to offer a possibility of ideal solution:
>
> 1. The trolley must for a period of experiment at least, be given the exclusive privilege of accepting and discharging passengers on the streets now occupied by their tracks.
> 2. The traffic division of the Police Department, or some especially appointed party, should make a survey, and check upon the service rendered.
> 3. Motor vehicles in the meantime should be permitted to operate on lines not served by the trolley and should, during this period, endeavor to supply that new service which will win them the sanction of public opinion.
> 4. If under such regulation it is evident that the trolley cannot or does not provide adequate service at reasonable rates, either to certain sections or at certain hours of the day, provision should be made to allow a supplementary use of motor vehicles under regulation in those sections or at these hours.
>
> The above suggestions offer a careful test and should prevent extreme measures which may work to the detriment of the public service. At the same time they permit of the proper development of motor bus service and provide for its reinstatement along all lines in so far as trolley service is inadequate. This solution recognizes the indispensability of the trolley, and also the merits of the motor vehicle through which it may hope to win the approval of public opinion. It may cause temporary inconvenience of some degree, but those so inconvenienced should see the problem in its entirety and judge accordingly.
>
> ### GENERAL REGULATION IMPERATIVE
>
> Regulation of motor bus transportation—Regardless of the regulation as to routes of public service motor vehicles, there must be ultimately a general regulation either by state or municipal legislation which will safeguard the interest of the public. Such regulation should include:
>
> 1. Licensing of public service motor vehicles.
> 2. Establishment of a standard, assuring competence of operators.
> 3. Establishment of routes, schedules, and tariffs.
> 4. Limitation of passengers to trade capacity of cars.
> 5. Requirement of certain safety appliances and certified condition of vehicle.
> 6. Such miscellaneous conditions, as no collection of fares while in motion, no smoking in cars, the report of accidents to police, the display of tariff rates, inspection of vehicles, and the method of acceptance and discharge of passengers.
>
> Distinction must be made between the regular public service and the service performed by so-called taxis which are now governed by sufficient municipal regulations.
>
> CONCLUSION.—This report has been made by a committee whose sole purpose is to set forth that solution of a serious problem, which will work to the best interest of the public of Waterbury. The problem must be solved as soon as possible before it assumes proportions which will threaten the welfare of every resident of Waterbury and which will make solution all the more difficult and disastrous.

Louisville Request Provokes Comment

The Allied Public Service League of Louisville, Ky., has decided that the Louisville Railway had failed to show justification of 7-cent fares and has condemned the action of the Round Table in favoring that fare under a service-at-cost plan.

The chief objections to the Round Table's solution of the railway problem were the service-at-cost feature and the proposed change in the company's perpetual franchise. The local Trades Union Assembly has also declared against the fare increase, but this may be discounted in view of the failure of the strike of the trainmen last year.

The Advertising Club has come out in favor of 7 cents and two of the daily newspapers, long suspicious, have declared themselves convinced that the company needs the fare. All four of the daily papers are urging city officials to take immediate action one way or the other and questions the motives of the city authorities for their inaction.

May Raise Youngstown Fares

Indications point to an increase in the rate of fare at Youngstown, Ohio, from 9 to 10 cents, with 1 cent for each transfer. It is reported that the stabilizing fund of the Youngstown Municipal Railway has fallen below $50,000, which is the minimum limit. The report of operations for July had not reached Street Railway Commissioner W. L. Sause on Aug. 25. This report may change the status of the fund to some extent, but possibly not sufficiently to retain the present rate of 9 cents, with a penny for transfers.

No provision for a higher rate than the present one was made in the franchise of the Youngstown Municipal Railway, but the City Council is empowered to establish a higher rate, when next to the highest rate has been reached. When this rate, known as rate No. 1 became effective, the company filed a communication with Council, asking that a 10-cent rate be authorized in accordance with the franchise, but Council has so far failed to take action on the request.

During the past few weeks there has been a decrease in the revenue of the company, due to some extent to the high rates. Many persons have walked to save money, it is reported. Another factor is the curtailment of iron and steel mill operations, which has reduced the number of riders.

Merchandising Transportation Stressed by Commercial Body

The secretary of the Chamber of Commerce of Springfield, Mass., has written to the secretary of the Chamber of Commerce of Bridgeport, Conn., giving its views of local transportation. Some of the outstanding features of the statement of the Springfield body are:

That automotive transportation is yet in its infancy and for several years to come cannot be a reliable means of public transportation.

That industrial expansion is impossible without adequate transportation.

That transportation service must be a monopoly.

The letter says further:

> The sentiment in Springfield is that automotive transportation is yet in its infancy and for a number of years to come cannot be a reliable means of public transportation. On the other hand, there must be a satisfactory re-creation of public confidence in electric railway operation. We are convinced that the average city electric railway has omitted a very fundamental operation in its organization, namely, merchandizing its service, and I think that articles like those by Walter Jackson, street transportation engineer, are splendid for their suggestive value for the railways adequately to merchandize their service to their community.

Interurban Rise Attacked

Steps have been taken by the Kentucky Railroad Commission to proceed in the courts against the Louisville & Interurban Railroad, Louisville, as the result of an increase in the rate of fare charged by the company from a basis of 2½ cents a mile to one of 3 cents a mile. The new rate became effective on Sept. 1, the company acting in the matter without first consulting the commission. The 2½-cent rate was set by the commission on Aug. 1, 1919, to stand until the commission saw fit to authorize a change. The commission has ordered Attorney General Dawson to institute injunction proceedings to restrain the railway from collecting the new rate. This is the first occasion on which the commission has attempted to indict an electric railway and is the first step taken to determine what power is lodged in the utilities board.

Transportation News Notes

Eight Cents in Dixon.—Cash fares on the city lines of the Sterling, Dixon & Eastern Electric Railway, Dixon, Ill., were raised on Aug. 13 to 8 cents. The fare between Dixon and Sterling was raised to 25 cents. The increase was authorized by the State Public Utilities Commission.

Appeals to Court in Fare Case.—The Jersey Central Traction Company, Keyport, N. J., has appealed to the State Supreme Court from a recent ruling of the State Board of Public Utility Commissioners refusing it permission to increase its fares. The company had applied for an advance from 7 cents to 10 cents in each zone.

Tokens in Toledo.—The metal tokens adopted for use in the fare boxes of the Toledo Railway & Light Company, Toledo, Ohio, were put in service on Sept. 1. The coins are smaller than a penny and are made of white metal. They have the Doherty emblem on one side and the legend "One Fare—T. R. & L. Co.,—F. R. Coates, Pres't." on the other. A triangular hole is cut in the center. The tokens are sold at the rate of three for 20 cents.

Trailers Soon on Baltimore Lines.—One hundred new trailer cars will shortly be operating on the lines of the United Railways & Electric Company, Baltimore, Md. The cars have already been ordered and the first four arrived in Baltimore on Sept. 1. Two-car trains have been in use in Baltimore for a number of years and the present cars will be used in the same manner as the company is now operating two-car trains to Sparrows Point.

May Raise Pine Bluff Rate.—An ordinance has been introduced in the City Council of Pine Bluff, Ark., which, if passed, will permit the Pine Bluff Company, operating the electric railway system in that city, to raise its fare from 6 cents to 7 cents. The proposed measure authorizes the company to sell four tickets for 25 cents. It also provides for an increase in power rates of 1 cent a kilowatt. The company recently raised the pay of the carmen in its employ.

Chicago & West Towns Gets Increase.—Effective on Aug. 4 the Chicago & West Towns Railway, Chicago, Ill., was granted an increase which abolished all ticket rates and established a minimum fare of 10 cents. The fare from Chicago to LaGrange, Ill., remains at 15 cents, though the fare within LaGrange, as in other towns served, is 10 cents. This abolishes the former rate of 7 cents cash with four tickets for 25 cents within towns and a 10-cent cash fare or 8-cent ticket between towns.

Jersey Line in Need.—The Burlington County Transit Company, Hainesport, N. J., has applied to the State Board of Public Utility Commissioners for permission to increase its fare to 7 cents where 5 cents is now charged. The company is now charging at the rate of about 2 cents a mile, and the proposed increase will make the rate about 3 cents. The road has never been a financial success. The company is one of the last in the State to apply for an increase in fares and the last to operate on a 5-cent schedule.

Seven Cents in Bellingham.—The Washington Public Service Commission on Aug. 26 permitted the filing of a 7-cent fare schedule by the Puget Sound Traction, Light & Power Company for its lines in Bellingham. The commission fixed Sept. 1 as the date for the new fare to become effective. The City Council of Bellingham approved the 7-cent fare, on condition that the carmen be given wage increases. The individual fare increase is from 6 to 7 cents, with the number of commutation tickets purchasable for $1 reduced from seventeen to fifteen.

Six Cents in St. Paul.—A 6-cent fare will go into effect in St. Paul, Minn., on Sept 13, making the rate the same as in Minneapolis. At present there is a neutral zone into which Minneapolis patrons ride for one fare, about two miles within St. Paul territory. Business organizations have asked for retention of this zone. The St. Paul City Council will amend its ordinance so that control of this zone fare is retained by the Council. The increase in fare was granted to the Twin City Rapid Transit Company to enable it to meet the demands of its carmen for an increase in wages. The St. Paul carmen had threatened to strike unless their pay were raised.

Hull Pensioners Carried Free.—Old age pensioners of the city of Hull, England, of whom there are 5,000, may hereafter ride in the trains of the tramways company without payment of fare. Heretofore this privilege has extended to the blind and to men who lost a leg in the war. The decision of the tramways committee was not put into effect without opposition, however. The tramways manager estimated that it would cost the company £10,000 a year. Also it was insisted that the Government should increase the old age pensions. All these objections were finally voted down, and hereafter old age pensioners may ride free on Hull tramcars.

Will Raise Interurban Rates.—Notice has been filed with the State Public Service Commission by the Puget Sound Traction, Light & Power Company, Seattle, Wash., that passenger fares on the company's interurban lines will be increased an average of 11 per cent effective Oct. 1. Tariffs embodying freight rate increases on the same lines, ranging from 20 to 25 per cent, to correspond with increases granted to steam roads, are being prepared for filing, and will take effect not later than Oct. 1. The new passenger fares are based on a mileage basis, with minimum charges fixed in the new rates, both on a single trip to any point, on school tickets, commutation tickets and general tickets for children taking half fare.

New Vote on Duluth Fares.—Voters of Duluth, Minn., will decide on Oct. 4 whether the Duluth Street Railway shall be allowed to charge a 6-cent fare on its local lines. An ordinance granting the company an increase from 5 cents to 6 cents was turned down at a referendum election on June 21. Following the rejection of the measure the car men asked for a pay increase. This demand the company refused on the ground that the payment of higher wages was impossible under the nickel fare. On July 20 the men walked out, but returned to work after a one-day strike with the understanding that their wages should be increased and that a new fare ordinance should be submitted to the voters.

P. R. T. Petition Withdrawn.—Permission has been granted to the Philadelphia (Pa.) Rapid Transit Company by the State Public Service Commission to withdraw the rate schedule under which the company proposed to increase its fare through the elimination of free transfers and the charging of 3 cents for exchange tickets. The schedule was filed by the company on June 1 last, but was never put into effect because of opposition from the city authorities. Thomas E. Mitten, president of the P. R. T., recently applied to the commission for authority to withdraw the schedule. Such a course was opposed by the municipal authorities on the ground that it would jeopardize the appraisal of the company's property, now under way. In allowing the company to withdraw the 3-cent rate, the commission directed that the appraisal be continued.

Tokens Cost More at Pittsburgh.—Pittsburgh car riders began paying an increased rate for tokens on Sept. 1, the Pittsburgh Railways advanced the token rate from 7½ cents to 8⅓ cents. The cash fare remains at 10 cents. Three tokens are now sold for 25 cents. To avoid unnecessary expense the company decided not to change the style of tokens in use, relying upon the honesty of its patrons not to stock up on the metal disks in anticipation for the rate advance. Hardly had this announcement been made when a mad rush to buy tokens began. The buying continued uninterrupted for several days. Then the company had to do something or run out of the metal disks. It therefore restricted the sale to two tokens to each rider instead of the customary four for 30 cents. Some of the conductors estimated that 80 per cent of their passengers were buying checks at every opportunity. A few passengers who did a great deal of riding in the days immediately preceding the increase are said to have purchased from fifty to 100 checks each.

Personal Mention

Charles A. Kolstad, secretary-treasurer of the Elmira Water, Light & Railroad Company, Elmira, N. Y., has resigned to enter the garage business in Seattle, Wash. Mr. Kolstad joined the Elmira system in 1910. Prior to that time he was traveling auditor for the United Gas & Electric Company.

C. I. Kephart, formerly electrical and valuation engineer of the Oregon Public Service Commission, has removed to Washington, D. C., where he has taken up his new duties as an examiner with the Interstate Commerce Commission. Mr. Kephart has been connected with the Oregon Commission for several years.

Arthur F. Brooks has been appointed superintendent of lines of the Brockton division of the Eastern Massachusetts Street Railway, Boston, Mass. Mr. Brooks will have charge of both office and construction work for the division. He has been connected with the company and its predecessor, the Bay State Street Railway, for the past fourteen years.

D. J. STROUSE

Walter E. Miller has resigned from the staff of the Wisconsin Railroad Commission to engage in private practice as a consulting engineer. Mr. Miller has opened offices in Madison, Wis. He has been connected with the commission for the past fourteen years. His practice will include investigations and studies of steam railroads and electric railways.

R. A. Wilson, general superintendent of the Washington Water Power Company, Spokane, Wash., left Spokane recently for a tour of the Pacific Coast and Middle West States. Mr. Wilson will be gone from his desk for about six weeks. He will inspect the large amusement parks in various cities to obtain new ideas for use at Natatorium Park, operated by his company.

D. J. Strouse, Comptroller

Auditor of the Twin City Rapid Transit Company Has Been Promoted—Mr. Macdonald Also Advanced

To facilitate the handling of the financial affairs of the Twin City Rapid Transit Company, Minneapolis, Minn., the office of comptroller has been re-established. Daniel J. Strouse, for several years auditor of the company, has been appointed to the new position. S. Macdonald has been given the title of assistant comptroller. The office of auditor has been abolished. Mr. Strouse and Mr. Macdonald will co-operate with E. A. Crosby, treasurer of the company, in directing the financial aspects of the operation of the traction system of Minneapolis and St. Paul.

Mr. Strouse was born on Nov. 6, 1879, at Charles City, Iowa. He attended the public schools there and for a short time was a student at Nora Springs, Iowa He was then employed by an abstract firm for three years and later represented Fleener & Carnahan, an Indianapolis firm of tax experts, for three years, checking up tax matters for the State and for various counties. In 1903 Mr. Strouse removed to Minneapolis, where he became general bookkeeper for the local traction system. Four years later Mr. Strouse was promoted to auditor.

Mr. Macdonald is thirty-six years old. He is a native of Duluth, Minn., where he made his home until five years ago. He received a common school education and in 1900 entered the service of the Duluth Street Railway as an office boy. After working in various capacities he was transferred to the accounting department, and, in 1912, he was made auditor of the company. Three years later he resigned to become assistant to the auditor of the Twin City Rapid Transit Company, continuing in that capacity until his recent promotion to be assistant comptroller.

Roy Connell, a signal inspector of the Brooklyn, (N.Y.) Rapid Transit System, has been appointed sales engineer of the General Railway Signal Company with headquarters in New York City. Mr. Connell entered railway work in 1895 as a signal helper with the Chicago & Northwestern Railway. After serving with that road and several manufacturing companies, he became designing engineer of electric interlocking apparatus for the Hall Switch & Signal Company. A year ago he resigned to join the B. R. T.

Franklin T. Griffith, president of the Portland Railway, Light & Power Company, Portland, Ore., has been reappointed chairman of the Water Power Development Committee of the National Electric Light Association. Mr. Griffith's reappointment to this position comes as a recognition of the splendid work which he has performed during the past year in behalf of the committee. In connection with his duties as chairman of the committee, Mr. Griffith has been spending some time in Washington, D. C., attending a conference of the Federal Power Commission.

George V. Hansler has been appointed assistant superintendent of signals of the Brooklyn (N. Y.) Rapid Transit Company. Mr. Hansler was born in Washington, N. J., on March 9, 1890. In 1901 he went to work in the signal department of the New York Central Railroad. He was later employed in the capacities of signalman, wireman and foreman, at various times, by the Hudson & Manhattan Railroad, the New York, New Haven & Hartford Railroad, the Long Island Railroad, the Erie Railroad and the General Railway Signal Company. He entered the service of the B. R. T. in June, 1914, and was assigned to the signal division as a signal maintainer. In May, 1919, he was appointed assistant supervisor of maintainers. He was later promoted to supervisor of maintainers.

S. MACDONALD

George S. Williams, whose appointment as general manager of the Androscoggin Electric Company, Lewiston, Maine, was announced in a recent issue, has been connected with the Central Maine Power Company for a number of years. While devoting most of his attention to his new duties at Lewiston, Mr. Williams will continue his connection with the Central Maine organization as general superintendent. Mr. Williams was born in Augusta, Maine, Sept. 9, 1882. In 1903, after studying for three years at the University of Maine, he became connected with the old Kennebec Light & Heat Company, which later became a part of the Central Maine Power Company. From June, 1903, to May, 1904, Mr. Williams worked in Augusta. He was then sent to Gardiner, where he worked for two years as lineman and inside wireman. Three years ago he became general superintendent of the company.

A. V. Kipp, general passenger and freight agent at Butte, Mont., for the Oregon Short Line, has been appointed to a similar position with the Salt Lake & Utah Railroad, Salt Lake City, Utah. Mr. Kipp began his railroading experience twenty years ago as traveling freight agent of the Union Pacific.

R. N. Ward has been appointed claim agent of the Southern Public Utilities Company, Charlotte, N. C. Mr. Ward succeeds the late Luther Guy. For the past fifteen years Mr. Ward has been connected with the Southern Railway as claim agent, chief clerk to the division superintendent, and in other positions. His headquarters will be at Greenville, S. C.

Dr. S. W. Stratton, director of the National Bureau of Standards, has sailed for Europe to attend a meeting of the International Bureau of Weights and Measures in September. Dr. Stratton will be the principal American representative to discuss proposed changes in function and scope of the bureau to include custody of other standards than weights and measures.

Wigginton E. Creed has been elected to succeed Frank E. Drum as president of the Pacific Gas & Electric Company, Sacramento, Cal. The company owns about 40 miles of electric railway line in addition to operating large central station installations. Mr. Creed is president of the Hooper Lumber Company and is interested in the East Bay Water Company, Oakland, Cal. Mr. Creed was the guest of honor at a recent banquet at the Palace Hotel, San Francisco, given by John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, to the board of directors, heads of departments and district managers of the company. Mr. Drum was president of the company for several years. He resigned to give his attention to other enterprises.

Lyndon Clapp has returned to the service of the Boston (Mass.) Elevated Railway after an absence of two years, during which he has held the position of assistant superintendent of the Water Department of Waltham, Mass. Mr. Clapp will resume his work in the engineering department of the Elevated. He was born in Boston in 1874. Removing to Waltham at an early age, he was educated in the public schools of that city, graduating from the Waltham High School in 1894. After serving for a number of years as rodman and timekeeper on various construction projects he went to the city of Newton as transitman. Later he was employed by the firm of Pierce & Barnes on the laying out and rebuilding of several lines of the Bay State Street Railway, now the Eastern Massachusetts Street Railway. In 1906 he entered the employ of the Boston Elevated Railway, his work consisting of the making of surveys and track building. Two years ago he resigned to become assistant superintendent of the Waltham Water Department.

R. B. Palmer Advances

Chief Engineer Succeeds H. E. Allen as General Superintendent of the Saginaw-Bay City Railway

Horace E Allen, general superintendent of the Saginaw-Bay City Railway, Saginaw, Mich., has resigned. Mr. Allen is succeeded by Russell B. Palmer, who has been serving as chief engineer of the company. In addition to directing the traction properties of Bay City and Saginaw and the interurban lines operating between these two cities, Mr. Palmer will have the duties of general superintendent of the Northeastern Division of the Michigan Railroad, the Consumers' Power Company and the Michigan Light Company.

Mr. Palmer joined the Saginaw-Bay City Railway in 1905. He was born in Saginaw in 1887. Two years after entering the company's employ he went to Ann Arbor, where he studied at the University of Michigan, from which he was graduated as a civil engineer in 1911. Following his graduation he rejoined the company, serving in the engineering department. He has been chief engineer of the railway for a number of years.

R. B. PALMER

Mr. Allen became general superintendent of the property about a year ago. He was formerly assistant general manager of the Springfield (Ill.) Consolidated Railway. He is a graduate of the Massachusetts Institute of Technology. After completing his electrical engineering course there, he accepted a position with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. In 1910 he became connected with the Toledo Railways & Light Company, Toledo, Ohio, under J. F. Collins, then assistant general manager. When Mr. Collins, now vice-president and general manager of the Michigan United Railways and the Michigan Railroad, resigned his position at Toledo, Mr. Allen was placed in charge of the Toledo, Ottawa Beach & Northern Railway and the Maumee Valley Railway & Light Company. He assumed the position of assistant general superintendent of the Michigan Railway in Sept. 1916. In the following year he resigned to become assistant general manager of the Springfield Consolidated Railway. A year ago he returned to the Michigan properties as general superintendent.

Obituary

Dr. Samuel Sheldon, professor of electrical engineering at the Brooklyn (N. Y.) Polytechnic Institute, died in Middlebury, Vt., on Sept. 5. Professor Sheldon was the author of a number of engineering works and was the joint author of "Electric Traction and Transmission Engineering." He was fifty-eight years old.

Arthur Diekmann, secretary-treasurer of the St. Louis Car Company, died recently after a serious operation. Mr. Diekmann was thirty-eight years old. He had been employed continuously by the company since his graduation from high school at the age of eighteen years. He began as a time-keeper and won his way to a responsible position, at the same time making a host of friends.

Dennis Dwyer, president of the Dayton, Covington & Piqua Traction Company, West Milton, Ohio, died at his home in Dayton, Ohio, on Aug. 27. Mr. Dwyer was ninety years of age. He had been a leading lawyer, business man and traction promoter in Dayton for many years. He was born in Ireland and came to this country when a boy. He secured an education by studying at odd moments and finally completed a law course. For several years he served as a Judge on the Common Pleas bench.

Prof. John Perry, F. R. S., who was closely identified with tramway developments in England and France, died at his home in London on Aug. 4. Professor Perry was well known in the United States, as well as in Great Britain for his work in electrical research. He was born in Garvagh, Ireland, in 1850. Graduating from Queen's College, Belfast, he became an instructor of physics at Clifton. In 1874 he became honorary assistant to Sir William Thomson (Lord Kelvin) at Glasgow. In the following year he went to Japan as Joint Professor of Engineering in the Imperial College of Engineering, where he remained until 1879. In association with the late Professor Ayrton he did much electrical work while in Japan, and on their return in 1879, Professor Perry organized the works of Messrs. Latimer Clark & Muirhead. Jointly with Professor Ayrton, he carried on much electric lighting and traction work. Among his numerous inventions was the multipolar dynamo in 1882. In 1885 he was elected a Fellow of the Royal Society. He retired from the Royal College of Science about six years ago.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Loom Prices Firm Despite Lower Cotton

Demand Less and Stocks Are Better, but Raw Material Was Bought at Spring Prices

Continued firm prices, slight building up of stocks and some decrease in demand mark the non-metallic flexible conduit situation. No immediate price reductions are to be expected, according to manufacturers, notwithstanding the recent declines in the cotton market. These makers claim that they were obliged to buy cotton in advance in order to cover themselves on the large volume of orders which they accepted last spring. As a consequence loom is priced according to the spring price of cotton. In the New York markets current quotations are about $32.50 and $35 for $\frac{7}{32}$-in. and $\frac{1}{4}$-in. loom respectively.

Stocks are beginning to build up and some jobbers and manufacturers can ship immediately. Other manufacturers say that they have orders on hand for the next three months' production. Deliveries have been hampered by railroad trouble, but this trouble is diminishing. Labor conditions are satisfactory and production is reported to be normal.

As a general condition demand is falling off to some extent, though it is still fairly strong. Collections are on the whole very good.

Sales of Westinghouse and G. E. Growing Fast

Improvement in Transportation Is Reflected in Recent Increase in Billing of Companies

In the first six months of 1920 General Electric Company booked total sales of $190,000,000, or at an annual rate of $380,000,000. The best figure recorded previously was about $230,000,000 of gross sales in 1919. No longer ago than in 1916 the company was transacting business at an annual rate of only $134,000,000. During the first half of this year orders were shipped at a rate of $260,000,000 per year, but an improvement in transportation facilities is evident from the recent increase in billings which were going forward at an annual rate of approximately $275,000,000 the latter half of July. Bookings, however, have slightly dropped off, for in the same period orders were received at a rate which would only amount to $375,000,000 for the year's total. The summer trade slackness is held accountable for this decrease.

The Westinghouse Electric & Manufacturing Company, it is reported, booked orders for April, May and June, the first quarter of its fiscal year, amounting to approximately $41,000,000, as compared with about $34,000,000 in 1919. This is at an annual rate of more than $160,000,000. During the same period the amount of goods shipped totaled approximately $31,000,000, or almost $7,000,000 ahead of the figures for 1919. However, outstanding orders on the company's books on April 1, 1920, the beginning of the fiscal year, were but $71,000,000, it is learned, while on July 1 the total was approximately $85,000,000, indicating the increasing transportation difficulties. During the month of July the shipping situation eased up sufficiently to allow orders to be shipped at close to an annual rate of $160,000,000. Bookings also increased during that time and at present a yearly rate of about $180,000,000 is said to be a close approximation.

Buying of Steam Roads Will Affect Market

Expenditure of About $750,000,000 in Equipment Should Lengthen Deliveries and Reduce Supplies Available for Traction Companies

In view of the close connection between the electric and steam railways so far as purchasing much of their equipment in the same market is concerned, the proposed program of expenditures of the latter is very important. The buying of track and roadbed material, car wheels and trucks, signal equipment and many other items by steam roads has a very direct bearing upon the supplies of the same goods available for traction companies. If the large carriers throughout the country should within the next few months place the greater part of orders they are now contemplating the market may be expected to be oversold for a long time to come, with chances of favorable deliveries pushed further into the background.

According to the estimates received by the Interstate Commerce Commission, the needs of the main carriers in the United States, constituting more than 100 lines, will necessitate expenditures aggregating more than $750,000,000. The greater part of this buying is said to be contemplated for 1921. Orders as yet have not been placed in large volume, mainly because of financial difficulties. Following the relief accorded to railroads by the inauguration of increased passenger and freight rates, however, steps have been taken to raise much of the $750,000,000 through private loans on the strength of improved credit. The I. C. C. has also approved applications for nearly $200,000,000 in railroad loans under the provisions of the Esch-Cummins Act. The carriers are now operating on their own initiative since the first of September, and though this may induce a short period of readjustment, it seems logical to believe that in combination with the above mentioned factors, it will result in hastening the anticipated buying. An indication of this is evident in the increased demand that is even now felt in certain lines, such as spikes, bolts, rails, etc.

More than a fourth of the estimated expenditures that will be made for improvements and extensions will be applied on track and roadbed equipment it is reported. Not quite a fourth of the total sum will go for rolling stock additions and repairs, and included in this quota is a provision for 30,000 box cars alone, not to mention open top cars, passenger coaches, refrigerator cars and locomotives. All this equipment will vitally affect the market for purchases along similar lines by electric railways. The balance of the budget will be divided among stations, shops, signal plants and among other departments.

Menace to Trade in Cancellation of Orders

National Chamber of Commerce Reveals Wide Extent of Practice—Danger in Regarding It Leniently

From time to time reports are received from electrical manufacturers of cancellations in their field. This is a tendency which, if regarded as unimportant, may assume serious proportions, according to the Chamber of Commerce of the United States. The latter has completed a survey of the manufacturing field which reveals the great prevalence of the cancellation evil in almost every phase of business. No separate classification of the electrical industry is apparently made in this report, but the general conclusions are interesting.

Inquiries were sent to 106 leading trade associations to learn the situation.

Some of the chief reasons given for cancellations were: Inability to make prompt delivery, overstock, business declining, revision of production schedule and financial embarrassment. The lumber industry seems to have been one of those hardest hit, as over 3,500 cars have been canceled in one division alone since January.

Responsibility does not rest wholly with the buyer, however, it is stated. Some factories have been in the habit of accepting considerably more orders than they knew they could fill, with the expectation that a certain proportion would be canceled. It is this tendency to regard the practice leniently which is said to represent a menace to the integrity of the country's business structure, as even the most upright of customers have indulged in the practice.

Several trade organizations have taken steps toward remedying the situation by creating advisory bureaus to pass upon the claims for cancellation grounds. The Chamber of Commerce will also take further steps in attempting to preserve the validity of all contracts.

Production of Friction Tape Increasing

Output Is Reducing Back Orders—Demand for Cotton Tape Is Especially Heavy

Friction tape is being produced at a rate which is rapidly overcoming back orders, according to leading manufacturers. Cotton insulating tape, on the other hand, is in great demand, and production is falling behind orders. A leading maker of friction tape recently informed the ELECTRIC RAILWAY JOURNAL that all production records were broken in his plant in a recent week, a total of 200,950 lb. being turned out. Tape manufacturers state that the raw material supply is now very satisfactory. Transportation conditions are improving, and a slackening of demand compared with a few weeks ago is facilitating the filling of back orders. Stocks are spotty, some makers having little tape on hand and others being prepared to make almost immediate shipment. Recent moderate reductions in the price of cotton have been insufficient to affect the price of friction tape to any extent. The latter quotes in representative cases from 60 to 70 cents per pound, according to quantity and quality involved. A representative jobbers' price last week on ¾-in. black friction tape was 68 cents per pound on lots of less than 10 lb., 60 cents on 10 to 25-lb. lots and 57 cents on 25 to 100-lb. lots.

One prominent distributer has sold four times as much tape to date this year as for the same period last year, and still can make immediate deliveries on fairly good-sized orders. Another producer reports 80 per cent more business this year, the month of July showing the largest production in the company's history. Foreign business is running about 15 per cent ahead of last year, this manufacturer states. Deliveries can easily be made in two to three weeks in large quantities. Labor conditions are steady for the time being, and since the wage increase accorded about three months ago production has been coming along well. Black and gray tapes are being sponsored vigorously by some manufacturers at present for use instead of white friction tape.

High-quality woven tapes used in the insulation of electrical machinery coils are in great demand. Deliveries are being quoted on about three months' basis. Prices are firm, with extremely wide range according to weave, size and quality purchased. A representative tape of high-class finish used in field coil winding sells for about $3 50 per gross yard, and a good quality used in armature coil work runs around $2. The cost of labor is a primary factor in price advances that have been made in the past, as well as in the increases in the price of the high-grade cotton involved in manufacture. No less than four handlings are required in preparing the raw yarn for weaving in one of the leading makes, and after the weaving the finishing process or calendering to exact size calls for skilled work. The thinner tapes must be finished with extreme accuracy on account of the space limitations of slots. It is not feasible to predict future price movements, but so long as raw material and labor costs remain close to present levels it is hard to see any early downward movement. Factory stocks are practically cleaned out and orders are holding up well.

Smaller Bulbs in 23-Watt Street Railway Lamps

The Edison Lamp Works of the General Electric Company announces that the 23-watt, S-19 bulb street railway lamp, listed on page 11 of its Data Book, will be superseded by an S-17 bulb. Arrangements have already been made to carry out this plan and from now on all of these lamps will be made with the S-17 bulb, which is similar in all respects to the S-19 type except that it is smaller in size. The new bulb is 2⅛ in. in diameter compared with 2⅝ in. for the old model. The new bulb is also smaller in length, giving a height of 4⅞ in. over all instead of 5¼ in. as in the S-19 type.

The reason for making the change is because of the saving in glass effected and the smaller space required for packing and shipping the lamps. The lighting qualities of the two bulbs are the same.

The new S-17 bulb is designed to operate in series with the old type so that customers who may not wish to make the change all at once will be able to use both bulbs. Because of the advantage of giving a uniform appearance, however, it is advised that a whole car should be changed over at one time.

Rolling Stock

Chicago Surface Lines, Chicago, Ill., has requested bids on fifteen standard safety cars.

Spokane & Eastern Railway & Power Company, Spokane, Wash., is spending $300,000 this year in improvements to rolling stock, mostly in electric equipment, and for bridges. The city cars are being remade into one-man cars, one-half of which have already been so altered.

Twin City Rapid Transit Company, Minneapolis, Minn., is changing over 300 cars to the front exit type. Castings have been delaying the work, but are now being received at the shops. New heating apparatus will be installed to cope with the severe climate. About 175 of the remodeled cars will be placed in service on the Minneapolis lines and the balance in St. Paul.

Pekin Municipal Railway, Pekin, Ill., will receive three new cars within the next thirty days. The cars are now being built by the American Car Company, **St. Louis, Mo.**

Northampton Street Railway Company, Northampton, Mass., has purchased two McGuire-Cummings sweepers, to be delivered on Oct. 1.

Omaha, Lincoln & Beatrice Railway Company, Lincoln, Neb., announces that it is in the market for a snow sweeper.

The Richland Public Service Company, Mansfield, Ohio, states that it has purchased two four-motor equipments to replace old motors on two interurban cars. The new motors are General Electric, No. 247.

Track and Roadway

Eastern Massachusetts Street Railway, Boston, Mass.—The Eastern Massachusetts Street Railway was granted permission to extend the tracks of a turnout on Water Street, between Main and Church Streets.

International Railway, Buffalo, N. Y.—Street and track repairs which will cost $500,000 will be undertaken at once in Buffalo by the International Railway. Herbert G. Tulley, president of the company, has submitted to the City Council a list of streets in which the company will make improvements.

International Railway, Buffalo, N. Y.—City Manager E. J. Fort of Niagara Falls has been authorized by the City Council to advertise for bids for repaving between the tracks of the International Railway, Buffalo, on certain Niagara Falls streets. The company has agreed to repay the city in ten annual installments.

New York (N. Y.) Railways.—Federal Judge Mayer has authorized Job. E. Hedges, receiver of the New York Railways, to sell the property covering the block between Park and Lexington Avenues and Thirty-second and Thirty-third

Streets, which was used by the Madison & Fourth Avenue Railroad as a carhouse. It is believed that orders authorizing the receiver of the New York Railways to sell other carhouse property in the vicinity of Fiftieth Street will be signed soon.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation is making a number of improvements to the line in the centre of Trenton. New switches and rails are being laid on East State Street and in other sections.

Public Service Railway, Trenton, N. J.—The Borough Commission of Collingswood, N. J., has ordered the Public Service Railway to lay a new roadbed and tracks from Lincoln Avenue to the city line. The company last spring gave notice that the work could not be done this year because of limited finances, but the borough officials insist that the improvement be done at once so concrete paving can be laid.

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—The Omaha, Lincoln & Beatrice Railway in the early fall expects to complete 2½ miles of track.

Richland Public Service Company, Mansfield, Ohio.—The Richland Public Service Company expects to build ¾ mile of new track of 100 lb. "A. R. A." rail laid in concrete with International Steel ties and paved with brick.

Oklahoma Railway, Oklahoma City, Okla.—The Oklahoma Railway, which owns and operates an interurban line between Oklahoma City and Guthrie, will soon begin work on an extension of the line from Guthrie to Stillwater, the seat of the Oklahoma Agricultural and Mechanical College, according to announcement by John W. Shartell, president.

Portland Railway, Light & Power Company, Portland, Ore.—The Portland Railway, Light & Power Company has notified the Public Dock Commission that it will operate the extension of the St. Johns Street railway line to municipal terminal No. 4 at actual cost. It was originally agreed that the traction company would operate the extension at cost plus 10 per cent, thus giving the company a profit, but the commission recently issued an order that the extension be operated on a cost basis.

Power Houses, Shops and Buildings

Omaha, Lincoln & Beatrice Railway, Lincoln, Neb.—The Omaha, Lincoln & Beatrice Railway is constructing a storage house and repair shop 50 ft. x 150 ft. The construction is absolutely fireproof, being reinforced concrete with tile roof and steel sash.

Richland Public Service Company, Mansfield, Ohio.—The Richland Public Service Company is just completing the installation of a new 10,000 kw. G. E. turbine and the construction of an additional 11-mile 66,000-volt transmission line. The construction of a 15,000-kw. outdoor substation is being started.

Northern Ohio Traction & Light Company, Akron, Ohio.—E. B. Atchley, publicity manager of the Northern Ohio Traction & Light Company, announces that real progress is being made on the new $300,000 East Akron carhouse. The work is being done by the H. P. Moran Construction Company. The building is of brick with stone trimmings. Plans have been made for the storage of 100 cars in the carhouse and the work of installing machinery of the latest type will begin shortly.

Mobile Light & Railroad Company, Mobile, Ala.—The Mobile Light & Railroad Company has drawn plans for a new carhouse 100 ft. x 192 ft. The building will be of Truscon steel with concrete foundation and pits. At present the company is installing one new 768-hp. Class "M" 28 Stirling boiler to be equipped to burn fuel oil. Recently the company contracted for one new 1,000-kw. Westinghouse steam turbine, connected through reduction gears to Westinghouse 600-volt d.c. generator. Delivery on this unit will be expected in about eight months.

Trade Notes

The Black & Decker Manufacturing Company, Towson Heights, Baltimore, Md., has increased its capital stock from $350,000 to $2,000,000.

The J. G. Brill Company, Philadelphia, Pa., announces that its London office has been removed from 110 Cannon Street to 150 Southampton Row, London, W. C. 1.

The Arrow Electric Company, Hartford, Conn., manufacturer of switches and other electrical equipment, has awarded contract for construction of an addition to its plant, 33 ft. x 40 ft.

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has awarded contract for the erection of a one-story addition to its plant at Essington, 120 ft. x 200 ft., to be used as a foundry.

The General Electric Company, Schenectady, N. Y., has filed plans for the construction of a one-story building at its plant at Columbia Avenue and Putnam Street, Baltimore, Md., recently acquired from the government. The factory will be used for the manufacture of electric switches and other specialties. It also announces that the Fort Wayne Electric Works of the company at Fort Wayne, Ind., has filed plans for the erection of a building there, at Wall Street and Broadway, to cost about $325,000.

The John C. Dolph Company, 168 Emmett Street, Newark, N. J., manufacturer of insulating varnishes and compounds, announces the appointment of Baker-Joslyn, 183 First Street, San Francisco, Cal., with branches in Los Angeles, and Seattle, Wash., as general sales agents and distributers of its products on the Pacific Coast. L. D. Fleig, 212 West Austin Street, Chicago, Ill., has been appointed general Middle Western sales agent. The Edgar O. Oeters Company, the Bourse, Philadelphia, will represent the company in Philadelphia and contiguous territory.

The Roller-Smith Company, 233 Broadway, New York City, announces that C. H. Mohr has been added to the sales force of its Baltimore representative, the Perkins-LeNoir Company, 113 East Franklin Street. He will devote his attention to the various lines of electrical apparatus handled by the Perkins-LeNoir Company and will specialize in the Roller-Smith products, comprising electrical instruments, meters and circuit breakers. Mr. Mohr has been connected in the past with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., and with the Standard Electric Elevator Company, Baltimore.

The Johnson Fare Box Company, manufacturer of the registering fare boxes used on the cars of a great many city properties, has moved into its new building in Ravenswood, Chicago, Ill., which it is expected will greatly facilitate the production of fare boxes and enable the company to make more prompt deliveries. The business of the company has grown so extensively in the last few years that its old quarters were outgrown and it was decided that the best way of enlarging its manufacturing facilities was to build a plant of its own. The new building has a frontage of 125 ft. and a depth of 167 ft. It is a three-story building constructed of concrete and brick with continuous windows on all four sides which provide unusually good lighting and ventilation facilities. The floor space totals over 62,000 sq.ft. and about 400 men are employed.

New Advertising Literature

Fare Register.—"Time and Tide" is the title of a booklet distributed by the Ohmer Fare Register Company, Dayton, Ohio, describing the Ohmer fare register.

Reversible Seats.—The J. G. Brill Company, Philadelphia, has issued bulletin No. 246, which describes and illustrates the "Winner" and the "Waylo" types of Brill reversible seats.

Copper Wire, Cables, Etc.—The Copper Clad Steel Company, Rankin, Pa., Braddock post office, has issued five four-page leaflets covering its "Copperweld" bond wires for aerial cables, signal service, low-voltage power transmission and for power transmission and distribution.

Counters.—"Veeders Counters Checking Up Production" is the title of catalog No. 1901, issued by the Veeder Manufacturing Company, Hartford, Conn., describing its products, including cyclometers, odometers, counters, tachometers, fine die castings, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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The Amalgamated and the B. R. T.

THE events of the past week have justified the position taken early in the Brooklyn strike by Receiver Garrison, acting under instructions of the Court, to have no further dealings with the Amalgamated Association. Even the effort of Governor Smith to bring about a conference over the situation between Judge Mayer and the head of the American Federation of Labor was unsuccessful. Evidently the time of the Amalgamated on the Brooklyn system has passed. It may be that the situation got out of the control of its highest officials during the early part of the contest. In that case, as Mr. Garrison points out and as was done in the Pittsburgh strike, the men should have been ordered back to work. As it is now, the officers responsible for the operation of the Brooklyn Rapid Transit system will have the opportunity of comparing the relative efficiency and discipline of its force under Amalgamated control, as during the past twenty months, and outside that control, as in the future.

Motor Truck Competition Is Not on a Sound Basis

THE motor truck manufacturers and rubber tire producers are engaged in a very broad and vigorous campaign to foster the "ship-by-truck" movement for evident selfish reasons. They are making real headway despite the fact that shipping by road is bound to be more expensive than by rail, except for the short-haul business.

The phenomenal growth of the ship-by-truck movement, in our opinion, has been due primarily to the inability of the steam railroads to handle the business offered, either at all or only with great delay. The cost of transportation has been of minor importance to the shipper, whose principal problem was to send to the consumer, or that of the consumer to get from the manufacturer, the equipment, merchandise, materials or supplies that were essential to the continuity of a business enterprise. In this circumstance an abnormally high transportation charge was of insignificant consequence compared to the need for the thing or material wanted, and wanted quickly. And since with war conditions there was no end of instances of this kind the truck transportation business flourished, and as war conditions or worse have continued since the signing of the armistice the trucking business has continued to grow. The companies so engaged have made money, but they have made it at fairly high rates and largely at the expense of the taxpayers who have built the roads.

In June of this year the writer drove from New York City to Chicago over the Lincoln Highway. Undoubtedly this highway has had more maintenance and improvement work done upon it in the last three years than any other series of roads in the country, by far. Yet, despite the enormous expenditures of money used in this way, decidedly the greater part of that famous highway between New York and Chicago is not only not good for driving but is decidedly bad. The only really good portions are those stretches that have been built within a year—or at least are practically new. Outside of these stretches of new construction the roads vary from fair, with an occasional hole, to roads with the surface all gone and the stone foundation so full of sharp holes that it is passable only at the slowest speed at which a car can be driven. For as much as 60 miles in a stretch road is encountered on which the surface is all gone, and the tourist—as well as the local farmer—is compelled to travel at a snail's pace and suffer great discomfort, not to mention the strain and wear on a car or farm motor truck. Then there is mile after mile where the tourists (and all vehicles) have taken refuge from the once improved road in a new trail in the sod along the roadside. Even road that is comparatively good is studded here and there with a dangerous hole or break in the paving—the beginning of what soon becomes a complete disintegration.

This is a rough picture of what heavy trucking is doing for our principal national highway, and we are informed by highway experts that it is typical of the deterioration of the improved roads everywhere, but particularly in the country surrounding all of the larger cities. Concrete, stone and macadam, brick and gravel roads, all seem to suffer a similarly rapid disintegration, for the better the road the heavier the traffic. Seemingly the only roads that are standing up are those from which heavy trucking is barred, and the number of such restricted roads is rapidly increasing.

This Form of Competition Should Grow Less

IT SEEMS to us that these things point unmistakably to the following conclusions:

The abnormally congested condition for freight on the steam roads, which has contributed so greatly to the success of motor truck companies in the past, is rapidly passing, so that the expense of transportation will be a more and more important consideration in the future when a choice of carrier is made. The astounding disintegration of the good roads, due to the trucking, is bound to react against the ship-by-truck movement. It is only a matter of time until the farmers and motorists and taxpayers generally will become aroused to the destruction of the roads that is resulting from the trucks and will then either insist upon truck transportation companies paying a justly heavy penalty for the privilege of using the roads or will rule them off the roads altogether. When truck companies are forced to pay their fair share of the original construction cost and maintenance of the highways they use their operating costs will be so high as to react seriously against their ability to secure business, except short haul. And this condition is surely coming.

The public is slow to appreciate a situation of this kind, but there are already frequent evidences of an aroused opinion against allowing the truck companies the free use of the highways. Certainly the people are not going to tolerate an endlessly increasing tax rate made necessary in large part by increasing road maintenance costs. And if the roads are not maintained because of limited funds truck companies are going to suffer materially and their operating costs and rates increase correspondingly, even though they are not made to share directly in road maintenance, for bad roads mean very high truck-maintenance costs.

Mindful of these things, we incline to the belief that the electric railways have not a great deal to fear in the future from motor truck competition. With a return to normal business conditions shipments of all kinds will find their way back to transportation by rail, and at rates that the truck companies cannot possibly meet. Normal times will mean a return of normal competition, and that is what the electric railways can welcome, for in neither service nor cost can the gasoline-propelled highway motor truck compete with the electrically propelled rail car—certainly not if the truck is compelled to pay a proper portion of the roadway expense, and probably not even without this expense.

We think the motor truck companies know full well that they must sooner or later stand a share of the highway expense, but they are getting business while the getting is good. If they can jump in now, free from right-of-way expense, and make a large profit they can afford to conduct an insecure business, retiring therefrom when the public is aroused to action. This would seem to point to the logical interest of the electric railways, as very large taxpayers, in the enlightenment of the public on the use of the rails to save the highways.

A Tremendous Undertaking Well Done

NO SMALL task confronted the Interborough Rapid Transit Company in the Brooklyn Rapid Transit strike. The company has long had short extensions in operation between Manhattan and Brooklyn, but just before the strike the Nostrand Avenue and the Eastern Parkway extensions of the subway were opened in that borough. It was to these lines that the principal task fell of lending transportation succor to the residents of the East New York and Flatbush sections of the "city of churches." The lines were not thoroughly tuned up when the call was made upon them for service in the strike, but so thoroughly had the Interborough done its work of schooling its men and preparing for the opening that the company was able to handle approximately 400,000 additional Brooklyn passengers a day on all of its lines. This was a physical task of tremendous proportions.

Motor bus lines and vehicles of all descriptions fed their hordes into the sixteen Interborough stations in Brooklyn, but the company picked the passengers up and landed them in Manhattan via two tubes under the East River with a minimum of discomfort as far as its part of the work was concerned. Publicity played its part in the undertaking, for the company, previous to opening the lines, carefully placarded its stations with maps and distributed pamphlets giving all details as to trains. Great credit has been reflected upon the whole organization by the celerity with which the task was accomplished. The Interborough has good reason to be proud of its record. New Yorkers, however, seem to have accepted as a matter of course a transportation feat at which men acquainted with problems of traffic handling all marvel.

That Section Membership Trophy Still Reposes at Providence

THE company section movement has not been very active during the past three years or so, which is not to be wondered at in view of the circumstances under which electric railways have been operating. The clouds are lifting now, however, and some live spirits in the industry ought to be starting new company sections of the American Electric Railway Association. With a view to stimulating interest in this worthy field of association activities, the ELECTRIC RAILWAY JOURNAL, in the spring of 1918, donated to the association a silver cup to be held by the section organized with the largest membership. This was in due course awarded to the Rhode Island Company section, which still retains it. Without desiring to deprive the section at Providence of the "rights, privileges and honors thereunto appertaining," the JOURNAL would suggest that the trophy fails of its main purpose unless it passes occasionally from hand to hand. It is necessary only to start a section with 217 members to secure possession of it.

A Live Line Not Necessarily a Deadly Line

SOME power companies have been testing and repairing high-voltage lines while "hot" and claim that such practice is cheaper, safer and quicker than the usual one of "killing" the line when work is to be done upon it. Shields, tools, insulators and methods have been developed to such an extent that many power companies now do all insulator replacement and testing, splicing and other line work on live lines. For example, the Consumers' Power Company in Michigan and the Georgia Railway & Power Company in Georgia have developed and successfully used methods for live work on their lines.

Both safety and service conditions indicate a trend toward other methods in line work than have been the practice. Accidents to employees occur to a great extent among linemen and electricians who have been educated in the "dead line" school. Sudden circuit interruptions, insulator and transformer breakdowns, rotary flashovers, fuse burnouts and other continuity-of-service factors in our ever-growing complexity of apparatus and circuits all tend to make for a quicker and better method for handling emergency and routine line and substation conditions.

Dead lines become live ones too frequently for safety in spite of extraordinary precautions; network circuits offer too many opportunities for energizing supposedly dead lines. Most accidents are due to the old story: "It was supposed to be a dead line." No man takes liberties with a live line, and perhaps there are many advantages in treating all lines as live lines. If we adopt the live-line method of operation only two factors enter into consideration, relative speed and availability of properly insulated apparatus and methods.

It is claimed that speed in repair and testing is much greater in live-line working, as no time delay occurs because of communication with substations or power stations in order to kill or energize lines and no special grounding apparatus is necessary. The line force can operate on the emergency repair immediately and need have no connection with any other division of the operating organization. All insulator tests can be made while lines are utilized for delivering energy. A remarkable fact is that the employees prefer live work. It means steady employment with better morale instead of late-at-night or off-load emergency and rush work. It permits routine rather than emergency line force conditions.

Probably the greatest asset to operating companies in live-line repair work is the fact that service interruptions are quickly repaired without disturbing the system routine. Costs of tools and the other items are immaterial under these conditions and only speed and safety are considered. We venture to predict a greatly increased amount of live-line work for the electrical industry and can see many advantages of live-line work on the high-voltage lines that will be used in connection with future trunk line electrification projects, particularly in the West.

Speeding Up Car Repairs

THE combination of high prices and lack of money has forced electric railways to defer the purchase of new rolling stock, and on many properties all of the available cars are needed continually. Naturally, considerable pressure is brought to bear upon the mechanical departments by officials to insure that necessary repairs are made as speedily as possible. Labor organizations have condemned the practice of working overtime, so the getting out of damaged cars and even those that are brought in for repairs on a prearranged schedule has proved a serious problem. The effect of this need is to place maintenance programs and practices on a higher plane than ever before. Railways are giving more attention to the arranging of repair schedules so as to fit in with the needs of the transportation department.

In the old days when duplicate equipment was used the open cars were repainted in winter and the closed cars in summer. Now with equipment in operation continually throughout the year the best schedule for the paint shop, the overhauling shop and other repair departments would be to have the cars pass through the shops at a uniform rate. But when the field of transportation is considered with a view to producing the most efficient system as a whole it is evident that there must be intimate co-operation between the operating and mechanical departments. The best arranged schedule of repairs from the transportation department standpoint would be one under which cars are withdrawn from service in greater numbers during off-peak periods of traffic. Thus, for example, if the transportation department finds that it needs all of the cars during December and January, repairs during these months should be limited to such as are absolutely necessary and should be carried out as speedily as possible.

The question in its broadest aspect then is to decide between low maintenance cost, which results from a uniform schedule of repairs with more equipment, as against a plan of eliminating certain work and classes of repairs during maximum periods of traffic in order to have a smaller investment in rolling stock.

To assist in this work the operating department can also do much. Careful operation decreases the number of damaged cars. Furthermore, cars should not be turned in for minor repairs by the transportation department as happens to suit its convenience, but they should be ordered in by the mechanical department at times when they can be handled speedily. It is only by exerting their best efforts in such directions as this that railways can give most satisfactory service to the public.

Automatic Substation Invades Cleveland

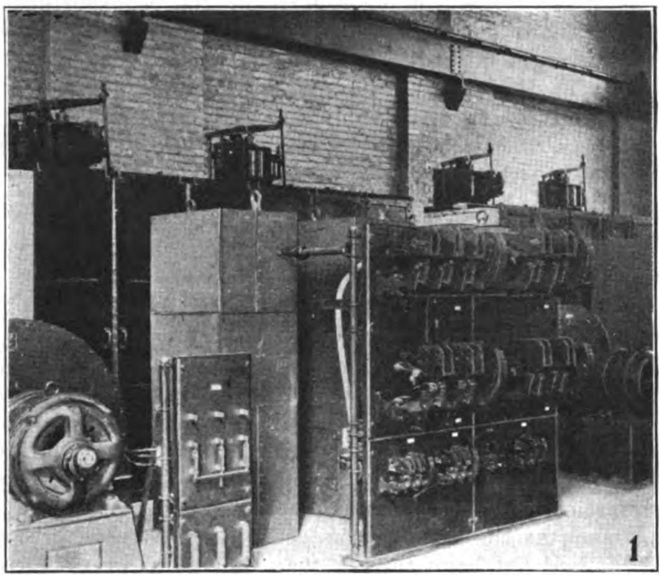
THE Cleveland (Ohio) Railway decided to try out the automatic control plan only after considerable deliberation. There was no question in the minds of its engineers as to the applicability of automatic control to interurban line operation and to many city conditions. Whether it would function adequately in Cleveland was another question. This question was considered several years ago, in fact as soon as the scheme was seen to have possibilities. If it had not been for the war Cleveland would have had at least one "automatic" much earlier, as it was the ardent desire of L. P. Crecelius, superintendent of power, to study the performance of a sample equipment under actual local conditions.

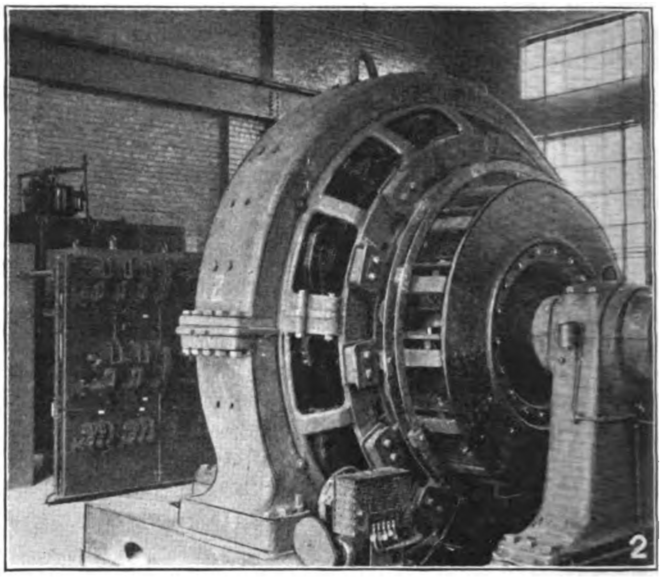
Now, when automatic equipments can be obtained with reasonable celerity, the railway company cannot wait to experiment, for Cleveland is growing so rapidly, with a corresponding demand for power to drive the cars, that additional substations had to be provided at once. And, fortunately, the reputation of the automatic substation is now so good that the decision was promptly reached to equip the next four "subs" at least, including the Cleveland Heights station just completed, with control apparatus of this type.

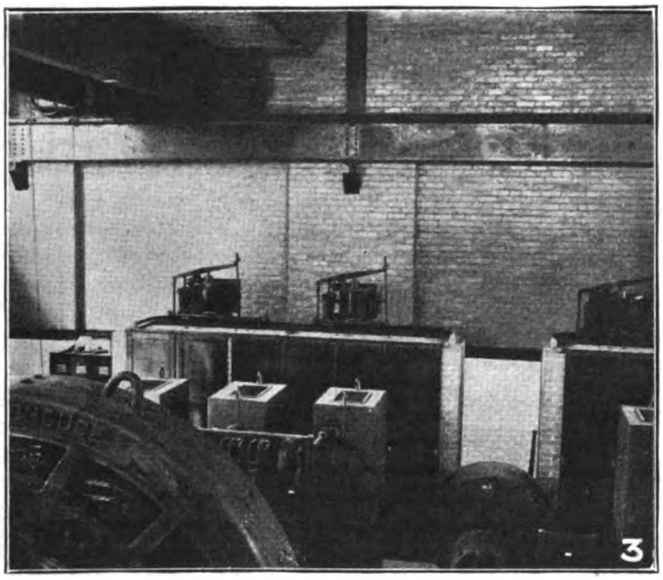
Practically all of the "automatics" now in operation are of the one-unit type. The notable exception is the Oakland substation of the Rhode Island Company, described in the issue of this paper for Dec. 14, 1918. To be sure, the Milwaukee Electric Railway & Light Company put in an automatic station with two rotaries as long ago as three years, but these were 600-volt machines, operated as a pair in series, and were essentially one unit as far as the control was concerned. The Heights substation in Cleveland contains a two-unit equipment and the two machines are arranged ingeniously to relay each other, keeping the individual rotary load factor as high as possible. This is the most difficult duty which can be imposed on the apparatus, but there is no inherent reason why it should not be reliably performed. The results here will be watched with particular interest because the Cleveland Railway has been very successful in keeping the rotary capacity adjusted to the "load line" in its manual substations. How the two methods of control compare in this respect will be considered later after operating records are available.

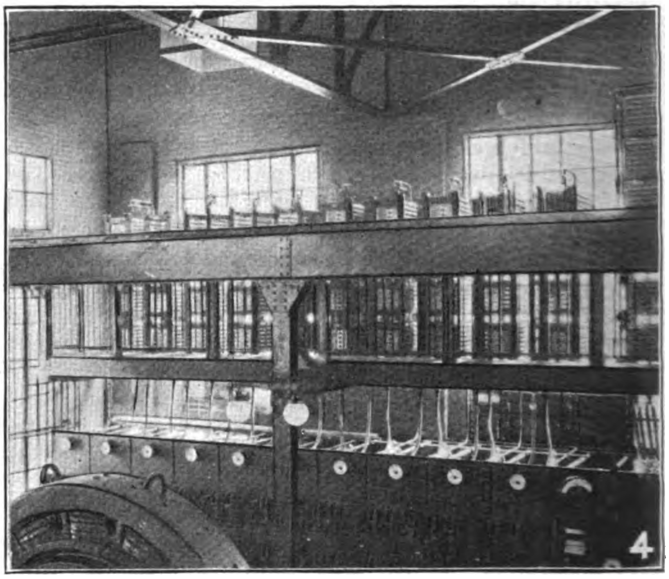
In an article printed elsewhere in this issue the appearance of the Heights substation is shown by means of drawings and pictures, and the essential operating principles are pointed out. A few minor changes in the control are still being made, so that the technical account of the layout will be deferred for a few weeks until the finishing touches have been applied. In the meantime the station is giving an excellent account of itself.

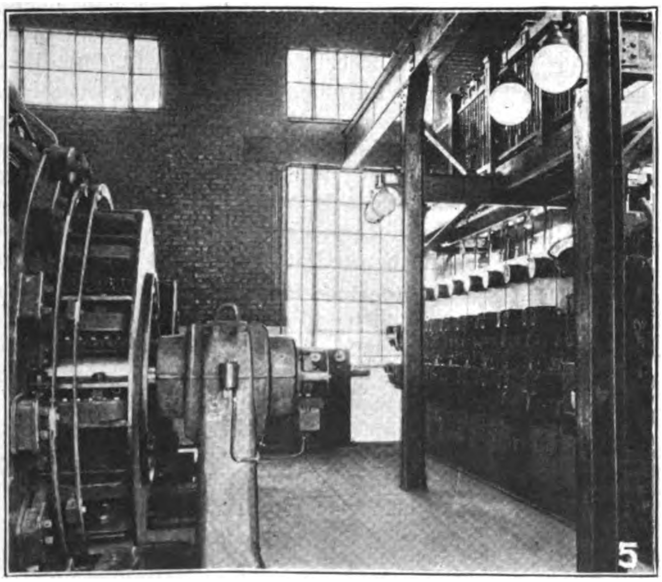
Cleveland Heights Two-Unit Automatic Substation [redacted]

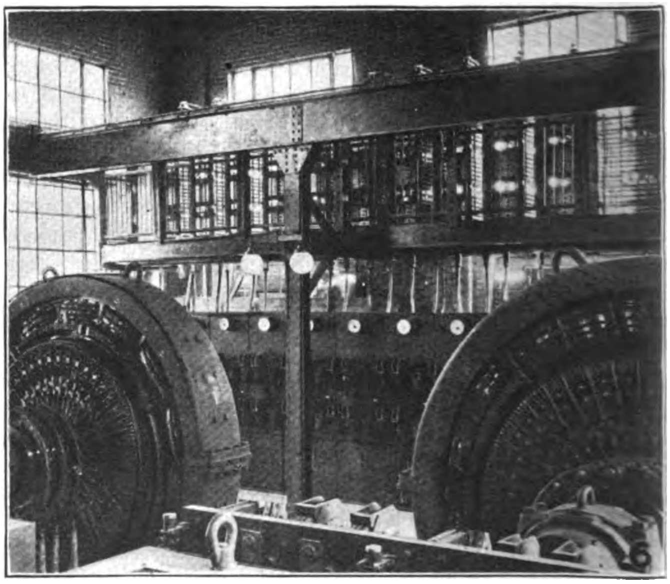










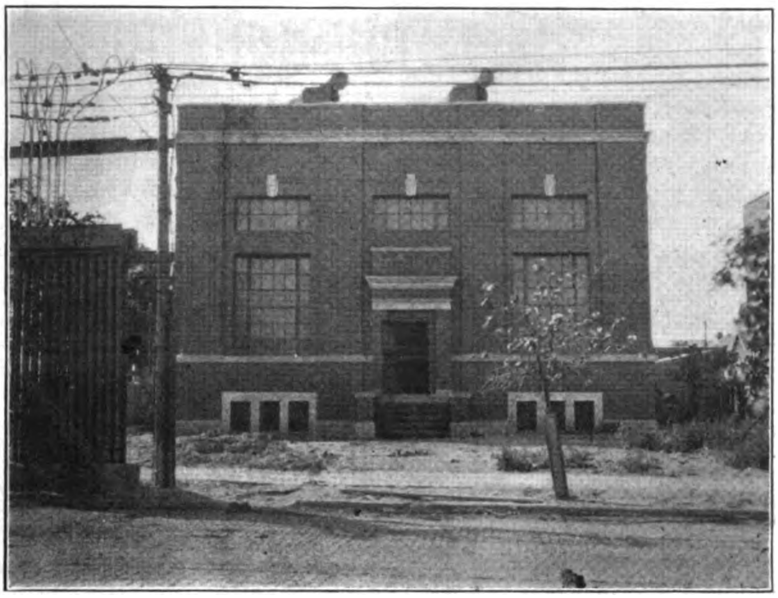


1—Starting panels for rotary and blower motor.
2—One of the 1,500-kw. rotary converters.
3—Looking down from gallery over one rotary and its starting panel, transformers and oil switches.
4—General view of equipment in and under gallery.
5—Commutator-end bearing of rotary, switchboard and columns supporting one crane rail.
6—Alternating-current end of rotaries with resistor gallery in background, taken from top of alternating-current oil-switch compartments.

The Cleveland Railway Commissions Its First Automatic Substation

Cleveland Heights Section Now Supplied from Two-Unit Station Containing 1,500-Kw. Rotary Converters, Arranged to Adjust Capacity to Load Automatically

THE Cleveland (Ohio) Railway has just put into operation the first of several automatic substations to care for the rapidly growing demand for power from its system. This substation is of particular interest because it is the first of the Westinghouse two-unit substations. It is the largest automatic substation yet put into operation and it embodies a number of new operating details. In fact, there are several minor improvements still being installed, so that at this time it is possible only to give a preliminary statement of the details. A later article will take up the technical features, with an account of the exact sequence of operations. The accompanying illustrations are from recent photographs and drawings and show the station as it is today, complete as far as the general apparatus is concerned, but awaiting a few finishing touches inside and out.


FACADE OF SUBSTATION WITH CONDUIT TERMINAL AT LEFT IN FOREGROUND

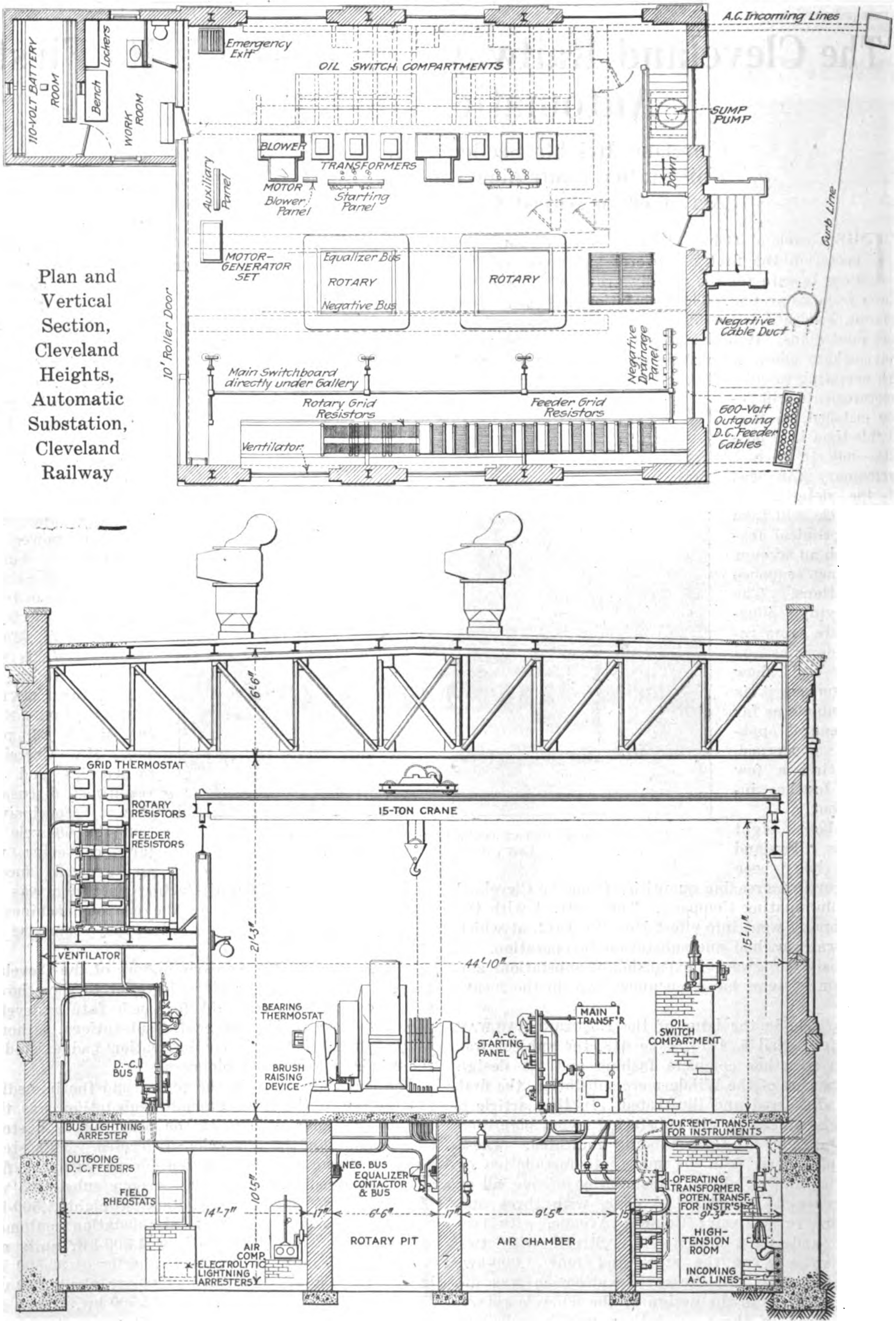
For about eight years the Cleveland Railway has been using power in increasing quantities from the Cleveland Electric Illuminating Company. The contract with the power company went into effect Nov. 15, 1912, at which time the railway had one substation in operation. A comprehensive program of expansion of substations and distribution systems has been under way in the meantime.

In an article in the issue of the ELECTRIC RAILWAY JOURNAL for April 5, 1913, page 618, the subject was covered in a rather complete fashion and the design and construction of the Windermere substation, the first one, were discussed and illustrated. In that article a map was given showing the substation layout plan then under way, four substations being indicated. These were: Windermere, with an immediate installation of four rotaries and an ultimate installation of five, all of 1,500-kw. capacity; Harvard Avenue, with three and five rotaries respectively; Coutant Avenue, with two and four, and West Twenty-fifth Street, with two 1,000-kw. rotaries at the start and four 1,000-kw. rotaries ultimately. In the article attention was directed particularly to the design of the 60-cycle rotary converters used in these substations, which embodied a number of features included for the purpose of minimizing danger of flashover, hunting, etc. The rotaries were built with liberal quantities of active iron and copper, and with very heavy armatures having great energy storage capacities and operating at high rotative speed. The rotaries are provided with squirrel-cage dampers, mounted in the main pole pieces, for use in starting and for preventing hunting. These rotary converters operated very satisfactorily.

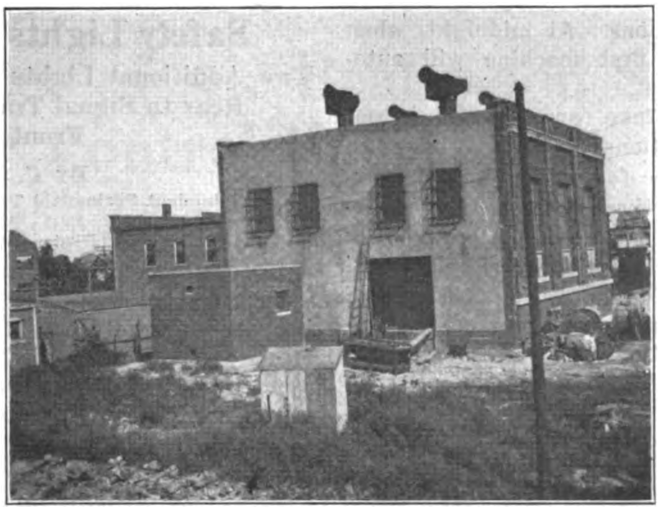
The experience of the Cleveland Railway with this new type of rotary was covered in a paper read by L. P. Crecelius, superintendent of power of the railway, before the Cleveland Section of the American Institute of Electrical Engineers, on March 23, 1914. This was abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for March 28, page 713. Mr. Crecelius' remarks and the resulting discussion showed conclusively that the 60-cycle rotary converter was an assured success and that the fear of unsatisfactory operation was not warranted as a deterrent in the use of machines of this type where there was good reason otherwise for using them.

These references to the early history of the Cleveland Railway substations are given in order to show how a logical foundation was laid for such future developments as that of the automatic substations, although at the time this particular innovation had existed in the minds of only a few pioneers.

The fifth substation in the series, and the immediate predecessor of the new automatic substation, was that located on Cedar Avenue at the point where a steam power plant had been previously located. This steam plant is shown on the map reproduced with the first article referred to. The Cedar Avenue substation was the largest of the series, containing eight 1,500-kw. rotaries. This brought the total substation equipment of the system up to twenty-three 1,500-kw. units and two 1,000-kw. units, a combined capacity of 36,500 kw. In addition there is the Viaduct power plant, 600-volt direct current, with a capacity of 42,500 kw. When the four automatic substations forming the present program are completed the substation capacity will have been


110-VOLT BATTERY ROOM
Bench
Lockers
WORK ROOM
Emergency Exit
OIL SWITCH COMPARTMENTS
A.C. Incoming Lines
SUMP PUMP
Curb Line
BLOWER
TRANSFORMERS
MOTOR
Blower Panel
Starting Panel
Auxiliary Panel
Down
MOTOR-GENERATOR SET
Equalizer Bus
ROTARY
Negative Bus
ROTARY
Negative Cable Duct
10' Roller Door
Main Switchboard directly under Gallery
Negative Drainage Panel
Rotary Grid Resistors
Feeder Grid Resistors
600-Volt Outgoing D.C. Feeder Cables
Ventilator
6'-6"
GRID THERMOSTAT
ROTARY RESISTORS
FEEDER RESISTORS
15-TON CRANE
21'-3"
15'-11"
44'-10"
VENTILATOR
BEARING THERMOSTAT
BRUSH RAISING DEVICE
D.-C. BUS
MAIN TRANSF'R
A.-C. STARTING PANEL
OIL SWITCH COMPARTMENT
BUS LIGHTNING ARRESTER
CURRENT-TRANSF. FOR INSTRUMENTS
OUTGOING D.-C. FEEDERS
NEG. BUS EQUALIZER CONTACTOR & BUS
OPERATING TRANSFORMER
POTEN. TRANSF. FOR INSTR'S
FIELD RHEOSTATS
10'-5"
14'-7"
17"
6'-6"
17"
9'-5"
15"
9'-3"
AIR COMP.
ELECTROLYTIC LIGHTNING ARRESTERS
ROTARY PIT
AIR CHAMBER
HIGH-TENSION ROOM
INCOMING A.-C. LINES

Plan and Vertical Section, Cleveland Heights, Automatic Substation, Cleveland Railway increased by 12,000 kw., or to a total of 46,500 kw. The combined power capacity of the system will then be more than 90,000 kw.

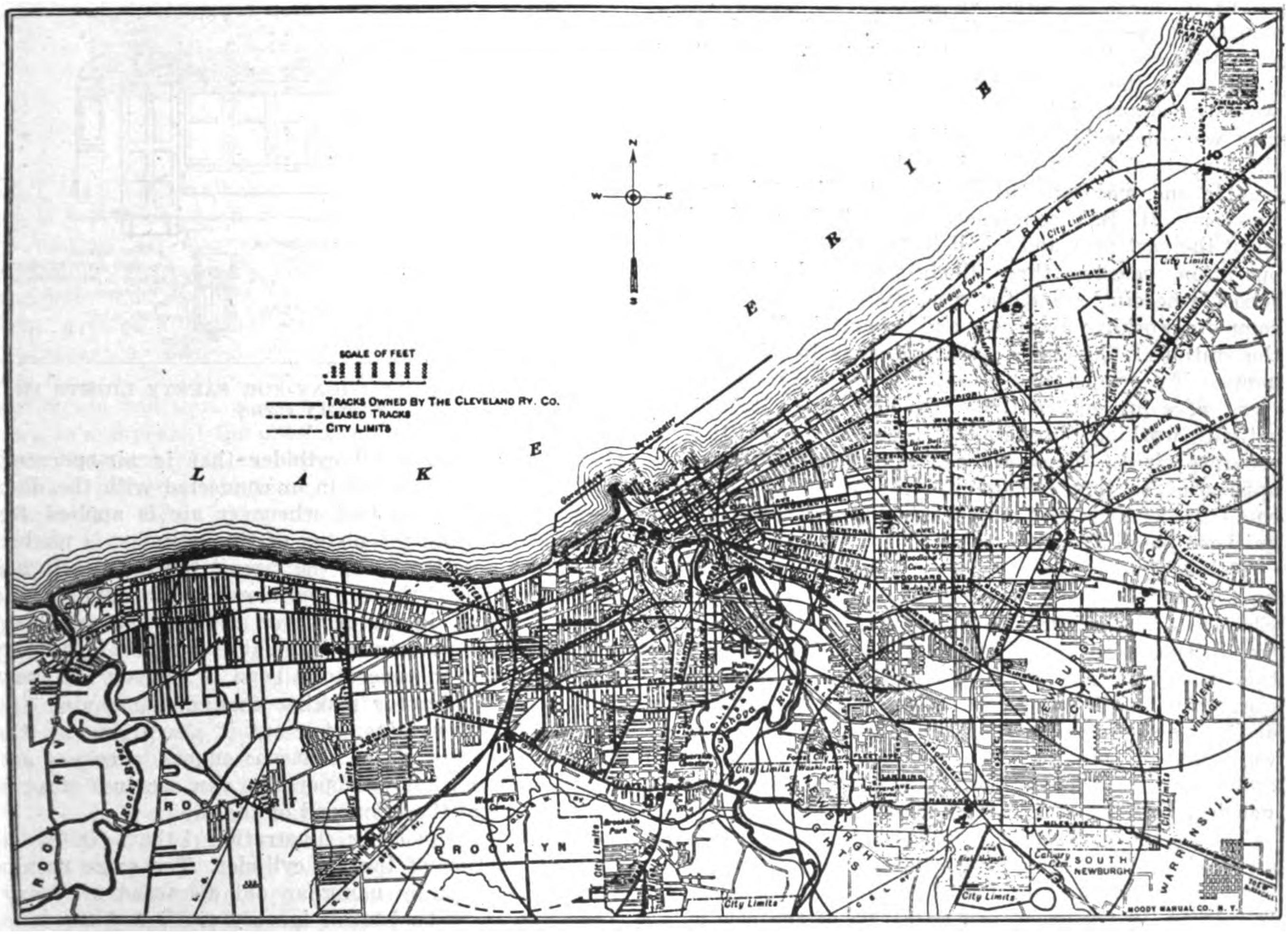


BACKYARD VIEW OF THE SUBSTATION, SHOP-BATTERY WING AT LEFT

The new automatic substation, known as the Heights substation from its location in Cleveland Heights, has been installed to take care of the city load which is outside of the two-mile limit of the Cedar Avenue substation and the load of the new Cleveland Interurban Railway line, which is being operated by the Cleveland Railway. This line was described in the issue of this paper for July 31, 1920, page 204. The interurban line extends about two miles beyond the Heights substation, so that its load can be easily taken care of. In addition the station will relieve greatly the load on the Cedar Avenue substation, which is in the most densely populated residential section of the city.

The Heights substation contains two 1,500-kw. Westinghouse rotary converters, each equipped with circuit breakers, transformers and automatic control equipment. Although the station will not carry a load continuously, at least one of the units will be operated from about 4 a.m. until midnight. This machine will be placed on the line automatically, when the cars in its district start running, and the trolley voltage drops below normal. After this happens it will take the unit about forty seconds to get under way and converting energy for the transportation system. This unit will continue to take care of the load until such time arrives as it has been obliged to carry full load for about fifteen minutes. At this time the second machine will be started automatically to take its share of the load.

The two machines will carry the load through the morning peak, the second continuing to operate until it carries only 50 per cent of normal load. Fifteen minutes after this point is reached the second machine will shut down, leaving the first to supply the energy for the day load. Then when the evening load comes on and goes off the second machine will be started and



POWER ZONES OF 2 MILES RADIUS SURROUNDING SUBSTATIONS

2—Viaduct power plant. 3—Windermere. 4—Harvard. 5—West 25th Street. 6—Coutant. 7—Cedar. 8—Heights. 9—St. Clair. 10—Collinwood. 11—West Seventy-third Street.

stopped to meet these conditions. At midnight, when the cars stop running, the first machine will automatically shut down.

Besides being designed to take care of varying conditions as described, precautions have been taken to meet all difficulties that can be foreseen. For this purpose there are eighteen protective relays, each one functioning as conditions for its use arise. As previously mentioned, the details connected with these relays will be taken up in a later article.

The next automatic station which is now under construction, the St. Clair substation, will pick up primarily the load on the St. Clair line between the districts economically served by Cedar Avenue and Windermere substations. The other new automatic substation, the Collinwood, will take care of increased load on existing stations and load of lines extended since the former stations were built. An interesting feature of the load to be served by the Collinwood station lies in the fact that the equipment is needed continuously in this location, near Euclid Beach, where heretofore only a summer load existed. So scarce have homes become in Cleveland that the summer cottages are being converted so as to be used the year round. This, of course, has increased the winter load materially in this locality.

SCHOOL INITIATED TO TEACH MEN PROPER MAINTENANCE OF SUBSTATIONS

The difficulty of obtaining proper maintenance men, sometimes encountered in the installation of automatic substation equipment, was obviated by the Cleveland Railway in the following manner: When the stations were contemplated it was seen that several high-class men were desirable who would be well informed as to the layout of the stations in order properly to locate trouble and maintain the equipment. For this reason Lawrence D. Bale, engineer of substations, who had spent the past year and a half in the study of automatic operation, selected three likely men and initiated a school, wherein he and the men studied extensively the complete working diagrams and schematic diagrams of the stations. Questions were raised as to what would happen if a relay failed to operate, or if certain conditions were present, and the answers were obtained by actually working through the circuits. In addition, a separate circuit diagram was made for each piece of apparatus, so that in case of trouble the exact cause could be located with the least difficulty and in the quickest possible manner.

The equipment for the four automatic substations was designed by the engineers of the Westinghouse Electric & Manufacturing Company, working in close conjunction with those of the Cleveland Railway. In this connection the practical experience of the operating company proved to be of no little value to the designing engineers. In numerous instances the former were able to point out the need for protective devices and relays to provide for varying operating contingencies.

The manufacturer forthwith designed and constructed the apparatus with which to meet these needs. Throughout the long period of development, which now terminates in the successful operation of the new automatic substation, Mr. Bale has worked indefatigably in co-operation with the engineers of the Westinghouse company.

Safety Lights for Safety Cars

Two Additional Lights Are Installed, One at the Rear to Signal Traffic, the Other on the Front Platform

BY C. H. COPLEY
Superintendent Springfield Traction Company, Springfield, Mo.

IN OPERATING our one-man safety cars we have had a considerable number of complaints from vehicle drivers that they experienced difficulty in telling when a safety car is standing with doors opened, either to pick up or discharge passengers. Our operators have also complained somewhat that, when operating at night with curtains drawn so as to shut off the light from the inside of car, whenever passengers board the car it is necessary to lift the curtain to secure sufficient light for making change.

To overcome these difficulties we have installed two lights with connections as shown in the accompanying diagram. One of these lights is installed directly over the operator's head and the other at the rear left-hand side of the car, which is the rear right-hand side to a vehicle traveling in the same direction as the car. This lamp at the rear is installed behind red glass, and apparatus and circuits are arranged so that these lights are lighted whenever the doors are open. By referring to the diagram it will be seen that these two lights are in a parallel circuit with two lights used for lighting the inside of the car. For opening and closing the circuit we use a small cylinder that is air-operated. This cylinder is inserted in or connected with the door opening air pipe, so that whenever air is applied for opening the doors the piston of this cylinder is pushed out and this action opens the circuit for the two lights in the interior of the car and closes the circuit for the two additional lights, one over the motorman's head and the other the signal light at the rear of the car. The light over the operator's head is not only of great assistance to him for making change and saving the lifting of the curtains, etc., but it also lights up the front end of the car so that passengers, checkers and others interested in car operation can see just what is taking place at the front end of the car.

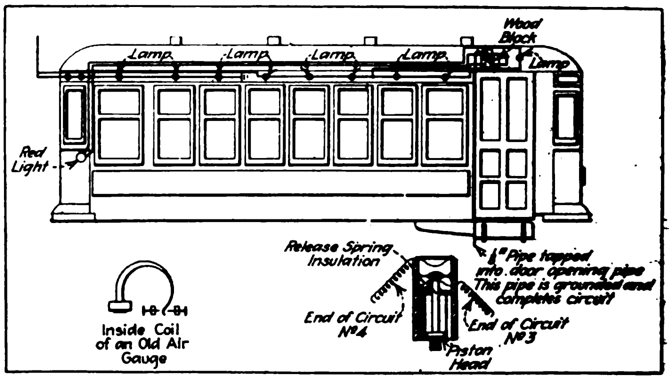

Wood Block
Lamp
Lamp
Lamp
Lamp
Lamp
Red Light
Release Spring Insulation
¼" Pipe tapped into door opening pipe This pipe is grounded and completes circuit
Inside Coil of an Old Air Gauge
End of Circuit Nº4
End of Circuit Nº3
Piston Head

DIAGRAM OF CONNECTIONS FOR SAFETY LIGHTS IN SAFETY CARS

In the accompanying illustration I have indicated the construction of the air cylinder. The same results can be obtained by using an old discarded air gage. The current to be broken is very small and we have found that an air gage can break the circuit satisfactorily and it is much cheaper to provide where old air gages are available.

Maintenance of Air Brake and Safety Car Control Equipment

Inspection Methods Should Be So Thorough That the Remotest Failures Will Be Guarded Against and Prevented and Tests Should Be Simple But Accurate

BY JOSEPH C. McCUNE
Assistant to District Engineer Westinghouse Traction Brake Company
New York, N. Y.

MOUNT
OLIVET

SAFETY CAR PROVIDES IDEAL SERVICE FOR SUBURBAN SECTIONS

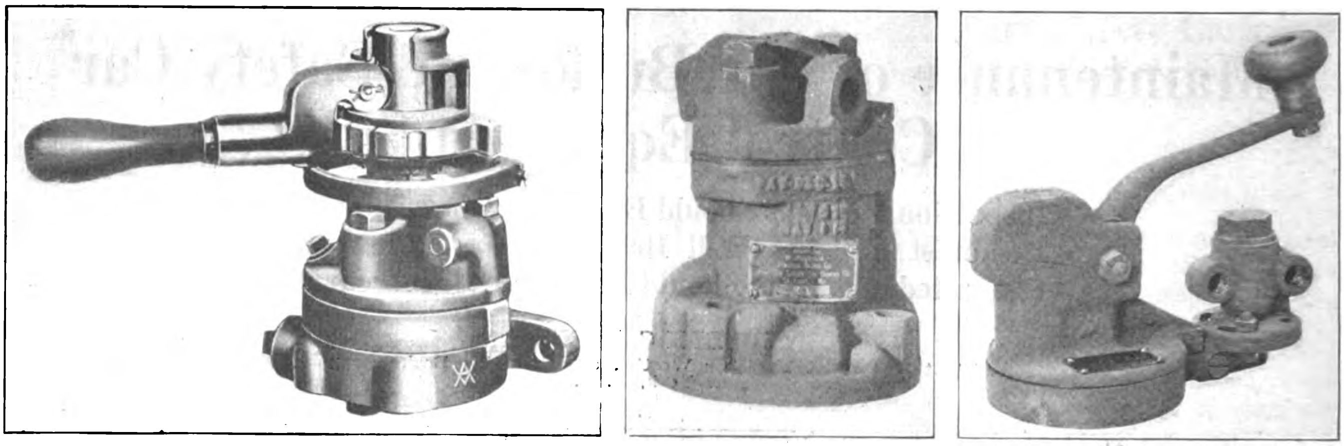
IT HAS been well said that "an ounce of prevention is worth a pound of cure." Preventive measures against all manner of anticipated difficulties are assuming increasing importance in every line of endeavor and in few lines do preventive measures have greater significance than in electric railway car maintenance. Inspection, cleaning, overhauling, renewals, etc., intelligently planned and properly carried out anticipate and thus avoid equipment failures in actual service and permit the uninterrupted sale of transportation, the commodity an electric railway has to offer.

Many preventive measures are in effect only on large properties. The larger the property and the more severe the operating requirements the more obvious the desirability of putting into force the most far-reaching preventive measures. Some of the very largest properties in the East are guided by the principle that anything that can happen will happen and take measures accordingly. Provision is made on such properties to guard against the most remote contingencies, since on account of the vast number of operations, failures are appreciable, even when such failures involve but a minute percentage of the total operations.

It is believed that many of the smaller roads could adopt more extensive preventive measures and thereby obtain very worth-while benefits. Particularly is this true of roads where cars, prior to the introduction of the safety car, were not equipped with power brakes. Precautionary steps on such roads must obviously be less far reaching than if the very large roads mentioned were involved. Possibly the most desirable and practical step is to place overhauling upon a more systematic basis. The article following describes practices which apply more particularly to systems operating large numbers of cars. Yet it is possible to employ, without change, many of these practices upon the smaller roads.

A preventive measure universally adopted is that of frequent inspection of the equipment. Such inspection detects not only actual shortcomings but also conditions which unless remedied are apt to result in failures. How frequent the inspections are to be is a question which must be settled by a consideration of local conditions, such as density of traffic, frequency of stops, climate, etc. But a broad rule which has rather a general application is that cars supplied with air brake and safety car control equipment require the same inspection as other air brake equipped cars. Such cars on large Eastern properties are quite commonly inspected every 1,000 miles.

It is quite frequently the practice to inspect the brake rigging and shoe adjustment daily. Piston travel should be maintained at about 4 in., measured after a full service application made while the car is standing. Running piston travel is about ½ to 1 in. more than standing travel, depending upon the brake rigging. As 5-in. running piston travel is desired, it is evident that the standing travel should be adjusted to about 4 in. If the running piston travel is too great, operators will complain of poor brakes; if too short, brake shoes will drag upon the wheels and cause excessive power consumption.



AT LEFT, BRAKE VALVE. IN CENTER, EMERGENCY VALVE. AT RIGHT, CONTROLLER HANDLE AND PILOT VALVE

The inspection made every 1,000 miles should be more thorough. It is necessary to inspect all parts of the air brake and safety car control equipment. Compressor crank cases must be refilled with oil. They must not be allowed to run dry, for then armatures and bearings will be burned. Compressor brushes need careful attention in order to detect brushes that, on account of wear, require replacement. Air gages require frequent attention in order to keep them properly adjusted. To adjust them accurately a special test gage is demanded, and such a gage ought to be part of the shop equipment. Governor settings vary widely in time from the standard unless readjusted at intervals. The standard setting provides that the compressor shall cut in at 50 lb. and out at 60 lb. The safety valve is set 15 lb. higher; that is, at 75 lb. Noticeable pipe leaks must be eliminated, as additional leakage means unnecessary work for the compressor and a consequent shortening of its life.

To determine if all parts of the air brake and safety car control equipment are in working order the following tests can be employed:

TESTS OF AIR BRAKE AND SAFETY CAR CONTROL EQUIPMENT

Begin the test at No. 1 end of car. Observe that the main reservoir drain cocks are closed, the cutout cock in the governor pipe open (if such a cock is supplied), the compressor fuse in place and "live," the brake valve handle on the brake valve and in "release" position before starting the compressor.

After the governor has stopped operation of the compressor, observe if the air gages at both ends of the car agree, which will require an additional observer

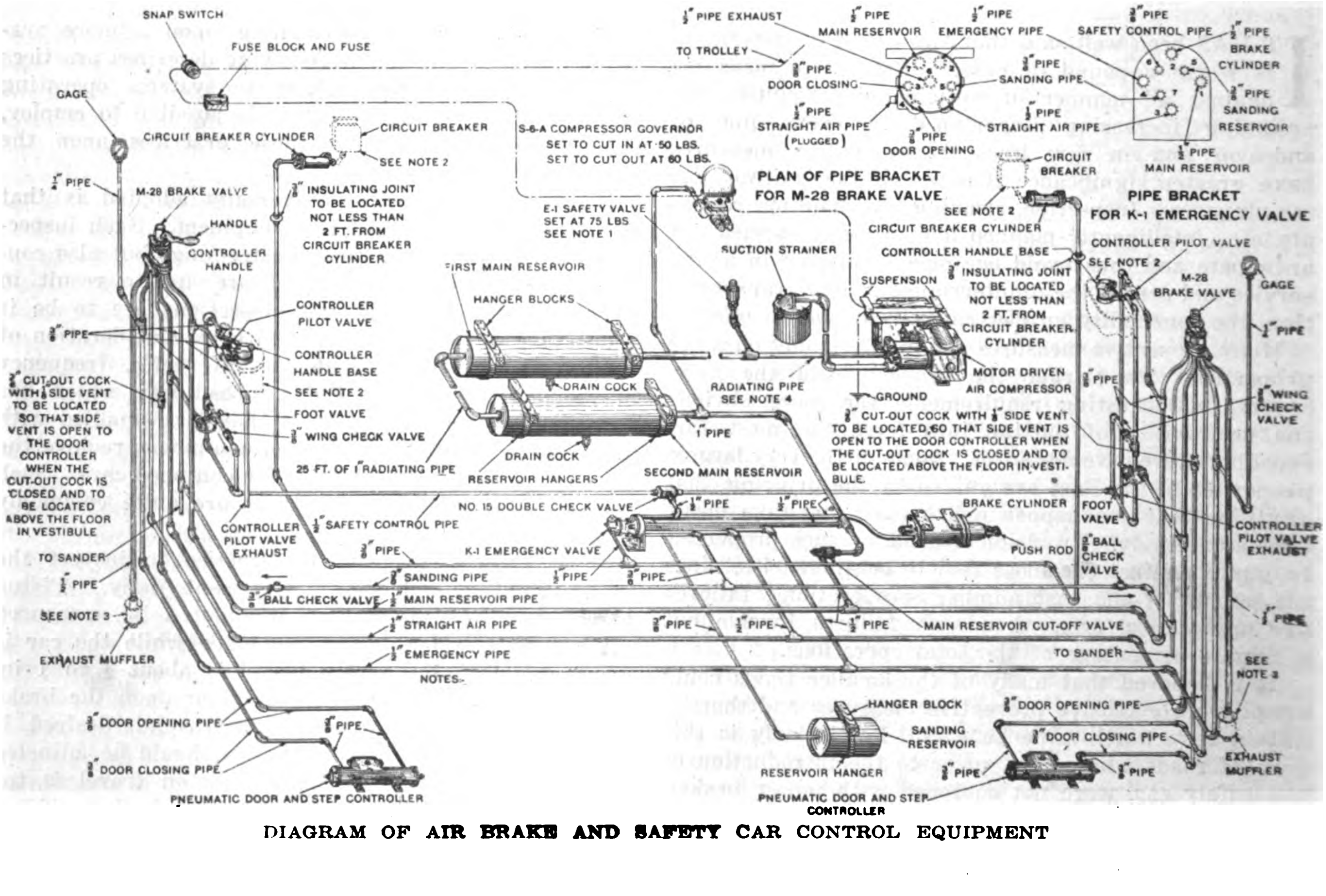
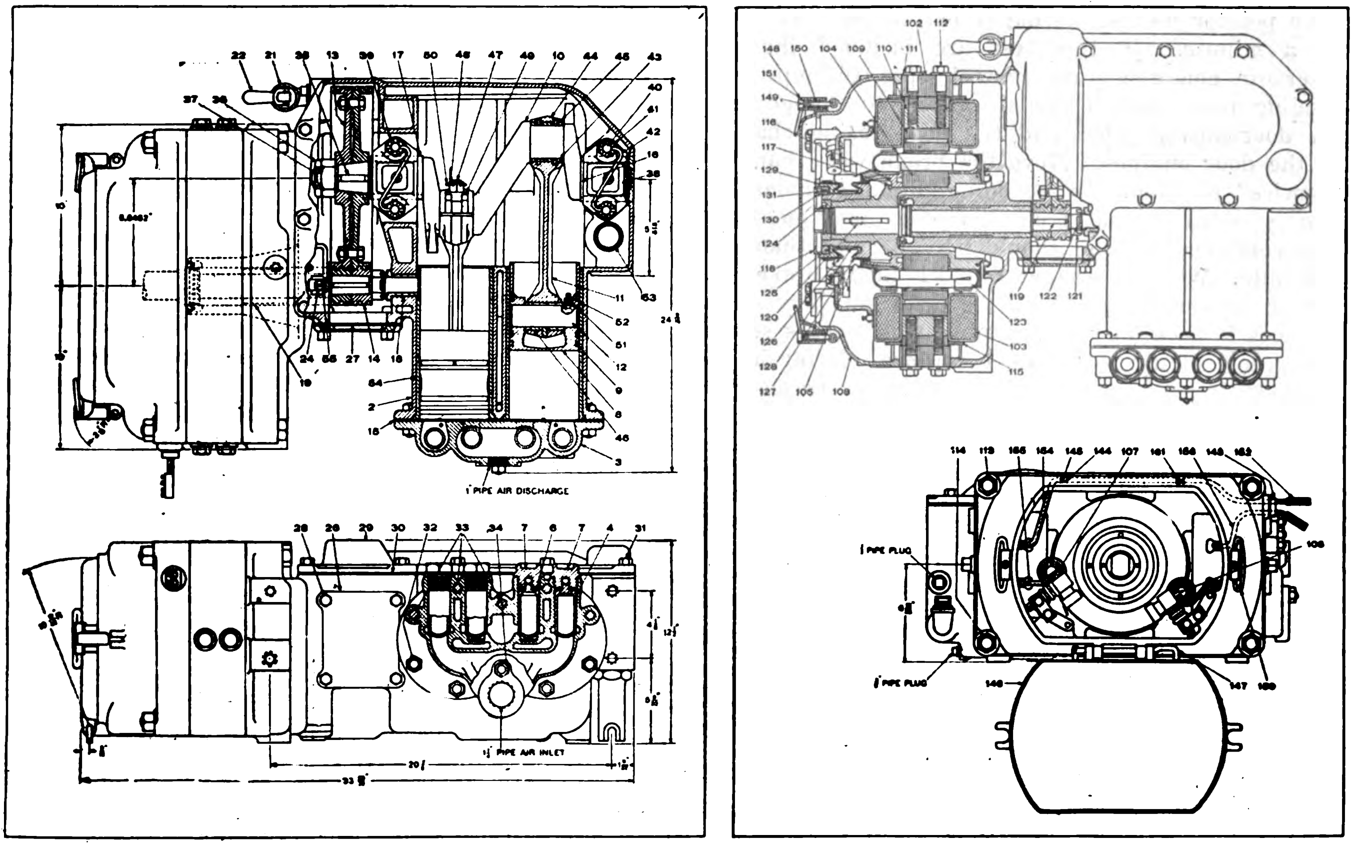

SNAP SWITCH
FUSE BLOCK AND FUSE
GAGE
CIRCUIT BREAKER CYLINDER
CIRCUIT BREAKER
SEE NOTE 2
S-6-A COMPRESSOR GOVERNOR
SET TO CUT IN AT 50 LBS.
SET TO CUT OUT AT 60 LBS.
¼" PIPE
M-28 BRAKE VALVE
HANDLE
CONTROLLER HANDLE
⅜" INSULATING JOINT TO BE LOCATED NOT LESS THAN 2 FT. FROM CIRCUIT BREAKER CYLINDER
E-1 SAFETY VALVE SET AT 75 LBS SEE NOTE 1
FIRST MAIN RESERVOIR
HANGER BLOCKS
CONTROLLER PILOT VALVE
⅜" PIPE
CONTROLLER HANDLE BASE
SEE NOTE 2
⅜" CUT-OUT COCK WITH ⅛" SIDE VENT TO BE LOCATED SO THAT SIDE VENT IS OPEN TO THE DOOR CONTROLLER WHEN THE CUT-OUT COCK IS CLOSED AND TO BE LOCATED ABOVE THE FLOOR IN VESTIBULE
FOOT VALVE
⅜" WING CHECK VALVE
DRAIN COCK
25 FT. OF 1" RADIATING PIPE
DRAIN COCK
RESERVOIR HANGERS
SECOND MAIN RESERVOIR
NO. 15 DOUBLE CHECK VALVE
CONTROLLER PILOT VALVE EXHAUST
½" SAFETY CONTROL PIPE
TO SANDER
⅜" PIPE
K-1 EMERGENCY VALVE
½" PIPE
⅜" SANDING PIPE
½" PIPE
⅜" PIPE
⅜" BALL CHECK VALVE
½" MAIN RESERVOIR PIPE
SEE NOTE 3
½" STRAIGHT AIR PIPE
EXHAUST MUFFLER
½" EMERGENCY PIPE
NOTES-
⅜" DOOR OPENING PIPE
⅜" PIPE
⅜" DOOR CLOSING PIPE
PNEUMATIC DOOR AND STEP CONTROLLER
½" PIPE EXHAUST
½" PIPE MAIN RESERVOIR
½" PIPE EMERGENCY PIPE
⅜" PIPE SAFETY CONTROL PIPE
½" PIPE BRAKE CYLINDER
TO TROLLEY
⅜" PIPE DOOR CLOSING
⅜" PIPE SANDING PIPE
⅜" PIPE SANDING RESERVOIR
½" PIPE STRAIGHT AIR PIPE (PLUGGED)
⅜" PIPE DOOR OPENING
½" PIPE STRAIGHT AIR PIPE
½" PIPE MAIN RESERVOIR
1 2 3 4 5 6 7 8
PLAN OF PIPE BRACKET FOR M-28 BRAKE VALVE
CIRCUIT BREAKER
SEE NOTE 2
CIRCUIT BREAKER CYLINDER
PIPE BRACKET FOR K-1 EMERGENCY VALVE
SUCTION STRAINER
CONTROLLER HANDLE BASE
CONTROLLER PILOT VALVE
SEE NOTE 2
SUSPENSION
⅜" INSULATING JOINT TO BE LOCATED NOT LESS THAN 2 FT. FROM CIRCUIT BREAKER CYLINDER
M-28 BRAKE VALVE
GAGE
½" PIPE
MOTOR DRIVEN AIR COMPRESSOR
RADIATING PIPE SEE NOTE 4
GROUND
⅜" PIPE
⅜" WING CHECK VALVE
1" PIPE
⅜" CUT-OUT COCK WITH ⅛" SIDE VENT TO BE LOCATED SO THAT SIDE VENT IS OPEN TO THE DOOR CONTROLLER WHEN THE CUT-OUT COCK IS CLOSED AND TO BE LOCATED ABOVE THE FLOOR IN VESTIBULE.
½" PIPE
½" PIPE
BRAKE CYLINDER
FOOT VALVE
CONTROLLER PILOT VALVE EXHAUST
PUSH ROD
⅜" BALL CHECK VALVE
½" PIPE
⅜" PIPE
½" PIPE
½" PIPE
MAIN RESERVOIR CUT-OFF VALVE
TO SANDER
SEE NOTE 3
HANGER BLOCK
⅜" DOOR OPENING PIPE
SANDING RESERVOIR
⅜" DOOR CLOSING PIPE
EXHAUST MUFFLER
RESERVOIR HANGER
⅜" PIPE
⅜" PIPE
PNEUMATIC DOOR AND STEP CONTROLLER

DIAGRAM OF AIR BRAKE AND SAFETY CAR CONTROL EQUIPMENT



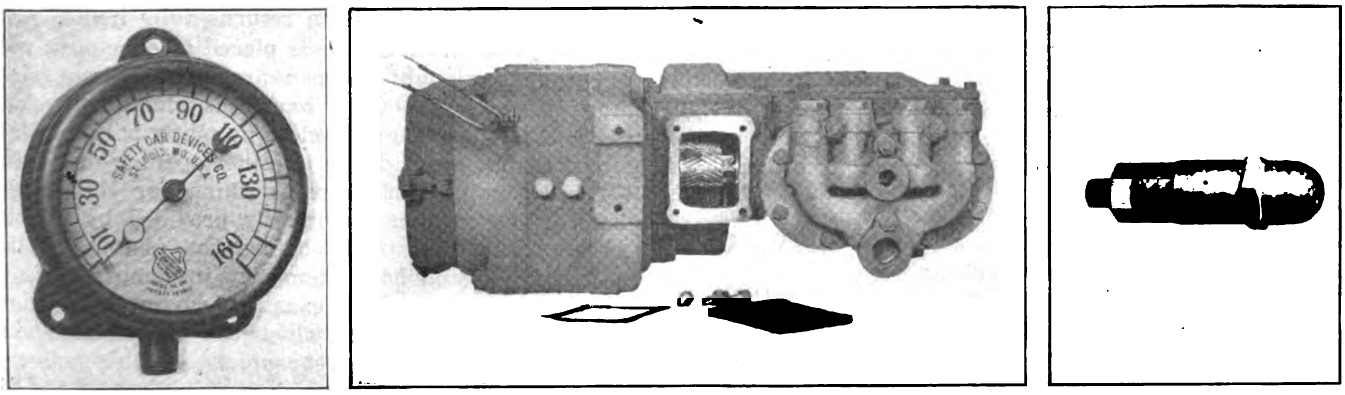
OPERATING PARTS OF TYPE DH COMPRESSORS

The parts with which we are chiefly concerned are: 2—Cylinder and crank case; 4—inlet valve; 6—discharge valve; 8—piston; 10—crank shaft; 11—connecting rod; 13—gear; 14—pinion; 16—rear crank shaft bearing; 17—front crank shaft bearing; 19—motor bearing; 102—field yoke; 103—field coil; 104—armature; 105—commutator; 106 and 107—carbon holders.

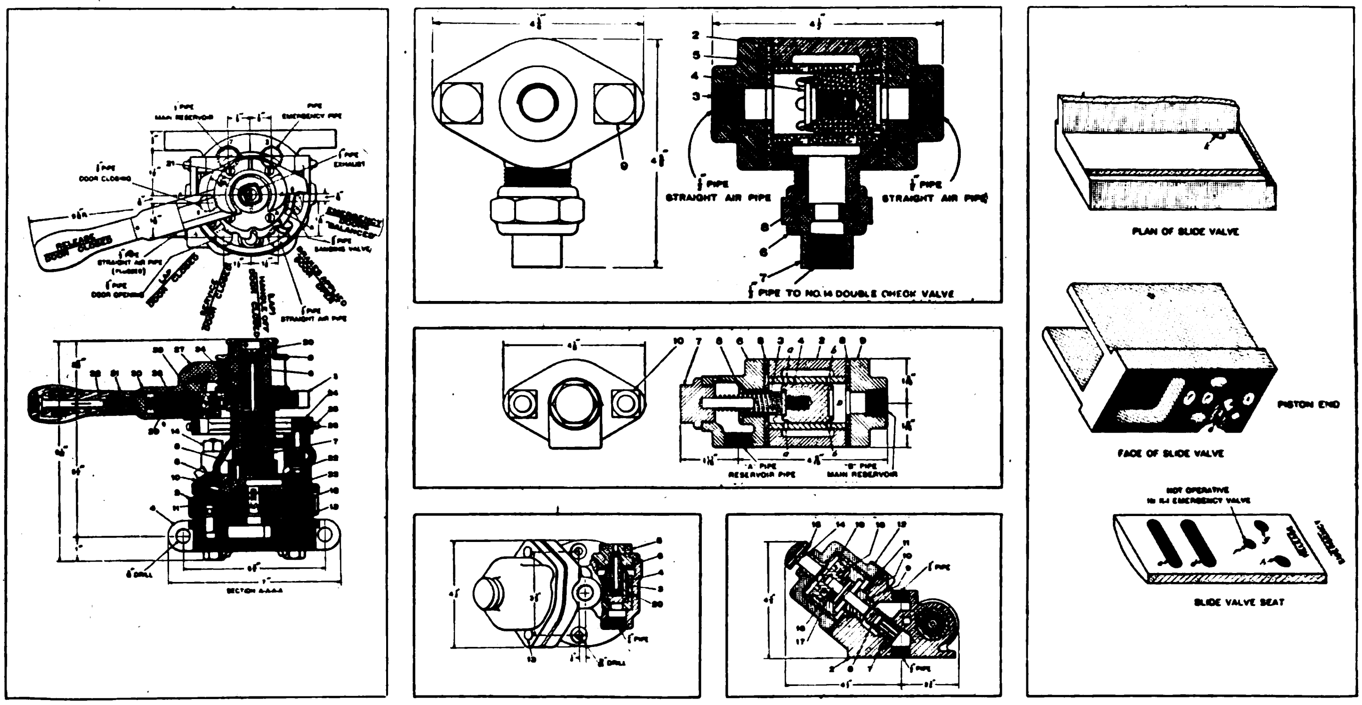
for the gage at No. 2 end. If they do not, make certain that the gage hands are not binding. If the hands are not binding, detach the gages and take to a bench for adjustment. A special test gage should be set up at the bench, so that car gages may be checked against it. Better results are obtained if the gages are adjusted at the bench than if adjusted on the car. If sufficient spares are available, correctly adjusted gages can be kept on hand and substituted for those removed from the car, these latter being adjusted at some later time.

After it is known that the air gages are correctly adjusted, make sufficient brake applications and releases to start the compresor or start it by opening temporarily the main reservoir drain cock. Observe that the governor stops the compressor when the main reservoir pressure is 60 lb. If it does not, adjust the governor as described later. Cause the compressor to start again by reducing main reservoir pressure by some means such as brake valve manipulation. Observe the main reservoir pressure when the compressor starts operation. If it is not 50 lb., make the necessary adjustments to bring it to this value. Cut out the governor by closing the cock in the governor pipe, when the compressor will start almost immediately. The safety valve, if correctly adjusted, will open at 75 lb. main reservoir pressure. If it does not open at this pressure, change the adjustment. After this test be certain to open the cock in the governor pipe. If there is no cutout cock in the governor pipe, short circuit the governor switch by the aid of a small wire jumper until the safety valve adjustment is determined.

It is important that leakage from the brake system be reduced as much as practicable. To determine the rate of leakage, after the compressor has stopped operating, wait for about one minute, then place the brake valve handle in release position and hold down on the controller handle. Observe the rate at which the air



AT LEFT, AIR GAGE. IN CENTER, COMPRESSOR. AT RIGHT, SAFETY VALVE gage pointer moves. It ought not to be more than 4 lb. a minute. In this test are included the main reservoir, emergency and control pipes, the pipe to the sanding reservoir, to the air gages, to the governor, the door-closing pipes and the door-closing chambers of the door engines. Move the brake valve handle to "service" position. By so doing, brake cylinder leakage is added to that from the pipes just mentioned. The combined leakage should not be more than 4 lb. a minute. Whether leakage found is in the brake cylinder or the door engines can be determined by closing the cock in each door-closing pipe, which cocks shut off the supply of air to the door engines. After leakage has been located, be careful to open these cocks again. After these tests have been completed, move the brake valve handle to "door open" position. Observe the combined leakage, which, as above, should not be more than 4 lb. a minute. In this case, the leakage includes the door open side of the door engines, whereas in the previous case it included the door closed side. Unless leakage can be detected by sound, it will be necessary to coat the pipe fittings with soapsuds.



PLAN AND SECTIONAL VIEWS OF SAFETY CAR AIR EQUIPMENT

At left, brake valve. Top center, double check valve. Center, main reservoir cutoff valve. Bottom center, foot valve. At right, slide valve and slide valve seat for K-1 emergency valve.

When leakage has been reduced to a permissible value and governor settings have been corrected the efficiency of the compressor can be roughly determined by noting the time the compressor operates in restoring main reservoir pressure to 60 lb. from 50 lb. This time will differ considerably with different cars, but an average time can be readily established, wide variation from which will justify examining the condition of the compressor.

PISTON TRAVEL SHOULD BE MAINTAINED AT FOUR INCHES

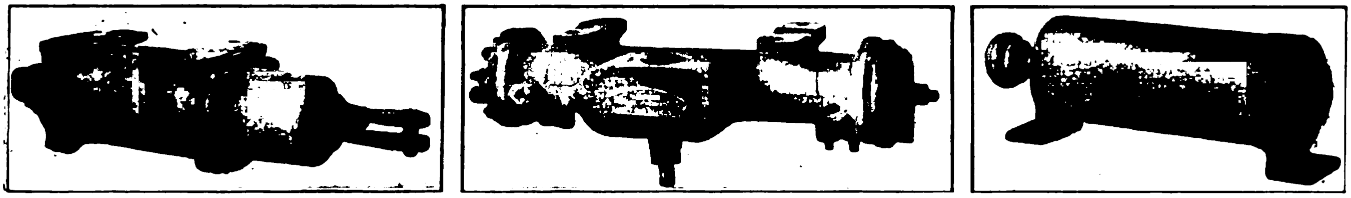
After the above tests have been concluded, make a service application from the No. 1 end of the car. Note if the piston moves out promptly to its full travel of 4 in. Then release the application. Make certain that the piston promptly returns fully home. Observe whether there is any fouling of the hand brake, and if so correct it. Make a full service application and then remove the hand from the controller handle. Note if the circuit breaker cylinder piston remains in position. If the piston moves out, examine the combined foot and cutoff valve to determine where the binding or sticking may be.

Make an emergency application by placing the brake valve handle in emergency position, but not releasing the controller handle. If the circuit breaker cylinder piston moves out, examine the combined foot and cutoff valve as above. Release controller handle and note if sand issues from all four sand pipes. If it does not, remove any wet sand found in the sand boxes. Determine if the air pressure has been removed from both doors by opening them by hand. Break a union in the main reservoir pipe between the main reservoir cutoff valve and the brake valve and quickly spring apart the pipes so as to have the pipe fully open. If the flow of air from the pipe leading to the cutoff valve does not diminish considerably, remove and clean the main reservoir cutoff valve. Reconnect the union and move the brake valve handle to release position. Ascertain if the brake cylinder piston returns fully home.

If the brake valve handle is placed in door-open position, the door ought to open promptly without slamming; if the brake valve handle is placed in release position, the door ought to close promptly without slamming. Slamming of doors, in either opening or closing, is caused by lack of proper cushion for the moving piston. The cushion is normally provided by choking the air exhausting from before the piston, so that the moving piston has a tendency to compress it. If a door slams, therefore, examine the large ballcheck valve in the head toward which the piston is moving, since the air can exhaust rapidly if this valve is unseated. Also ascertain if the packing cup of the piston is in good condition and well lubricated. If it is desired to change the cushioning effect slightly, screw in or out the choke plug in the center of the door engine head. If the door opens slowly, it may be due to the slowness with which air is admitted to the one piston chamber or to the slowness with which the air is exhausted from the other. Examine the port in each head to determine if it is clear. Also make certain that the packing cups are tight. If the door opens slowly and air exhausts from the gear portion of the door engine, examine the small check valve in the door engine head from which the piston is moving away to determine if it is unseated.

TESTING THE EMERGENCY ACTION OF EQUIPMENT

To test the emergency action of the equipment, charge the system to at least 50 lb., with the brake valve in release position. Leaving the brake valve in release, remove the hand from the controller handle. The brake cylinder piston will at once move out, sand will issue at all four sand pipes, the circuit breaker cylinder piston will knock out the circuit breaker and the air pressure holding the doors closed will be removed. If sand does not issue from the sand pipes, examine the boxes for wet sand. If the circuit breaker is not knocked out, examine and clean the relay valve in the emergency valve. The other two events will invariably occur.



AT LEFT, BRAKE CYLINDER. IN CENTER, DOOR AND STEP CONTROLLER. AT RIGHT, CIRCUIT BREAKER CYLINDER

With the system fully charged and the brake valve in release position, press against the button of the combined foot and cutoff valve and then release the controller handle. Observe if the circuit breaker is knocked out. If it is, the valve actuated by the piston of the foot valve is not seating. Ascertain if the valve is held from its seat by foreign matter or if it is jammed. If the circuit breaker is not knocked out, remove the foot from the foot valve. The circuit breaker will then be opened, unless the valve just mentioned is stuck so as to restrict the opening from the control pipe. Make the same test by releasing the controller handle from power on position and note if the circuit breaker cylinder piston moves out. It is important for this test that the circuit breaker be opened by hand before commencement.

Depress the brake valve handle and observe if sand issues from the adjacent pair of sand pipes. If it does not and the sand boxes are in proper order, examine the sander valve in the brake valve.

Make a full service application by placing the brake valve in service position. Release the controller handle. The circuit breaker should not be opened. If it is opened examine and clean the combined foot and cutoff valve.

All of the above tests involving brake valve manipulation should be repeated from No. 2 end of the car.

If it is found that with the brake valve handle in release position and the controller handle held down the brakes cannot be released it is probable that some defect exists in the control system. Such defect is generally due to a bit of pipe scale lodging under a valve seat. With new cars, difficulties with pipe scale will be experienced until the scale works out of the various pipes. If the brakes cannot be released with the brake valve handle in release position, hold down on the controller handle and determine if there is a flow of air from the controller pilot valve atmospheric exhaust. If there is such a flow, clean the lower pilot valve and give it a good bearing on its seat. If there is not, examine the No. 15 double check valve to determine if it is seating against the seat away from the operating brake valve. If a satisfactory seat is being made, no air will flow when the pipe leading from the check valve to the non-operating end of the car is broken. If no difficulty exists with the double check valve, break the pipe connection leading from the relay valve of the emergency valve to the circuit breaker cylinders. If air passes the relay valve, this valve is at fault. If no air passes the relay valve, examine and clean the emergency valve.

If the brake applies when not intended, excessive leakage must exist from the emergency pipe and its connections, which include the door-closing sides of the door engines. This piping must be tested for leaks, the removal of which will eliminate the trouble.

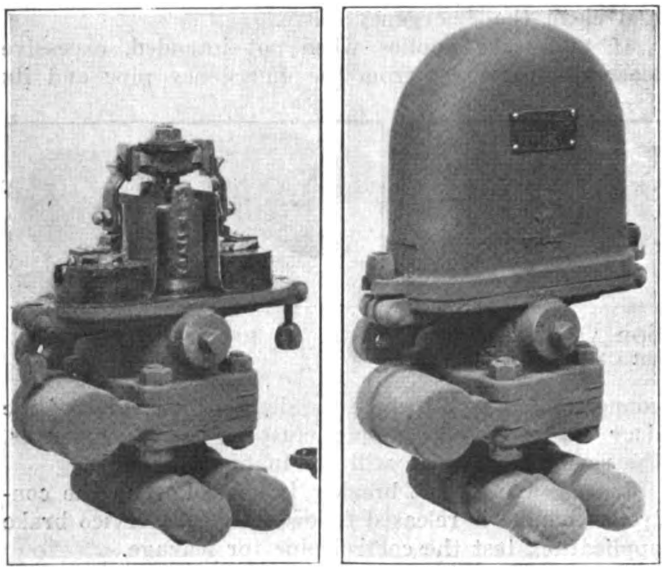
In case the circuit breaker is opened when the controller handle is released following a full service brake application, test the control pipe for leakage.

DETERMINING CAUSE OF ESCAPING AIR FROM BRAKE VALVE EXHAUST

To determine the cause of air escaping from the brake valve exhaust, move the brake valve handle to "handle off" position. If the flow of air then continues, it is due either to a leaking rotary valve or to a defective gasket between the brake valve and pipe bracket, though the former is the most common cause. If air escapes from the brake valve exhaust only in release position, it may be caused either by the emergency valve or by the brake valve at the other end of the car. To ascertain positively which of these is the source, disconnect the straight air pipe near the brake valve from which air is escaping. If no air issues from the section attached to the emergency valve, the trouble is with the brake valve. If air does issue from this pipe, disconnect the straight air branch pipe leading to the emergency valve. If air issues from the section attached to the emergency valve, the trouble is due to a leaking slide valve or a defective gasket in the emergency valve. If air does not issue from this section, the trouble is with the brake valve at the other end of the car. Air escaping around the sander valve stem can frequently be stopped by the operation of the valve a few times.

Escape of air from the lower vent port of the combined foot and cutoff valve, at either end of the car, with the brake released, indicates leakage around the upper of the double valves and its stem. Escape of air at either vent port, at either end of the car, with the brakes fully applied, indicates that the seal of the valve adjacent to the vent is not tight. Leakage by the stem of the knob indicates that the valve on the end of the stem is not seating. If, with the brake fully applied, air escapes at the pilot valve exhaust when the controller handle is released, examine the by-pass check valve for leakage.

Air issuing at the operative end of the car from the pilot valve exhaust with the controller handle held down is caused either by the lower valve not seating or by its making a poor seat. With the controller handle released, escape of air at the same exhaust is due either to the upper pilot valve, to the lower of the double valves in the foot valve or to the by-pass check valve. By successively disconnecting pipes, leakage may be traced to one of these three sources. In the event that the trouble is discovered to be with the upper pilot valve, make certain that the lever in the handle base is so adjusted that the upper pilot valve is caused to seat when the controller handle is released. The contrary applies to the lower pilot valve. Escape of air from the pilot valve exhaust at the non-operative end of the car results either from a leaking upper pilot valve or from a double check valve which does not seat properly.


ELECTRIC COMPRESSOR GOVERNOR

Issuance of air from the exhaust port in the main body of the emergency valve can be stopped by fitting the emergency slide valve to its seat. Air escaping from the exhaust port in the casting containing the relay valve with the brakes released comes either from a defective gasket or a poor seal made by the small end of the emergency piston. Leakage by the relay valve in release position is evidenced by air escaping from the circuit breaker cylinders.

GENERAL REPAIRS TO COMPRESSOR AND ACCESSORIES

It is advisable to follow a systematic schedule in making general repairs or overhauling equipment. Such schedules are carefully laid out upon all large properties. Smaller roads will find it decidedly practical from an economical standpoint to follow their example. Overhauling is generally upon a time basis and the interval adopted is usually one year. Emergency valves may require more frequent cleaning, determined by local conditions. A yearly basis, however, will probably be found satisfactory for the other items of the air brake and safety car control equipment.

The efficiency of a compressor may be determined by a suitable operating test and this efficiency used to determine whether or not the compressor is in need of overhauling. Such procedure is quite general in connection with steam-driven compressors on steam railroads, but is very exceptional on electric roads. Overhauling of motor-driven compressors is generally on a yearly basis, at least on properties in the East, without reference to the actual condition of a particular compressor.

To make satisfactory repairs to a compressor, it is necessary to provide a bench with such air and electrical connections that the compressor may be operated under pressure. It is advisable to have sufficient spare compressors in order that time may be available to do all necessary repairing to the compressors before their return to service. At each overhauling drain all oil from the crank case and clean up the compressor portion thoroughly with gasoline. Examine piston rings to ascertain if they have been making good contact against the cylinder walls and in their grooves. If not, replace with new rings, as the efficiency of the compressor and any tendency to pass oil will thereby be considerably bettered. If many compressors are overhauled, a clamping device to permit the easy installation of segmental rings is a worth-while addition to the shop equipment.

After the cylinder walls become worn from long service, the efficiency of the compressor can only be maintained by reboring or rebushing the cylinders. After the cylinder walls have been reduced in thickness by reboring, it is necessary that they be rebushed. Two sizes of repair piston rings can be furnished for DH-16 compressors, one size 1/16 in. larger than standard and one 1/8 in. When rings 1/8 in. over size are no longer able to take care of wear, it is necessary that the cylinders be rebushed.

The valves in the cylinder head require cleaning, any carbonization being removed. Valve seats must be refaced when it is evident that valves are seating badly. This work must be so carried out that the valve lift is not changed from that specified for the compressor. Tools are manufactured by which this work may be readily done. It is important that the slope of the seat be retained as it existed in the original design in order that the bearing area of the valve may not be changed.

Crankshafts may require new bearings. Connecting rod bearings must be tightened up and shims adjusted. Bearings must be rebabbitted when sufficiently worn. Nuts throughout the compressor demand tightening. Pinion and gear, the pinion particularly, need examination, for the pinion after long wear may require replacement.

Armature and field coils of the motor should be blown out, then cleaned with gasoline, dried and finally shellacked or varnished. Bearings must be tested by checking the armature gap in the usual way. After commutators have worn down to the mica, turn and reslot. Brushes ought to be free in their holders. The proper spring tension, with adjustable brush holders, is 4 and 5 lb. per square inch of brush area.

When the compressor is reassembled, care must be taken that the cylinder head is drawn up tightly against the cylinder casting. If cork cylinder gaskets are used, they can be held in place by shellacking the side which goes against the cylinder casting. If the other side is coated with graphite grease or finely powdered graphite the cylinder head may be removed without tearing the gasket.

The strainer is not generally given the attention warranted by its importance on account of the vital bearing its proper functioning has upon the life of the compressor. Many compressor troubles are due to neglect of the strainer. Compressors have been found in service without any strainer. The strainer needs to be blown out frequently, the more frequently the better. At the yearly overhauling the hair should be removed and cleaned.

Overhauling of governors should be done at a suitable bench and not attempted upon the car. Leather seats and gaskets when found leaking need to be replaced. The governor strainer must be given attention. In time, valve cylinders will have to be rebushed. To adjust the setting of the governor, remove the caps covering the regulating nuts and screw down the cut-out regulating nut until the compresor cuts out at approximately the pressure desired. At the same time or possibly before this nut is adjusted, back off the cut-in nut until it is certain that the cutting-in point is below the cutting-out point. If this is not done, it will be difficult to make proper adjustment. After the cutting-out point has been set, screw down on the cut-in regulating nut until the compressor cuts in as desired. The caps covering the regulating nuts must be in place and tightened when the final adjustments are made, as otherwise the adjustment will be disturbed when they are put back. At the yearly overhauling testing the adjustment of the safety valve should be carefully and accurately done. This setting should be 75 lb.

CARE OF EMERGENCY AND OTHER VALVES

The emergency valve must be gone over at least once a year or if dirt, gum or verdigris accumulates in sufficient quantity every six months. It is very desirable that the overhauling be done at a bench provided with means for testing the valve under pressure. A suitable test rack was described in the Aug. 21 issue of this publication in connection with an account of safety car operation in Kansas City. If any slide valve leakage is found, the slide valve must be ground in or spotted to overcome it. Gaskets and leather seats must be renewed when found leaking. The cleaning of the relay valve cannot be overlooked. Relay valve and main piston must move freely in their cylinders. When new piston rings are installed, ascertain that they make a tight and uniform fit in their groove. New rings can be worn in by moving the piston back and forth by hand or by a proper tool. Good practice requires that the ring be fitted to the cylinder rather than the cylinder to the ring. It goes without saying that piston and slide valve should be returned to the body from which removed. Emergency valves may be applied, however, to any pipe bracket. The lubrication of the emergency valve has been described in a previous article.

The circuit breaker cylinder, the double check valve, the main reservoir cutoff valve and the combined foot and cutoff valve must all receive attention at the same time as the emergency valve. Cleaning is the principal work to be done. Gaskets and seats must be replaced when necessary to overcome leakage. Valves in the combined foot and cutoff valve or in the pilot valve when discovered leaking will have to be ground in.

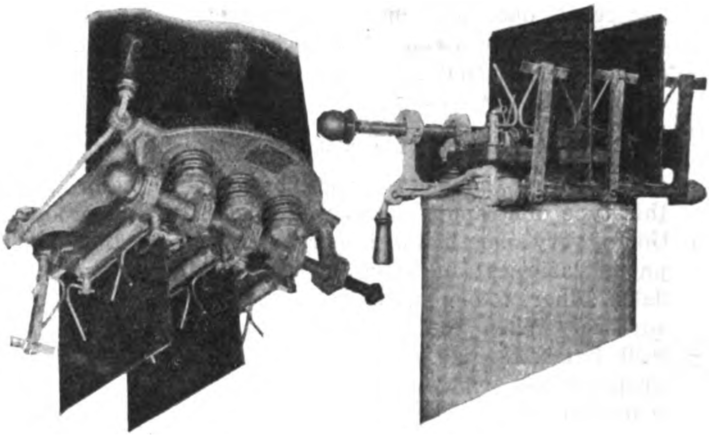
Gaskets and leather seats require renewal when found leaking. Handles can be rebushed when they become loose on the brake valve stem. The sander valve needs to be inspected for leakage. Worn latches require replacement. The wearing strip bearing on the bail will have to be renewed before it becomes too thin. Brake cylinders ought to be cleaned yearly. Door and step controllers can be on the same basis. Cup leathers worn and cracked must be replaced. All leathers should be lubricated. The gear case must be kept filled with a suitable non-fluid oil or a hard grease.

In following out the tests for locating troubles as described, charts, diagrams and sectional views of the character illustrated will be found of great assistance to the workmen. The manufacturers of the equipment have these in convenient size and can supply them as required.

Improved Electrolytic Lightning Arrester

MOUNTING the transfer switch and gap structure on the tank top is one of the main features of the 1,000-7,500-volt type AK lightning arresters recently placed upon the market by the Westinghouse Electric & Manufacturing Company. This arrester is self-contained and of the indoor mounting form. Transfer switch, horn gaps, charging resistance and short-circuiting devices are all located on the tank top.

The transfer switch is of the sliding rod type, consisting of a rod with sections of conducting and insulating materials, operating through five self-aligning contacts, supported by the cover. Three middle contacts are insulated from the tank cover by porcelain pillar insulators, but the end contacts are connected directly to the tank top through their metal supports and form a part of the ground circuit. A ball handle with guard provides an easy method of operating the switch.


LOW-VOLTAGE ELECTROLYTIC LIGHTNING ARRESTER

The horn gap, charging resistance and short-circuiting device are mounted on insulating bases located between barriers and on the tank top. Short-circuiting metal strips are carried by insulated supports attached to a shaft. The shaft or rod is operated by means of a rope or handle against a spring which normally holds the short-circuiting device in the open position.

Use of Solid Lubricants

Two Functions of Making Rubbing Surfaces Smooth and Slippery Are Supplied by Solid and Semi-Solid Lubricants

THE Department of Scientific and Industrial Research in Great Britain has just issued a memorandum on solid lubricants. Certain points discussed, of interest to electric railways, are abstracted below:

On introducing a solid lubricant between otherwise unlubricated surfaces the finely divided particles of the lubricant associate themselves with one or the other of the rubbing surfaces, filling in the pores and depressions, and acting to some extent as a smoothing and polishing agent. As a result, the coefficient of friction is reduced and the solid friction between the more or less rough original rubbing surfaces is replaced by the lesser solid friction between the smooth surfaces formed by the solid lubricant.

When oil lubricated surfaces remain at rest for some time the oil film is more or less completely squeezed out and a certain amount of solid contact takes place. As a result, the starting effort is much greater than the running effort; in fact, the static coefficient of friction usually approximates to the values applying to dry friction. The high values for the static coefficient of friction explain the great effort often required to start machinery from rest and form one of the chief reasons why ball and roller bearings are used, as with surfaces in rolling contact there is practically no difference between the static and kinetic coefficient of friction.

The effect of the use of a suitable solid lubricant or a solid colloidal lubricant is to reduce the tendency to abrasion and to produce smoothness of the surfaces. As the solid lubricant cannot be displaced by pressure, the static coefficient of friction is reduced as compared with the result obtained when oil alone is used, assuming that the solid lubricant is of such a nature and used in such a manner that it has increased the smoothness of the rubbing surfaces.

FLAKE GRAPHITE FORMS SLIPPERY SURFACE

Makers of the flake variety of graphite claim that this type of graphite lends itself better to the production of very smooth and slippery surfaces than the amorphous varieties; in bearings with rough surfaces the flakes adhere to one another and easily build up a smooth surface. When the bearing surfaces are reasonably well finished this "building up" action of the flake graphite does not appear to be of special value; in fact, it may be detrimental where small clearances exist, particularly if fed in excess.

A good solid lubricant must possess ability to adhere to metallic surfaces and it must be capable of producing a smooth surface. Graphite possesses both of these properties to a marked degree. Talc and mica do not adhere to surfaces as well as graphite does, nor do they produce so smooth a surface.

In the case of well-finished rubbing surfaces very finely divided graphite must obviously be used, and the coating of the surfaces is easier to accomplish than with rough surfaces. Under these conditions, makers of amorphous graphite claim that flake graphite, when used in excess, is apt to build up too thick a surface and reduce the working clearance to a dangerous extent, whereas with amorphous graphite excessive use can have no ill effects; the soft amorphous grains are easily crushed; in fact, a surface of fine amorphous graphite under pressure moves within itself like a film of oil.

The admixture of a hard solid lubricant, like hard talc or mica, with a grease, particularly if an excessive amount is added, may cause a great deal of continuous uniform wear, yet with no cutting or excessive heating of the bearing.

When a bearing gives warning by heating the usual procedure is to resort to the use of a fixed oil, like castor or rape oil, or to a viscous mineral oil, like steam cylinder oil; the effect of using such oils is to produce a better film, which separates the metallic surfaces and reduces the temperature. When the surfaces have commenced seriously to abrade one another oils may prove of no avail and solid lubricants must be used, such as graphite.

MILD ABRASIVES CURE HOT BEARINGS

Flowers of sulphur and white lead are often used to cure hot bearings; they act not so much as lubricants, but rather as mild abrasives; they grind away the rough spots and produce a smooth surface. Much more drastic remedies, such as salt, brick dust and grindstone dust have been successfully employed in very serious cases of large hot bearings; their function is quickly to grind away the rough parts which have commenced to seize. They may be applied mixed with thick oils. The oil should be applied in a liberal manner in order that it may clean away the gritty powder after it has done its duty.

Speaking generally, semi-solid lubricants are always improved by the admixture of a small amount of finely pulverized pure flake or amorphous graphite. In this case a softer grease, or a grease containing a lower viscosity oil, can be employed than that used without the addition of a solid lubricant. Exceptions are bearings with highly polished surfaces and small clearances and high-class ball and roller bearings, for which colloidal solid lubricants are the only solid lubricants that can be considered.

There are numerous experiences which testify to the value of solid lubricants, and graphite in particular, for use in bearings. One British railway reports that good results have been obtained by using either colloidal graphite or flake graphite mixed with their ordinary engine oil.

The graphite is used for regular running, but only as a temporary remedy, whenever important bearings are inclined to heat. Several railways report that by continuous use of colloidal graphite mixed with pure mineral oils they have obtained excellent results on heavy duty bearings which previously gave trouble, even when using oils heavily compounded with fixed oil. Not only did the bearings run cooler but also with an appreciable reduction in consumption of oil, and without flocculation of the graphite.

Bulletin No. 7 of the Federated American Engineering Societies announces the addition of the Cleveland Engineering Society to the list of charter members. This bulletin also discusses the form of organization, showing why a federation form is superior for the purposes involved to any new all inclusive body of individuals which could be found. It further emphasizes the retention of autonomy by each member society and also discusses the manner of the selection of representatives.

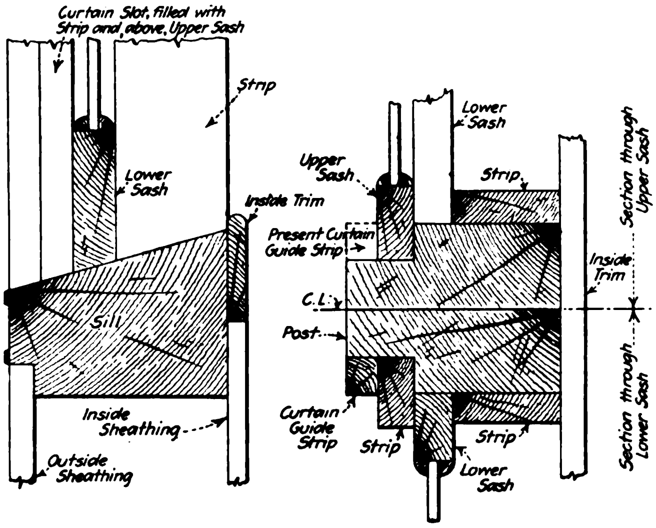
Modifying Open Cars for Prepayment Service

Connecticut Company Rebuilds Fifty Cars for P.A.Y.E. Operation—Although Company Plans to Use Them Only for Summer Open Service, Cars Are Adaptable to Conversion to Closed All-Year Types

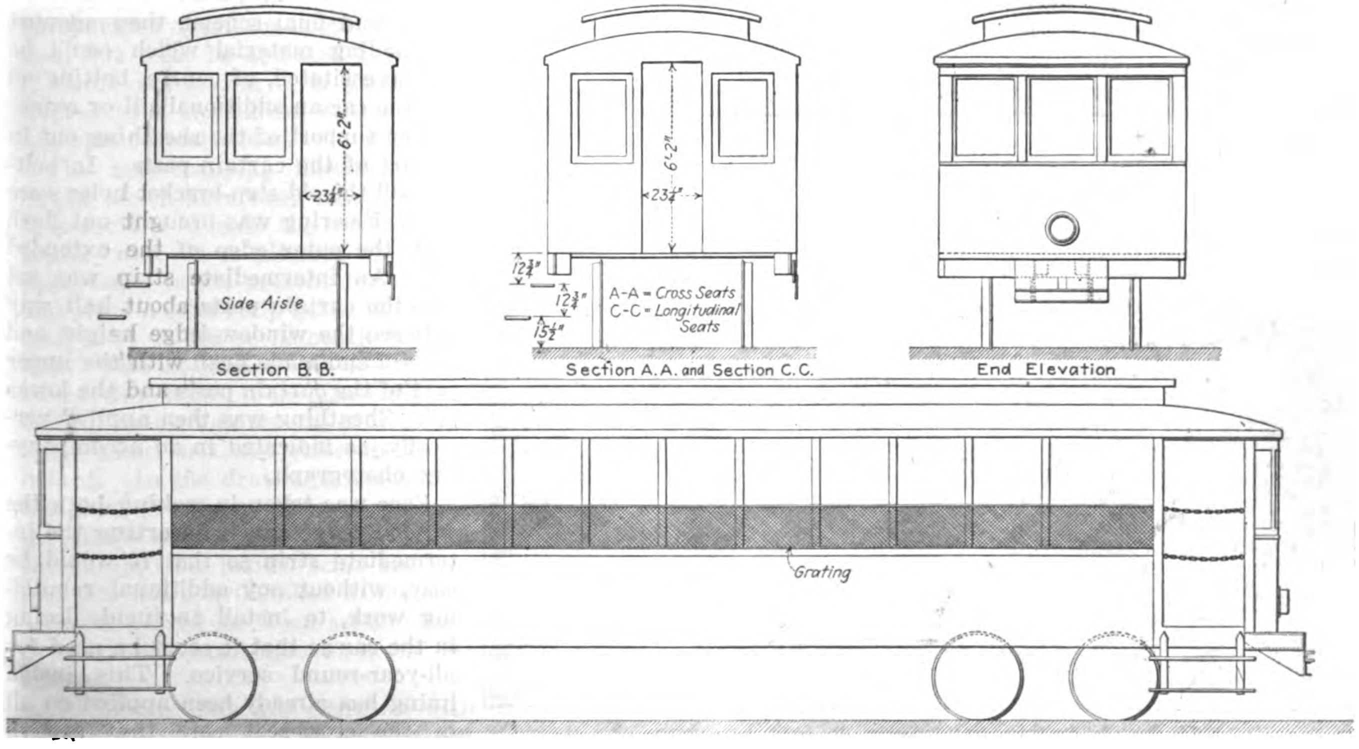
As THE Connecticut Company approached the summer months it was evident that it would have a large amount of open equipment which would be useless under the zone system of fare collection, which was in vogue on the lines of the company during the spring. While some use could be made of open equipment for a few standard runs on express service, with one cash fare for the entire run or any part of it, there were still many of the more than 400 open cars which would necessarily be idle under a zone system. Plans were therefore made to change over 100 of these cars, as a first step, in such a way that they could be used on the zone system with the same sort of fare collection in use on the ordinary closed car.

The Connecticut Company's open cars, seating seventy-five passengers, were of the ordinary reversible-seat, open-platform, two-step running-board type. One of these is shown in an accompanying illustration.

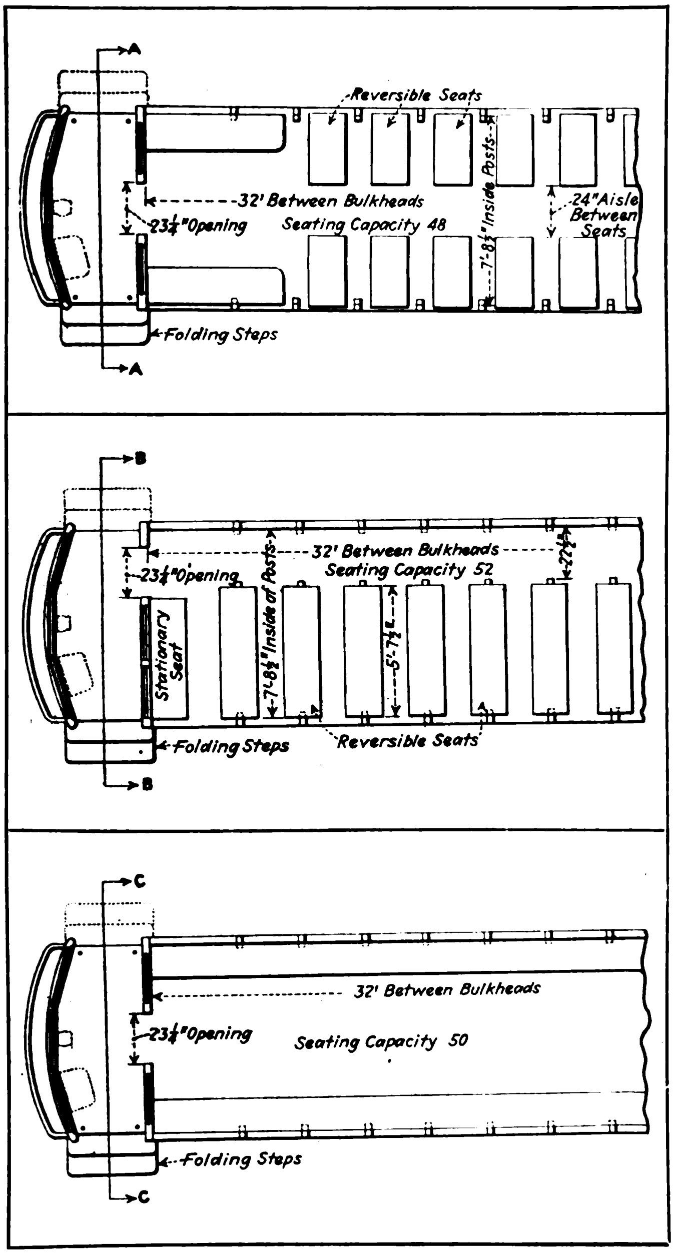
Various seating arrangements for the rebuilt cars were suggested which would allow ingress and egress of passengers in such a way that fares could be collected on the zone system. A sample car was constructed on each of three seating arrangement designs. The three designs are shown in an accompanying drawing and interior views of the three finished cars are shown in an accompanying illustration. One of these is the ordinary longitudinal-seat car, largely designed for rush-hour extras. This car will seat forty-eight passengers as now arranged. The second style is the cross-seat, with a center aisle, and arranged to seat fifty passengers. The third style is the side aisle arrangement with cross seats, which provides a seating capacity of fifty-two. Original plans called for fifty cars with longitudinal seats, ten with the cross-seat center-aisle plan and forty with the cross-seat side-aisle. It was soon evident, however, that the complete 100-car program could not be carried out in time for use during the summer of 1920 and the program was reduced to fifty. The plans


Curtain Slot, filled with Strip and, above, Upper Sash
Strip
Lower Sash
Sill
Inside Trim
Inside Sheathing
Outside Sheathing
Lower Sash
Upper Sash
Strip
Present Curtain Guide Strip
C.L.
Post
Inside Trim
Curtain Guide Strip
Strip
Strip
Lower Sash
Section through Upper Sash
Section through Lower Sash

HOW IT IS PLANNED TO SET WINDOWS, USING THE PRESENT CURTAIN POSTS


6'-2"
23¼"
Side Aisle
Section B.B.
6'-2"
23¼"
12¾"
12¾"
15½"
A-A = Cross Seats
C-C = Longitudinal Seats
Section A.A. and Section C.C.
End Elevation
Grating
Side Elevation

ELEVATIONS SHOWING DETAILS OF CONNECTICUT COMPANY'S MODIFIED OPEN CARS



THE THREE SEATING ARRANGEMENTS USED ON THE MODIFIED OPEN CARS

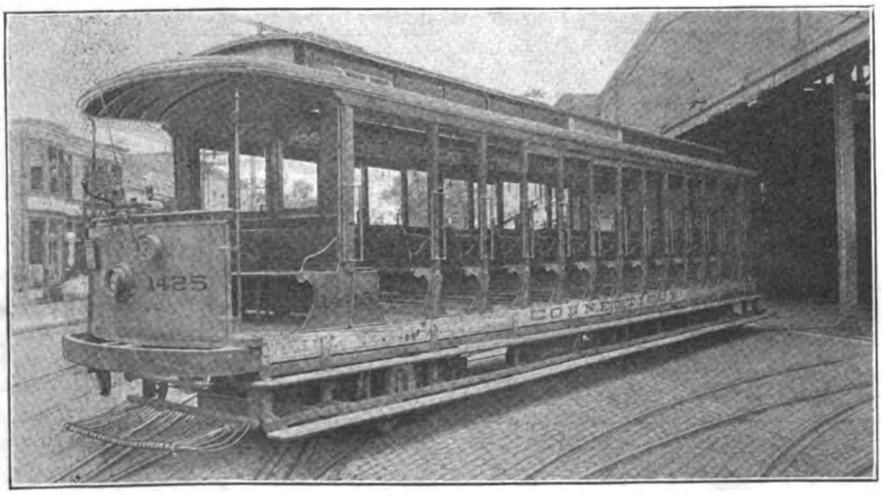
called for using the existing material in the open cars to make the three-quarter width seats and to make the longitudinal seats, but the cross seats for the center-aisle cars were to be purchased. As these orders had already been given, on the basis of the original program of ten cross seats, and as there were on hand enough cross seats in abandoned cars to equip three more of the new cars the following program was decided upon and carried into execution: Thirty-six longitudinal-seat, thirteen cross-seat, center-aisle, and one, the sample, side-aisle car. It was planned that the cars with longitudinal seats would be used for rush-hour extras and those with cross-seats in suburban service.

Most of these cars have already been put into service, and the reports received by the company indicate that the cars are very well liked. It is interesting to note that in some localities where both longitudinal and cross seats have been provided there is a demand that all the cars have longitudinal seats; in other communities the demand is exactly the opposite, *i.e.*, that all the cars should be of the cross-seat type.

These cars are arranged to be operated on the "pay-as-you-enter" scheme, the same as the standard two-man car. Of course, under the zone system as worked by the Connecticut Company, entrance was by the front platform and exit at the rear, using "pay-as-you-leave" collection. Since these cars are built to collect fares the same as a regular car, they can now be used as "pay-as-you-enter" cars on the present fare system.

In the actual change-over of the cars, attempt was made, of course, to utilize as much of the original open car material and construction in place as possible. The first plan called for the use of sheet iron for the sides, shaping this to the curtain posts. As it was impossible to get the material in time to make the reconstruction for this summer's period this plan had to be abandoned. A second scheme was then evolved to use agasote or nevasplit, putting this in the curtain slots, thus again following the shape of the posts. This material could not be promised on time, and this plan also had to be abandoned. The third and final scheme then adopted was to use straight siding material which could be secured locally. This necessitated, of course, bolting on to the existing sill of the car an additional sill or extension to bring the bottom support of the sheathing out in line with the upper part of the curtain posts. In bolting on this additional sill the old step-bracket holes were used. Flooring was brought out flush with the outer edge of the extended sill. An intermediate strip was set into the curtain posts about half way between the window ledge height and the sill and made flush with the upper part of the curtain posts and the lower sill. Sheathing was then applied vertically, as indicated in an accompanying photograph.

Care was taken in making both the window ledge and in inserting the intermediate strip so that it would be easy, without any additional rebuilding work, to install an inside lining in the car so that it could be used for all-year-round service. This inside lining has already been applied on all of the cross-seat cars that are in service.



THE ORIGINAL DOUBLE-TRUCK OPEN CAR WITH DOUBLE RUNNING BOARD

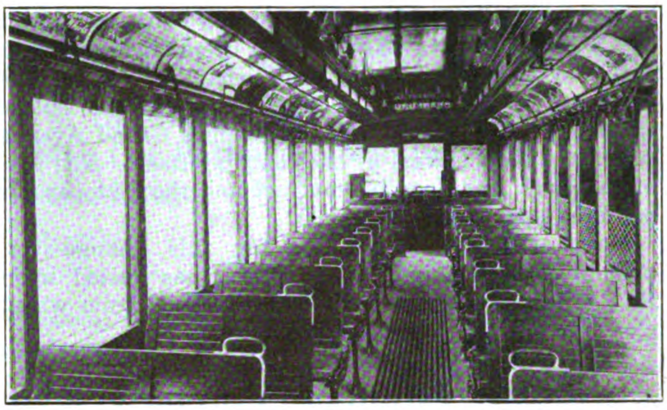
Since, however, the present plan contemplates using these cars only in the summertime no windows or doors have been provided, but the curtains have been retained. Bottoms have been cut off the curtains, so that they now reach only to the window ledge rather than to the floor as originally. The old flooring on the cars was used as a base and they were refloored on top of this to 8 in. in front of the longitudinal seats on the longitudinal-seat cars and out to the end of the cross seats on the cross-seat cars. The original slats, which ran crosswise on the open cars, were taken up and laid longitudinally on the rest of the floors of the remodeled cars.

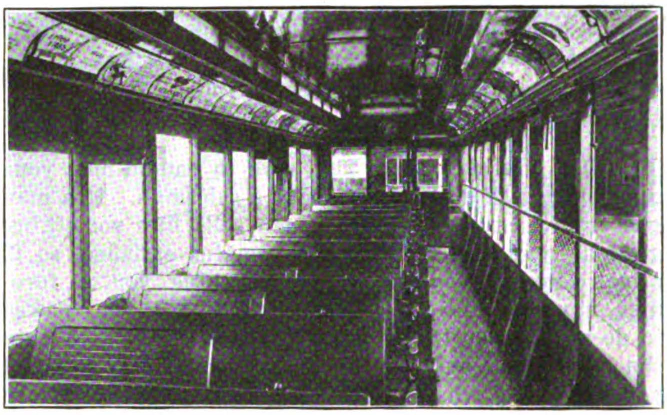
As stated above, the same seats and backs were used in the longitudinal and the side-aisle cars as had been previously used in the open summer cars. In the case of the side-aisle cars these were merely cut down and the same hardware used. In the case of the longitudinal cars all of the hardware was taken off, of course, the remaining material being used to construct one long longitudinal seat on each side of the car.

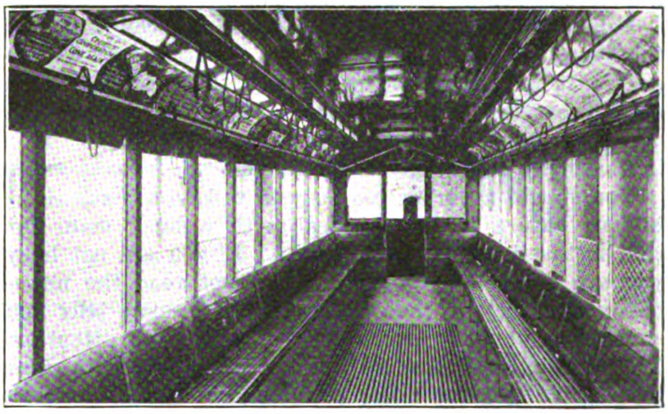
While the remodeling was being done it was decided best to put a vestibule on, and this vestibule was made ready to take a one-door wide, two-piece folding door of the same type as used on other single-entrance cars of the company. The old dashboards were, of course, removed and new dashers installed as part of the new vestibule.

There was no change whatever in the framework of the car. A stanchion was provided on either side of the entrance in the vestibule and no arrangements were made for a door from the vestibule to the car.

With reference to the steps, all of the open cars were, as seen in an accompanying photograph, provided with a two-step running board. In making the remodeled car the same steps and brackets were used as far as needed, the unused part of the running board being cut off without the necessity for removal. It happened that the two front brackets were so spaced as to be in just exactly the right location for the steps needed to enter the vestibule. These steps are not now arranged to be operated from the motorman's or conductor's position, but must be operated manually from the outside. If doors are added, it is planned to have these steps worked by a mechanism which operates when the doors are opened and closed.





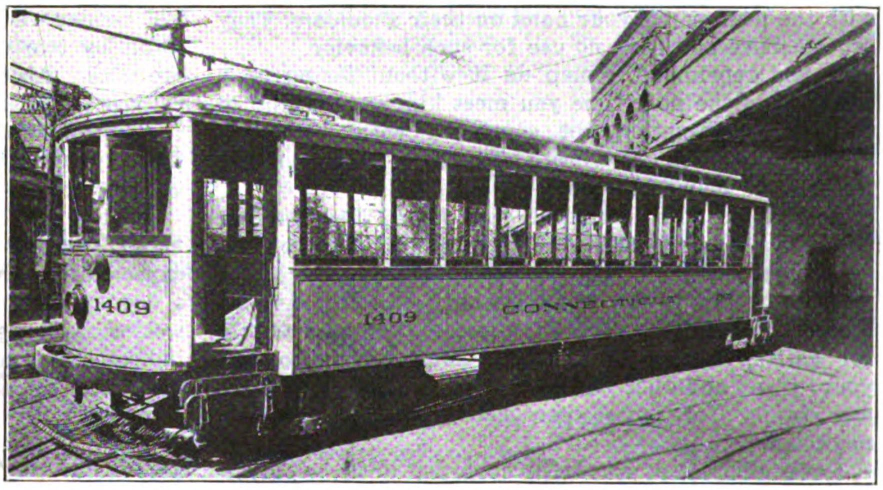


INTERIOR VIEWS SHOWING THE THREE SEATING ARRANGEMENTS

The accompanying illustrations show the arrangements which have been made to take windows in case it is decided to make the cars all-year-round cars. It is planned to set the upper sash in the present curtain slot and place a solid strip below the upper sash so it will be permanently in position. The lower sash will operate between this strip on the one hand and a strip nailed against the post on the other hand and will raise its entire height. In the drawings illustrating the plans for the addition of windows the strips there indicated, the inside sheathing, the inside trim and the sash are not now installed in the cars.

Some weight has been added to the cars, but the exact amount is not yet known.

All of the cars are equipped with O-50 trucks, with 4 G.E. motors and with G.E. control, either K-6 or K-35.



HOW THE CAR LOOKS AFTER RECONSTRUCTION, READY FOR PLATFORM ENTRANCE AND ZONE FARE COLLECTION

No change was made in the lighting or the ceiling of any of the cars with the exception of refinishing.

It may be of interest to know what the cost of this change-over has been. The first three cars fitted out as samples were prepared in the company's Grand Avenue carhouses, New Haven, by the company itself. The rest of the work was done by contract and the cost per car has been approximately $1,000.

Most of the responsibility for this change-over, including the making of the plans, has rested upon H. C. Beebe, superintendent of equipment, from whom most of this information was obtained.

Suggestions to Foremen

Be a Salesman and Sell Satisfaction—Lead, Not Drive, the Keynote of Success—Character Study Essential

BY JOHN F. SPENCER

IF YOU are a foreman and have to handle men your problem is the same as that of a salesman. If a man goes into a store and a salesman sells him something good he goes out satisfied and remains satisfied, so if a man comes to you and wants something, you, as foreman, must see that he is satisfied if it is in your power to do so. If you cannot give him what he wants state the reason and only let him leave when he is satisfied you cannot do what he desires. You, as foreman, are a salesman selling satisfaction, not goods.

Ninety per cent of the men know the conditions in the shop, factory or power station about as well as you do, so it is useless to try to fool them or put them off. Treat them so as to retain their friendship and respect so they will come back for another favor. This is the policy of any good salesman.

You should never be too busy to talk to a man. It is human nature to like to deal with a busy man, for that is the type that gets results. If you are not busy you are not selling anything. Do not read the newspaper or look out the window when a man tells you something about a car, but give him your attention. The inattentive treatment might cause him not to come back to tell you of other troubles which, if remedied, would prevent serious accidents.

Do not try to do too much for your men or to patronize them. They are quick to detect insincerity and you will spoil all discipline. Do not be familiar with the men or put your hand on their shoulders. They are sensitive and have no use for such behavior.

If you reprimand a man do it without losing your temper and the next time you meet him engage him in pleasant conversation not connected with his work. This action will convince him there was nothing personal in your reprimand.

You should be a teacher to your men. Never refuse to show a man the schedule, the plans or the working of a machine. The more you explain a thing the better you understand it yourself. Do not tell a curious man to see some one else. Make the question an opportunity for getting better acquainted. Your aim is to lead your men and not drive them, so no legitimate opportunity for better personal relations should be neglected.

Never dismiss a man with an order until he understands exactly what is wanted. You will find men different, and it pays to study character. You may have to talk fast to blond men and slow to brunette men in order to make them quickly understand your order. Different men require different treatment.

Always be frank, truthful and sincere with your men. Use good judgement in making promises and, above all, do not make promises you cannot carry out. Favoritism will cause endless trouble, while a square deal and consideration for every man will get co-operation in the work. Nothing is too slight to watch in avoiding charges of favoritism. Do not go on fishing trips, theater parties, etc., with your men unless all go.

There are many incidental things not directly connected with your duties as foreman that will help you handle men. Learn all you can about the fire protection, safety and sanitary appliances. A knowledge of first aid is an invaluable asset as it affords opportunity for your talking to a man in an emergency when he is not so critical in his attitude and at the same time you are placing him under a slight feeling of personal obligation to you for your aid.

Let your men talk and make suggestions about the work. Many of them will be valuable and every man likes to express his ideas.

You should keep a complete record of all your men in great detail. You should know whether they are married or single, whether they own or rent their homes, pay high or low rent, where they live and their telephone numbers.

You can also help them by posting notices of athletic events, etc., on the plant bulletin board.

A large measure of your success will be determined by your ability to handle your men, for, to the men, you are the company.

Insuring Current for Bond Testing

BOND testing on street railway tracks is generally unsatisfactory because the amount of current flowing through the rails is not known. The Wilkes-Barre Railway Company, under the direction of E. A. Hoffman, chief engineer, has devised a method of testing which removes this uncertainty.

The company has several small portable resistance welders used for welding joints, bonding tracks, etc. To insure a current flowing through the rail to be tested, the terminal of one of these welders is grounded to the rail, and the joints between the machine and the power house are tested approximately every 300 ft., or every four or five joints to each setting of the machine. The welder weighs only about 80 lb. and is easily moved about by two men. In open track two or three men are used. About 50 per cent of the track of this company is paved, and for testing this portion two laborers in addition to the men necessary for the testing operations are used to open up and relay the paving around the joints.

All the track on the system, consisting of approximately 100 miles, will be tested out this season. It is expected that the testing crew will average about 1 mile a day, repairing all bad joints and bad bonds with the welder as they proceed with the work. Past experience indicates that not more than 3 per cent of the bonds will have to be renewed. Bonds recently tested have shown a conductivity equivalent to from 3.3 to 4.4 ft. of rail. About 7 ft. is used as a standard on this property. The average weight of all rail on the property is 75 lb. The estimated cost of making this test and performing the repair work necessary over the Wilkes-Barre Railway's entire system is $2,000.

New Standard Type of Safety Car Suggested

Separate Entrance and Exit, Longitudinal Seats at the Ends and Other Changes Recommended to Make the Small One-Man Car Better Adapted to Fairly Heavy Traffic Lines

By WRAY T. THORN
Equipment Engineer, Chicago, Ill.

THE birth of the safety car was occasioned very largely by the competition of that *bête noir* of the electric railway business, the jitney. In its early application it was thought of more particularly for use in the smaller cities where traffic conditions are not particular severe. However, the economic advantages of these cars in the smaller cities were so quickly demonstrated that there has been a decided tendency to make use of them in larger and larger cities and on increasingly heavy traffic lines. In fact, this increase in the use of the safety car is truly remarkable and forms a well-earned tribute to its originators and to those who in the beginning had the courage to take it up and place it in operation.

In those metropolitan communities in which the safety car has been used, such as Brooklyn, Philadelphia, Baltimore, Boston, etc., it has been installed in most instances on routes not having severe traffic characteristics. The notable exception to this is Kansas City, where the safety cars have been operated through the downtown district, but in this connection recent reports of John A. Beeler have recommended that the cars be arranged so that auxiliary collectors stationed in the downtown district could open the rear door from the outside of the car and permit the egress and ingress of passengers from the rear end as well as at the front.

In order to make the great economic advantages of the safety car available in a broader way to properties operating in large cities it would seem that it might be advisable to have two standard designs of the one-man safety car—the present standard for smaller cities and lighter traffic lines and another standard car built along the same general lines but revised in some respects, as pointed out below, for use in larger cities and on heavier traffic lines. In this discussion no disparagement of the present standard car is intended. Rather, it is desired to give certain suggestions as to designs which it is believed would better adapt these small light-weight cars to the cross-town lines and some main lines of the larger systems. With the proposed second standard available a company would then simply make a choice as to which car would better meet its operating requirements.

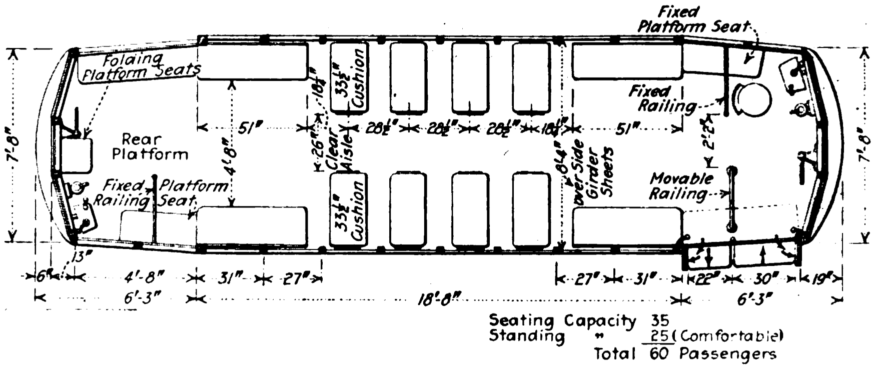
Design for Heavier Traffic Routes

In planning a safety car suitable for installation in large cities, where the equipment in use consists of double-truck cars which have comfortable seats, ample aisle width, low steps and platforms so arranged that passengers can board and alight simultaneously without confusion or delay, great care must be taken that the design of any new car will not be such as to suffer by comparison with the older cars and produce unfavorable reaction because of less comfortable seats, narrow aisles and excessive standing time while loading and unloading. With this thought in mind it is suggested that the following features, as shown in the accompanying floor plan, should be incorporated in the proposed new standard:

1. Car arranged for double-end operation.

2. Width over all to be such as to provide (a) an aisle width of not less than 26 in., (b) a length of cross-seat cushion not less than 33½ in., (c) longitudinal seats at each end of the car body to seat three persons at 17 in. each.

3. Platform arranged with double-door opening, one for entrance and one for exit, with approximately 22 in. clear opening for exit and 30 in. for entrance.



FLOOR PLAN OF PROPOSED ONE-MAN SAFETY CAR FOR LARGE CITY USE

4. Exit and entrance doors to be arranged, if possible, for independent operation so that the operator can close the exit door when all passengers have alighted and confine the ingress of passengers to the entrance door, if this is found necessary to prevent loss of fares. This independent operation of the doors would also minimize the loss of heat in cold weather.

5. Platform railings to be arranged to separate boarding and alighting passengers.

6. Step heights made as low as possible by ramps from the car body to the platform floor, taking into consideration the proper wheel diameter and clearance. By this means step heights of 13 and 12 in. into the car could readily be secured, using 24-in. wheels.

7. Install platform seats in order to give the maximum seating capacity in the space available.

A car designed along these lines would have the following approximate dimensions as compared with the present standard car:

	Proposed car	Present car
Length over body	18 ft. 8 in.	17 ft. 9½ in.
Length over all	31 ft. 2 in.	27 ft. 9½ in.
Length of platform	6 ft. 3 in.	5 ft. 0 in.
Width over side girder plates	8 ft. 4 in.	7 ft. 8 in.
Seating capacity	35	30

Such a car would weigh, with careful designing, about 17,000 lb., as compared to the average weight of the present standard car of 14,500 lb.

ADVANTAGES SET FORTH

The proposed car differs from the present standard principally in the provision for the double opening of the platforms, the width over all and the arrangement of longitudinal seats at the ends of the car body.

With respect to the width over all of the car, which is determined by the width of aisle and length of cross-seat cushions, it is very necessary in a car where the movement of passengers is to and from the same platform that an aisle of ample width be provided so that standees will not interfere too seriously with such passenger movement. The desirability of a comfortable length of cross-seat cushion is obvious. The arrangement of longitudinal seats at the ends of the car body, each seating three persons, provides an ample maneuvering space at the point where experience on street, elevated and subway properties has shown it to be very desirable. Such longitudinal seats have already been adopted on the safety cars of the Kansas City (Mo.) Railways.

Platforms of sufficient length to provide for separate entrance and exit passageways are believed to be necessary in order to conserve time at points of comparatively heavy passenger interchange. Such points are rather numerous in large cities, and the double door would provide for the rapid unloading of the car without causing boarding passengers the irritation of having to wait until leaving passengers have alighted, and also thereby provide a distinct saving in the standing time.

The objection will be raised that the double-door platform will allow passengers to sneak in through the exit opening during times of passenger interchange. This point is not believed to be well founded, for the car operator would occupy practically the same relative position with respect to the exit opening as does the conductor on the so-called near-side car. There has been no trouble of this sort reported on the large number of near-side cars operated in three of our large cities.

At such places as baseball parks, amusement parks and large industrial plants, where it is possible to arrange for prepayment areas, the whole platform could be used for loading, or two streams of boarding passengers could be handled, the fares of one queue being collected by the operator and those of the other queue, entering through the exit door, by an operator or special collector.

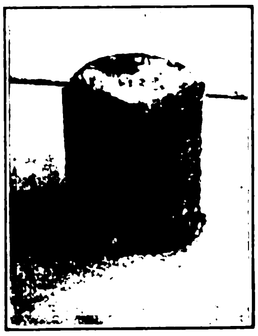
There is also the possibility, which is worthy of serious study, of operating these safety cars on the pay-leave plan on routes where there are many stops at which large groups of passengers board the cars, thus saving considerable time. Or it is entirely possible that on the average line a combination use of pay-enter during the morning rush, when the loading is scattered and the unloading concentrated in the downtown district, and a pay-leave plan during the evening rush, when the loading is concentrated downtown and the unloading scattered, would prove advantageous.

All of the standard safety equipment now in use on the present type of car could be used without change on the proposed car, except for the alterations in the door-operating mechanism to provide for independent operation of the entrance and exit doors. It is understood that electrical manufacturers have stated that the motors now developed for the safety car will satisfactorily handle equipment weighing up to 17,000 lb. light. The present truck would be suitable for the proposed car, maintaining the present 9-ft. wheelbase and general design, changing only the weight of the springs and perhaps slightly strengthening some of the truck members.

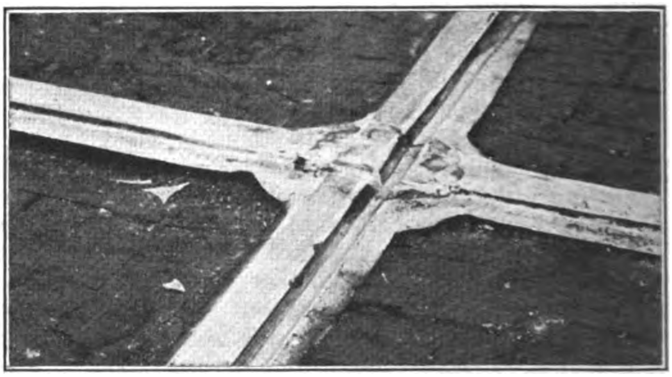
It is hoped that this article will bring out discussion on the car proposed, for it is believed that it would have a wide field of usefulness without encroaching on the field of the present standard car.

Solid Manganese Special Trackwork Repairs

Few railway track engineers have had much success in building up solid manganese special trackwork with an electric welder. However, C. L. Hawkins, engineer maintenance of way United Railways of St. Louis, Mo., has developed a scheme for renewing the frogs in this type of special trackwork which seems to be working out very satisfactorily.


CAST-STEEL INSERT AND THE TWO WEDGES USED IN REPAIRING BROKEN-DOWN SOLID MANGANESE SPECIAL TRACKWORK

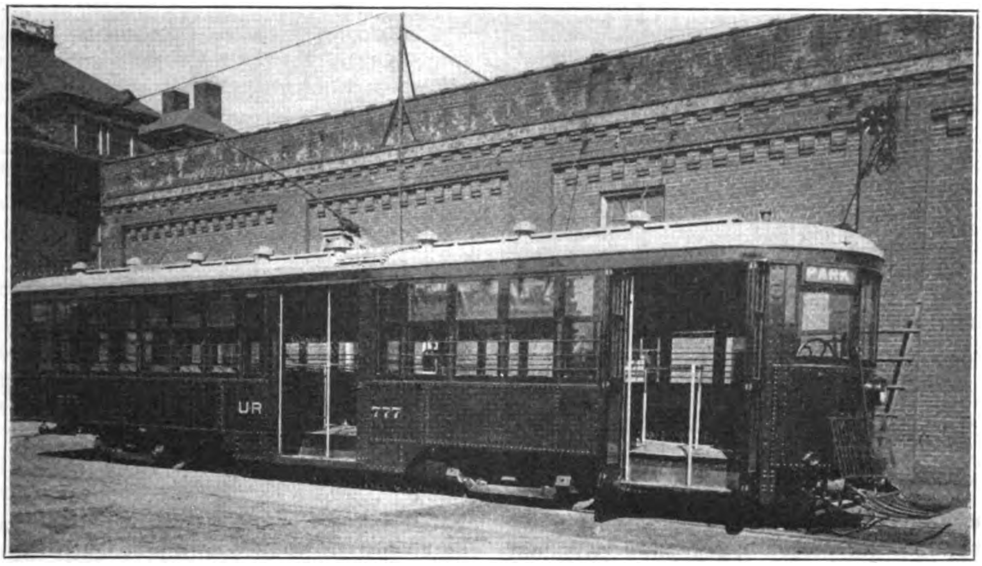
Making use of an acetylene torch, the top of the casting at the frog points is cut out back to the walls of the cylindrical web which supports the frogs. A hollow cast-steel cylindrical block which is flattened on two sides is then inserted in this hole. It is wedged in place by means of two steel wedges shaped to fit the space between the flattened sides of the block and the cylindrical web of the special work. An electric welder is then used to build up the tread and flangeways on the top of this cast-steel insert, the great diversity of crossing angles making it impractical to cast the tread on the insert. A grinder then finishes the job.


A SOLID MANGANESE INTERSECTION REPAIRED WITH CAST-STEEL INSERTS, AFTER SEVERAL MONTHS' SERVICE

An increase of 104.5 per cent in the cost of living of American wage-earners between July, 1914, and July, 1920, is shown in a statement issued Sept. 13 by the National Industrial Conference Board. This figure is based on the board's most recent investigation of changes in the cost of living, a complete report of which will be made public shortly. This increase marks a rise of nearly 19 per cent within the last year and of 5 per cent since March, 1920, the date of the board's last survey of the problem.

New Motor and Trail Cars for St. Louis

Peter Witt Type Motor Cars Have Only Two Steps — Trailers Are Center Entrance and Exit, but Front Half of Car Is Made a Loading Platform



NEW PETER WITT TYPE MOTOR CAR FOR ST. LOUIS, HAVING ONLY TWO STEPS

THE United Railways of St. Louis, Mo., has on order with the St. Louis Car Company for October delivery fifty trail cars which embody a new idea in trailer design. These cars will be designed for one-way operation, with a separate entrance and exit on the side of the car, both of which are ahead of the center of the car body and separated by a 36-in. space providing a convenient location for the conductor between the doors and on the near side of the car. Passengers will enter the forward door, be seated on the longitudinal seats without paying their fare and later leave the car by the exit door and pay their fare as they pass the conductor, or they may enter the forward door and immediately pass the conductor, paying as they pass, and be seated on one of the cross seats to the rear of the conductor's position. This makes an arrangement much the same as that employed in the Peter Witt type motor car, except that the entrance is near the center of the car instead of at the front end.

The advantages advanced for this arrangement of a trailer by M. O'Brien, master mechanic, are that it separates the incoming from the outgoing passengers, provides a very large loading space, induces a single-file entrance of passengers, so that the conductor has better control; minimizes the possibility of losing fares and decreases the standing time required to load. Since the more comfortable cross seats are placed at the rear of the car, passengers are induced to pay their fare immediately upon boarding the car and thereby reduce the amount of attention required from the conductor by alighting passengers. The detailed seating arrangement, door locations, conductor's position and other interior arrangements are clearly shown in the accompanying floor plan of the car.

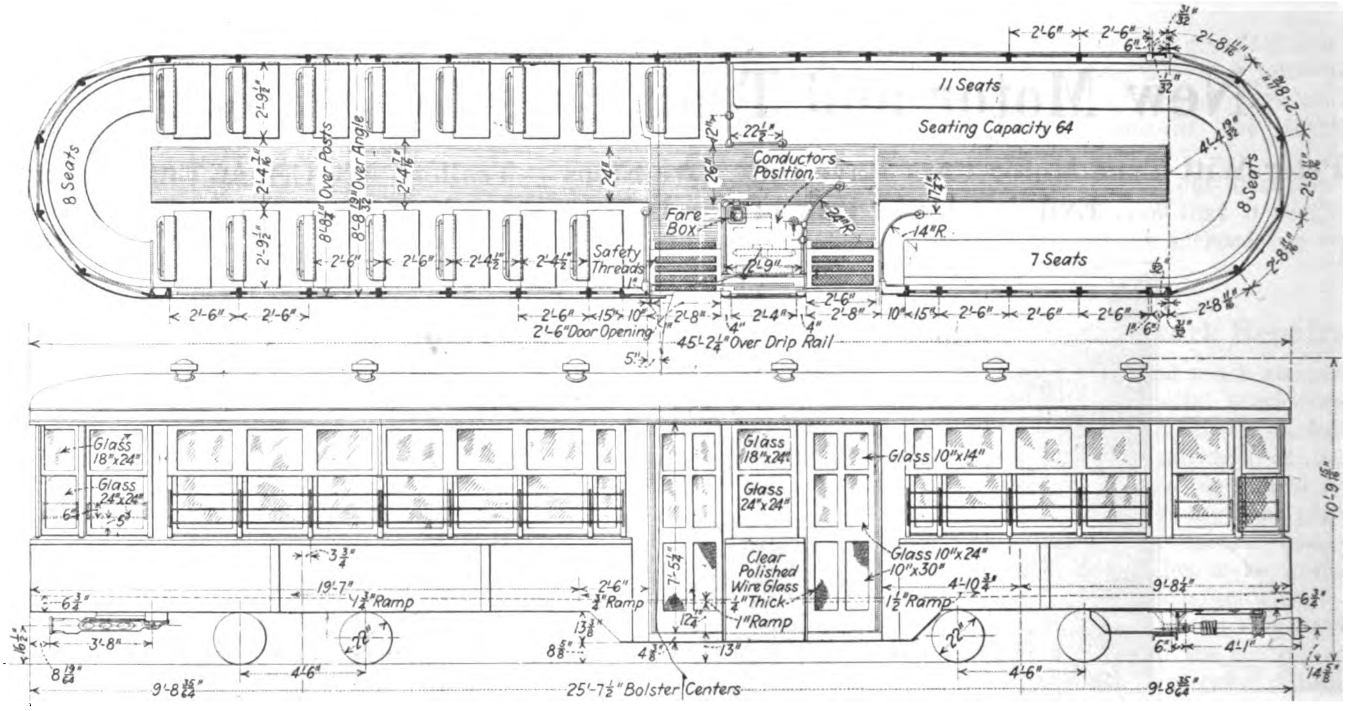
The trailer design used by the United Railways heretofore has been of the double-door, center-entrance type, with a well in the center of the car and the conductor's position on the far side of the car opposite the doors. In these cars there was one step to the floor of the well and another step onto the car floor. With passengers boarding this type of car in double file and passing both ways to seats, it is believed that a number of fares are lost. In the new car there is no well and the two steps of 13 in. and 12¼ in. are both placed at the doors. These step heights have been reduced to these figures by ramping the car floor from the bolsters to the center platform and the platform from the far side to the near side. This ramp from the forward bolster to the platform is 1½ in. in 5 ft., from the rear bolster to the platform 1¾ in. in 22 ft. and for the platform itself 1 in. across the car.

The general construction of the trailer will be steel up to the belt rail, with a wood superstructure and arched roof. It will be mounted on trucks placed at 25-ft. 7½-in. centers, which will be equipped with 22-in. wheels on a 4-ft. 6-in. wheel-base. These trucks are of a special design drawn up by the engineers of the United Railways in conjunction with the Commonwealth Steel Company. Completely equipped, it is expected that these trailers will weigh approximately 25,000 lb. They will seat sixty-four passengers and will be hauled by some of the heavier type motor cars of the company now in service.

One of the features of the car body construction is the stiffening of the superstructure, which is obtained through the use of a steel frame around the doors and a steel post at each of the four corners of the car body.

FIFTY NEW MOTOR CARS TO BE BUILT

The United Railways has ordered the necessary materials and is getting ready to build fifty Peter Witt type motor cars in its own shops. A sample car of this type has already been built in the company's shops and placed in operation. It is pictured herewith. The



FLOOR PLAN AND ELEVATION OF NEW TRAILERS FOR ST. LOUIS

principal feature of the new car is that by cutting down the clearance between the motor trucks and car floor and by ramping the floors it has been possible to build this car without a center well and with only two steps of 15 in. and 12½ in. onto the car floor at center and front, instead of the usual three steps either at the entrance or distributed between the entrance and the steps from well to car floor. The ramp from the front bolster to the center platform was made 4 in. in 6 ft. 9 in., from the rear bolster to the center platform 4 in. in 7 ft. 10 in. and from the aisle to the steps at the center door 1½ in. in 24 in. There are also ramps in the floor and platform at the front end of the car so that the same step heights prevail as at the center. At the front entrance there is a double two-part folding door which folds outward and is air operated and controlled by the motorman. At the side exit there is a double sliding door, also air operated and each half independently controlled by the conductor. The entrance and exit doors have a clear opening of 5 ft., which is divided in the center by an aluminum railing, providing passageway for two streams of passengers either boarding or alighting.

The car body is of all steel construction up to the belt rail, with a wooden superstructure. The equipment of the new motor cars will consist of special designed trucks developed by the Commonwealth Steel Company in co-operation with the railway company engineers and arranged for four inside hung motors. These trucks are of the full-equalized, arch-bar type, the principal feature being that the main frame is made of a single steel casting, which is said to eliminate all the usual connecting bolts and rivets and at the same time to make it impossible for the truck to get out of square. The cars will be equipped with four Westinghouse 508-A, 25-hp. motors and K-35 AA 2 control with a ratchet switch for operating the line switch, and a National Pneumatic Company door-interlock system. A plain magnetic blowout switch is placed in the motorman's cab for use in opening the main power circuit by hand when desired. The overload relay on the line switch takes the place of a circuit breaker and causes the circuit to be broken underneath the car, thus eliminating all noise and flash from the interior.

The new cars will have an over-all length of 50 ft. 6 in. and an extreme width of 8 ft. 10 in. Completely equipped, the weight of the sample car was 36,300 lb., which for a seating capacity of fifty-nine gives a dead load of 615 lb. per seated passenger.

Lubrication of Pneumatic Tools

Some Common-Sense Comments from the Standpoint of the Lubrication Expert of Value to Electric Railway Shop Men

IN ORDER to obtain a full measure of service from pneumatic tools and eliminate the necessity for repairs, it is important that they be handled carefully, be kept clean and be well lubricated with a high-grade lubricant. In the July issue of *Lubrication* some notes on lubricants for pneumatic tools are given which should be of value to electric railway shop men and others. The following points among others are made:

Moisture and some little dust are contained in the air carried into the cylinders of pneumatic tools. Further, the moisture in the air tends to corrode the transmission pipes and storage tanks, with the result that some small particles of rust are carried along by the air. Particles of rubber from the air hose and gaskets may find their way with the other foreign matter into the air passages and cylinders and greatly interfere with the free operation of the tool. Dust, rust or rubber cannot be classed as lubricants and should be kept out of the tool by means of a fine wire strainer inserted in the inlet pipe.

Not all foreign matter which gets into the cylinders and valves of pneumatic tools is carried in with the air. Unless care is exercised a great deal may be fed in with the lubricant. Cases have been known where the lubricant for pneumatic drills was kept in an open can near the drills. A great deal of dust and grit naturally fell into the can, with the result that the drills were being "lubricated" with an abrasive compound.

The lubricant most suitable for any particular pneumatic tool will vary with the type of tool, the nature of the work, the condition of the air and the state of the atmosphere. Generally speaking, the heavier tools require the heaviest lubricants, slow-moving tools requiring a heavier lubricant than those operating at high speed. Heavy lubricants are necessary for use on tools using preheated air or those exposed to high temperatures.

Tools of the trunk-piston and rotary types are commonly lubricated with a light grease, while the high-speed, hammer types, such as riveting hammers, under average conditions of operation are most successfully lubricated with a light oil of about 100-150 seconds viscosity, Saybolt, at 100 deg. F. Tools such as reciprocating drills are provided with grease chambers which are filled by means of a grease gun and from which the grease slowly exudes into the cylinders. One charge of grease if suitable should last several weeks. The gears, crankshaft and pistons of rotary tools all operate in a bath of grease, new applications of which are necessary only after long periods of time. The high-speed tools are lubricated with oil by means of a squirt can. As there is a tendency on the part of the exhausting air to carry a light oil out with it, tools of this kind should receive a few drops of oil every hour or so.

Oils used upon pneumatic tools should have a low cold test, and greases to be successful must be manufactured from low cold-test oils. In addition, pneumatic-tool lubricants should possess enough body to prevent metal contact and friction, but if they are too heavy for the mechanical conditions they tend to impede the action of the tools.

Fundamentals of Substitute Tie Design

THE American Railway Engineering Association has devoted a great amount of time to the study of the subject of substitute ties. In Bulletin No. 227, July, 1920, the association presents the special report of the committee on ties relating to this important subject. Certain conclusions are reached which should be of interest to electric railway engineers. The opinion is expressed that railways should take a more active part in the design and development of substitute ties. This is in line with the editorial which was published in this paper for Aug. 21, which indicated the need for similar procedure on the part of electric railway engineers.

The conclusions of the committee on ties are as follows:

1. No substitute tie has yet been developed which can be recommended for general use on high-speed railroad tracks.
2. The development of substitute ties should be taken up by the railroads with a view of conserving the available timber supply and of producing a track structure of longer life which may be maintained with less labor.
3. Any statements made to urge the introduction of substitute ties on the claim that safe tracks cannot be maintained with wooden ties, such as will be available for some time to come, are without foundation and are contrary to the facts.

This steam railroad point of view will be of interest to electric railway men. The report is exhaustive and is too long for reprinting in these columns. However, Appendix E of the report gives the fundamentals which the committee believes essential in connection with substitute tie design, and this should be of value in connection with designs for tracks in streets and we reprint it in full.

Some Fundamentals Regarding Substitute Tie Design

The tie committee in its investigation of various substitute ties has been impressed with the fact that many of them violate fundamental principles of track construction or maintenance, and it is with a view of pointing out some of those features that this appendix is added to the report.

The experience with substitute ties, so far recorded, indicates the following features as being productive of failure:

(1) Lack of efficient protection against corrosion.

(2) Failure of rail fastenings.

(3) Failure of insulation.

(4) Loss of beam strength due to weakening tie in vicinity of rail to accommodate rail fastening features.

(5) Use of sharp interior angles or square holes, from which cracks are developed.

(6) Lack of protection against derailed wheels.

(7) Design of base of tie such as to render tamping difficult or impossible and such as to make maintenance of proper surface of track impracticable.

(8) Design of the tie such that track will not hold line, or such as to make lining of track impracticable.

(9) Lack of beam strength, causing breakage on yielding roadbed.

(10) Lack of protection from abrasion from ballast in concrete ties.

It is believed that any track supported on ties will not remain permanently to gage, surface and line and that the labor operations necessary to restore it to gage, surface and line will have to be performed with more or less frequency. Therefore, any substitute tie should be designed as far as practicable to

(a) Resist the forces tending to disturb gage, surface and line, and

(b) Lend itself readily to the labor operations necessary to restore the track to its original position.

It is recognized that no tie can completely meet these requirements and that the most that can be expected is a compromise.

Gage.—The fastenings, in addition to being of sufficient strength to resist the stresses produced by traffic, should be of such design that without taking the tie from the track and without change to the holes or fixed bolts or projections in the tie, a reasonable change of width of base of rail or variation of gage may be made. The fastenings should provide a freeway between the base of rail and lip of the fastening.

If the tie is so designed that it is essentially one support under each rail united by a transverse member to hold gage, this transverse piece must be of sufficient strength to maintain gage under all conditions.

Surface.—The tie should have sufficient strength as a beam to support the loads imposed without undue deflection, so that the load may be distributed properly over the tamped bed.

The shape of the base of the tie must be such that it will not cut into or destroy the tamped bed. And, further, it must be possible readily to tamp the ballast under the tie.

Line.—The tie should be of such shape that it will not only resist the tendency of track to get out of line but also permit the track to be thrown back to line.

Ties clamped in pairs or which inclose considerable amounts of ballast between their several parts to such extent that the ballast must be removed before the track is lined would add a material burden to the labor necessary to line track.

Projections on the base of the tie that project into the ballast would make necessary throwing the track out of surface before same can be lined. Such a design would so interfere with lining track as to make it impossible to do satisfactory work.

The end of the tie should be of such shape that the ballast beyond the end would offer resistance to the later movement of the track.

In addition to the above the following features should be provided for:

(c) Insulation or the possibility of insulation without a material change in the tie proper should be provided.

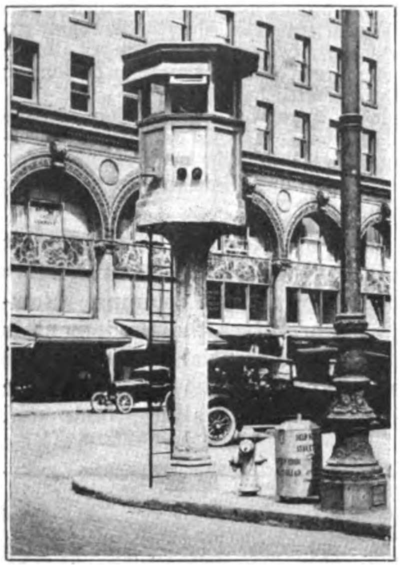
(d) The fastenings should be such as to offer as little obstruction to derailed wheels as possible. They should permit the changing of a defective rail or the renewal of rails with ease, and should be of such character that they can be replaced if broken or defective without disturbing the tie.

(e) The tie should be of such design as to be able to stand a reasonable amount of punishment from derailed cars.

Switchman's Station Supported on Reinforced Concrete Pole

Temporary Wooden Signal Tower on Lines of United Railroads of San Francisco Replaced with Concrete Structure

THE United Railroads of San Francisco has recently completed an installation at Spear and Market Streets by means of which cars approaching the ferry loop are switched from inner to outer tracks from a tower control station on the sidewalk. The crossover between these two tracks was installed when the third loop at the ferry was put in, as described on page 103 of the ELECTRIC RAILWAY JOURNAL for Jan. 11, 1919. The temporary wooden switch control tower which was put in at that time has recently been replaced by the more modern installation shown in the accompanying illustration. Because of the importance of getting cars past this crossover with the absolute minimum of delay, every effort was made to have the switching installation as convenient as possible. The equipment consists of an electrically operated switch of standard type with the remote control push button in a tower. These control circuits are so interconnected with the controls of two signal lights and a target that when the switch is closed the red target turns to a horizontal plane or, after dark, the green light shows. When the switch is thrown to the open position the target is in a vertical plane or the red light shows. Thus green light or flat target is a signal for the motorman on the outer track to proceed at will and for the motorman on the inner track to wait.


SWITCHING TOWER IN SAN FRANCISCO

When the target is in a vertical plane or the red light shows it indicates that the crossover is open to the car from the inner track and that the car on the outer track must wait.

In planning the construction of the tower it was found most economical to use one of the standard reinforced concrete trolley poles made for the Municipal Railways. One was accordingly selected and the concrete was cut off at the desired height, leaving the reinforcing bars projecting for a bond with the top to be cast upon it. As there is a basement under the sidewalk at this point it was necessary to have the concrete trolley pole extend through the pavement and into the concrete floor of the basement.

When the pole had been set in place and the usual cast-iron base placed around it at curb level wooden forms were built up around the top of the pole and the floor for the superstructure or house was cast monolithic. The house has a wood frame with sheet iron panels and is bolted and grouted to the concrete floor. The pair of conduits cast in the original reinforced concrete pole are used for the wiring. In addition to the switch control circuits, the house has electric light and telephone connections. An electric heater is also provided. The ladder which gives access to the house was set about 18 in. away from the post so that a crippled operator could wedge himself between pillar and ladder while changing holds on the ladder. The finish on the concrete work of the tower is a rough surface which was put on by sprinkling on grout with a whiskbroom. This is to prevent defacement, such as writing with chalk and crayon, which would be likely on a smooth finish surface.

The setting of the tower on the curb at the intersection of property lines prevents interference with the traffic in front of or the view from the bank building adjoining. The projection over the windows on the street side is a sheet-iron shield or shade put up to screen the operator's eyes from the sun's rays. The design of the tower is such that it has an attractive appearance and blends with the surroundings. The total cost was about $750. This includes the pole, but does not include the street work, which had already been put in for the temporary wooden tower.

The installation was made under the direction of B. P. Legare, engineer maintenance of way United Railroads, in accordance with designs prepared by the city engineer.

Rail Depends Upon Ingot

Bureau of Standards Finds That Rails Made from Sink-Head Ingots Are in General More Free from Piping

THERE is a constant endeavor toward the betterment of steel rails through improvements in mill practice. Among the details of manufacture the size, shape and method of casting of the ingot have had considerable attention. The United States Bureau of Standards has recently issued a technologic paper by George K. Burgess, entitled "Steel Rails from Sink-Head and Ordinary Rail Ingots," covering a report on tests of several types of ingots and rail steels. The following abstract of this paper should be of interest:

The object of this investigation was to determine the relation of ingot practice to the properties of rails from such ingots, and in particular the amount of total discard necessary to obtain rails free from piping and segregation above 12 per cent which had been rolled from steel made in accordance with varying melting, casting and ingot practices.

To that end thirty-five ingots made by the converter process at Hadfield's, Sheffield, England, and cast by the sink-head process with large end uppermost were shipped to Sparrows Point, Md., and rolled into rails in comparison with fifteen rail ingots made in the ordinary manner with the small end uppermost. Each sink-head ingot, of about 5,300 lb. weight and deoxidized with aluminium in the mold, represented a separate heat of converter steel and all the heats and ingots were made in the same manner. The composition and properties of these ingots were of remarkable uniformity. The comparison ingots, of 7,300 lb. each, were from three separate open-hearth heats, an intentional variation being made in the open hearth and casting practice for each. Five ingots were selected from each of these three heats. Thus, in reality, comparison was made of four different kinds of steel, of very nearly the same composition and physical properties and of two types of ingot form.

The comparison was made by rolling most of the ingots into rails and taking test specimens at each rail cut, as well as from a considerable portion of the upper part, in 5-ft. steps, of the rail bar from each ingot. In this way there was obtained a detailed physical, chemical and metallographic survey of each ingot, and it was possible exactly to delimit the regions of sound and homogeneous from those of unsound and segregated steel. Two complete sink-head ingots were cut longitudinally and examined, as well as representative blooms from both sink-head and ordinary ingots.

The results obtained indicate a decided superiority of the sink-head ingots over the comparison ingots as made of three grades of steel in spite of the fact that the sink-head ingots suffered from the disadvantage of having gone cold before rolling. The Hadfield type of ingot required a total discard of only 18.4 per cent on the average (13 per cent top discard to eliminate piping and segregation above 12 per cent), while the average ingot of the ordinary type for rails required a total discard of 43.9 per cent (26 per cent top discard), with great variations dependent upon the furnace and ingot practices.

The comparison ingots from heat M1-M5 made of non-deoxidized rising steel, chilled on top of ingot by cast-iron caps, required excessive discard to eliminate positive segregation at the top and negative segregation at the bottom of the ingot, the latter often accompanied by dangerous enclosed pipes.

The second heat (M6-M10) made of rising steel deoxidized with aluminum in the molds and the ingot tops of which were cooled with water, required the least total discard of the three heats. It was more subject to piping and less to segregation than the first heat of ingots made in the usual manner.

The third heat (M11-M15), made of quiet or "killed" steel, was not chilled on top with water or caps and was deoxidized with aluminum in the molds. The ingots of this heat required an intermediate amount of total discard when compared to the first and second heats; this heat was the only one for which a greater top discard was required to eliminate piping than to eliminate segregation above 12 per cent. One of the ingots of this third heat contained a small pipe at the bottom and all the rails from the middle and bottom of the ingots showed high negative segregation.

The distribution of physical properties throughout the length of each ingot is characteristic not only of the type of the ingot, as sink-head or ordinary, but also of the state of the steel when cast and the ingot practice.

It has been established in the foregoing that after removal of the top discard of 13 per cent the Hadfield type of sink-head ingot is free from piping and undue segregation. The ordinary type of ingot, cast small end up without sink-head, as is usual for rail ingots, requires an average top discard of 26 per cent, and the remainder of the ingot is liable to contain enclosed piping and excessive segregation. Defective rails, from the middle and bottom portion of the ingot, are not certainly detected by means of existing rail specifications, and as a result of this uncertainty rails containing pipes or excessive segregation may get into service, with disastrous results.

The surface condition of the rails from the sink-head ingots was not as good as for the ordinary ingots, but this is not considered an essential characteristic for rails from such ingots.

The markedly differing characteristics of the three heats of Maryland ingots lead one to raise the question whether or not it might be advisable to specify, at least in some degree, the methods of steel manufacture or of ingot practice for rails and similar products on which the safety of the traveling public depends.

While it is not claimed that the use of the sink-head process for the manufacture of ingots will solve all rail problems, it is maintained that its adoption would be a step in the right direction in view of the present heavy casualties and property losses on American railroads. The necessary changes in mill operations, it is believed, could be made without too great difficulties.

Specifications for Wood Ties

In Specifying the Material the Physical Qualities and Characteristics of the Wood Must Be Considered

By Howard H. George
Assistant Engineer Public Service Railway of New Jersey

THE difficulty of securing satisfactory timber for ties has increased greatly during the last few years. Costs have increased from about 75 cents per tie to approximately $1.50, and in some cases as high as $1.75 each f.o.b. point of shipment. This scarcity and high price has been an incentive for trying many experiments with steel, concrete and composite ties, but the great majority of railways still favor wood for ties. In view of the diversity of practice in connection with ties other than wood and of their, as yet, relatively limited use, no attempt will be made here to give detailed specifications for such ties.

Of course, the problem, as regards the kind of timber to be used, is largely controlled by local considerations. The specifications appended were intended to cover the conditions which govern for our own territory in so far as the kinds of timber are concerned. Other companies will undoubtedly find it necessary to include other timber in their specifications, which may be easily purchased locally or which is within easy shipping distance of the property. It is generally conceded that the following woods may satisfactorily be used untreated for ties: White oak family, long-leaf strict heart yellow pine, red cypress, red wood, white cedar, chestnut, catalpa and locust, except honey locust. In addition the following timber will make satisfactory ties when treated: red oak family, beech, birch, elm, maple, gum, douglass fir, spruce, hemlock, tamarack, yellow and white cypress, and all pines except long-leaf strict heart yellow pine. In the attached specifications the sound and square-edged long and short leaf yellow pine ties are generally purchased for treatment and are rarely used untreated.

In determining problems of this character it is well to keep in mind the physical qualities and characteristics of the wood under consideration. Red oak, for example, is a porous wood which is generally full of water and which, if exposed to seasoning influences, has a tendency to dry with great rapidity in a more or less uneven manner, which is apt to result in checks and splits. Checks in this wood are largely end checks and there is a tendency for section men to drive spikes into small checks, thereby increasing the split. This peculiarity is also common to beech and gum.

Cross Ties

Quality:

All ties to be cut within ten months from the time of delivery from sound, straight, live and thrifty timber, free from loose or rotten knots, dry rot, splits, wind shakes or any other imperfection affecting the strength or durability of the timber.

Dimensions:

6 in. thick, 8 in. width of face and 8 ft. long. A variation from above specifications will be allowed as follows:

	Hewn	Pole	Sawed
Depth not less than.	6 in.	6 in.	6 in.
Depth not more than	7 in.	7 in.	7 in.
Face not less than...	7½ in.	6 in.	8 in.
Length............	8 ft. to 8 ft. 2 in.	8 ft. to 8 ft. 2 in.	8 ft. 0 in.

Ties which do not conform in size to the above or have any other defects will be classed as cull ties and will not be accepted.

White Oak and Rock Oak:

Hewn ties must be stripped of bark, hewn smooth and clean of all splinters, deep score marks, straight, with faces true and parallel and of uniform thickness with ends sawed off square. Ties hewn from one-half or one-quarter logs, or sawed from large timber will not be accepted. No off oaks will be accepted.

Mixed Oak and Chestnut:

Hewn ties must be stripped of all bark, hewn smooth and clean of all splinters, deep score marks, straight with faces true and parallel and of uniform thickness and ends saw butted. Ties hewn from one-half or one-quarter logs or sawed from large timber will not be accepted.

Yellow Pine Heart Ties:

Ties must be of good, sound Southern long leaf yellow pine and must be hewn smooth on all sides with faces parallel and of uniform thickness with ends sawed off square. Ties must be free from defects such as injurious heart or wind shakes, red heart, rot, worm holes, loose or unsound knots, or other defects that will impair the strength and durability of the ties.

Ties must be hewn so that the heart will be at or near the center of the tie and must not have over one inch of sap on each corner, which means the tie must show 6 in. clear heart on the 8-in. face and 4 in. of clear heart on the 6-in. side.

No short leaf pine will be accepted.

Sound and square edge long leaf yellow pine: Ties must be of good Southern long leaf yellow pine, or, in other words, must have the same qualities and must pass the same inspection as the heart pine regardless of the sap.

Sound and Square Edge Yellow Pine:

Ties must be of good Southern yellow pine, and must pass the same inspection as the sound and square edge long leaf yellow pine except that all kinds of Southern pines will be accepted.

Cypress:

Hewn ties must be of good red cypress, free from wane, rot, dote, honeycomb or other defects, to show one heart face, allowance 1-in. sap on two opposite corners.

Ties must be hewn smooth on all sides with faces parallel and of uniform thickness and saw butted at both ends.

No white cypress will be accepted.

Inspection:

All ties shall be subject to the inspection of an agent of the Maintenance of Way Department at the point of shipment as ties are being loaded into cars or vessels. Any ties shipped for point of destination inspection, without our consent, will be rejected and be subject to owner's risk.

It is very desirable that a definite permissible variation be adhered to in the general dimensions of the ties. This is particularly true in the case of city track, where a trench of limited width is provided, and where excess length means greater disturbance of the adjacent paving. It is also very important that the width of the tie at the bearing point be maintained up to a certain standard in order to prevent premature failure of the tie due to crushing.

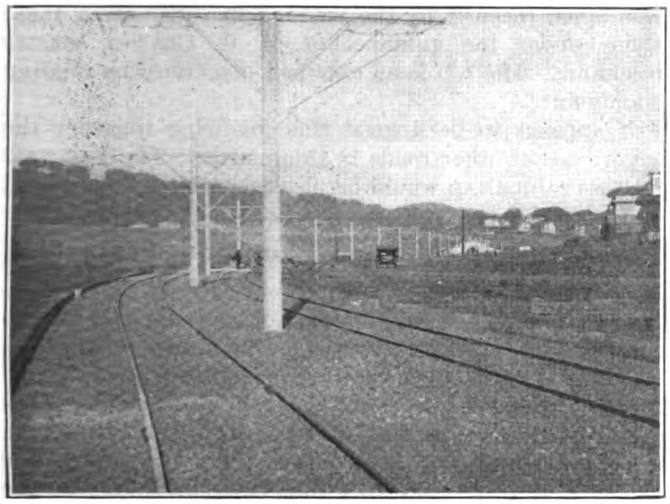
The cost of inspection, of course, varies widely. Under favorable conditions, it may not run over 2 cents per tie, while it may approximate 25 cents. The latter cost is, however, exceptional and excessive, and no order should be placed where a dealer is not in a position to furnish a sufficient number of satisfactory ties at one location to eliminate the possibility of such an expense being incurred. The writer has in mind one instance where, out of a total of about 6,000 ties offered, only about 900 were accepted by the inspector, the period of inspection covering about ten days. However, one experience of this kind should be sufficient to bar such a dealer from doing any further business with a railway company. When ties are running as they should and the dealer is honestly endeavoring to comply with the specifications and is not trying to palm off a lot of defective ties, a competent inspector should be able to pass a carload of approximately 500 ties per day in the hardwood districts. In the case of pine ties, where shipment is being made by boat, it may be possible, under very favorable conditions, to accept as many as 8,000 ties per week, but this is the exception rather than the rule and 4,000 ties would be considered a good week's work for one inspector. It is generally desirable that tie inspection be made by the railway company's own inspector at the point of shipment, as this eliminates the possibility of disputes which almost invariably arise where inspection is made at destination. The cost of handling is largely increased due to having to handle a lot of ties which are not up to the requirements of the specifications.

Glass Headlight Reflectors

A SATISFACTORY headlight is an important aid to railway operation and a recent report of the Electric Service Supplies Company gives some useful information about glass headlight reflectors. The ground and unground glass reflectors are compared on a basis of efficiency, cost, space saving, durability and optical qualities. In comparing cost and diameter for the two types the figures show that the cost increases rapidly for each type as the diameter increases and that the unground reflectors cost approximately one-third less than the ground reflectors. On comparing the reflectors on a beam candle-power basis the curves indicate that the beam candle-power increases only approximately as the square of the reflector diameter and that the ground and polished reflector averages about 50 per cent higher in beam candle-power than the unground for the same diameter of reflector, while on a cost per candle-power basis the curves indicate a much lower cost for the ground and polished reflector as compared with the use of the unground reflector.

These data lead to the conclusion that on the same candle-power basis the unground reflectors must have a larger diameter and a greater cost than the ground reflectors.

The diameter of the headlight reflector is an important factor in determining the cost and type of headlight case. The use of a strong and water-tight case is advocated in order to insure reliability and decrease maintenance.



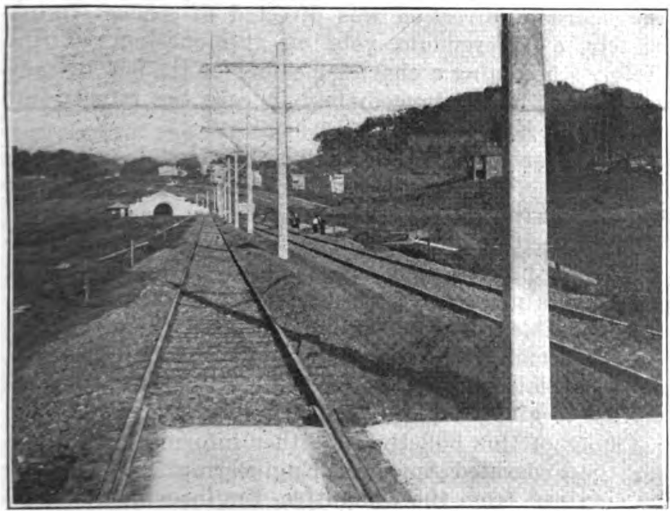
AN EXTENSION TO THE NEW BRACKET TAKES THE PLACE OF OUTSIDE POLES ON CURVES

A Neat Trolley Bracket

Extension to Specially Designed Angle-Iron Bracket Used in San Francisco to Take Place of Extra Poles

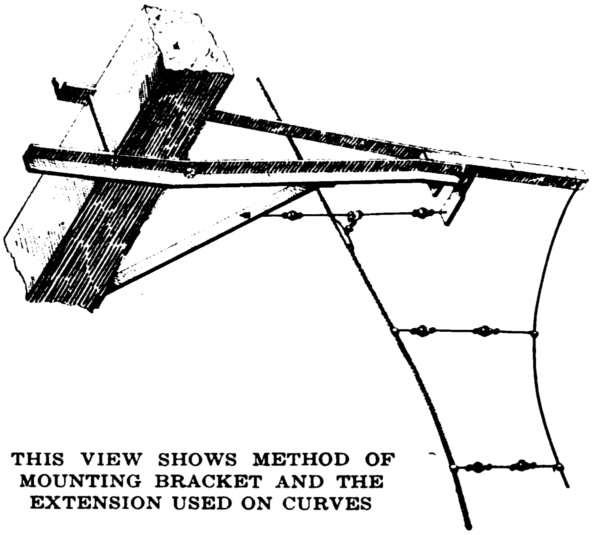
THE city of San Francisco, through the agency of its engineering department, has developed and adopted a particularly attractive and practical design of trolley bracket arm for use on ornamental concrete poles. Aside from its use upon tangent track as a very effective and economical support for the trolley wire, it is adapted for use upon curves as well, thereby eliminating the extra poles usually set upon the outside of the curve to support "pull-off" wires.

Concrete poles of square cross-section with graceful tapers and pyramid tops are provided, when poured, with transverse slots at the proper height for the support of a double angle-iron bracket. This bracket is mounted rigidly in the slot in the pole by means of two bolts passing through both angles just outside the pole, as indicated in the accompanying drawing. A 45-deg. brace of similar cross-section extends from the bracket down to the pole. The outer end of the bracket is tapered to a point and bent downward in a quarter-bend of about 8-in. radius. This forms the outer support for the strain insulators and short span-wire holding the trolley wire. The inner end of the span-wire is connected, with the proper insulation, to the brace.



USE OF ANGLE-IRON TROLLEY-WIRE BRACKET IN SAN FRANCISCO UPON TANGENT TRACK

When used upon curves an extension is bolted to the angle-iron bracket. This extension is sufficiently long to support the necessary bridle span-wire for the trolley "pull-offs" required by the curve. The construction is clearly shown in the accompanying plan view drawing.



THIS VIEW SHOWS METHOD OF MOUNTING BRACKET AND THE EXTENSION USED ON CURVES

Two photographs, reproduced herewith, illustrate very well the use of this new double-bracket construction upon both curves and tangent track.

Stopping Rust Formation

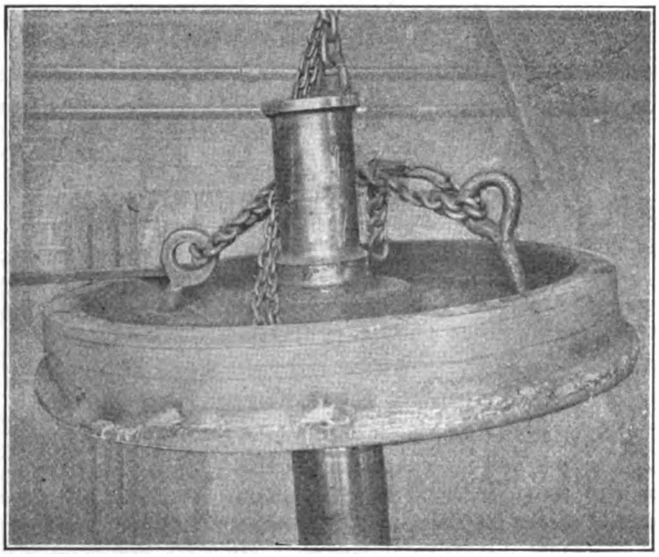
AN OIL for use on metallic surfaces which have already become rusted or for use on new surfaces as a preventive for rust is being placed on the market by the American Chemicals & Manufacturing Company, New York. It is claimed that this oil has such an affinity for steel that it practically welds itself to the steel whether it has a smooth or rough surface. It penetrates through the rust to the clean base metal and stops further corrosion. By chemical action it causes the rust to unite with the oil, forming a non-porous elastic film, which toughens with age and remains flexible. Its flexibility will meet the expansion and contraction of metals to the extent of bending over a radius smaller than the diameter of the thickness of the metal to which it is applied. This oil is sold under the trade name of "Hippo" permanent, pliable oil, and other claims made for its use are that it will withstand the destructive influences of acids, alkali and gases and that it is entirely waterproof. It is a good insulator.

In the current issue of *National Safety News* a form of stop sign is described which is located at the door opening of center-entrance cars. This sign and its method of operation were developed by J. F. McInerney, master mechanic New York State Railways, Syracuse. This railway is a member of the National Safety Council. The sign has a white background and in black letters is the word "Stop." When the car is in motion the sign lies flat against the door. As soon as the car stops and the doors are open the sign is released and swings out by the action of a small spring to a position at right angles to the side of the car. Automobilists who are following are thus warned that the car has stopped and is about to receive or discharge passengers and reminded that the traffic ordinance forbids them to pass a car at such a time.

Thickening Wheel Flanges by Welding

This Process Was Promising When Introduced, but Metallurgical Experts Advised Caution—What Results Have Been Obtained Since?

SOMEWHAT more than five years ago an article on restoring steel wheel flanges with a welder by F. A. Murphy, Ottawa, Ill., was published. (See ELECTRIC RAILWAY JOURNAL, April 10, 1915, page 719.) He had found the practice economical, although it was confessedly experimental. He invited comment, and in response Morgan D. Hayes, Midvale Steel Company, Philadelphia, Pa., gave valuable information as to the metallurgy of the matter. Mr. Hayes advised caution on account of the complications in the structure of the steel caused by the unequal distribution of heat in the welding process.


WORN FLANGES BEING THICKENED BY ARC WELDING

Commenting at the time upon the then new application of the welding art, this paper said editorially:

> There are, it seems to us, three questions to be answered: First, if wheel flanges and treads can be built up without serious injury to the structure of the metal, would such building up be profitable? Assuming an affirmative answer for the sake of argument, then, in the second place, is it possible to build up worn or broken sections without the formation of hard and soft zones? Finally, assuming a negative answer for the same reason, is such stratification a dangerous condition under some conditions of railway service, and if so, under what conditions?

During the period which has elapsed since the above discussion the electric railways have passed through the war period, with its difficult maintenance problems. The practice of building up thin tires has been found very useful, as was illustrated by the experience of the Western Ohio Railway, described in the paper by E. B. Gunn at the July meeting of the Central Electric Railway Association. (See ELECTRIC RAILWAY JOURNAL, July 17, page 127.) This paper brought out much valuable discussion. At the meeting of steam railroad master mechanics, held at Atlantic City in June, the discussion also favored the practice.

The plan is followed in the shops of the Spokane & Eastern Railway & Power Company, Spokane, Wash., with good results. The photograph reproduced herewith was taken recently by the writer when inspecting these shops under the guidance of M. G. Charles, master mechanic. The job is an excellent one from the welding standpoint.

It appears to be a good time to bring together the experience of other roads in this matter. The ELECTRIC RAILWAY JOURNAL would be pleased to hear from them.

Co-operation Between Shop and Train Men

INTEREST of the trainmen, co-operation of all departments and competent instruction are essential to success in high coasting records. The benefits, however, fully justify the effort put forth, as shown by the experience of one company recently. This company feels confident that more than 95 per cent of its motormen are sincerely trying to run their cars correctly. The evidence of this is the fact that this percentage of the cars are operated with a record of more than 30 per cent coasting. As the vice-president of this company says, "No man who is not really trying can possibly make such a record." The benefits of coasting are not alone in operation, for the maintenance work is greatly facilitated by accurate reports of motor, brake and other equipment conditions. A motorman who turns in a car with tight brakes will complain bitterly if his report of this condition does not receive immediate attention when he knows that failure to correct the difficulty means that his coasting record is spoiled. Light wear on brakes and wheels and all-around improvement in equipment condition follow from the co-operation between shop and train men.

The saving of current in coasting is, of course, the principal direct object of the effort. The experience of this above company indicates that this saving continues to be proportional even when coasting reaches high average percentages. A very material reduction in power costs is, therefore, possible when the best operating results are had.

Joint Conference Committee Issues Bulletin

THE joint conference committee of the four founder societies, the ad interim executive body of the Federated American Engineering Societies, has issued under date of Aug. 20 its Bulletin No. 6, giving answer to several pertinent questions which have been asked and also telling of the recent action of the American Society of Civil Engineers in annual convention, when the board of direction was directed to conduct immediately a referendum vote on the question of the society's becoming a charter member of the new organization and to act immediately in case the referendum receives a favorable vote.

In answer to questions, the bulletin explains why the "proposed federation" should supplant Engineering Council if the latter is either a failure or a success; it tells what class of engineering organizations were invited to become members and states that the list it now has is not considered complete and that organizations eligible for membership, whether they have received formal invitations or not, may make application, and it explains how members of the executive board are elected to give fair representation.

Copies of this bulletin and other information regarding the Federated American Engineering Societies may be obtained from the committee, Engineering Societies Building, 29 West Thirty-ninth Street, New York.

Federal Report Brings More Comment

Two Additional Statements, One Already Given Much Publicity in the Daily Press, Emphasize Some of the Features of the Report

TWO more statements, reflections of the report of the Federal Electric Railways Commission, are given below. Mr. Pardee's statement was released to the daily press the early part of this week and was widely printed. Mr. Mortimer calls the report a "masterly report" and suggests periodic repetitions of similar commission studies of the industry.

John H. Pardee

President American Electric Railway Association

Credit, vitally needed by electric railways throughout the United States, can best be restored by regulatory bodies making the rates of returns to lines more flexible. I strongly indorse the declaration of the Federal Electric Railways Commission, in its report to President Wilson, that "the first essential to the industry is to restore credit."

In the electric railway industry, as in every other business, economic law dictates that the price of the product must be based upon the cost of producing it. In the attempt to regulate the profits and the service of electric railways, this truth has been lost sight of and the operation of these carriers has been so hedged about with laws, ordinances, regulations and contract restrictions, that in the main their revenue has been controlled by the dictum of commissions and other regulatory authorities, while their expenses have been controlled by economic law alone, and have mounted as expenses in all other business and among private individuals have mounted.

To restore electric railway credit it is essential that these artificial methods of fixing electric railway prices should be done away with. As the commission well states, "public control must be flexible enough to enable them to secure sufficient revenues to pay the entire cost of the service rendered, including the necessary cost of both capital and labor."

The report of the Federal Electric Railways Commission strongly emphasizes its finding that the systems of electric railway transportation are permanent, essential to, and must be preserved for, the social and economic functioning of our cities and communities.

A very acute situation exists among the electric railways at the present time. The abnormal increase in urban population, which has marked the development of the country during the last thirty years, continues, as is evidenced by the latest census returns. The problem of caring for these new millions of city dwellers is not alone one of providing dwellings, it is equally a problem of providing local transportation facilities.

The industry needs immediately for such extensions and betterments and for the rehabilitation of existing properties which have deteriorated during the war between $300,000,000 and $400,000,000 of new capital and it will need for years to come an average of more than $200,000,000 a year, exclusive of its refunding obligations. Today, the investor looks askance at electric railway securities, and it is practically impossible for these companies to dispose of either their stocks or bonds.

Under such circumstances, it is no wonder that the commission declared that the "first essential is to restore credit." No impartial investigator can come to any other conclusion, and it cannot too forcibly be brought home to the American public, that unless the confidence of the investor be regained, the electric railways of this country, which represent an outlay of more than five billions of dollars, will cease properly to function and will prove of little avail in the solution of the housing and transportation problem which confronts almost every community in the entire United States.

Ordinary business common sense dictates the way in which this must be accomplished. The credit of the industry was destroyed because its revenues were insufficient to provide a return satisfactory to the investor and at the same time provide surety that this return should be continuously forthcoming.

The social service performed by these utilities is their most important function and the public interest demands that no undue obstacles should be put in the way of the performance of their full public duty. They perform an essential public service, which as the commission points out can be performed by no other means of transportation now in existence. They should not be weakened in their ability to serve the public by the competition of jitneys or city buses which cannot approach the complete service rendered by electric railways; they should not be compelled to bear an undue burden of taxation and public charges and they should be given freedom to put into operation every practicable operating economy that is in the public interest. Only in this way are low fares possible, and the lowest fare compatible with the payment of full cost of service, including a return that will attract the necessary new capital, is in the interest of both the public and the companies.

The report of the commission should awaken the public to the necessity of restoring electric railway credit, and if so, the commission will have accomplished a great work in the public interest.

The report deserves wide publicity and close study by all having real interest in the affairs of their respective communities.

J. D. Mortimer

New York, N. Y.

In many respects the July 28, 1920, report of the Federal Electric Railways Commission is a masterly document. It discusses the most important questions having to do with the electric railway industry and arrives at general conclusions. The similar characteristics of these problems, as they are met throughout the country, show that we have to do with a national problem; the symptoms may differ, but the general remedy is the same. All the railways require new capital. New capital cannot be obtained without credit. Credit cannot exist without adequate net earnings. Adequate net earnings cannot exist unless the operating revenues show a stable difference over operating expenses in sufficient amount to permit the issue of securities that will be absorbed by the investing public in sufficiently large amounts. All the other things are details fastened on the main trunk.

The unanimity of the report is striking. Many questions of a controversial nature were dealt with. It required important concessions in expressed opinions on the part of individual members to arrive at unanimous conclusions. Here is one of the principal elements of the value of the report. If the commission had split up into little groups, each with an impending separate report, much of the work done before and by the commission would have been lost.

At first study one is inclined to regret that the commission found it advisable to soft pedal the political problems met in dealing with the railway industry. Spades are spades but public co-operation may be the same as the elimination of politics in a public service. But, considering the results to be accomplished, the commission wisely avoided direct reference to problems raised or accentuated by the public office seeker.

It is no doubt true that in the final analysis "Fair

Valuation" of the utility property will play a prominent part in any readjustment of contractual relations between utility corporation and municipality. It is already one of the two big factors in states where the regulating commissions have power over fares. The federal commission follows up this idea by inviting the electric railway corporations to reduce capitalization to the respective "fair values" of physical property where differences of that nature exist. Probably the commission is right in its recommendation. Probably the readjustment would be advantageous in the long run. Probably railway utility corporations would find it easier to attract new capital. Probably the differences between "fair value" and capitalization, where they exist, have an important influence on credit. But we need a new breed of men to have any reasonable expectation that the electric railway industry will voluntarily destroy whatever investments have been honestly made in the securities which would suffer the most by such a reorganization. Forced reorganization is another thing; there the proper relationship of fair value and capitalization should be recognized.

From the personal point of view I regret that the federal commission could not see its way clear to say something more complimentary toward public ownership of electric railways. Those who heard the testimony on the subject were not impressed with the logic of the public ownership advocates. The best argument was that of Bauer, who favored free street railway service. The "mathematician" from St. Louis hurt the idea by this excessive enthusiasm. The commission probably passed on this question of public ownership with its eye on the pocket of the public. The commission would later be subjected to criticism if it favored public ownership in its report and it worked out to be advantageous to the railway corporations, rather than the public.

Without any suggestion of attempted compromise in viewpoint leading to inconsistency, the report supports the views of practically all the schools of operators and publicists. Any one can find portions of the report that will support his theories. But the report as a whole is consistent. If the business were re-established on the basis recommended, it would be in better condition than is now the case. Many operators probably feel that the same commission, were it to report a few years later, would lay greater stress on certain matters not touched on or only incidentally referred to in this report. The success attained by the first Federal Electric Railways Commission suggests that the idea is meritorious and investigations and reports at five-year intervals might do much to re-establish the electric railway business as a necessary industry and give it an improved position in the investment markets of the world.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Up-to-the-Minute Convention Notes

A DISCUSSION of the report of the Federal Electric Railways Commission will be given a prominent place on the American Association program at the Atlantic City convention. Arrangements are being made with men prominently identified with the federal inquiry to lead in this discussion.

* * *

The committee having in charge the transportation of the Western delegates to the convention has sent out a circular calling attention to the necessity of securing 125 passengers to insure the provision of a special train. Otherwise special sleeping cars will be attached to regular trains. The special schedule is as follows: Leave Chicago, Oct. 9, 5.30 p.m.; leave Ft. Wayne, Oct. 9, 9.08 p.m.; leave Pittsburgh, Oct. 10, 7 a.m..; leave Harrisburg, Oct. 10, 12.55 p.m.; arrive Atlantic City, Oct. 10, 5.40 p.m. Reservations can be made by application to the chairman, H. J. Kenfield, or to any of the sub-chairmen, as listed in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 21, page 375.

* * *

The list of convention exhibitors continues to grow, the following names having been added since the publication of lists in the issues of this paper for Aug. 21, page 376, and Sept. 4, page 469: Rowe Motor Manufacturing Company, Packard Motor Car Company, the White Company, V. V. Fittings Company, Standard Coin Counter, Inc., C. I. Earll and Foamite Fire Foam Company.

Committee on Safety Car Operation

THE T. & T. Association committee on safety car operation met in New York on Sept. 8. In the absence of the chairman, C. W. Kellogg, New York City, E. M. Walker, Terre Haute, Ind., presided. There were present also C. H. Beck, New York City; W. H. Burke, Boston, Mass. (representing Mr. Kellogg); L. H. Palmer, Baltimore, Md. (sponsor); J. C. Thirlwall, Schenectady, N. Y.; Gardner F. Wells, New York City, and J. W. Welsh, of the association staff. The committee considered a preliminary draft of a report prepared by the chairman and the results of a questionnaire as tabulated by the association staff. The situation regarding safety car operation was discussed by the committee in detail.

Reunion of Past-Presidents of Accountants' Association

PLANS are under way for a reunion meeting and dinner at the time of the Atlantic City convention of past-presidents of the American Electric Railway Accountants' Association and of its predecessor the Street Railway Accountants' Association of America. The idea was originally suggested in a letter published in the issue of this paper for June 26, 1920, by Walter B. Brockway, former president of the Accountants' Association and for many years its secretary, and the matter is now in charge of a committee consisting of three past presidents, the present president and the secretary. The dinner will be held on the evening of Tuesday, Oct. 12, unless some change is made in the program as now arranged.

Company Section Committee Meets

M. H. SOMMERVILLE, Toledo, Ohio, chairman of the American Association committee on company sections, met with C. H. Jones, Chicago Elevated Railways, and Messrs. Burritt and Welsh of the association staff, on Sept. 2, to put the finishing touches upon the report of the committee for the current year.

Safety Car Accident Data

In the communication from E. M. Walker, printed in the issue of the paper for Sept. 11, page 509, a typographical error occurs in the accident data table, third line from bottom. The figures should read "per 1,000 car-miles," and on this basis are as follows: $8.38 for the safety cars and $15.78 for the two-man cars.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Council Postpones Action

Toledo Railway Measures Before Council Again on Sept. 27—Bus Interests Busy

The Council of Toledo, Ohio, postponed action upon the cost-of-service and twin municipal ownership propositions when it met on Sept. 13. The measures will be passed again for submission to the electorate at the November election when Council meets on Sept. 27 if present plans and a gentlemen's agreement are carried out.

BUS MEASURE PRESENTED

At the meeting of the Council, however, two propositions came up which may have a bearing upon the solution of the question and the final vote of the people. One is a measure authorizing the issuance of $845,000 of deficiency bonds. The other is a bus regulation ordinance.

The deficiency bond issue discloses a system of city finance that may throw additional light upon the wisdom of refraining from purchase of the street railway system, or rather, the issuance of $7,000,000 for an indefinite "transportation system."

The municipal ownership enthusiasts used as their argument the fact that the city was a corporation larger than the railway and better able to finance itself, when they urged the passage of the bond issues at the primary election.

At the present time the city has a deficit for last year of nearly $350,000 in operating expenses alone. This same amount has been accumulating three years and the deficit will be enhanced this year because of increased salaries for practically all city employees.

On account of tax limitations revenue does not increase and there is also a limitation placed upon the amount of bonded indebtedness which the city can assume. If the deficiency bond issues become a regular annual procedure then in the event of a municipal ownership of the railway system it would only be a few years till no further financing could be secured through bond issues.

CAMPAIGN SLOW IN STARTING

Councilman Bitter, socialist, submitted to the Council on Monday evening an ordinance prepared by Leo Griswold and other bus owners for the regulation of motor buses. It was referred to the railroad committee. The ordinance provides for the licensing of bus owners and drivers and requires the posting of a $10,000 bond with the Council for indemnity in case of accidents. Maximum fare to be charged is placed at 10 cents.

It is thought that the regulatory measure is a move on the part of the bus owners to protect their business against any regulations which might be asked on the part of the traction interests if either the city regulation or city ownership ordinances passes or by the Toledo Railways & Light Company in case the measures just mentioned should fail.

Neither of the interested parties in the coming election has begun any definite campaign.

Help in Housing

Home Building Fund of $150,000 Created by Los Angeles Railway for Its Employees

An extensive plan for improving the housing conditions of the employees of the Los Angeles (Cal.) Railway was announced by G. J. Kuhrts, general manager, on Sept. 6. The railway plans to create a home building fund of $150,000 for the use of employees in purchasing or building houses.

Housing conditions in Los Angeles have been a considerable problem for some time and the shortage of homes near the five division points and the main shops has assumed serious proportions.

$150,000 ROTATING FUND

Although details of the plan have not been completed, it is proposed that employees will be loaned money from the $150,000 fund at a minimum rate of interest and allowed to repay the railway in small monthly installments deducted from the pay check. This is expected to relieve the burden that would be occasioned by a loan from an outside source requiring large payments.

Another tentative plan of the company is the building of bungalow courts near the division points and placing the homes at the disposal of employees only, at a moderate rent.

The fund will be revolving so that as one employee repays his loan the money becomes available for other employees to establish homes. Applications will be considered in the order they are made to the company and the amount to be advanced will be determined on the merits and needs of the individual case. To prevent employees commercializing the offer, it is proposed that no loan shall be made to an employee who already has a home and who might use the fund for building another house or houses to rent.

Complete details of the plan will be announced later by Mr. Kuhrts.

New Franchise Planned

Dallas Railway Will Seek Real Service-at-Cost Grant at Spring Election —Financing Impossible Now

Richard Meriwether, vice-president and general manager of the Dallas (Tex.) Railway, has announced that his company will seek a strictly service-at-cost franchise from the city of Dallas at the municipal elections to be held in April, 1921. The new franchise will be asked with a view to completion of an "ultimate development plan," which will include a number of extensions, improvements and betterments.

PRESENT FRANCHISE UNSATISFACTORY

The Dallas Railway has been operating under a franchise embodying some of the service-at-cost features since its new grant at the election in April, 1917. The present franchise, however, does not guarantee a fixed return, but provides that whenever the earnings of the company shall exceed 7 per cent on the agreed valuation, the fare shall be automatically reduced. The company has never earned 7 per cent under this franchise, but there has been a steadily accumulating deficit.

Under the terms of the 1917 franchise, the company is to make certain improvements, all looking to an "ultimate development plan," which calls for the construction of several cross-town lines that will eliminate much wasted mileage as compared with the present system and at the same time relieve congestion on downtown streets.

Although the fare was fixed under the 1917 grant at 5 cents, the City Commission recently granted a 6-cent fare. This was done when the company represented that the 5-cent fare was confiscatory. Mr. Meriwether said that the company's gross operating revenue had increased 8 per cent during the five months the 6-cent fare had been in effect as compared with the same five months of last year. During this time, however, increased operating expenses had more than offset the increased revenue. Mr. Meriwether said the company was unable to borrow money for improvements under the present franchise.

VALUATION ALREADY MADE

Under the present franchise the city has the exact value of the railroad property, all expenditures for improvements having to be approved by the Board of City Commissioners before they can be made. The new franchise will also embody the benefit assessment plan. This would place the burden of extension on the property owners that benefit directly rather than on the general public.

$1,400,000 Additional for Bay State Men

Eleven Cents an Hour More Awarded in Arbitration Under Way Since Last Spring—Company's Arbitrator Dissents

An increase of 21½ per cent in the wages of the trainmen of the Eastern Massachusetts Street Railway, Boston, or a jump to each of the 4,000 employees of 11 cents an hour, was announced on Sept. 11 in a majority decision handed down by the board of arbitrators between the company and the Amalgamated Association. The men asked for a flat rate of 75 cents an hour, an increase of 24 cents. The award means an increase in pay from 51 cents an hour to 62 cents. The decision is retroactive to May 1. It means that the company will have to make up back pay of $500,000. The annual payroll is increased $1,400,000 by the award. At meetings of the men Saturday night the award was accepted. The award is effective only until May 1, 1921.

WITHIN a very short time, the company proposes to declare a new schedule of rates on all its lines. In connection with this it is also announced that all workingmen's tickets are to be called in and all free transfers to be abolished. It seemed doubtful on Sept. 13 whether any increase would be made in the flat 10-cent fare now in force on the company's lines. The burden of any advance appeared at that time more likely to hit the steady customers of the road or users of the reduced rate punch tickets.

TRYING TIMES AHEAD

The seriousness of the situation was emphasized by the trustees of the company on Sept. 12 in a statement as follows:

> Of the $1,400,000 additional which the company must pay its employees annually the car riders in the principal districts will be called upon to share approximately as follows: Lynn, $180,000; Salem, $140,000; Brockton $190,000; Chelsea $160,000; Lowell $170,000; Lawrence $120,000; Haverhill $65,000; Quincy $115,000; Taunton $40,000; Fall River $125,000; Melrose-Woburn $90,000; Norwood $20,000.
>
> Two courses are now open to us in our efforts to obtain the money to pay this 21½ per cent increase.
>
> One course is substantially to increase fares; the other is greatly to reduce service.
>
> Thoroughly convinced as we have been since our appointment by the Governor to rehabilitate this railway that what the public wants and needs more than anything else is good service, we have concluded to increase fares.

The revenue of the company from fares was so divided that until the award 60.58 per cent of the whole went toward paying wages of the trainmen. As a result of the award the company will now be compelled to pay in wages 71 per cent of its total revenue from fares. The trustees maintain the company has virtually no other sources of income.

FIVE CENTS EXTRA FOR ONE-MAN OPERATORS

Special provision has been made for the operators of one-man cars. There are some 200 of these on the lines of the company. They have been awarded an extra 5 cents an hour over the pay of the regular motormen and conductors. It was the problem as to what larger pay should be awarded to operators of one-man cars that began the arbitration proceedings back in December, 1919, the problem concerning a general wage increase to all the employees of the road being drawn into the proceedings as events developed.

The board of arbitration was composed of Philip G. Carleton, Cambridge, for the company; James H. Vahey, Watertown, for the workers; and Hugh W. Ogden, Brookline, the neutral arbitrator.

Under the award the employees of the company receive 8 cents less in pay per hour than the employees of the Boston Elevated Railway.

Mr. Ogden and Mr. Vahey concurred in the finding. Mr. Carleton dissented.

The points at issue resolved themselves into three main division:

> 1. What, if any, increase in wages shall be awarded to the employees whose wage scale is now under consideration?
> 2. What shall be the rate of compensation for employees operating one-man cars?
> 3. What, if any, change in hours of labor shall be inaugurated?

Hearings began June 29 and proceeded until Aug. 9, when briefs were filed. Two thousand pages of testimony and 115 exhibits were submitted to the board. One of the points brought out was that a total of 150.82 miles of track has been discontinued within the last three years, leaving a total of about 750 miles of track now in operation. The capitalization of the company was fixed by the act of the Legislature at not to exceed $40,282,340, plus certain amounts to be approved by the Public Service Commission, which fixation of capital was based upon an investigation and finding of the Public Service Commission of Massachusetts.

BASIS OF MEN'S CLAIM

The men based their claim to an increased wage at this time upon two propositions:

> 1. The increase in the cost of living during the last six years has more than kept pace with their increased wage, and therefore they are today relatively worse off than they were in 1914.
> 2. Other systems geographically near, upon which the work done is substantially the same, pay a very much higher rate of compensation.

They contended that upon both of these grounds the men should receive at least 66⅔ cents an hour, and in justice and equity a minimum wage of $6 a day, that day to consist of eight working hours.

The men proved that the cost of living has increased since 1914 at least 100 per cent, and has increased from March, 1919, to March, 1920, at least 20 per cent. They proved that the scale of wages paid to them under the award of the War Labor Board dated Aug. 12, 1919, as of June 3, 1919, and now in force, has been and is less than the wage scale paid by railways in many other cities.

To these propositions the company replied that the 51 cents an hour which the men have been receiving was a fair living wage and that the financial condition of the company absolutely forbade any increase in wages at this time. The public trustees of the road showed that since the road was taken out of the receivership in 1919 it has never earned the cost of service as defined in the statute which incorporated the company. They proved that each increase of fare for the last five years has resulted in a diminution in the public use of the system and in a percentage of increase in revenue much less than the percentage of the increase in fares.

In short the figures of the public trustees showed that in the aggregate the demands under the seventeen points at issue would more than consume that part of the total revenue of the road which is not devoted to wages. They offered evidence tending to show that they can hire all the men they need at present rates of pay and claim that the law of supply and demand has a decided bearing upon the question of whether the men are getting a living wage.

Mr. Ogden said that logical analysis seems to be this:

> 1. Are the street railway employees here considered, irrespective of the law of supply and demand, entitled to (a) a fair living wage; or (b) more than a fair living wage? If in each case the answer is "No," we need go no further; if in either case the answer is "Yes," then
> 2. Is the wage scale now in force equal to the requirements of (b) more than a fair living wage; or if not (b) is it equal to the requirements of (a) a fair living wage? If it is equal to (b) we need go no further; if it is equal to (a) we need go no further, if (a) is all that justice requires. If it is not equal to (a) then
> 3. Is the financial condition of the company an adequate answer to a demand for such increase? If so, we need go no further. If not.
> 4. What increase in the present wage scale shall be made to meet such demands?

In his finding he said in part:

> I do not decide whether the company could fill these positions at its present wage scale, because I do not regard a finding upon that disputed question of fact as conclusive one way or the other.
>
> The men strenuously argued that there are but two interested parties in this hearing—one themselves; the other the company—and that the neutral arbitrator has no right to take into account the interest of the public in any way.
>
> It has seemed, therefore, to the neutral arbitrator that the highest considerations of public policy require him to view the maximum demands of the men in the light of their necessary consequences upon the common prosperity, which is the Commonwealth. So far as these employees are not receiving a minimum fair living wage, undoubtedly they should have it, even at the cost of a receivership; so far as these employees, however, in their demands have gone beyond that minimum, and in so doing insist upon a rate of compensation the effect of which cannot fail to bring disaster upon these other interests, the neutral arbitrator has felt constrained to refuse them. The public may not assert its interest against a particular group to deprive that group of fair living wages; on the other hand, neither may any group in an essential public utility assert its individual interest against the public to profit inordinately at the expense of all others concerned.
>
> While I am convinced that the claim of the employees to a substantial increase of wages is justified, I do not believe that the claim of a minimum wage of $6 a day, or $2,000 a year, is warranted under the circumstances of this case.

Admitting that the men are otherwise entitled to an increase of pay, is the financial condition of the company a complete answer to such demand? The short and conclusive reply is "No." Federal judges have refused to allow full liberty to boards of arbitration to fix wages upon systems involved in receiverships and have insisted upon their duty and power to revise all findings. If a road is not in the hands of a receiver, however, the great weight of authority is in favor of the recognition of the power and duty of a board of arbitration to fix a minimum fair living wage for the employees, irrespective of the effect of such fixation upon the financial condition of the company. If the operation of miles of road, now non-productive, from original excess of optimism, the present existence of the jitney, or what not, should be accepted as a complete answer to a claim for higher wages, it would follow that the men might never get an increase, irrespective of their possible needs. This cannot be, and I have not therefore, in awarding what I deemed to be a minimum fair living wage, allowed the possible effect of such fixation upon the financial condition of the company to influence the amount of the award. That minimum must be a charge upon the revenues of the road if the line is going to operate within the Commonwealth of Massachusetts.

Based upon all the evidence I find that the wages which shall be paid to conductors and motormen, and employees of the mechanical and miscellaneous departments, shall be increased a total 20 per cent, the fraction in each case to count as an additional cent an hour. This will allow a small increase in the rate per hour above the increase in cost of living from June, 1919, to May, 1920, as shown by the best available figures, but no more than is amply justified by the considerations above set forth.

No arbitration hitherto has awarded a differential in excess of 5 cents to the operator of the one-man car. Upon many roads such operator receives no differential whatever. I think he is entitled to something, and decide the operator of a one-man car shall be paid a differential of 5 cents an hour.

So far as the eight-hour day is concerned I have given most anxious study to the very voluminous literature upon this subject which has been submitted to the board. From my general knowledge of the economic situation of the world to-day, however, both in Europe and in this country, I do not believe that any progress in this direction in this particular occupation is feasible at this time.

So far as the award seems inconsistent with the present financial exigencies of the corporation, I can only say that it is no more than the men are entitled to, and that the management, the public, and all who are interested in the preservation and maintenance of an adequate trolley service, must co-operate to secure the necessary funds. I am confident that the operatives, by ready, efficient, careful and economical effort, can and will co-operate to that end so far as their ability lies.

I think the present compensation paid for breaking in new men adequate and therefore do not recommend any change in Item No. 10. Conversely, I recommend no change in 15, 16, 17 and 18. The company cannot grant vacations. Conversely, what privileges under present conditions the men enjoy I think for the present they should retain.

I think that the fourteen-hour span which the men must remain on duty to earn their day's pay is too long, and if the amount of extra compensation awarded in another part of this opinion did not reach such tremendous figures in the light of the financial condition of the company I should cut down the span of the working day at least to twelve hours. Under the circumstances, however, and for the reasons set forth above, I recommend no change.

I fail to find any evidence presented that the employees are not at the present time receiving what is described in the opinion of the majority as "a minimum fair living wage."

In his dissenting opinion Mr. Carleton said:

No evidence was offered of any hardships or privations. The U. S. National War Labor Board adopted the principle that "in fixing wages minimum rates of pay shall be established which will insure the subsistence of the employee and his family in health and reasonable comfort." No evidence was offered that the present wages did not enable employees and their families to live in health and reasonable comfort.

In granting an increase of 20 per cent, with the provision that the fraction in each case is to count as an additional cent per hour, the board has granted an increase of 11 cents an hour, which is actually an increase of more than 21.5 per cent over the present wage of 51 cents. In other words, the award of the majority has exceeded by more than 5 per cent the actual increase in the cost of living since the award of the last War Labor Board. The majority decision, therefore, does not accurately follow the reasoning that it has tried to apply to the case.

In my opinion the increase awarded is grossly excessive from any standpoint. As shown in evidence each cent per hour of increase costs about $109,000. The increase of 11 cents as granted by the majority aggregates practically $1,400,000. This is as much as the interest on the entire funded debt of the company for a year. On July 1 the company was obliged to postpone payment of about $400,000 interest on its bonds as it was allowed to do under its mortgage. After Jan. 1, 1921, it has no such privilege. The enormous increase given seems to me to favor out of all proportion the employees at the expense of the holders of the bonds, whose money largely built the very line and cars upon which these men are absolutely dependent for their livelihood. The decision of the board is likely to mean that the people whose investment enables these men to earn a living will eventually lose their investment.

I agree with a recent decision of the United States District Court in Iowa, in which the Court stated as follows: "I have held several times I have no power to take interest due upon indebtedness and apply it upon the wages of the men, because in that event the mortgage would be foreclosed and the owners of the property would be deprived of every dollar of investment therein. The court has no power to deprive a man or corporation of its property in that way."

As shown in evidence the present payroll of the company takes 60.58 per cent of its passenger revenue. With the increase of $1,200,000 granted by this award, more than 71 per cent. of the revenue will be devoted to the payroll. No industry should be required to pay any such proportion of its revenue to its employees.

Finally and of paramount importance, the public, which pays this company its only income in the shape of fares and in this way pays the wages of its employees, deserves consideration. This is especially true of a public service corporation operated by public trustees appointed by the Governor under an act of the Legislature. The present fares of the company as shown in evidence are as high as any trolley lines anywhere in the country. The granting of excessive wages to employees will mean one of two things—either numerous lines will have to be discontinued or the fares will have to be made higher than anywhere else in this country. This system serves small industrial cities and rural communities where the average car-rider is in poor or very moderate circumstances. If fares are increased, as seems inevitable in face of the award, it is taxing an absolute necessity of many poor persons in order to pay these employees an excessive wage. If the cars have to be discontinued so that these people must walk, the unfairness to the public is self-evident.

Railway Insists on Co-operation

Houston Electric Company Refuses to Proceed with Franchise Election in City Divided Against Itself

Hopes are not bright at this time for an extension of the franchise of the Houston (Tex.) Electric Company. The matter has been up recently for consideration and an election was practically arranged, but the company in an open letter to the Mayor and City Council some time ago requested the city officials to call off the election on the service-at-cost grant. This action was predicated on the company's belief that the co-operation essential to the successful working out of the service-at-cost franchise was lacking. The company is continuing to operate on a 7-cent fare under the protection of a court decree.

THE conditions which led to the franchise negotiations will bear reciting. The company's condition since 1914 has been extremely precarious, due first to the jitney competition and then to the high operating costs brought about by the war. It asked many times for relief, but it was not until 1918 that the City Council passed the 6-cent fare ordinance.

Before that ordinance took effect, its operation was suspended by a referendum petition. At the election, the 6-cent fare ordinance was rejected and it was promptly repealed by the City Council. This left the company no alternative, and though reluctant to do so, it became necessary for it to go into the Federal Court to save its property from confiscation. The Federal Court, after a full hearing, enjoined the 5-cent fare ordinance. A 7-cent fare was then put into effect.

It had been publicly suggested to the company that a service-at-cost franchise might lead to an ultimate solution of the railway problem. The company, realizing the value of the good will and co-operation of the public, agreed to join with the city officials in endeavoring to work out such a plan. In entering into negotiations, therefore, it entertained the hope that they would lead to a clear recognition of the fundamental community of interest between the railway and the public, and would develop a helpful and sympathetic co-operation as the predominating feature. It seemed to the company that only on such a basis would a service-at-cost franchise work out in a manner satisfactory alike to the car-riding public and the city and the company. If this vital element was lacking, the company had grave fears for the successful operation of such a franchise.

A franchise was drawn as a result of many conferences between Mayor Amerman, Special Attorney W. J. Howard, City Solicitor B. H. Powell of the firm of Vinson, Elkins & Wood, Lamar Lyndon, the city's expert, and the officials of the Houston Electric Company. The officials of the company approached the negotiations with the desire to be frank and fair. The merits and demerits of every proposed franchise feature were discussed frankly at the conference, the endeavor of all parties to the negotiations being to draft a franchise which would be workable, and assure the city of a railway adequate to its needs and one which would enable the company to assume and fulfill its obligations thereunder.

When the representatives of the city and the company believed that they had arrived at such a conclusion, the proposed franchise draft was submitted to and carefully considered by the special railway committee of the expansion board, and later by the full expansion board, in a series of public meetings. Thereafter the expansion board indorsed the franchise and recommended its passage by the City Council. Subsequent events, however, seemed clearly to indicate that whatever the result of the election the company would not get that hearty support which it considered absolutely essential, for despite the long and conscientious work of the city representatives, and those of the company, and despite the approval of the franchise by the subcommittee and the expansion board, the City Council refused to pass the grant and send it to the people with their sanction. Thus, at the very beginning, even the city officials were divided. This division violated at the start the very spirit which was a moving factor throughout the negotiations. It was of so vital a nature that the company could not bring itself to believe it portended satisfactory results for the future. Thus convinced that no useful purpose would be served by continuing the matter, the company requested that the election be cancelled.

Omaha Men Appeal to Court

The wage controversy which has been pending between the Omaha & Council Bluffs Street Railway, Omaha, Neb., and its employees, for several months, has been taken to the State Supreme Court through an appeal filed by the trainmen's union against the recent decision of the State Railway Commission. A transcript and bill of exceptions have been filed with the higher court, but briefs will not be filed earlier than the middle of October.

The threatened strike has not been called and there are no present indications that it will be ordered, although the union leaders say they have been authorized by the men to call a strike if in their judgment such action should be the thing to do.

The State Railway Commission recently rendered a lengthy finding and order which was against the men in their contention for an increase of 13 cents an hour above the existing scale of 53 to 57 cents an hour. One of the declarations of the State Commission was that the men did not have the legal right to interrupt the operations of a common carrier by striking, although one of the commissioners gave a dissenting opinion on that point.

In taking their case to the Supreme Court the men will endeavor to have the Railway Commission's finding on the right to strike set aside and also have the whole case referred back to the State Railway Commission for rehearing.

This decision of the commission was referred to at length in the ELECTRIC RAILWAY JOURNAL for Aug. 28, page 428. In the finding the application of the trainmen for an increase of 13 cents an hour in wages was refused. This denial was based on the principle that an increased wage scale would necessitate an increase in fare and that step the commission decided was not fair.

Brooklyn's Striking Employees Abandon Hope

Governor Fails in Effort to Have Court Confer with Mr. Gompers—Receiver Advises Men to Return

Outstanding features this week in connection with the Brooklyn strike were the refusal by Judge Mayer of Governor Smith's request to confer with Mr. Gompers, president of the American Federation of Labor, and with J. H. Vahey, general counsel for the Amalgamated Association, and the appeal of Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, to the men who are still out to return to work. Service is gradually being restored. On Thursday nearly the complete complement of rapid transit cars was in use and 737 surface cars were in operation on fifty-one of the sixty-seven lines of the company. Under fully normal conditions 850 surface cars are run. Seven surface lines and all rapid transit lines are being run at night.

JUDGE Mayer reiterated his determination not to deal with the Amalgamated. The Governor, Judge Mayer and Mr. Garrison are said to have been closeted for several hours. The only statement the Governor would make was that he had been unsuccessful in his effort to arrange a conference. Judge Mayer said:

> The Governor, Judge Mayer and Receiver Garrison had a conference this afternoon. The Governor stated that he had been visited by Mr. Vahey, the general counsel for the Amalgamated Association, accompanied by Mr. Gompers, and that they desired to have the Governor see if he could arrange a meeting with Judge Mayer.
>
> Judge Mayer stated to the Governor that his position had been deliberately taken and was well known. He had definitely determined and publicly stated upon more than one occasion that he would not deal in any way with the Amalgamated Association directly or indirectly, and that so far as he was concerned the matter was closed.
>
> He further stated that while under other circumstances he would, of course, meet Mr. Gompers, such a meeting at this time under the existing circumstances would not only be useless but would serve solely to prolong a situation which should be brought to an end. That it was obvious from the circumstances that Mr. Vahey and Mr. Gompers sought a meeting for the purpose of again going over the situation in respect of the Amalgamated Association. That Judge Mayer stated that his position had been fully, clearly and finally set forth in his letter to the Mayor dated Sept. 2, on which he stood.

"MOST HUMILIATING," SAYS MR. GOMPERS

Mr. Gompers let it be known that he considered the statement by the court to be "most humiliating." He said it was his purpose to suggest a way out of the present situation. This Judge Mayer, according to Mr. Gompers, resented without hearing "what might have been presented to him." It was Mr. Gompers' purpose to be observant in a difficult situation. This the court had declined. "This position," said Mr. Gompers, "is not judicial; it is autocratic."

Mr. Garrison's statement of Sept. 14 follows in full:

> Any one who has followed events could have foretold the failure of Mr. Gompers to extricate the leaders of the Amalgamated Association from their inextricable position.
>
> This marks, I trust, the end of the efforts of these leaders to buoy up their deluded followers with false hopes. The vast majority of the men were given no opportunity to vote on the calling of the strike. They left their work reluctantly and in large part they remained out because of their reliance upon the assurances of their leaders that each new move would result in reinstating the Amalgamated in control. One after the other these leaders have appealed to every local and state agency, each time assuring their followers that success would attend their efforts. Before the strike Commissioner Delaney's advice to the men was that they should not break off negotiations with the receiver. Mayor Hylan was then sought, with similar results.
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> After the strike was called the leaders appealed successively to Acting Public Service Commissioner Barrett, then to the Mayor and the Board of Estimate, then again to the Mayor and Board of Estimate (the Governor being present), and the advice received by the men was to return to work. Later, upon Commissioner Nixon's return, he gave similar advice.
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> In his letter of Sept. 2 Judge Mayer fully and finally stated his position.
>
> Nevertheless, later, some days after the strike began, Mr. Mahon, president of the Amalgamated, appeared on the scene, and his arrival was heralded as the positive assurance of success. No result came from his efforts. Finally Mr. Vahey, from Boston, the general counsel for the Amalgamated, appeared and enlisted the services of Mr. Gompers, with the result now known.
>
> PLACES STILL OPEN
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> During all this time the men have been without their wages, thereby producing a situation which is serious to them now and will grow worse. If the number of men still on strike is anywhere near what is claimed by the Amalgamated officers, the aggregate of the weekly wages of such men is well over $300,000. I have no faith that the Amalgamated Association or those that it can enlist in its cause will now or in the future pay these men this sum or any appreciable part of it.
>
> I hope that in their own interests the men will face their situation in the light of facts and no longer be cruelly deluded by false hopes I trust by this time that they fully realize that the courts and the receiver mean exactly what they say: that there is no hope now or in the future of the Amalgamated Association again being entrusted with the control. The one and only sensible course for the men to pursue is to return to work. We want and will welcome back our own experienced and trustworthy men, letting bygones be bygones. The agitators and disturbers are not wanted and will not be taken back.

Mr. Garrison said on Sept. 16 that the appeal of the strike leaders to all unions in New York city for financial support revealed that the "closed shop," despite assurances to the contrary, was the sole purpose of the strike on the B. R. T. lines.

St. Louis Men Insist Upon Advance

The employees of the United Railways, St. Louis, Mo., through their attorney, Edward Foristel, submitted arguments on Aug. 30 before the Public Service Commission in support of an application to re-open consideration of the wage scale. Last July the commission increased the wages of the employees 5 cents an hour. The employees want an increase of 20 per cent, but judging from the arguments submitted to the commission, would be satisfied with an increase of 10 per cent added to the 5 per cent already granted. An increase of 10 per cent would give the old employees 75 cents an hour, and would cost the company $1,600,000 a year, according to the estimates submitted.

Wages Increased in Spokane

Wage increases of from $12.50 to $17.50 a month affecting some 500 employees and amounting to approximately $100,000 a year have been announced by Vice-President F. E. Connors of the Spokane & Eastern Railway & Power Company, Spokane, Wash., retroactive to Sept. 1. Mr. Connors said:

> I have received word from Chicago headquarters to the effect that a wage increase recommendation made by me has been approved by the board of directors. The increase will amount to approximately $100,000 a year and will embrace all departments, including the office and depot people, with the exception of the car platform men.

All repair shop men, electricians, railway clerks and office employees are included. A year ago the company, then known as the Inland Empire System, suffered a strike of the electricians, machinists and other shop men, which it broke. The platform men remained at their posts, faithful to a recently signed contract which gave them better wages and improved conditions.

At that time Mr. Connors, then receiver, admitted the men who were on strike had a grievance in the matter of wages which he would gladly rectify if he could but that he was powerless. He agreed then that at the earliest date he could do so he would remedy the conditions about which complaint had been made. His statements of fact did not avert the strike, but he has now made good his word given at that time.

New Akron Grant Completed

The proposed franchise to be granted the Northern Ohio Traction & Light Company for the operation of cars in Akron has been practically completed. The sixty-day limit under which the company has been collecting a 5-cent straight fare expired on Sept. 15, but an extension is understood to have been arranged.

The new arrangement provides for service at cost. The city will guarantee the company 7 per cent return on the valuation of the company's railway property. The initial fare will be 5 cents, but this will be increased from time to time if it is shown by the company that additional fare is needed to pay the 7 per cent and also to carry out other provisions of the new contract.

The company has agreed to open its books for inspection by the city under conditions imposed by the city and also to agree to the appointment of a utilities commissioner whose duty it will be to keep in close touch with the complete operations of the company and to make reports to Council. The valuation upon which the city will insure the company a 7 per cent return is to be determined by the city and the company jointly, under the new contract.

A feature of the proposal is that an auto bus system is provided to supplement the street railway system. There is a special incentive to the company to hold fares to 5 cents.

News Notes

Increase for Savannah Men.—H. C. Foss, receiver of the Savannah (Ga.) Electric Company, stated on Aug. 26 that effective on Sept. 1 the compensation of conductors and motormen would be increased from the present rate of 38 cents to 42 cents an hour, and 41 cents to 46 cents an hour. One-man car operators are now receiving a bonus of 4 cents an hour.

Pittsfield Men Accept. — Announcement was made on Aug. 31 that the union had accepted by a small majority the latest offer of the Berkshire Street Railway, Pittsfield, Mass., which was for an increase of 16 per cent over the wages of last year and 10 cents an hour extra for one man cars. Conferences will be held shortly for the purpose of signing the agreement.

Wage Rise in McAlester. — After negotiations covering a period of thirty days, the employees of the Pittsburg County Railway, McAlester, Okla., have been granted a wage increase. The employees of the Choctaw Power & Light Company, an associate company, also receive wage increases. The wage advance ranges from 26 to 40 per cent and affects all employees except office men.

Railway Electrification in South Africa.—United States Trade Commissioner Lundquist reports from South Africa that a sum of $48,665 is included in the railway estimates for the coming year for electrification purposes, the same apparently being provided for the preparation of detailed plans and specifications for electrification of a part of the main line between Durban and Glencoe Junction, in Natal Province.

Western New York Line Advances Pay.—Announcement was made on Aug. 30 that employees in car service on the lines of the Western New York & Pennsylvania Traction Company, Olean, N. Y., receive a raise in wages amounting to 5 cents an hour, effective Sept. 1. Carmen in passenger service receive from 43 to 48 cents an hour now and new men in freight service the same. Older men in freight work get 50 cents an hour.

Holyoke Men Demand $7 a Day.—On Aug. 31 the union of employees of the Holyoke (Mass.) Street Railway presented demands to the company for a wage of $7 a day and a straight eight-hour day with one day off in fifteen with pay. The demands also call for a pension system in effect after twenty years' service or after an employee has reached sixty years of age. Repairmen and others demand a 40 per cent increase.

Suggests Alternative to Wage Increase. — Replying to the demand of motormen and conductors of the West India Electric Company, Kingston, Jamaica, for increased pay and altered conditions of work, the manager says he has recommended to the directors in Canada that the men should get time and a half pay on two holidays, and in lieu of an increase each man should receive a life insurance policy of $500.

Wage Settlement at Lexington.—George McLeod, representing the Kentucky Traction & Terminal Company, at Washington, in a wage dispute before Hyell Davies, federal conciliator, agreed to an increase of 7 cents an hour for employees of the Kentucky Traction & Terminal Company, according to a wire received by General Manager J. P. Pope, on Sept. 9. The workers asked for 20 cents an hour increase, from 40 cents to 60 cents, but will get 47 cents. It was decided that an increase of 7 cents an hour would meet the needs of the men on the basis of increased living costs.

Program of Meeting

Ninth Annual Safety Council

The National Safety Council has completed the program for the Ninth Annual Safety Congress which is to be held at the Auditorium, Milwaukee, Wis., Sept. 27 to Oct. 1. There will be two electric railway section sessions under the chairmanship of R. N. Hemming, superintendent of transportation, Indiana Service Corporation, Ft. Wayne.

The addresses to be delivered before the electric railway section are as follows:

"The Enforcement of Laws and Ordinances Relating to the Operation of Self-Propelled Vehicles," by J. A. Van Osdol, general attorney of the Union Traction Company of Indiana.

"Advertising Campaign to Reduce Automobile and Street Car Accidents," by Charles B. Hardin, general claim agent of the United Railways, St. Louis.

"Public Safety," by C. M. Talbert, chairman of the Public Safety Section of the National Safety Council.

"The Necessity for and Importance of Observing Operating Rules":

(a) "Safety Department," by Hugh Wilson, safety department of the Northern Ohio Traction & Light Company.

(b) "Claim Department," by F. T. Holliday, claim agent of the Gary (Ind.) Street Railway.

(c) "Transportation Department," by C. E. Thompson, assistant to the president of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

"Duties and Responsibilities with Reference to the Safety of Employees Under the Jurisdiction of Foremen and Men in Advisory Positions," by J. H. Mallon, Chicago, Ill.

There will be papers of interest to electric railway men to be read before the public utilities, public safety and other sections. The annual banquet will be held at the Arena on Sept. 30.

Financial and Corporate

May Reinstate Shore Line

Public Concerned When It Is Realized Tracks Are Being Torn Up—Operating Arrangement Proposed

The Shore Line Electric Railway, Norwich, Conn., the tracks of which from New Haven to Flanders were recently sold for junk, may not be allowed to die, though apparently the final gasp had already been made. Citizens along the western half of the abandoned part of the system grew much concerned over their transportation future when they saw men actually at work tearing up the one fixed line of local communication and are proposing to form an organization to buy the property and have it operated by the Connecticut Company, New Haven Division. Options have been secured from the present owners of the "junk" and negotiations are fast proceeding toward restoration of service.

BUS LINE QUITS

The Shore Line, operating more than 160 miles of single track in and between New Haven, Guilford, Saybrook, New London, Norwich, etc., was closed down entirely by a strike in May, 1919. The Norwich Division, New London to Norwich, and suburban to New London out to adjacent shore resorts, was started up again and is now operated by the Connecticut Company. That part of the New London-New Haven line from Flanders to New Haven, about 44 miles, however, was never brought to life and was recently sold for junk. From New Haven to Guilford, 16 miles, there is an all-year service demand, but, from Guilford east, about the only business is that of summer residents of the numerous shore resorts. During the past spring and summer, a bus line has operated from New Haven as far east as Saybrook, 33 miles, and another line as far as Madison, 22 miles, but the former ceased operation recently and the experience of last winter rouses no hopes for a continuation of the latter line, with any regularity, this coming winter.

BUSINESS MEN ACT

As a result a group of interested business men from Foxon, a growing Italian suburb; North Branford, the seat of a large trap-rock industry, and Guilford, formerly dependent on the Shore Line, has arranged with the present owners not to tear up any of the line west of Madison and is raising money and working on an organization to take over the 16 miles at a price of $10,000 per mile. An effort is also being made to interest Madisonites in assisting so that they may take over the other 6 miles to Madison. Indications are that the first 16 miles will surely be put in operation and probably the other six.

As to operation, it seems impracticable to try to utilize the heavy rolling stock of the Shore Line Electric Railway, and present plans indicate the use of one-man safeties. Gasoline-motor cars have been discussed, but as the overhead is still in good condition, electric power will probably be used.

The Connecticut Company has agreed to operate the line at cost plus a fixed sum for management and operating charges. The line will be manned by Connecticut Company employees and operated practically as a part of the New Haven Division.

Seattle Increase Helpful

Average Daily Revenue of Municipal Railway Increased 27 per Cent Under Fare Advance

Figures compiled by the Seattle (Wash.) Municipal Railway Department show that one month's operation under increased fare has resulted in an increase of 27 per cent in the average daily revenue, and a decrease of 6.6 per cent in the average daily number of passengers.

Railway department officers assert that in the face of the estimates made at the time the city was considering the increase in fare, the increase in revenue is measuring up to expectations. The estimated increase in revenue on the 6¼-cent fare basis made at that time was 30 per cent, a difference of only 3 per cent over the actual showing for thirty-one days from July 24, when the new fare became effective, to Aug. 23, inclusive.

Figures submitted to Mayor Caldwell show that from July 24 to Aug. 23, inclusive, the actual revenue under the increased fare was $496,034; under the old fare, the revenue would have been $388,972, showing an increase under the new fare of $107,061, or 27.5 per cent.

The daily average under the old fare would have been $12,547; under the new, it was $16,001, or an increase of $3,543. The daily average of passengers carried for the period from July 24 to Aug. 23 inclusive was 324,101, compared with 347,037, for the period from June 26 to July 23, inclusive. The average daily decrease in passengers compared with the period immediately preceding the increase in fare was 22,936 during the thirty-day period stated. The net decrease figures 6.6 per cent.

Figures prepared by the department show that the municipal railway system carried 630,559 more passengers in the first seven months of 1920 than in the corresponding period for 1919. From Jan. 1 to Aug. 1 the number of passengers carried was 74,832,148, compared with 74,201,589 for the same period in 1919.

Railway Would Sell

Price Made to Ontario Hydro-Electric Commission for Toronto Railway and Allied Lines

Negotiations which have been carried on between Sir Adam Beck, chairman of the Ontario Hydro-Electric Power Commission, and Sir William MacKenzie, president of the Toronto Railway, have reached the point where a price has been made by Sir William MacKenzie for the sale to the Power Commission, on behalf of the Ontario Municipalities, of the Toronto Railway, the electric power generating plant at Niagara Falls belonging to the Electrical Development Company of Ontario, the transmission lines from Niagara to Toronto and the distribution system in Toronto belonging to the Toronto & Niagara Power Company; also the Metropolitan Railway line on Yonge Street and the Port Credit and Scarborough radial lines.

POWER CONTRACT A FACTOR

The quoting of a lump price will place upon Sir Adam Beck the responsibility of apportioning the cost to be borne by the city of Toronto and the other Hydro power and Hydro-radial municipalities which are now using the Hydro-Electric power.

The prime consideration which it is reported is impelling Sir Adam Beck toward acceptance of the offer of the MacKenzie interests is the fact that in October next a five-year contract with the Toronto Power Company expires under which that company supplied the Ontario Power Company (now owned by the Hydro-Electric Power Commission) with 13,000 hp. at $13 per horsepower.

The Hydro Power Commission has been notified that this supply of power will be cut off. This would cause much embarrassment to the Hydro Commission in view of the fact that the latter is now short of power owing to the great demand made upon it. As the Toronto Power Company (owned by the Toronto Railway-MacKenzie interests) can readily get $35 per horsepower at present, it is not surprising that the company refuses to renew the contract with the Ontario Commission.

$28,000,000 OF SECURITIES INVOLVED

This important deal will include the local power, light and radial and railway lines in Toronto. It will involve approximately $28,000,000 of bonds and securities. Before the purchase can be consummated the consent of the Provincial Government will have to be obtained.

It would cost about $2,500,000 and take nearly a year to link up the Hydro substations with the Toronto Railway system in order to give a service next September when the railway franchise expires. In addition it is doubtful if the Chippewa development will be ready when the City Corporation of Toronto proposes to take over the property included in the Toronto Railway system next year.

Receiver Appointed for Kansas City Railways

Frank C. Niles Named Temporarily Pending Hearing on Sept. 30—Second Receivership in Nine Years

The Kansas City (Mo.) Railways went into involuntary bankruptcy on Sept. 9, on the petition of the Kansas City Refining Company, Kansas City, Kan. The amount of the debt, incurred for oil and material since July 1, 1920, was $21,404. There was no other petitioner. Acting on the application of the fuel company Judge Kimbrough Stone, sitting for Judge Arba S. Van Valkenburgh in the Federal Court, named Frank C. Niles, president of the Niles & Moser Cigar Company, temporary receiver. Mr. Niles will serve until Sept. 30, when a hearing to name a permanent receiver will be held in the Federal Court. Bond for Mr. Niles was fixed at $50,000. He was one of the original city directors of the reorganized Kansas City Railways under the new franchise and was reappointed in July, 1916.

ON July 3, 1911, the local company, then known as the Metropolitan Street Railway, was placed in the hands of R. J. Dunham, Chicago, and Ford Harvey, Kansas City, as receivers. This receivership terminated on Oct. 26, 1916, following the reorganization of the company under the name of the Kansas City Railways, July, 1914. It has continued since that time under the present management. This, then, is the second receivership that has occurred in the last nine years.

In the application for a receivership the Kansas City Refining Company set forth the following facts regarding the condition of the Kansas City Railways, which were admitted by the company in a bill of acceptance:

That the railway company operates 370 miles of track and equipment for the same in Kansas City, Mo., Kansas City, Kan., Independence, Rosedale, and in territories outside of those cities.

That it has a capital stock of $30,000,000 of which there has been issued and is outstanding stock to the amount of $100,000.

That the company is subject to a first mortgage dated in July, 1916, bonds of which are outstanding in the sum of more than $27,508,800.

That it also is subject to a second mortgage dated in July, 1916, bonds of which are now outstanding in the sum of $5,290,000.

That $11,590,600 of the first mortgage bonds have been pledged under indentures to secure gold notes of the company totaling $8,500,000 and that $1,000,000 of these notes are not paid, although due.

That the company defaulted in the payment of the interest due upon the first mortgage bonds on Jan. 1, 1920, and again on July 1, 1920.

That it defaulted in the payment of the interest on the second mortgage bonds and secured gold notes, which defaults have continued more than sixty days and are still unpaid.

That the company owes the Kansas City Refining Company $21,404 for materials and supplies.

That the company has been operating at a loss and has not been paying its operating expenses.

That the fare increases granted by the public authorities of Kansas and Missouri, upon whose decision the right to collect increased revenue depends, have not been sufficient to keep the concern going.

That 2,000 suits are now pending in the various courts in which damages to the extent of $20,000,000 are asked and that the company will be without means to meet judgments recovered in such suits.

That the railway has current liabilities in excess of $5,500,000, represented by notes payable for materials, equipment, taxes, and supplies for $2,230,000; vouchers payable for the same, $625,000; accounts payable for the same, $110,000; wages due employees, $400,000; moneys due to city for Twenty-third Street viaduct, $190,000, and accrued and matured interest, $2,000,000.

That judgments which have not been satisfied are now in the courts of Missouri and Kansas against the company totaling approximately $800,000, which include judgments rendered in the recent term of the Circuit Court for $180,000.

That the company is without means to fight such cases or properly handle them.

That there is an additional several million dollars of indebtedness arising from the default of the first and second mortgage interest payments.

That the creditors are pressing the company for immediate payment and that some of these creditors have threatened to bring suit and levy executions upon the company's property.

That there is danger that the lines of the company may be broken up and operated separately.

That the cities through which the lines run are making claims for large amounts of capital expenditures, totaling nearly $1,000,000, which cannot be obtained.

That there is a possibility that the company, through its financial condition, may default its franchise, and that the rights of the creditors should be ascertained and a receiver appointed.

Total liabilities are estimated at $37,917,000. The company's assets as fixed by the Missouri Public Service Commission at the hearing for increased fare last year are $27,866,345. This leaves a total liability over and above the assets of more than $10,000,000.

Following a conference of the officials of the Kansas City Railways, Col. Philip J. Kealy, president, gave out a statement in which he attributed the company's present situation to the failure of the public to grasp the full significance of conditions, of three years' standing. He said:

The Kansas City Railways has been compelled to accept a receivership of its property by reason of the increased indebtedness that has been constantly piling up for the past three years. The public from time to time has been advised of the growing indebtedness of the company; but for one reason or another, the public has apparently not fully realized the seriousness of the company's situation. Contrary to the popular notion, the Kansas City Railways is not owned by one man, or by any single interest, but is really the property of some 6,000 investors in its securities. Numerous savings banks, trust estates, life insurance companies and other such institutions, as well as private individuals, are the owners of the securities of the Kansas City Railways, and they have been the real sufferers from the inability of the company to make both ends meet.

The difficulties of the company date back more than three years, when the railway began to feel the effect of war inflation on prices of materials and labor. Such increases have continued progressively. The adjustments of fares have not been sufficient in time or amount to overcome the increased cost of operation.

The directors and the representatives of the securities holders have put forth strenuous efforts to avoid a receivership. Large sums of money have been advanced with which to continue the company's operation and meet its most pressing obligations. For example, representatives of the bondholders advanced nearly $500,000 last February to pay the taxes on the property due for the year 1919; and a year ago, several of the Kansas City banks united in advancing to the company $400,000 out of which the company met its payrolls.

The physical condition of the property, upon the whole, is very good. There is sufficient business in Kansas City to justify the continuance and full operation of this property upon a basis that is fair, both to the public and the investors. I believe that even now, with the proper kind of co-operation, this property can be put upon such a basis that the revenues will pay all reasonable operating expenses, provide an allowance for future replacements and afford a reasonable return to the investors.

The company's officials repeatedly have complained to the city that the operation of jitneys has reduced the company's revenue between $3,000 and $5,000 daily. This curtailment of income, in addition to the advanced cost of operation and maintenance, it had been prophesied, would lead to a receivership.

The first official order of Frank C. Niles, temporary receiver, was to the effect that all the officers and employees of the company were appointed as officers and employees of the receiver. No steps will be taken in the actual work of adjusting the company's financial difficulties until the court names a permanent receiver.

New Haven Changes Explained

There is misunderstanding, explains the Boston *News Bureau*, in the financial district relative to the granting of approval in the United States District Court, New York, for a merger of the Harlem River & Portchester Railroad and the Central New England Railway with the New York, New Haven & Hartford Railroad. Press accounts as to what the New Haven sought have been inaccurate and obscure. The *News Bureau* says that the New Haven actually asked:

1. Permission to merge the Harlem River & Portchester.
2. Permission to merge the Central New England.
3. Direction to trustees of the Connecticut Company stock to vote for a mortgage to secure Consolidated Railway debentures amounting to $10,884,000.

The merger of the two roads with the New Haven is both a logical and desirable development. The New Haven owns all of the Harlem River & Portchester stock and all but 50 shares of the capital stock of the Central New England.

These roads are really integral parts of the New Haven system and a merger is both in line with past policy of the New Haven and with the evident intent of the transportation act which permits mergers where desirable in the public interest.

The only obstacle to carrying this out, so far as the New Haven was concerned, was possibly the federal decree of dissolution for the New Haven. Accordingly, the New Haven asked the court to modify the decree to permit the merger. As the department of justice agreed to this the District Court signed the order.

The real purpose in asking the Court to require the Connecticut Company to secure the Consolidated Railway debentures by a mortgage on its property was to relieve the New Haven, if it should ever mortgage its own property, of the necessity of securing these debentures by such mortgage.

The Consolidated Railway, which formerly owned, controlled or leased a large number of electric railways and public utilities in New England, was merged with the New Haven in 1910. The 400,000 shares of stock of the Connecticut Company, controlling trolley lines in Connecticut, are owned by the New Haven but are in the hands of trustees under the dissolution decree.

Judge Mayer, in the District Court, declined to grant the New Haven's request with reference to the Connecticut Company until the electric railway situation in Connecticut has been straightened out to greater extent.

City Wants Fund

Asks That Dividend Over 6 Per Cent Be Returned by Cleveland Railway—Company Going Behind

The Mayor of Cleveland, Ohio, has ordered Street Railroad Commissioner Fielder Sanders to make formal demand on the Cleveland Railway for the return of $72,000 paid stockholders on April 1 as dividends at the rate of 7 per cent. If the $72,000 is paid back it will keep the interest fund, the fare barometer, from going below $300,000 as of Aug. 31, and will put off a fare increase until the interest fund goes below that figure despite the addition of the $72,000.

It is understood the company takes the position that the $72,000 was paid legally because petitions for the referendum, which defeated the dividend increase from 6 to 7 per cent, had been held invalid by the Common Pleas Court at that time. It was on additional petitions that the election was brought about which defeated the dividend increase Aug. 10.

A report made by city accountants to Commissioner Sanders showed that in June, July and August the actual cost of operating the system exceeded the income by $415,087 under the present rate of 5 cents.

The company has operated under a deficit of 2 cents a car-mile in the last six months, President John J. Stanley advised Council. That is why he asked for an additional allowance of 4 cents a car-mile for operation, 2 cents to make up the deficit and 2 cents to break even in the ensuing six months.

Accountants have reported to Commissioner Sanders the receipts, costs and deficits in the three months after the new wage increase of 25 per cent went into effect May 1 as follows:

May—Receipts $1,498,405.52; cost of service $1,542,056.96; deficit $42,651.44.

June—Receipts $1,507,526.76, cost of service $1,731,869.10, deficit $224,342.34.

July—Receipts $1,531,008.56, cost of service $1,679,101.84, deficit $148,093.28.

This is a partial report. As soon as the report is complete, Mayor FitzGerald will call a meeting of the street railway committee and ask as to the city's course on the allowance demands.

Utility Investments Will Be Stabilized

Large speculative profits in public utility securities are a thing of the past, according to H. M. Addinsell of Harris, Forbes & Company, New York, N. Y., investment bankers, who is a member of the public utility committee of the Investment Bankers' Association. It is his contention that securities of this character, because of the public necessity which the industries serve, and because of the regulation which is consequently put upon them, will eventually become in the nature of quasi-municipal securities enjoying somewhat the same degree of stability as municipal issues.

In an address at New London on Sept. 15 before the annual convention of the Association of Edison Illuminating Companies he emphasized the fact that the public utilities need fair play and a square deal. After discussing the various methods of financing that are open to these properties and the necessity for regulation sufficiently elastic to permit changes in rates to meet varying costs of operation, he said in part:

> We may just as well face frankly the fact that the day of possible large speculative profit in public utility securities is passed.
>
> With the regulation that exists and the incontrovertible fact that these industries are an indispensable and permanent part of the economic structure of the communities they serve they are becoming, and I think will become, increasingly of the nature of quasi-municipal securities.
>
> I look forward to the day when the public utility practice and financing will be so standardized and stabilized that the securities of these companies, at first in the larger communities and eventually everywhere, will command a market closely approximating—both as to level and real marketability—that enjoyed by the obligations of the municipalities themselves.
>
> I think that eventually some combination of the indeterminate permit and service-at-cost franchise will be universal. I perhaps should mention, however, that in view of recent experience, to be satisfactory, such franchises should contain no maximum rate and should provide a cushion in the form of a reserve fund to take up slack pending the readjustment of rates and thus insure continuously to the companies the fair rate of return on their investment that is contemplated by such a franchise. So the broad solution lies in frankly putting the cards on the table and letting the light of publicity shine on the problems and purposes.

New York Gross Increases

Deductions, However, Overbalance Gross Income—Net Corporate Income Shows a Deficit

The October-December, 1919, quarterly report of the revenues and expenses of the surface and rapid transit electric railways operating in New York City has recently been issued by the Public Service Commission for the First District.

The summary shows that passenger revenue has increased $5,823,929 or 23.8 per cent over the 1918 quarter. Operating expenses increased by 31 per cent from $18,671,000 in 1918 to $24,445,000 in 1919. Total deductions from the gross income of the various companies increased about the same amount as the gross income itself.

EARNINGS OF NEW YORK CITY COMPANIES

Quarter October—December	1919	1918	Percentage Change
Passenger revenue	$30,320,201	$24,496,272	+23.8
Other transportation revenue	195,436	177,757	+10.0
Total revenue from transportation	$30,515,637	$24,674,029	+23.7
Other railway operating revenue	2,222,644	1,431,577	+55.3
Total railway operating revenue	$32,738,281	$26,105,606	+25.4
Operating expenses:			
Maintenance expended	$6,101,896	$5,137,886	+18.7
Depreciation reserve	562,993	Cr. 903,074	+162.5
Operation of power plant	4,462,132	3,729,806	+19.6
Operation of cars	11,242,763	8,566,902	+30.9
Injuries and damages	888,866	1,253,400	—29.1
Traffic and general expenses	1,186,483	885,593	+33.9
Total operating expenses	$24,445,132	$18,671,513	+30.9
Net operating income	$8,293,149	$7,434,093	+11.6
Street railway taxes	1,820,784	1,914,442	— 4.9
Operating income	$6,472,365	$5,519,651	+17.3
Non-operating income	$1,099,677	1,062,834	+ 3.5
Gross income	$7,572,042	$6,582,485	+15.0
Deductions from gross income:			
Interest	$5,552,298	$4,557,012	+21.8
Rents	3,769,038	3,956,348	— 4.7
Miscellaneous	642,767	421,831	+52.5
Total deductions from gross income	$9,964,103	$8,935,191	+11.5
Net corporate income	*$2,392,061	*$2,352,706	— 1.7

* Deficit.

Net Corporate Income Unchanged

Net corporate income was approximately the same as the corresponding quarter a year previous, the increase in deficit being only $40,000. This made a total deficit of $2,392,061 for 1919. The operating ratio increased only 3.3 per cent, although approximately 90,000,000 more passengers were carried than in 1918, and the car-miles increased by 4,000,000 or 4.7 per cent.

TRAFFIC AND MISCELLANEOUS STATISTICS OF NEW YORK CITY COMPANIES

Quarter October—December	1919	1918	Percentage Change
Miles of track, exclusive of storage and yard tracks	1,789.62	....	......
Average daily maximum number cars operated (Dec.)	8,069	....	......
Passenger car-miles (active)	85,454,471	....	......
Car seat miles	4,267,022,623	....	......
Total revenue car-miles	87,099,022	83,151,313	+ 4.7
Passenger car-hours	7,253,771	....	......
Ratio C. M. to C. H. (speed m.p.h.)	11.76	....	......
Revenue passengers	603,472,394	491,785,623	+22.7
Revenue transfer passengers	12,587,642	....	......
Total revenue passengers	616,060,036	491,785,623	+25.3
Free transfer passengers	32,120,419	66,821,552	—51.9
Total passengers	648,180,455	558,607,175	+16.0
Operating ratio	74.67	71.38	+ 3.3
Statistics per car-mile:			
Operating revenue (cents)	37.55	30.21	+24.3
Operating expenses (cents)	28.10	22.48	+25.0
Net income (cents)	*2.75	*2.83	— 2.8
Number of passengers (total)	7.44	6.73	+10.5
Car-miles per revenue passengers	0.144	0.169	-14.8

* Deficit.

Mr. Allen Has Plan to Rescue Road

C. Loomis Allen, president of the Syracuse & Suburban Traction Company, Syracuse, N. Y., has sent to Ira L. Terry, chairman of the committee appointed by the Long Island Real Estate Board, a sketch of his proposal for the operation of the New York & North Shore Traction Company, which has recently discontinued service on its lines between Flushing and Roslyn.

His proposition is that the line should be purchased outright, that the power house at Douglaston, which has long been a burden to the company, be disposed of and that power be purchased. He further believes that one-man cars should be substituted for the present equipment.

Mr. Allen considers that about $350,000 would be sufficient to purchase the road and meet all these needs. He bases his belief that the road could be put on a sound operating basis on the decision of the Court of Appeals that the Public Service Commission had a right to grant an increase in fare to the line if the franchise had been granted since the passing of the law creating the commission.

In the matter of fares Mr. Allen has indicated further that Long Island residents are willing to pay an increased fare if the operation of the cars is assured them. The Real Estate Board will consider the proposition of Mr. Allen and if thought practicable a stock corporation will be formed.

Financial News Notes

May Issue Common Stock.—The Public Service Commission for the Second District on Aug. 27 authorized the International Railway, Buffalo, N. Y., to issue $792,500 in common stock. Proceeds to be realized from the stock are to be used to pay for additions and betterments to the railway.

Deferred Dividends Paid.—A dividend of 2½ per cent was paid on Aug. 20 on the preferred stock of the Washington Railway & Electric Company, Washington, D. C. This represented the quarterly disbursements of 1¼ per cent which were due on March 1 and on June 1 and on which no action was taken because of the poor financial condition of the company. No action has been taken on the quarterly dividend that fell due on Sept. 1.

Interest Payment Postponed.—The directors of the Hudson & Manhattan Railroad, New York, N. Y., at their August meeting decided that income from operation has been insufficient to permit the resumption of interest payment on the 5 per cent income bonds on Oct. 1. It was explained that this was but a formal action, as there has been no intention of resuming payments at this time.

Municipal Line Going Behind.—The report of operation of the Tacoma (Wash.) Municipal Railway for the month of July shows a loss of $5,010. Operating revenues amounted to $11,879, with operating expenses of $13,916. Interest on the investment and other charges against the line ran the deficit to more than $5,000. Commissioner Harrison hopes to reduce operating expenses by the use of one-man cars, which are under construction at the present time.

Corporate Changes Planned.—A company bearing the name of United Light & Railways Company was incorporated under the laws of Delaware on Sept. 8 with a total authorized capital of $50,000,000. This action, it is understood, is in line with a plan to be presented to the directors of the existing United Light & Railways Company, Grand Rapids, Mich., shortly, a scheme for changes in the corporate organization and in the capitalization.

Interest Payments Put Over.—The trustees of the Eastern Massachusetts Street Railway, Boston, Mass., state that coupon interest due on Sept. 15, 1920, on $972,000 of Series C bonds, amounting to $29,160 and coupon interest due on Oct. 1, 1920, on Series D bonds, amounting to $24,180 will not be paid at maturity. The public trustees have been obliged to extend this interest under moratorium privilege of the mortgage indenture, because the company has no available income for its payment.

Will Abandon Penn Line.—By authority of the State Public Service Commission, the Waverly, Sayre & Athens Traction Company, Waverly, N. Y., will abandon a portion of its line in Pennsylvania. The parts of the line to be given up are those found by the commission to be unremunerative and such a burden that to require continued operation under the circumstances would be unreasonable. They comprise 2,000 ft. at the extreme southern end of the line at Athens, and the South Waverly branch.

Bluefield Traction Deal Completed.—President Hardy and General Manager Evans of the Princeton Power Company have reported to the board of directors of the Bluefield Chamber of Commerce that at a meeting of the stockholders of the Princeton Power Company held recently plans for taking over and operating the railway system of the Appalachian Power Company, in Bluefield and Graham, W. Va., had been approved, and that within sixty to ninety days the line would be under the new management. Relative to the suggestion of changing the name of the Princeton Power Company in order that Bluefield would appear in the official title it was decided to appoint a committee from the Bluefield chamber to confer with a similar committee from the Princeton Chamber of Commerce. The name Bluefield-Princeton Traction Company is one to be considered.

Consolidation Talk Again.—The city lines of the Spokane & Eastern Railway & Power Company, Spokane, Wash., carried 765,181 passengers during the month of July, from whom it collected $40,026 in 6-cent fares. The cars were operated 168,685 car-miles at a cost including depreciation of $45,620. Plans for the consolidation of this property with that of the Washington Water Power Company, are again being discussed and have reached the same stage as when the matter was in the air several years ago, namely, a committee of engineers and accountants has practically completed the assembling of data which will show the gain to be made by the elimination of competing lines and the building of physical connections. Jacob Taylor, Chicago, president of the Spokane & Eastern Railway & Power Company, is expected in Spokane soon, at which time the consolidation plans are to be taken up again.

Abandoned Road Reported Sold.—The recently incorporated North Carolina Lines, Inc., Charlotte, N. C., is reported to have purchased the franchise rights of the Charlotte Rapid Transit Company. The latter road went into the hands of a receiver in 1918 and its effects were sold early in the present year at auction. The property consists of 2 miles of track and overhead work with some additional poles, ballast material and other supplies. Service was discontinued on May 19, 1918. Reference to the affairs of the company was made in the ELECTRIC RAILWAY JOURNAL for March 27, 1920, page 669. The North Carolina Lines, Inc., contemplates constructing an electric railway from Charlotte to Winston-Salem. Among the incorporators are Harry F. Hahn, Winston-Salem, and John McGibbons, vice-president of the U. S. Fidelity & Guaranty Company, Baltimore.

Viaduct Payments Not Made.—The Hecker Construction Company, building the Twenty-third Street viaduct, has complained to Mayor Cowgill that the Kansas City (Mo.) Railway is in arrears in the payment of its proportion toward the construction of the viaduct, estimated to cost $750,000. The company's proportion, including engineering and inspection fees, amounts to $267,000, and all it has paid of this amount is $25,000 in cash and $30,000 in materials. Philip J. Kealy, president of the railway, said he thought if the city advanced the $85,000 the company could pay it back shortly from revenues anticipated as a result of negotiations pending for the sale of carhouses at St. John and Denver Avenues and Montgall and Nicholson Avenues respectively and the sale of the present buildings used for general headquarters at Fifteenth and Grand, and the sale of power houses, substations and transmitting lines to the Kansas City Power & Light Company. The receipts from the sales to the light company were estimated at $6,500,000.

Traffic and Transportation

Would End All Transfers

President Mitten Proposes New Plan to Meet P. R. T. Needs—Would Yield $350,000 Monthly

Abolition of all transfers of whatever nature is now proposed by Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, as a temporary solution of the system's financial problems. Under the new plan as outlined by Mr. Mitten on Sept. 14 in a letter to the Philadelphia City Council the basic 5-cent fare would be retained.

FRANCHISE DRAFT PRESENTED

The issuance of the 3-cent "exchange tickets," as well as free transfers, would be discontinued. Mr. Mitten estimates that the company's revenue would thus be increased to a sufficient extent to enable it to pay the carmen the wage increase due them.

With his letter to Council, Mr. Mitten submitted a draft of a proposed ordinance granting to the P. R. T. permission to apply to the State Public Service Commission for approval of the new fare system. The proposed tariff change would be temporary in character and would remain in force until the commission, on the basis of the valuation of the company's properties now under way, had been able to fix a permanent rate.

Mr. Mitten pointed out that the company's need of immediate financial relief resulted from the failure of the Union Traction Company, chief underlying company of the P. R. T. system, to sanction an issue of $6,000,000 in equipment trust certificates. Under a continuance of existing conditions at the end of the current year, Dec. 31, the company will be short approximately $2,000,000 and at the rate of about $4,500,000 for the next twelve months. Of the P. R. T.'s present condition, Mr. Mitten said:

> Increased revenue is immediately necessary not only to meet the already overdue wages of the men and other increased costs of operation but also to place the company in a position properly to handle the rush-hour traffic of the coming winter and later to operate city-built lines.

MR. MITTEN'S LETTER

The discontinuance of all transfers is expected to yield increased revenues of $350,000 monthly.

Mr. Mitten's letter follows in part:

> P. R. T. has for ten years past increased in prosperity under present direction. Until overcome by war-time costs P. R. T. has consistently increased its earning capacity; nevertheless, in its endeavor to improve service, has confined its dividend payments to but 5 per cent per annum. and has put back into the property by way of improvements over $4,000,000 of its net earnings which might otherwise have been used to make payment on account of the deferred dividends due to P. R. T. stockholders at the rate of 6 per cent per annum under the terms of the 1907 agreement. * * *
>
> The company, after careful consideration, is of the opinion that the simplest and most effective method of now securing the required increase will be to abolish all transfer and exchange tickets and make a straight charge of 5 cents for each ride. By this means it is estimated the company's revenue will be increased by about $350,000 per month, an amount imperatively needed for the continued operation of the company. * * *
>
> Seven hundred and sixty million passengers or 76 per cent of all present passengers, will, it is estimated, be carried, without change of cars, for a 5-cent fare. These 5-cent passengers will not, therefore, be disturbed so as to lessen the number of short riders, in the encouragement and accommodation of which so much work on the part of both management and men has been expended.
>
> It is estimated that of the present 230,000,000 free transfer and 3-cent exchange passengers per annum 100,000,000 will no longer make use of this privilege for very short distances. They do so now simply because it can be done for little or no cost. If this estimate be correct there will thus be provided an added available car capacity equal to 100,000,000 passengers per annum for those passengers whose ride is of sufficient importance to justify the payment of a 5-cent fare.

Right-Hand Running Planned

A change in street traffic to operate in accordance with the right-hand rule in conformity with the rest of the continent is about to take place in the Province of British Columbia. Traffic in that province has always conformed to the English or left-hand rule. This is believed to have increased accidents and decreased automobile traffic from outside the province. There are no large cities in the province except Vancouver and Victoria. These and the neighboring communities of New Westminster and North Vancouver are the only ones with electric railway systems, except that in Nelson there is a small road which operates two cars.

The railways and other electrical utilities in Vancouver, Victoria, New Westminster and North Vancouver are operated by the British Columbia Electric Railway. The work of making this change will, therefore, be entirely a matter of the cost of changing the electric railway systems. The province has been divided into two parts separated by a range of mountains over which there is no road communication. The right-hand rule went into effect on July 15 in the interior of the province. It will not go into effect in that part occupied by the cities named until a date yet to be decided. This will depend upon the time required for changing the special work and switches and rearranging the car platforms.

Estimates of the cost of the change to the railway range from $1,000,000 to $1,500,000. The allocation of this cost has not been decided, but the British Columbia Electric Railway contends that the provincial government should assume part of the cost inasmuch as the railway built its system in conformity to the road regulations which are now being changed at the request of the people.

Norfolk Report and Valuation Completed

A. Merritt Taylor and his associate, Charles B. Cooke, Jr., have completed their report on the Norfolk street railway problem. Mr. Taylor has filed the report together with his recommendations, with the Norfolk Public Utilities Commission. This report was made at the instance of the city. Its purpose is to develop and define the respective rights and obligations of the city and of the Virginia Railway & Power Company. It includes a valuation of the company's property, a complete plan for the rehabilitation and extension of the company's property, definite recommendations with respect to rates of fare, and a complete outline of a recommended franchise which is designed to protect and advance the interests of the city and of the company and protect the capital invested in the public service.

It is understood that the report constitutes a very thorough treatise on all problems entering into valuation, rate making and franchise writing. It also discusses the jitney problem.

Because of Mr. Taylor's broad experience as a builder and operator of electric railway properties, as director of the Department of City Transit in Philadelphia, and as director of the Department of Housing & Transportation of the Emergency Fleet Corporation, where he had the responsibility of transportation to 180 shipyards, this report will be awaited with great interest by the electric railway industry. It will be published, it is understood, within a few days.

Echoes of the Denver Strike

A mass meeting was held in the Municipal Auditorium at Denver, Col., on Sept. 13 to argue the strike. It was really an indignation meeting of union labor. G. Y. Harry, federal mediator and member of the National Labor Board, supposed to be a non-partisan, showed in his talk that he was a labor man and pointed with pride to the fact that the head of the department he represented was a union man and that he (Harry) advocated the closed shop.

The strikers apparently have some big point in view to accomplish their work. This seems to be in the form of initiated petitions being circulated on Sept. 16, calling for a special election for municipal ownership of the Denver Tramway. One of the sponsors of the petition is Henry Silberg, executive of Tramway Local 746, who is now in jail.

William Thornton, vice-president of the Colorado State Federation of Labor; William J. O'Brien, former president of the Tramway Employees' Union, and Charles Ahlstrom, president of the Denver Trades and Labor Assembly, have been indicted by the Grand Jury for inciting to riot. F. W. Jefferay, local clothing merchant and persistent villifier of General Manager Hild of the tramway, for four years, has also been indicted for inciting and participating in riots.

Bay State Fares Up

Company Advances Rates to Meet $1,400,000 Additional Wage Payment —May Shut Down Lines

To secure sufficient revenue for the payment of increased wages to its employees, the Eastern Massachusetts Street Railway, Boston, planned to place a revised schedule of rates in effect on Sept. 15. At the same time the railway management announced that higher fares alone would prove inadequate, and that the only hope of continued operation lay in the practice of the strictest economy. It also notified its employees that it would begin at once a policy of laying off all men who could be spared.

WAGE INCREASE BRINGS CRISIS

The immediate cause of these measures was the award to the carmen of $1,400,000 in increased pay, discussed at length on page 562 of this issue. Even before the granting of the higher pay the railway was losing money on all but one of its divisions. The company operates over 750 miles of street railway lines running from the New Hampshire line on the north to Boston. On the south its lines extend from Quincy to the Rhode Island boundary. The principal cities affected are Lowell, Lawrence, Haverhill, Salem, Lynn, Peabody, Chelsea, Revere, Woburn, Melrose and Malden on the north of Boston and Brockton and Taunton on the south.

Under the new fare system free transfers are discontinued. The sixteen-ride ticket, selling for $1, is withdrawn, a fourteen-ride ticket selling at the same price taking its place. This ticket is good only for rides in more than one zone and in all cities and towns except Lynn, which is given a fifteen-ride ticket for $1. Fares between Boston and Revere and between Lynn and Peabody are raised from 10 cents to 15 cents, while the fare between Boston and Lynn is advanced from 25 to 30 cents. The ten-ride ticket between Lynn and Boston is replaced by an eight-ride ticket selling at $1.50, the price remaining unchanged. Zones are also shortened in a number of cases.

NO RISE IN FALL RIVER

Fall River will be the only city served by the company which will not be affected in any way by the new schedule. Fares there will stay at the old figure because the district is earning its cost of service according to the public control act under which the road is operated. Each month has shown receipts enough to cover all expenses and leave a surplus. Homer Loring, chairman of the trustees, said yesterday that he attributed the success of the road in that district to public co-operation and particularly to the work of the home rule committee, headed by James Tansy, president of the Fall River Textile Council.

With regard to the possibility that the railway might be forced to discontinue a number of its lines if the revenue were not increased, an official of the company said:

> Following every increase in fares traffic has fallen off. We do not anticipate any falling off now, but if the lines are found not to be supporting, it is probable that they will have to be lopped off and service discontinued.

The railway management on Sept. 13 summoned the joint conference board, representing the carmen, and announced that it would begin at once a policy of rigid economy embracing a more extended use of one-man cars and the laying off of many employees. The company's labor's committee reported that the joint board promised co-operation of the workers in cutting expenses and realized they would have to expect a weeding out of employees who could be dispensed with, if the rest of the men were to hold their jobs at increased pay. It was Manager Fritch who announced that the curtailing of the working force would be so regulated that it would not in any way cripple the service.

Louisville Fares Await Election

There have been no developments of real interest lately in the fight of the Louisville (Ky.) Railway for higher fares. The "service-at-cost" plan of the Round Table Club apparently didn't get anywhere. The ordinance of the railway before the City Council was withdrawn. The various civic clubs, especially the smaller suburban ones, are voting pretty freely against any increases. The Board of Trade has again taken up a discussion of the matter.

Politics and the fall election have some considerable bearing on the matter. A member of the City Council, in discussing the increase on Sept. 10 with the representative of the ELECTRIC RAILWAY JOURNAL at Louisville, said:

> The company must have an increase. I'm for it, and a lot of the other members are. However, there will be no service-at-cost plan. If there is any advance in fares it will be a flat increase, probably for one or two years, or under an agreement that the Council may renew the option at the end of one or two years. However, there isn't going to be anything done in the matter until after election. Everyone is sparring for time in the interval.

The man who made this statement is one of the best posted and shrewdest men in the Council. The slow progress that is being made bears out this statement.

Six-Cent Fare Stands

The State Board of Public Utilities Commissioners has issued an order authorizing the Hudson & Manhattan Railroad, N. Y., to continue to collect a 6-cent fare between points in Hudson County, New Jersey. The company is required to refund 1 cent upon arrival at the point of destination, and to extend the time for redemption of excess fare tickets from ten minutes to one-half hour. The company was recently authorized by the Interstate Commerce Commission to raise its fare between New Jersey and downtown New York to 6 cents.

Bus Compromise Likely

Seattle May Allow Jitneys to Operate on Some Routes—Drivers Offer to Pay City

An ordinance recently drafted by Corporation Counsel Walter F. Meier of Seattle, Wash., and transmitted to the City Council, provides new jitney regulations that would mean a compromise between the present jitney ordinance and complete ban of buses from the city streets. The bill provides for the creation of an area in the business district, in which section no jitneys would be permitted to operate.

RESTRICTIONS SUGGESTED

To operate in districts outside the area, jitney drivers would be compelled to file applications for permits with the city comptroller, specifying the routes, terminals, schedules and rates of fare desired, and such permits would then be automatically granted by the comptroller without reference to the Council. The proposed bill, if adopted by the Council, would have to be submitted to the voters at the municipal election next March, as an alternative measure to the jitney initiative measure, which would permit jitneys to operate without city restrictions in any part of the city.

It also offers an alternative to the proposed ordinance which is to be considered soon by the utilities committee of the Council. This would entirely ban jitneys from operating within the corporate limits of the city. The new bill does not stipulate any rate of fare to be charged for jitney transportation, as is provided in the present regulations, since the city was enjoined from enforcing that part of the present ordinance by a decision rendered in the Federal Court. The bill provides, however, that persons operating jitneys must first obtain a permit from the city comptroller, and such permit must be posted on the front side of the machine's windshield. It would then be unlawful for any jitney driver to charge a fare other than that specified by the permit, or to operate over any routes other than that specified. It also provides that all buses will be subject to inspection by the Department of Public Utilities.

CASE BEFORE COURT

The State Supreme Court has taken under advisement the case of the Seattle jitney interests' suit to prevent the King County Superior Court from vacating the temporary injunction under which jitneys are now operating in Seattle. Decision in the matter was deferred after hearing the arguments of Assistant Corporation Counsel George A. Meagher, representing the city, and W. R. Crawford, representing the jitney interests.

The attorney for the jitney drivers has made a tentative offer to the city utilities committee to pay ½ cent to the city for every passenger carried into or out of the business district by the jitney buses.

Winnipeg Fares Up

Granting of Seven-Cent Rate by the Manitoba Commission Rounds Out Rehabilitation Program

Seven cents became the cash fare on the city lines of the Winnipeg (Man.) Electric Railway on Sept. 1. Four adults' tickets and seven children's tickets are sold for 25 cents. The sale of workmen's tickets at reduced rates has been discontinued. Fares on the company's suburban lines are raised approximately 25 per cent. The fare on the Winnipeg local lines was formerly 6 cents.

These increases were authorized by the Manitoba Public Utilities Commission in a judgment handed down on Aug. 23. During the past two years the commission has conducted an elaborate and thorough appraisal of the company's property, which it has valued at $24,369,431. The commission fixed 8 per cent as constituting a fair return on the investment. The commission further points out that the new fares will provide surplus funds for contingencies.

Many Obstacles Overcome

This decision of the commission marks the successful close of a vigorous and consistent effort to put the Winnipeg Electric Railway on its feet, lasting since October, 1917, when A. W. McLimont took charge of the property as vice-president and general manager. At that time jitneys were on the street, making inroads into the company's revenues to the extent of $1,000,000 a year. Traction fares were the same as those set in the original franchise, averaging 3.85 cents for each revenue passenger. Public opinion toward the company was not of the friendliest, while labor troubles were a continuous menace.

In the winter of 1917 Mr. McLimont conducted a campaign against the jitneys which resulted in their complete elimination from the streets in April of the following year. Incidentally he accomplished reforms in the matter of service, such as the inauguration of the skip-stop system, re-routing and other improvements which resulted in the revenue per car mile being increased very appreciably.

Commission Grants Relief

Four months after the elimination of the jitneys the company petitioned for increased fares. An interim increase was granted. The commission decided to make an appraisal of the company's property in order to fix a fare "which will produce revenue sufficient to cover operating costs and insure a fair return being paid those whose money is in the property." Twelve months later, in October, 1919, while the appraisal was still being made, the company was granted a further increase to 6 cents cash fares, with reduced rate tickets. Now comes the 7-cent fare with the elimination of all but two classes of tickets and the assurance from the commission that these fares will be sufficient to permit adequate service being given, to keep the road in first class condition and to provide a return of 8 per cent.

Starting in the spring of 1918 the company embarked on a program to rehabilitate the rolling stock. The cars have been equipped with new motors, front and rear exits, and other improvements which make for more economical operation. Forty new cars have been purchased, thirty of which are now in operation. A sum of approximately $1,000,000 has been applied during the past three years to this rehabilitation program.

Will Bar New Haven Buses

An ordinance has been passed by the Board of Aldermen of New Haven, Conn., ruling motor buses off a number of streets in that city served by the Connecticut Company. The measure is similar to the one adopted recently by the city authorities of Bridgeport, and designates eleven streets in the central area of New Haven from which the jitneys will be barred. It is provided that all persons operating public service motor vehicles, while carrying passengers, "shall keep in the traffic route fixed in the ordinance."

Any person, firm, or corporation violating any of the provisions of the measure shall pay a fine of not more than $100 for each offence. The bus men have announced their intention of fighting the measure in the courts. They claim that it is unconstitutional in that it was not given a public hearing prior to its passage.

The subject of bus regulation originally came before the board as a result of a letter from Lucius S. Storrs, president of the Connecticut Company, to Mayor Fitzgerald. Mr. Storrs declared that the company might have to suspend service on its New Haven division if jitney competition were not curtailed. The Mayor sent this letter and a communication of his own, urging immediate consideration of the emergency, to the Aldermen. The jitney men contend that enforcement of the new measure would put them out of business and give the trolley company a monopoly.

Eight-Cent Fare in Geneva

The Public Service Commission for the Second District of New York has authorized the Geneva, Seneca Falls & Auburn Railroad, Seneca Falls, to charge a fare of 8 cents in Geneva including that part of the interurban line, city line to Lake road, and 8 cents in each of the existing zones. Commutation and school fares and chartered car rates remain unchanged. Book tickets may be sold as heretofore but on the basis of 7 cents for each zone involved. The new fare rates are effective for a year from Sept. 1 and thereafter until otherwise ordered by the commission. The fare on the company's line in Geneva has been 6 cents.

Ten-Cent Fare Needed

President Kealy Tells State Commission Why Kansas City Lines Must Have More Revenue

Officials of the Kansas City, Mo., Railways appeared before the Missouri Public Service Commission on Sept. 8 at a hearing on the petition of the company for a further increase in fare. The railway recently applied to the commission for permission to install a sliding fare system, based on the service-at-cost principle. Under the proposed plan the fare would advance to 9 cents or possibly to 10 cents cash, with three tickets for 25 cents. The fare is now 8 cents straight.

Office Workers Demand Speed

Phillip J. Kealy, president of the railway, in discussing the new plan before the commission, declared that a 10-cent fare would eliminate the inconvenience to the public of "making change." Mr. Kealy said that the dislike on the part of the public to make change was one reason why people were willing to pay 10 cents to ride in a jitney when they could ride at less cost in an electric car. He contended that a greater part of the jitney patrons were clerks and stenographers, to whom a saving by cheaper fare might mean more than to the more mature persons who almost uniformly use the street cars.

In discussing the jitneys, Mr. Kealy declared "that a rain during the rush hour was worth $1,500 to the company any day." He said, however, that this extra patronage drawn from the jitneys often came unexpectedly and caused complaint because the railway had not foreseen that sudden showers would demand more street cars downtown. He did not believe that a 10-cent fare would increase jitney riding. He added that he believed that the use of private cars would be curtailed somewhat in the next few months.

Bus competition is largely responsible for the company's present plight. On fair days, said Mr. Kealy, the jitnews haul about 42,000 persons. Without jitney competition, he said, the company almost would have earned its interest charges in the period between January and June. He said that in Kansas City the joint business of the electric railway and of its jitney rivals was growing about 4 per cent a year, despite the thousands of privately owned cars. However, because of the jitneys, he said that the company was carrying from 3 per cent to 7 per cent fewer passengers than under the 5-cent fare.

Passenger Cost 6.96 Cents

A cash fare of 10 cents, with tickets selling at three for a quarter, would bring the railway an average of 8$\frac{1}{10}$ cents from each passenger, according to Mr. Kealy. He pointed out that without taking into consideration any return on investment, the cost of carrying a passenger had increased from 3.6 cents to 6.96 cents.

No Opposition to Freight Increase

The petition of the Connecticut Company to the Public Utilities Commission for an increase of 40 per cent in its tariffs on all classes of freight was heard in the offices of the commission in Hartford on Sept. 16. The company wants a higher rate for freight on all sections of its lines except the New London Division. Victor S. Curtis, secretary of the company, and S. W. Baldwin, attorney for the company, presented the company's side of the case. No one appeared to oppose the granting of the increase. The company produced figures for the period from July, 1919, to June, 1920, showing that the trolley express service had been run at a loss. The commission probably will not decide for several days.

Ten Killed in Interurban Crash

Ten persons were killed and 100 others were injured, several of them fatally, when two interurban electric cars of the Denver & Interurban Railroad met in a headon collision on Sept. 6. The accident occurred near Globeville, Col., a Denver suburb. Failure on the part of the motorman of one of the cars to obey dispatchers' orders is said to have been the cause of the accident. Among those killed was Judge R. S. Morrison, pioneer resident of Denver and a recognized authority on mining law.

Transportation News Notes

Ten Cents on Newport Line.—The Bay State Street Railway, Providence, R. I., has raised the fare on its Bay State line from 8 cents to 10 cents. The company operates between Newport and the Massachusetts State line.

Twelve Cents on Interurban.—The Lawton Railway & Lighting Company, Lawton, Okla., has been granted authority to increase fares between Lawton and Fort Sill from 10 cents to 12 cents. The new rate took effect on Sept. 1.

Seven Cents in Each Zone.—Under authority of an order issued by the State Public Utilities Commission, the Western Virginia Traction & Electric Company, Wheeling, W. Va., has raised the fare in each of the four zones between Elm Grove, W. Va., and West Alexander, Pa., from 6 cents to 7 cents. The fare between Wheeling and Elm Grove remains at 10 cents. The total charge between Wheeling and West Alexander is raised from 34 cents to 38 cents.

Would Raise Spartanburg Fares.—George B. Tripp, vice-president and general manager of the South Carolina Light, Power & Railways Company, Spartanburg, S. C., recently asked the Spartanburg City Council to allow the company to raise its fare from 7 cents to 10 cents. Mr. Tripp also asked that the company be relieved of street paving, which under the franchise it is obliged to do. The company seeks also to be excused from extending its lines to Whitney and Clifton Streets.

Utah Interurban Wants More.—A petition was recently filed with the Utah Public Utilities Commission by the Utah-Idaho Central railroad, Ogden, requesting permission to increase its minimum charges between stations 5 cents for one-way and 10 cents for round-trip fares, making a minimum of 10 cents for one-way and 20 cents for round-trip rates. The change would affect about fifty stations in Weber, Boxelder and Cache counties. The company operates 137 miles of electric line.

Eight Cents in Muskogee.—The Muskogee (Okla.) Electric Traction Company has been authorized by the State Corporation Commission to charge an 8-cent cash fare on its city lines. The company is directed to sell two tickets for 15 cents and fourteen for $1. The new rates are to become effective at once. School children are to be allowed to buy twenty-five tickets for $1. Fares between Muskogee and Hyde Park are to be 15 cents each, and the line to Fort Gibson, is to be divided to five zones in each of which the fare is to be 8 cents.

Rate Interference Enjoined.—A temporary injunction has been issued by Circuit Judge Stout restraining the Kentucky Railroad Commission from interferring with the collection of rates now being charged by the Louisville & Interurban Railroad, Louisville. The company raised its fares on Sept. 1 without consulting the commission. The latter thereupon instructed the State Attorney General to take steps to prosecute the railway on the ground that it had violated the terms of an order issued by the commission a year ago fixing the fare to be charged.

Hearings on Scranton Plea.—Milton J. Brecht, a member of the Pennsylvania Public Service Commission, recently heard the petition of the Scranton Railway for permission to raise its fare to 10 cents. Counsel for the city of Scranton contended that although the company needs an increase in fare to meet obligations and to overcome a deficit a dividend was declared last winter when the railway deferred maintenance work, amounting to approximately $300,000. It was also claimed that last year the company carried more passengers than in any other previous single year and that some of the earnings from this source had been used to pay dividends.

Cars Collide; Five Persons Killed.—In a head-on collision on Sept. 5 on the Fairview line of the Monongahela Valley Traction Company at Baxter, W. Va., five persons were killed and about twenty-five injured. A passenger car bound from Fairview to Fairmont collided with a freight electric train heavily loaded. The freight train had followed a passenger car out from Fairmont and was scheduled to pass the passenger car bound from Fairview to Fairmont. The passenger car passed and instead of waiting in the switch for the freight train, which was signaled, the passenger car started toward Fairmont, and about a half-mile out the collision occurred.

Interurban Rise Postponed.—F. E. Connor, vice-president of the Spokane & Eastern Railway & Power Company, successor to the Spokane & Inland Empire Railroad, Spokane, Wash., has received notice from the State Public Service Commission that the company will be allowed to increase its interurban rates by 20 per cent beginning Sept. 26. The increase will be made to place the company on a par with the steam roads which received a similar increase recently from the Interstate Commerce Commission. The railway advanced its freight rates on Aug. 26. Mr. Connor has announced that simultaneously with the advance in passenger fares, the pay of the carmen in the company's employ will be substantially increased.

May Raise Syracuse Rate.—An increase in the fare charged on the Syracuse lines of the New York State Railways is likely in the near future. Mayor Farmer of Syracuse sometime ago appointed a committee of citizens to recommend measures of relief for the local system. The committee engaged the firm of Ford, Bacon & Davis, to investigate the local railway situation. In their report, which has just been submitted to the committee and which will now be placed in the hands of the Mayor, the engineers favor adoption of a service-at-cost plan for the Syracuse lines. If the city enters into a service-at-cost agreement with the company, the latter will make a number of improvements in its local service.

Will Hear Los Angeles Petition.—A hearing on the application of the Los Angeles (Cal.) Railway for an increase in fare will be conducted by the California Railway Commission in Los Angeles on Sept. 20. It is expected that one day will be sufficient for the railway to set forth its need for increased revenue. The commission is familiar with the affairs of the company due to the thorough survey made last year which resulted in the rerouting of the entire system last May and the establishment of safety-car service on some lines. The city has announced that it will ask a continuance of the case after the railway has presented its side so that the statements may be investigated. The Business Men's Co-operative Association, an organization of merchants, has announced that it favors an increase of fare, provided the new rate does not exceed 7 cents. The Los Angeles Railway is charging a 5-cent fare. The application for an increase does not ask a specific rate. The commission is asked to authorize what it considers a just and necessary fare to make income meet operating expense.

Personal Mention

F. C. Niles, Receiver

Temporary Representative of Court for Kansas City Railways a Successful Merchant of Broad Vision

Frank C. Niles, recently appointed temporary receiver of the Kansas City (Mo.) Railways by Judge Kimbrough Stone of the federal court, is an example of the quiet civic worker and high type of business man who comes into prominence only when matters are put up to him. He has never sought publicity, yet is known in Kansas City as an exceedingly efficient man, capable of carrying through any civic project for which he assumes responsibility.

Mr. Niles was born in Waymart, Wayne County, Pa., Oct. 21, 1858, the son of Frank Niles, a country physician. He started his business career at sixteen as a school teacher. One year later he took over the management of a country store in that section and ran it for three years. When he was between nineteen and twenty he went West and settled in St. Paul, Minn. For about ten years he traveled for a grocery and cigar house. Later he went to Kansas and traveled for the H. C. Fischer Company, Chicago. He was also on the road for a time for Rothenberg & Schloss when they were located in Leavenworth, Kan. In 1899 he went into business for himself and established a wholesale cigar business in St. Joseph, Mo., under the firm name of the Niles & Moser Cigar Company. Six months later the firm moved its headquarters to Kansas City. It is now one of the largest jobbing houses of its kind in the Middle West.

He was named one of the original city directors of the Kansas City Railways and was reappointed to that office in July, 1916. His appointment as temporary receiver met with the approval of R. J. Higgins, attorney for the railway; Arthur Miller, counsel for the Kansas City Refining Company, which initiated the receivership proceedings, and Henry R. Platt, Chicago, representing the bondholders' protective committee.

Otis Gerke has been appointed auditor of the Eastern Wisconsin Electric Company, Sheboygan, Wis. Mr. Gerke was formerly assistant to the auditor of the company.

A. E. Harvey, chief engineer of the Kansas City (Mo.) Railways, has been appointed a member of a National Committee on Employment of the American Association of Engineers.

J. A. Beard has been appointed general manager of the Richmond & Fairfield Electric Railway. The company is the successor to the Richmond & Seven Pines Railway.

C. D. Purkhiser has been appointed receiver of the Caldwell Idaho Traction Company. Mr. Purkhiser was formerly assistant general manager of the company.

B. McGinnis has been appointed master mechanic of the Albany Southern Railroad, Albany, N. Y. Mr. McGinnis was formerly general foreman of the company.

Dennis J. Cullinan has resigned as track foreman of the Bangor Railway & Electric Company, Bangor, Maine, after spending twenty years in the service of the company.

R. S. Reading has been appointed electrical engineer of the Galveston (Texas) Electric Company, the Galveston-Houston Electric Railway and the Houston Electric Company.

Oscar E. Parish has been elected vice-president and treasurer of the Richmond & Fairfield Electric Railway, Richmond, Va., the successor to the Richmond & Seven Pines Railway.

J. C. Robbins has been appointed mechanical and electrical engineer of the Albany Southern Railroad, Albany, N. Y., succeeding George Osburn, who has been made general superintendent.

George Osburn has been appointed general superintendent of the Albany Southern Railroad, Albany, N. Y. Mr. Osburn was formerly the chemical and electrical superintendent of the company.

E. P. Williams, assistant treasurer of the Baton Rouge (La.) Electric Company, has resigned to accept a position as assistant comptroller of the Godchaux Sugars, Inc., with headquarters in New Orleans, La.

R. R. Randall has been appointed an assistant engineer on the staff of the Federal Power Commission. Mr. Randall has been in immediate charge of water-power matters for the United States Forest Service.

J. C. Lamb has succeeded W. R. Bell as commercial agent of the Baton Rouge (La.) Electric Company. Mr. Lamb has for some years past been in the commercial department of the Tampa (Fla.) Electric Company.

H. C. Pressler has succeeded J. E. Gallaher as master mechanic of the Eastern Texas Electric Company, Beaumont, Texas. Mr. Pressler was formerly general carhouse foreman of the Galveston Electric Company.

J. V. Sutton has been appointed chief claim agent of the Southern Public Utilities Company, the Southern Power Company, and the Piedmont & Northern Railway, Charlotte, N. C. Mr. Sutton was formerly connected with the claim department of the Southern Railway.

William E. Blodgett, secretary-treasurer of the Utah Light & Traction Company, Salt Lake City, Utah, has been appointed comptroller of the Winnipeg (Man.) Electric Railway. Mr. Blodgett has been connected with the Salt Lake City company for several years.

Oliver J. Sands has been elected president of the Richmond & Fairfield Electric Railway, Richmond, Va., the successor to the Richmond & Seven Pines Railway. Mr. Sands, a Richmond banker, recently purchased the road, which is 8 miles in length, from the United States Housing Corporation.

Col. Bion J. Arnold, consulting engineer of Chicago, Ill., has been retained by the Hydro-Electric Power Commission of Ontario to make a report on the cost, earnings and operating expenses of the radial lines which it is the intention of the commission to construct in the near future.

Harry E. Gough, superintendent of generation of the Elmira Water, Light & Railroad Company, Elmira, N. Y., has been appointed assistant to the general manager. Mr. Gough will also act as superintendent of electric construction and as superintendent of the electric meter department.

J. L. Longino has been appointed manager of the Pine Bluff Company, Pine Bluff, Ark., which operates the electric railway system in that city. Mr. Longino succeeds J. A. Whitlow, who will in the future devote his entire attention to his duties with the Arkansas Light & Power Company.

Harry B. Cleveland has been elected secretary and treasurer of the Elmira Water, Light & Railroad Company, Elmira, N. Y., succeeding C. A. Kolstad. Mr. Cleveland, who was at one time auditor of the company, has been for a number of years an expert accountant with the New York State Tax Commission.

Emil Schroeder has been appointed superintendent of the Norwood Division of the Eastern Massachusetts Street Railway, Boston. The division, which has just been established, includes the company's Norwood & Walpole lines. Mr. Schroeder has been in the employ of the Eastern Massachusetts system for several years.

Edwin Gruhl has been chosen a vice-president of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Mr. Gruhl's election to this position follows quite naturally his assumption of the duties of a vice-president of the North American Company, New York, N. Y., which controls the Milwaukee system.

W. H. Flury has been appointed a division superintendent of the Georgia Railway & Power Company, Atlanta, Ga., to succeed R. W. George, resigned. Mr. Flury was formerly a car starter. He has been connected with the company and its predecessors since 1898. Since that time he has filled the positions of conductor, motorman, instructor, complaint investigator and starter.

James B. Neal, a motorman in the employ of the Boston (Mass.) Elevated Railway, has retired on a pension after fifty-two years of service with the Boston street railway system. Mr. Neal is known to thousands of patrons of the elevated lines as a special officer during the rush hours at the Copley Square and Massachusetts Avenue station in the Bolyston Street subway. He was a driver in the old horse car days.

Alfred C. Jordan, superintendent of equipment and distribution of the Elmira Water, Light & Railroad Company, Elmira, N. Y., will also assume the duties of superintendent of generation of the company. Mr. Jordan will have charge of the operation of the power house and all substations. He succeeds Harry E. Gough, who has been appointed assistant to the general manager.

Otto Gottschalk has been appointed engineer of railway equipment of the Havana Electric Railway, Light & Power Company, Havana, Cuba. Mr. Gottschalk was formerly master mechanic of the Richmond Light & Railroad Company, Richmond Borough, New York City. Before joining that company two years ago he was assistant superintendent of electrical equipment of the Interborough Rapid Transit Company.

W. O. Clure, general passenger agent of the Twin City Rapid Transit Company, Minneapolis, Minn., was severely injured on Sept. 6 when he stepped into an open elevator shaft, falling twelve feet. Mr. Clure is now in a Minneapolis hospital with a fractured pelvis, a fractured left wrist and a compound fracture of the elbow. The accident occurred at the general office building of the railway at Hennepin Avenue and Eleventh Street, Minneapolis.

William B. Graham, formerly superintendent of the Southern Division of the Public Service Railway, Newark, N. J., who has been appointed a member of the staff of N. W. Bolen, general superintendent, with headquarters at Newark, has been presented with a gold watch by carmen of the Camden local, No. 180, Amalgamated Association of Street & Electric Railway Employees of America. The presentation was made at a farewell reception to Mr. Graham held at the Camden carhouse.

Charles Whiting Baker, who was editor-in-chief of *Engineering News* from 1895 to 1917, and has been consulting editor of *Engineering News-Record* for the past three years, announces his retirement from engineering journalism to organize the Engineering Business Exchange. The headquarters of the Exchange will be at 30 Church Street, New York City; and its purpose is to bring together those desiring to sell any sound engineering or technical business, manufacturing, constructing, selling or professional, and those who seek opportunities to purchase. Appraisals of such enterprises and similar allied work will be conducted by the Exchange.

David H. Goodwillie, City Service Director of Toledo, Ohio, whose name has figured prominently in the controversy between the city and the Toledo Railways & Light Company, has resigned. Mr. Goodwillie has accepted a position with the Edward Ford Plate Glass Company, Rossford, Ohio. He has been Service Director since January, 1916. During his tenure of office he has been active in working out the valuation of the properties of the Toledo Railways & Light Company. He was the chairman of a committee of three which set the $8,000,000 valuation on the Rail-Light property.

Obituary

E. A. Maher, Sr., Dead

Former President Third Avenue Railway Was a Pioneer in Electric Traction and Lighting Fields

Edward A. Maher, Sr., formerly president of the Third Avenue Railway, New York, N. Y., died at his home in New York City on Sept. 13. Mr. Maher was seventy-two years old. He retired from the presidency of the Third Avenue system two years ago.

Mr. Maher's connection with the Third Avenue Railway began nearly thirty years ago. In May, 1917, when he was vice-president of the company, he completed twenty-five years of service with the railway. The unexpected death of F. W. Whitridge, then president of the railway, changed Mr. Maher's plan to retire and he was elected president. He resigned in the following year, however, after being actively engaged in business for more than fifty years. His son, Edward A. Maher, Jr., was formerly vice-president and general manager of the company.

Mr. Maher was born in Albany, N. Y. He was graduated from the State Normal School and then entered politics, being elected president of the Board of Supervisors of Albany County at the age of twenty-three years. He also served as a member of the New York Assembly and as Mayor of Albany in 1888 and 1889. Upon the expiration of his term as Mayor he was made president and general manager of the Albany Electric Illuminating Company.

In 1892 Mr. Maher became president of the Union Railway, New York City. When the Third Avenue Railway acquired the Union Railway's properties, Mr. Maher was retained as president and general manager of one of the subsidiary lines. He was appointed general manager of the Third Avenue Railway in 1908 and later was elected vice-president in addition. Three years ago he became president.

A. L. Neereamer Dead

Secretary of Central Electric Railway Association Dies Suddenly Following Stroke of Apoplexy

Albert L. Neereamer, secretary-treasurer of the Central Electric Railway Association for the last twelve years, died at his home in the city of Indianapolis on Friday evening, Sept. 10, following a stroke of apoplexy. Mr Neereamer had left his office shortly after 4 o'clock, and death came almost instantly while he was walking in his garden at the rear of his home.

Deep regret at the death of Mr. Neereamer was expressed by officials of the various electric railway systems operating out of Indianapolis. Robert I. Todd, president of the Indianapolis Street Railway and president of the Central Electric Railway Association, said:

> In the death of Mr. Neereamer the interurban railways of the Middle West suffer a signal loss. Realizing the advantages of an organization which would unite and coordinate the mutual interests of the electric railways in the States of Indiana, Illinois, Ohio, Michigan, Kentucky and the northern part of West Virginia, the Central Electric Railway Association was organized some twelve years ago. Mr. Neereamer was elected secretary and treasurer soon after the association was organized and filled that position continuously up to the date of his death. His genial personality and splendid executive ability contributed largely to the building up of the association. At its inception twelve years ago the association included only a few electric lines with a very small membership, while at the present time there are sixty-six interurban railways with a total of 5,238 miles.
>
> Mr. Neereamer also acted as chairman of the Central Traffic Association and helped materially in the compilation of joint passenger and freight tariffs, and the inauguration of the present interchangeable coupon mileage books.
>
> He enjoyed the esteem and confidence of the officers and employees of the various electric railways, who keenly feel his loss. It might well be said of Mr. Neereamer that "none knew him but to love him, or named him but to praise."

To his work for the association Mr. Neereamer brought experience in steam railroad, accounting and traffic handling. Almost single-handedly he took care of all the mass of routine, correspondence and study which was represented but not seen in the finished product. It was his undaunted spirit and that of a few others which carried the association successfully through the early period of its establishment.

Mr. Neereamer was fifty-six years old. Previous to taking up residence in Indianapolis he was general superintendent and traffic manager of the Columbus, Delaware & Marion Railway. He started his railroad career as a machinist apprentice in the shops of the Hocking Valley Railroad at Columbus, Ohio. He was later an engineer on this road. Mr. Neereamer then spent about three years in civil engineering work, and later became connected with the auditing department of the Hocking Valley and traffic department of the Columbus, Sandusky & Hocking Railway.

Mr. Neereamer was very active in Masonic affairs. He was a member of the Scottish Rite, of the Mystic Shrine and of the local Shrine Gatling Gun Squad. Mr. Neereamer is survived by his wife and a brother.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Raw Material Retarding Production of Electric Heaters

Shipments of Porcelain and Steel Are Slow—Prices Firm at Present—Labor Conditions Improved

Orders for electric railway heaters this season have not been up to the standard of other years, manufacturers report. Foreign inquiries are increasing, but the number of actual orders from abroad is light. The buying of heater repair parts, on the other hand, has been fully as large as in past years and perhaps even somewhat in excess of other seasons. The financial condition of many traction companies has resulted in fewer additions than usual being made to rolling stock and as a consequence the buying of new heaters has suffered.

This circumstance has been more than counteracted, however, by unfavorable conditions of production which manufacturers have met in respect to raw material. In an article which appeared in the April 3, 1920, issue of ELECTRIC RAILWAY JOURNAL deliveries were said to be lengthening and attention was called to the need of railways ordering heaters during the spring for use in the coming winter. Shipments of hollow ware and porcelain at that time were difficult to obtain under six to eight months. Several railways which heeded these conditions and ordered during April report that they are congratulating themselves upon receiving shipments in good time. Manufacturers seem to think there are still many traction companies which have neglected to order needed repair parts and heaters for this winter's equipment. If companies whose needs are not so pressing but which are anticipating future requirements should also dump their orders upon the manufacturer this fall, considerable delay and congestion may be expected to result.

CONDITIONS SLIGHTLY IMPROVED

Manufacturing conditions show some improvement over last spring. There is still much room for further betterment, however. The prices of raw material are now fairly steady compared with early summer, but are much higher than last year at this time. Porcelain plants are swamped with orders and the best shipments of this material that are promised range from three to four months, manufacturers report. Wire for resistance coils is reported in good shape as to shipments, but no reduction in price is expected for some time. Deliveries of steel are very slow, and the items that are used in heaters, such as sheets, clips, screws, fastenings, etc., are especially scarce. If this class of material is purchased from local stocks to cover rush orders premium prices are demanded and the material is not uniform. Transportation is easing up compared with the situation last spring, but the improvement on shipments of goods used by heater manufacturers has not been commensurate with other material.

Labor is now in greater supply, and a better class of workmen is said to be available. The production per man is also increasing. Prices of heaters are fairly firm at present and no fluctuation is apparently anticipated in the immediate future. Manufacturers state that in view of existing conditions traction companies should begin to take stock of their future needs for heaters and parts, with a view toward ordering their 1921 supplies by April for shipment next August or September.

Car Shortage to Blame for Wood Pole Tieup

Deliveries Slow in Spite of Sizeable Stocks at Storage Yards and Producing Points—Prices Show an Upward Tendency

Little improvement is evident in the transportation situation as it affects the wood pole supply, according to representative producers, for shortage of cars is still the main difficulty in filling orders promptly. Demand is holding up as strongly as it has been for some months. In some quarters the effect of the higher rates accorded to steam railroads is felt in heavier orders from them, and still other producers, who have not felt the increased buying yet, are anticipating it. Traction companies are not ordering heavily at present, it is stated.

Here in the East there is a considerable shortage, but at the producing points in the West fairly good stocks have accumulated, awaiting cars to carry away the poles. One of the large companies also reports good stocks at its storage yards in the Middle West, but another states that its supplies there are broken. Deliveries can be made from these storage points in from 4 to 6 weeks it is stated, while shipments from the Far West in general require from two to three months to reach the Atlantic seaboard. One of the largest pole consumers is sending out personal tracers in an effort to facilitate the movement of cars of poles. The unfavorable weather conditions last winter, when the lack of snow in the West hindered the work of getting out poles, is one of the factors to blame for present conditions.

In spite of the accumulation of back orders and the slowness of deliveries few cancellations have apparently been made. Hope is held out that if transportation continues to improve, all shortage of cedar poles will vanish. Chestnut poles, however, which have heretofore been in good supply, are now becoming more scarce. One reason for this is said to be the increasing difficulty of finding chestnut trees that are free from blight. The demand for yellow pine poles is reported as less than in other seasons. Stocks of these poles are rarely carried, and deliveries can be made in from two to four weeks.

Representative prices quoted on western red-cedar poles, f.o.b. New York, are as follows: 30-ft. 7-in. top, $11.30; 35-ft. 7-in. top, $17.95; 40-ft. 7-in. top, $18.45; and 35-ft. 8-in. top, $18.95. Yellow pine poles, 30-ft. 7-in. top, can be bought for $7.50, and 35-ft. 7-in. top, $8.50. In one instance at least all prices on poles have recently been withdrawn, and higher prices seem to be generally expected as a result of the increased cost of transportation.

Insulated Wire Manufacturers Optimistic

Demand Slightly Less Now, but Big Market Seen Abroad—Transportation Improving

Manufacturers of insulated wire are very optimistic about the future of the business. Although in many quarters the demand is said to have fallen off recently, a good volume of business is still under way. A big market is looked for abroad, too, and the demand there, which several producers say has been rather off, seems to be picking up.

Reports on production vary. Some producers are turning out material considerably in advance of their normal output due to the strong demand which has existed. Other factories have been affected adversely by transportation and labor difficulties. The supply of raw cotton and copper is plentiful, but in spite of that the supplies reaching wire mills have in many cases not been adequate because of delays in delivery. The outlook in this respect is regarded as encouraging as the transportation tension has materially lessened within the last six weeks.

Rubber-covered wire appears to be in better supply than weatherproof.

Deliveries from the factory cover a wide range among different companies, some of which are in a position to deliver rubber-covered in two to four weeks. Other manufacturers who have had back orders pile up quote as long as ten weeks on this material. Shipments of weatherproof wire are somewhat slower and range as long as fifteen weeks. Manufacturers' stocks in general are very low. A few producers report fair supplies that are badly broken, while only in one or two cases are good stocks in existence.

Labor conditions do not seem as favorable with insulated wire manufacturers as in other branches of the electrical industry. Several producers report either that labor is scarce or that they are having strikes; or else the complaint is against current high wages. One of the large companies recently reduced prices on both insulated and weatherproof wire varying in amount according to size, but averaging in the main about 5 per cent. Inquiries reveal no further price changes on the part of other manufacturers, however. The general feeling seems to be that no immediate fluctuation is in sight. One or two express the view that any change in price will probably be upward because the new freight rates are expected to advance the price of copper. Weatherproof wire is quoted on 27 cents base and rubber-covered on 29 cents base.

Deliveries Improved on Pole Line Hardware

Better Transportation Is Easing the Situation—Demand Is Strong and Orders Are Still Behind

Although supplies of pole line hardware in general are still low, manufacturers are more hopeful regarding the situation because transportation has improved materially. Deliveries, which were running from three to five months only two months ago, are now being made in from eight to ten weeks, according to representative manufacturers. This improvement is primarily a result of the better transportation situation. Steel mills are turning out material in about the same volume as ever, but they are now able to ship the goods away much faster, and this is reflected in the improved deliveries that have been noted. Some producers of line hardware are still resorting to trucks to supplement freight shipments and this is also helping to relieve congestion, albeit increasing overhead expenses. Prices have thus far remained firm in spite of higher freight costs.

Demand is holding up as strongly as ever and a very active market is also reported from abroad. In fact, some manufacturers state that their foreign sales are even larger than their volume of domestic orders, and this of course has a direct bearing on the supply available for home consumption. Electric railways are still purchasing only for immediate needs. Stocks in general remain very low and manufacturers have not caught up with their back orders. In an effort to accomplish this, however, producers in some quarters are discouraging new buying it is reported, until they have caught up on filling orders. One of the largest distributers in the East recently received a couple of carloads of material and turned the goods over almost immediately. Word has just arrived from Chicago territory to the effect that new price lists on line hardware have been issued there amounting to an advance of about 5 per cent. According to this report, local jobbers' prices in that district on galvanized pole steps, $\frac{5}{8}$ in. x 9 in., are $92.51 per 1;000 in quantities of from 500 to 1,500 and $104.10 per 1,000 in lesser quantities. Galvanized machine bolts, $\frac{5}{8}$ in. x 10 in., are $13.99 per 100 in large quantities and $15.74 per 100 in small lots. No advance was recorded on cross-arm braces.

Rolling Stock

The Portsmouth (N. H.) Electric Railway states that it has purchased three large snow plows.

The Detroit (Mich.) United Railway is reported to have purchased fifteen safety cars on Sept. 15.

The Detroit (Mich.) Municipal Railway was expected to place an order for fifty safety cars on Sept. 18.

The Lincoln (Neb.) Traction Company announces that it expects to purchase one No. P-1021 McGuire-Cummings snow plow.

The Chicago (Ill.) Surface Lines have placed an order for ten safety cars with the J. G. Brill Company. It is reported that the order was placed on a thirty to forty days' delivery basis.

The Dallas (Tex.) Railway announces that delivery of four of the fifty new safety cars that have been ordered is expected about the middle of the month. All of the new cars will be in Dallas by Oct. 10, it is stated, and will be put in service at once.

The Pacific Electric Railway, Los Angeles, Cal., announces that eleven of the forty-nine new Birney type one-man safety cars recently ordered by the company as announced in the August 21 issue of ELECTRIC RAILWAY JOURNAL have arrived in Los Angeles and are to be promptly equipped and placed in service within thirty days from Sept. 9. The company does not intend to place any of the one-man cars on its city lines in Los Angeles. The eleven just received will be used to replace the heavier equipment now in use on the company's city lines in Long Beach. Twenty-one additional cars of the same type are now en route to Los Angeles and when received will be placed in local service in Pasadena and other smaller towns on the company's system. Twenty-five safety cars have already been in service for some time at outside points, and it was because of the efficient and economical showing of these cars that the additional equipment of this type was purchased. Delivery of the thirty large interurban all-steel type of cars now on order is expected by November 1, 1920. It is anticipated that with the addition of this new equipment much of the older equipment can be overhauled, thus permitting of a very decided improvement in the service on all the company's lines.

Track and Roadway

Alabama Power Company, Gadsden, Ala.—According to President T. W. Martin the Alabama Power Company will spend $100,000 on improvements on the system of the Gadsden Street Railway.

Lincoln (Neb.) Traction Company.—The Lincoln Traction Company within the next few months expects to rebuild the line to the State Penitentiary which was removed recently on account of the grading and paving of the roadway.

Pacific Electric Railway, Los Angeles, Cal.—The inspection trip over the lines of the Pacific Electric Railway has resulted in the approval by the legislative body of the concrete macadam pavement laid by the railway along its Santa Ana tracks.

Jacksonville (Fla.) Traction Company.—A movement has been started by the City Commission of Jacksonville to have the street line which at present runs to Eighth and Talleyrand Avenues extend to the municipal docks. The extension would be only a little over a half mile. Commissioner Acosta suggested that the city construct the line and that the Jacksonville Traction Company should operate it. According to the city attorney the city's charter will not permit the building of an electric line, and the question will be submitted to the Council.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Public Utility Commission has approved the application of the Trenton & Mercer County Traction Corporation, Trenton, N. J., for the conveyance of a right-of-way to the borough of Princeton. The board also approved an application by the same company for the conveyance of the land to Princeton University. The traction company has changed its trolley terminus at Princeton that the university authorities might have additional land for a boulevard. The university agreed to furnish the land, buildings and all of the material for the construction of the new terminus.

Allen Street Railway, Nazareth, Pa.—The Allen Street Railway has just finished the erection of a steel trestle over a railroad crossing. This trestle replaces a wooden structure. The trestle was fabricated and erected by the Bethlehem Fabricators, Inc., and it was designed by R. T. Peppell.

Dallas-Wichita Falls Interurban Railway, Dallas, Tex.—The recent extension of the time within which to complete financial details of the building of the Dallas-Wichita Falls interurban line insures completion of the project, according to a telegram received by Wiley Blair of Dallas, Tex., chairman of the local interurban committee, from George Bishop of Cleveland, Ohio, who guaranteed to sell $5,000,000 of first mortgage bonds of the company. Mr. Bishop has sold $3,500,000 of the $5,000,000 issue, and has until Dec. 1, under the terms of the extension, in which to dispose of the remaining $1,500,000. Actual construction then must begin by March 1, 1921.

Dallas (Tex.) Railway.—The Dallas (Tex.) Railway will soon be asked by the City Commission to construct a new cross-town line, according to Hal Moseley, Commissioner of Streets. The proposed cross-town line will be operated in connection with the Masten Street extension now in course of construction, and will afford a means of re-routing cars that come into the business district from North Dallas and continue to South Dallas under the present plan of cross-town operation. These cars now make a loop of the business district before going to South Dallas, and under the plan now being worked out by Mr. Moseley, this downtown loop would be eliminated, effecting a saving of many car-miles for the traction company. While Richard Meriwether, vice-president and general manager of the railway, has not disclosed his plans, it is understood he contemplates the construction of a line on St. Paul from the Masten Street line to Commerce, thus affording a means of routing South Dallas cars out of Harwood Street.

Power Houses, Shops and Buildings

Lincoln (Neb.) Traction Company.—The Lincoln Traction Company is considering the purchase of new additional boilers for the power station and also coal-handling equipment.

Monongahela Valley Traction Company, Morgantown, W. Va. — The Monongahela Valley Traction Company has installed three new transformers at a cost of more than $10,000 at the Morgantown, W. Va., substation. Rights-of-way are being secured by the traction company for a new power line extension to Richard, W. Va., where a substation will be established.

Southern Pacific Company, Portland, Ore.—Plans have been approved for the new passenger station for the electric lines of the Southern Pacific Company at Portland. The new station will occupy the site of the old Lyric Theatre at Fourth and Stark Streets. The ground area is 50 ft. x 100 ft., and the arrangement will make it attractive in an architectual way, with ample room for the accommodation of traffic.

Trade Notes

Meters.—The Economy Electric Devices Company, Chicago, Ill., is distributing information in the form of a letter with enclosures, showing the work of its Economy Power Saving Meters in conserving current on electric cars.

Farrell-Cheek Steel Foundry Company, Sandusky, Ohio, manufacturer of small steel castings, announces that Julius Jones has been appointed its sales representative for the Cleveland district. Mr. Jones was formerly president of the Standard Steel Castings Company, Cleveland, Ohio.

The National Association of Purchasing Agents will hold its annual convention at Chicago on Oct. 11, 12 and 13. Business sessions will be held on each of these dates. Some of the speakers on the program are: Russell A. Pettengill, of the Russell A. Pettengill Company, Chicago; Professor Irving Fisher of Yale University, and Dr. F. W. Russe of Mallinckrodt Chemical Works, St. Louis, Mo. The members of the association now number 3,500.

The Economy Fuse & Manufacturing Corrpany, Chicago, Ill., announce that S. W. Fries has been appointed district sales manager for Kansas City territory, with offices at 1205 Commerce Building, Kansas City, Mo. Mr. Fries succeeds R. P. Crawley, who has resigned to take over the active management of the Crawley Electric Company of Peoria, Ill. Mr. Fries has had a long and wide acquaintance with the electrical field. He has been with Economy Fuse & Manufacturing Company for a number of years.

Fred W. Venton of the Railroad Sales Department of Crane Company, Chicago, was elected president of the Air Brake Appliance Association for the ensuing year, at the twenty-seventh annual convention of the Air Brake Association, recently held in conjunction with the Air Brake Appliance Association. Mr. Venton was formerly secretary of the association, which is composed of manufacturers throughout this country and Canada. He remains as secretary of the Railway Equipment Manufacturers' Association.

The Super Refined Metals Company of Detroit, Mich., will exhibit at its space, Booth No. 7, Association of Iron & Steel Electrical Engineers' Convention, Pennsylvania Hotel Roof, New York City, Sept. 20 to 23, inclusive, an automobile motor mounted on Kelly metal bearings. This motor will be run continuously without lubrication for five days. The Kelly process for super-refining and alloying non-ferrous metals has been perfected to such a degree that a uniform amalgamation is obtained. It is particularly suitable for use on electric railway car journals and many roads have used it with good results. The exhibit and demonstration should be interesting to railway men.

Ackley Brake and Supply Corporation, 50 Church Street, New York, N. Y., has appointed Walter H. Evans, McCormack Building, Chicago, Ill., as general Western agent for the sale of Ackley brakes and G. & B. mineral oil paint in the territory covered by Illinois, Michigan, Wisconsin, Minnesota, part of Indiana and the city of Toledo, Ohio. Mr. Evans was connected for a number of years with the Baltimore & Ohio Railroad. He first entered electric railway work with the Twin City Rapid Transit Company at Minneapolis, Minn. He became connected with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., and later became superintendent of motor power of the Indiana Union Traction Company, Anderson, Ind. He was formerly master mechanic of the International Railway, Buffalo, N. Y., and at one time was master mechanic of the Indianapolis Traction & Terminal Company, Indianapolis, Ind. In 1911 he resigned as superintendent of motor power of the Indiana Union Traction Company to accept the position of manager of one of the departments of the Edgar Allen American Manganese Steel Company, Chicago, Ill. Recently Mr. Evans entered, and still is in the railway supply field, with headquarters at Chicago, Ill.

New Advertising Literature

Signal Bells.—Nachod Signal Company, Inc., Louisville, Ky., has issued catalog No. 720, which is a 14-page illustrated bulletin on highway crossing bells.

Culverts.—The Canton Culvert & Silo Company, Canton, Ohio, has issued a new catalog, No. 3, covering its "Acme" (Nestor) corrugated metal culverts and other products.

Insulators.—The Jeffrey-Dewitt Insulator Company, Huntington, W. Va., is distributing catalog No. 3, entitled "Rugged Insulators," covering different types of its disk insulators, etc.

Flooring Material.—Armstrong Cork & Insulation Company, Pittsburgh, Pa., is distributing new bulletins on "Linotile Floors" and "Armstrong's Cork Tile," copies of which may be had upon request.

Rail Bonds.—General Electric Company, Schenectady, N. Y., has issued bulletin No. 44002-A, superseding bulletin No. 44002. Bonding tools and numerous forms of bonds covering wide variations in rails and joint plates are described.

Steam Data.—The Locomotive Superheater Company, New York City, through its industrial department, has issued a "Data Book for Engineers." This is a book with flexible covers containing sixty-four pages of data of every-day interest to the steam plant engineer; besides an abbreviated steam table it contains a table of the various coals of the United States arranged by states and giving an approximate analysis.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

Volume 56 New York, Saturday, September 25, 1920 *Number* 13

What About the Federated American Engineering Societies?

AS ANNOUNCED on another page of this issue, the first meeting of American Engineering Council, the functioning organization of the Federated American Engineering Societies, has been called for November. As to what the significance of this new organization is, we have already expressed our personal belief, strengthened by the opinions of others with whom we have come in contact. This council, representing, as it is designed to do, all engineering organizations in the country, should be effective in the councils of the nation in connection with all matters where an engineer's voice should be heard. It has already been said that "Wherever you look you see the work that the engineer has done," and it is important that the engineer be heard.

With this meeting approaching, there is presented to each electric railway engineer the question as to what the American Electric Railway Engineering Association should do and what the local engineering associations, to which so many belong, should do. The Engineering Association and the local engineering societies have received invitations to join the Federated Societies. They must decide what action to take. If they are going to join, and we hope they will and believe they should, they should do so now and be represented at the first meeting.

At the October convention of the Engineering Association it seems probable that the matter will be up for discussion. It will be up for discussion in local engineering society meetings during the next two months. Engineers should study this matter thoroughly and be prepared to help decide whether the organizations to which they belong will join in this forward step in engineering activities.

Iowans Rejuvenate Association Work

THERE have been evidences during the year of a distinct lack of interest in many of the sectional association meetings, a neglect of committee work and a general tendency to ignore or slight the reciprocal obligations of railway companies which gave rise to the formation of these associations. This trend of association work has taken place at a time when the reason for combining and interchanging ideas for the common good are more important than ever. It may be due to the great stress of work which railway men are under at home, to the fact that the programs in a number of instances have not been such as to attract large attendances, and perhaps, in a measure, on the part of some, to a feeling of discouragement, although we feel that there is really substantial reason for encouragement in the general railway situation. With these things in mind it is most heartening to note the unusual success of the recent Iowa Association meeting at Omaha, which is reported elsewhere in this issue, and to analyze the reasons therefor.

The men who started this association stopped a while back to take stock of their organization. They recalled that it was created for the purpose of combining for protection against adverse legislation and to improve operating conditions through interchange of ideas and experience. As most of the meetings up to this time had been devoted largely to discussions on policy, it appeared that the immediate need of the association was to give greater attention to the operating side. So it was decided that one of the two meetings a year should be devoted entirely to the problems of direct concern to the operating men. The result has been a great revival in interest in the meetings, record attendance, and an invaluable exchange of information. The managers were not there, and consequently there was not the restraint on discussion which is felt by many operating men when the "boss" is present. Apparently the men at this meeting spoke their minds, without hesitation.

Perhaps the signal success of this experiment in the Iowa Association work may suggest the wisdom of following a similar course in other associations in order to arouse greater interest and make the meetings more valuable.

"But It Doesn't Mean Anything"

"RUBE" GOLDBERG is not only a cartoonist extraordinary but also a coiner of winged phrases. One of the latest of these, "But it doesn't mean anything," is about the most apt we can think of in connection with the contradictory interpretations now rampant as to the effect of increased fares on riding. Some say that these increases have produced severe cuts in traffic, and they produce a group of railways to prove their allegation; others say the contrary and trot forth their own little group of railways in rebuttal. Nor does it seem to matter whether logarithmic or man-in-the-street calculations are used by the opposing parties. Each finds just what he hoped to find.

All jesting aside, we believe that in making these studies not enough attention is given to going back of the returns. In one instance, we observed that every time the fare went up the traffic bounded up too. Such a result seemed altogether too utopian. Upon investigation it turned out that the fare increases happened to synchronize with the opening of important extensions to newly developed industries. Hence the results for the system as a whole were surely misleading. At the same time, we were left in the dark as to what happened on individual routes not affected by these new sources of traffic. If we had these data, it would be possible to learn something more definite.

Still, as we pointed out in the issue of Sept. 4 ("Fare Is Not the Only Factor Which Affects Riding"), so many factors are involved that deductions from superficial figures really do not mean anything. Among the questions we might ask in any real study are: What proportion of your riders is helping to keep up the schedule speeds of nickel days by using tokens? What are the relative effects of fare increases on hilly lines, long-haul lines, short-ride business district lines? Are the decreases more pronounced during the hours of voluntary travel than during the (rush) hours of involuntary travel? Have the fare increases been indorsed as just by the entire community or are you suffering from partial boycotting, jitney competition or excessive use of private machines? A study which noted and weighed factors like these would give less occasion to quote another and older gibe: "Figures don't lie, but liars can figure."

Proper Publicity, Its Need and How Shall We Get It?

THE need of publicity work—systematic publicity work—as a means of correctly informing the general public in electric railway matters has been almost universally accepted by managements, at least in theory, and something along this line has been quite generally done. The accomplishment has been great, indeed. But we cannot escape the fact that the accomplishment has not been all that we have desired or would desire. It would be idle talk to say that the publicity work thus far has not attained its mission to an important degree, yet none will contend that there should be any cessation of effort. Rather would it be nearer to the facts to say that only a beginning has been made and that the street and interurban railways have not by any means "put their story over." It has been told in full perhaps in a few places, but it has been learned in full in probably no place.

How great is the need for a new kind of publicity, for a more comprehensive and dramatic effort to make the public understand, is indicated in this recent statement of John J. Stanley, president of the Cleveland Railway, which is probably in less trouble and is in better condition than almost any other railway in the country and which operates in a city where the people are unusually well informed on street railway matters:

> The report of the Federal Electric Railways Commission will help the industry if the country is sufficiently interested to heed it. . . . How the public generally is to be brought to a full realization of its transportation needs and costs I do not know, unless the complete breaking down of service throughout the country carries home the lesson.

Let us hope the latter is not necessary. The railways do not wish to repeat the experience of the railroads, though they may be close to doing so. What can be done to make our publicity efforts more successful? Thus far our publicity work has been conducted almost wholly through the printed word. Without discounting its effect, but rather with encouragement to keep this work up, to the limit, it is only fair to recognize that publicity machinery advances with new inventions and developments the same as all other machinery and use should be made of these latest methods.

What, then, is the next step? We don't pretend to know. But we do believe the answer to the question is of vital importance to the industry. The good work that is done in any one place should be told for the benefit of all. Discussion of ways and means of effecting proper publicity for the industry, as a national proposition as well as for local needs, is important, and is doubly important now, when in many states legislation affecting electric railways and public utilities in general is expected during the next legislative session. The public and the railways need a thorough understanding and it is up to the railways to see that it is gained. The question, again, is how?

In order to bring to a focus, or at least to assist in so doing, the exchange of opinion and information along this line the ELECTRIC RAILWAY JOURNAL plans, and starts in this issue, to devote even more attention than in the past to this subject. We recognize that there are at least two kinds of publicity; the one directed toward having the public understand the story of the railways, as analyzed by the Federal Electric Railways Commission, for example; the other directed toward the local problems of "Merchandising Transportation." But a local publicity campaign must do both if the ends sought are to be obtained.

This week, among other items, there is an editorial suggestion which is intended to elicit some discussion, if no more. We hope that our readers will make contributions to this paper in the way of stories of what they are doing in publicity work and also in the way of suggestions and comments. Through free criticism and approval, ideas crystallize and plans formulate into action. And publicity action is what is needed.

A Hundred Years of Joint Application of Electricity and Magnetism

THE electric railway industry owes its existence to a series of scientific discoveries made early in the nineteenth century, several of the most important of these having occurred just one hundred years ago. Exactly a century earlier than the day on which this issue of the ELECTRIC RAILWAY JOURNAL is mailed to its readers, *i.e.*, on Sept. 25, 1820, a French scientist-teacher announced the discovery of the laws governing the mechanical reaction of one wire carrying a current upon another. This was André Marie Ampère, whose name has been popularized by association with the practical unit of electric current. A week earlier he had called attention to the laws of mechanical reaction between a wire carrying current and a magnetic field.

Ampère was the skilled analyst who studied and extended the discoveries of another teacher-scientist, Hans Christian Oersted of Copenhagen, Denmark, who published results of his research in this field earlier in 1820. Oersted deserves and receives the credit for making the astounding discovery that electricity and magnetism have something to do with each other. Knowledge of this fact is now so commonplace that it is difficult to comprehend a period in which these two physical entities were supposed to be unrelated. From the ages of antiquity up to the years just preceding 1820 the curious effects of lodestone upon pieces of iron, and certain "galvanic" and static effects of electricity were known and utilized, partly for practical, but more largely for entertainment and scientific purposes. The mariner's compass was the principal useful application of the knowledge of magnetism, the lightning rod that of static electricity and the electric primary battery that of current electricity.

The work of Oersted, Ampère and their contemporaries promptly bore fruit in practical invention in several fields. It was but a few years until the electric motor was invented and applied to the stationary and railway power fields. But invention along power-producing lines lagged behind utilization, or the electric railway would have been made commercially successful much earlier than it was.

Historical detail is of interest only to the specialist, but every man whose bread and butter (not to mention cake) are derived from the electric railway business owes at least a grateful thought, this centenary year, to the pioneers who laid the foundation for his success.

Confiscation Will Not Be Allowed

UTILITIES must be allowed "proper opportunity for an adequate judicial hearing as to confiscation," according to a recent opinion of the United States Supreme Court. The case in question is the Ohio Valley Water Company vs. Ben Avon Borough, in which the Pennsylvania Public Service Commission had allowed a valuation of $924,744; the Superior Court had reviewed the record, appraised the property at $1,324,621.80 and remanded the proceeding; the State Supreme Court had reversed the Superior Court, holding that it had no right to make a "substitution of the former's (the court's) judgment for that of the commission," but that it should have confined itself to questions of legality of procedure and competency of evidence. The Federal Supreme Court, using the phrase quoted in the first sentence, then reversed the State Supreme Court and remanded the cause. As a result the State Supreme Court has now sent the case back to the Superior Court with instructions to "determine, upon its own independent judgment as to the law and facts involved, whether the order of the commission is confiscatory" and to make satisfactory disposition of the case in accordance with the Federal court's opinion.

Without remarking on the technicalities of the opinion introduced by the particular state laws, which do not, however, affect the fundamental philosophy or law of the case, it appears that there has been thus definitely established the unassailable right of utilities to have a fair and final judicial hearing on questions of fact of valuation where confiscation is alleged in the figures set by commissions.

We have always hoped that commissions would grow more and more to draw to themselves that same quality of respect and almost reverence that is given to the courts of the country as a whole; that they would eventually become so organized as to personnel, tenure of office, etc., that they would be on a par with courts in the public's esteem. But even so, they might still make errors of judgment in decisions which should be subject to the same review as those of courts.

Now, as appeals from confiscatory rulings will certainly be made in the future upon the basis of this decision, it appears to us that there may be many beneficial results in the line of still further clarifying, from a judicial standpoint, what properly belongs in a valuation. As appeals are made, the decisions from time to time must increasingly deal with the question as to whether the inclusion or exclusion of certain items or as to whether the use of this basis or that basis of arriving at certain figures is confiscatory or not. So that ultimately there will be more clearly formulated the attitude which must be taken with respect to valuation items now most debatable.

But, of course, most important is the assurance that the Supreme Court holds open the door for the correction of mistakes which would involve confiscation of property devoted to the public use.

A Whole City Shares This Shame

"BARON" NELSON is dead, but his soul goes marching on in the Kansas City *Star*. The pet aversion of the "Baron" during his direction of the paper was the Kansas City Railways and its predecessor, the Metropolitan Street Railway. He could find no good in them. His pen was ever against the company and those who manage it. Since his death the tirades have been less frequent, but the work seems to have passed on to those he left behind.

The latest occasion for badgering is the receivership. Nearly all the crimes on the corporation calendar are charged against the company by the *Star*. None of us is perfect, but surely the Kansas City Railways is not entirely bad. Most certainly the last thing the company desired was a receivership. The simple facts are that material and labor costs to the railway in Kansas City, as elsewhere, have increased faster than has relief in the shape of increased fares. In short, in three years expenses of the Kansas City Railways have increased more than 110 per cent whereas fares have increased only 48 per cent. In July the cost of coal was $75,000 more than in May. In addition, jitneys have been taking about $3,000 a day revenue from the company. These things, however, mean nothing to the *Star*. It sees only a "monopolistic business in which the people have no confidence." On the other hand, the *Journal* of the same city much more aptly says that "the very fact that the courts have been appealed to reflects seriously upon the community as a whole."

The *Star* refers felicitously to Cleveland. Cleveland has done well, but then Cleveland has no corporation baiting influence such as the *Star* wields. Moreover, Cleveland has no jitneys. The receipts of this pest alone, for the first six month of the year, if diverted to the Kansas City Railways, would have been sufficient to meet the interest charges of the railway there. It is perhaps too much to expect the *Star* to be fair to the Kansas City Railways, but the fact remains, as the Kansas City *Journal* points out, that communities do not thrive on receiverships and no amount of camouflage or vituperative "corporation baiting" can disguise the fact that Kansas City suffers materially in the eyes of the financial and business world when it drives its street railway industry into a receivership.

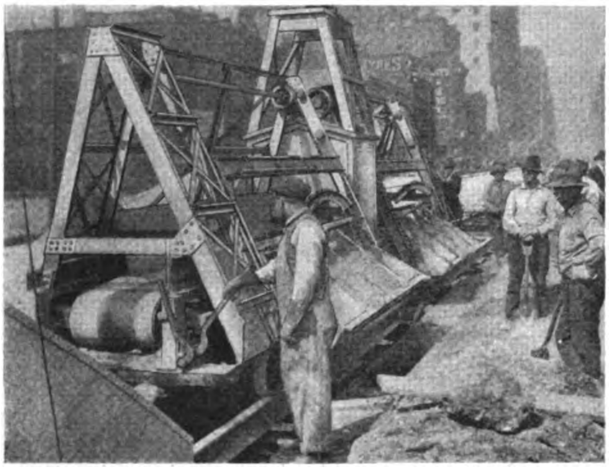
This issue contains the program for the Atlantic City Convention, October 11-15.

Next week we shall publish our annual convention issue. The subject selected for this number is **"Mass Transportation,"** and different phases of this topic are treated by authorities in the industry.

Labor-Saving Devices in Use at Cleveland

COMPLETE CONCRETE MIXING MACHINE IN ACTION

FILLING THE POCKETS BY MACHINE IS AN EASY JOB



THE MEN REST WHILE THE MACHINE DOES THE WORK

THE DUMPING PROCESS IS SMOOTH BUT PROMPT

TRANSPORTING A POLE IS SIMPLE FOR THE CRANE AND SETTING IT IS JUST AS EASY

These views, taken recently, illustrate ways in which construction and maintenance costs are being controlled by the Cleveland Railway. This company has long been a consistent advocate of the policy of using machinery wherever practicable and its work is of such magnitude that investment in special as well as standard machines is warranted. These machines would be useful on smaller roads also.

Outdoor Machines Save Money in Cleveland

The Cleveland Railway Uses an Increasing Number of Labor and Time-Saving Devices, Particularly for Track and Line Work—The Latest of These Are Unique

IN NORMAL times the track rehabilitation and extension program of the Cleveland Railway calls for 20 miles or more of new track annually. The present track mileage is more than 350. The magnitude of the annual work necessitates the extensive use of machines, many of which are original with C. H. Clark, engineer maintenance of way.

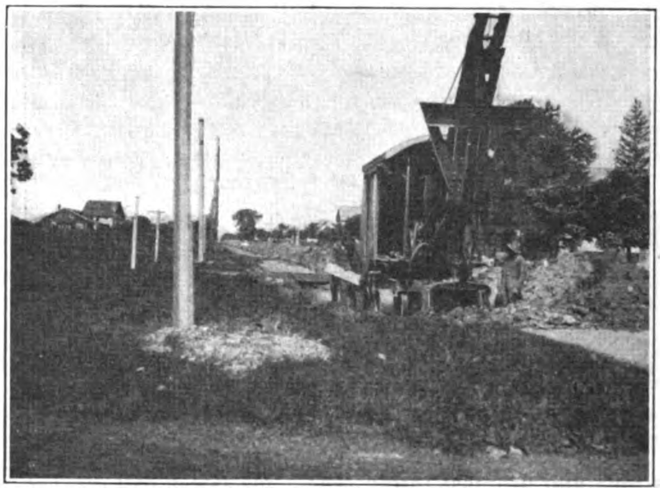
The Clark pavement plow is one of the best known of these. This device, which loosens the paving blocks between the rails at a rate of 3 or 4 m.p.h., has been in successful use for years and its operation is spectacular in the extreme. A story is told of a manager who wished to see a demonstration of the loosening of some pavement by the plow, but, arriving a few minutes late, found the pavement already in furrows and the blocks being tossed into waiting cars. It is so difficult for a visitor to Cleveland to catch the plow at work that the Cleveland Railway has had a motion picture film prepared to show how it, as well as other mechanical devices used on the system, actually performs. The equipment used previous to the current year has been covered in articles in this paper from time to time.* The present article deals with the latest additions.

The concrete mixing machine shown in several accompanying illustrations is one of Mr. Clark's latest inventions. It was designed with three purposes in view: (1) To insure uniformity in size of the batches; (2) to render equal the amounts of work done by all of the men who charge the machine; (3) to minimize the amount of labor required. The machine consists of two bins for the materials, each divided into four pockets, with an elevating and dumping arrangement for the bins and a horizontal belt conveyor for transferring the batch to the mixer. In the loading position the front edge of the bins is within 8 or 10 in. of the ground, so that a very short lift is necessary in filling them. The inclined elevator guides are supported by a triangular framework built up of structural steel shapes and up these the bins are hauled and are dumped by power furnished by a 10-hp. motor belted to a horizontal shaft at the top of the machine.

The belt conveyor onto which the materials are dumped travels at 800 ft. per minute and it is driven by the same motor. The cement is dumped into the hoppers on the side opposite the elevators.

The mixer used with the machine is of 14 cu.ft. capacity, and it is allowed to run from 50 to 60 seconds per batch. The whole cycle of loading, raising and discharging of the bins and returning them to the starting point can be accomplished in 2 minutes, and 268 batches have been mixed in a working day. Normally the bins rise to elevating position in 17 seconds. They are elevated, dumped and returned in 33 seconds, a total of 50 seconds. The dumping alone occupies 25 seconds. This allows at least a full minute for loading, which is liberal for the average man and allows him a good rest period. With this machine, as high as 546 ft. of track has been concreted in a working day.

THE CRANE FLITS SWIFTLY FROM JOB TO JOB



THE ELECTRIC SHOVEL LEADS THE WAY

Referring to the specifications listed earlier, it is evident that uniformity in mix is secured by the provision of uniform bins or pockets in the elevator, each of which is of 3 cu.ft. capacity. On the second point, but four men are used in filling the bins, one to each of four. The time required has varied from 12 seconds to 1 minute. Finally, the labor saving which this machine has effected is remarkable in that four men can lift as much gravel through the short distance necessary as eight men can lift the distance of 40 in. formerly required. The pictures tell the rest of the story.

Another device which promises important savings is a multiple-tup concrete breaker, applying the "skull-cracker" principle on a larger scale. It will have five pointed hammers, three between rails and one outside on each side, with apparatus for raising them slowly and tripping them at the top of their travel, the whole machine meanwhile being moved forward at any predetermined rate.

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*See issues of this paper for July 10, 1915, page 73; Feb. 24, March 17 and April 21, 1917, pages 336, 508 and 747, respectively; Sept. 8, 1917, page 403, and Nov. 30, 1918, page 969.

TRUCK CRANE A GREAT ECONOMIZER

A device which is jointly used by the overhead and track departments at present is the "International" truck crane, made by the International Crane Company. Its appearance is indicated in several of the accompanying illustrations, where it is shown doing line department work.

This device consists of a rotatable derrick, mounted on a 7½-ton Mack truck. The derrick has a lifting capacity of 6,000 lb. at 12-ft. radius, with corresponding capacities at other radii. The derrick is operated by a Stearns engine.

For loading purposes in the track department a ½-yard Lakewood bucket is added to the derrick, but there are also numerous uses for it in lifting and carrying, as shown. The writer witnessed a job in which a steel trolley pole was lifted with a mass of concrete around its butt and dropped into a hole some yards distant, the whole operation requiring but a few minutes after the machine reached the work. The pole and attached concrete weighed about a ton. Only a foreman and two men are required on the ground and the derrick man and the chauffeur on the truck.

A STRETCH OF NEWLY LAID TRACK IN CLEVELAND THE TRACK AT THE RIGHT IS TEMPORARY

This crane was originally designed to be self-propelling, and to that end was provided with a driving shaft with sprockets on the end to connect it by chain to the truck axles. The mounting on the Mack truck, however, provides a means of transporting the crane rapidly, as it can now be moved at a speed of 10 m.p.h., more or less. The sprocket shaft, however, will be utilized on the crane with its Mack truck mounting by putting on one or two "niggerheads" in place of the sprockets. This will still further extend the field of usefulness of the outfit.

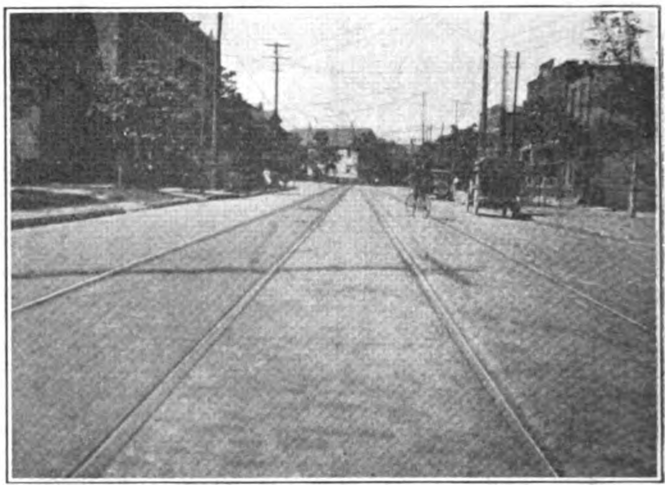
No outriggers have been found necessary on the truck because by a simple clamping device the elliptical springs are clamped solid and the fulcrum or point of reaction is transferred to the outside rear wheel treads. As the outside gage of these wheels, which are double, is very wide this furnishes a reactive moment ample to resist overturning at the rated load.

In connection with its construction work the way department of the Cleveland Railway employs a Thew electric shovel, illustrated in action preparing the way for a stretch of new track now being installed. The picture also shows the concrete trolley poles, which are used very largely in the city, in place ready for plumbing.

While investigating the present track work in Cleveland the writer "snapped" a couple of views of some finished track and a job concreted in paving between rails and ready for connection with the city paving. The temporary track is still in place in the latter picture. The other is doubly interesting because it shows T-rail track and grooved girder-rail track side by side. At a little distance the two cannot be distinguished.

Dismantle to Escape Paving

THE North Coast Power Company has at Vancouver, Wash., about 8 miles of track within the city limits and about 7 miles outside the city. The franchise requires that when the street is improved, the company shall prepare the foundation for the paving and pave within the rails and for a foot outside of the rails. Recently the city council decided upon the improvement of a portion of Columbia Street on which the company has tracks for a distance of approximately 2,600 ft. The cost of preparing the foundation for this section would have been approximately $10,000. Since the company earns less than 1 per cent on its investment, after deducting operating expenses, taxes and 3½ per cent depreciation, it was not in a position to raise the money for this foundation and paving.



ONE OF THESE TRACKS IS T-RAIL, THE OTHER GROOVED GIRDER. WHICH IS WHICH?

As the company has approximately 13,000 ft. of track in Vancouver that is in streets not paved, and as some of these streets may be paved later, the company has requested the city council to amend its franchise to the effect that when paving is ordered for any streets on which there are tracks the company will not be obliged to prepare the foundation or lay the paving unless it is earning more than 6 per cent on its investment. The council is not inclined to do this, and the company at present sees no alternative other than to remove tracks from Columbia Street and to follow the same course on other streets when paving is ordered for them. The half mile of track in question is not essential to the operation of the passenger service of the company, but it is helpful in its freight business and especially so for industries which have large investments near by.

Record Attendance and Interest at Omaha

Mid-Year Operating Men's Meeting of Iowa Electric Railway Association and Nebraska Railway Men Enlivened by Large Number of Stereopticon Slides Showing Shop Kinks

THE mid-year convention of the Iowa Electric Railway Association, held at Omaha, Neb., Sept. 16 and 17, was unanimously declared to have been an outstanding success by the fifty-four railway men in attendance, representing every electric railway in Iowa and Nebraska except six, and concurred in by the thirty commercial men present. This registration of eighty-four delegates set a new record for the association, and this, together with the business-like manner in which the convention was conducted, and the worth-while papers and discussions, dispelled any doubt that may have existed as to the desirability of continuing the association meetings. The success of the meetings was attributable in large measure to the work done by John Sutherland, master mechanic Tri-City Railway, Davenport, Iowa, as chairman of the committee on program and arrangements, by T. E. Wood, master mechanic, Omaha & Council Bluffs Street Railway, and W. G. Brooks, Westinghouse Electric & Manufacturing Company, who personally took seventy-six pictures in various Iowa railway shops, from which stereopticon slides were made so that the kinks and equipment shown could be more interestingly and intelligently discussed at the convention.

The opening session of the convention on Thursday morning was called to order by President H. E. Weeks, vice-president Tri-City Railway & Light Company, Davenport, who spoke briefly of the change in outlook for the electric railways in Iowa from hopelessness to hopefulness by virtue of the recent decision of the State Supreme Court, which relieved the companies from the authority of the municipalities to enforce the rates of fare specified in the franchises. He thought this would put the railways in a position to go ahead, although it would be necessary to continue strict economy in the operation of the properties in order to hold fares down to a basis that would not drive away traffic. Mr. Weeks then turned the meeting over to John Sutherland and retired, for it had been planned that this mid-year meeting should be exclusively for the operating men, the prevalent feeling being that there would be greater liberty of discussion if the managers were not present.

The remainder of the Thursday morning session was occupied entirely by the reading of the four papers by Messrs. Keith, Anderson, Feist and Kennedy, the opportunity for discussion having been reserved until the Friday morning session. These papers are printed in abstract elsewhere in this issue, except the one by Thomas L. Kennedy, storekeeper Tri-City Railway, on railway shop storekeeping methods, which will appear in a later issue.

On Thursday afternoon the members were taken in a special two-car train of the Omaha & Council Bluffs Street Railway on an inspection trip of the local property. Two of the company's carhouses, the training school for trainmen, the shops and one of the substations were visited. At the trainmen's school George Beetle, instructor, demonstrated the course given the students. Track and overhead were inspected en route, and at the shops arrangements had been made so that the delegates were able to see all of the shop activities in operation, including several new practices recently inaugurated, and which will be covered later. A few of the delegates particularly interested in trackwork accompanied R. H. Findley, superintendent of track and roadway for the local company, in an automobile, for an inspection of some of the new track and track construction facilities, including a new four-track open terminal recently installed to serve the new Ak-Sar-Ben fair grounds at the time of the annual fair, which was under way at the time of the convention.

CAPITALIZING THE RESULTS OF THURSDAY'S MEETING

The Friday morning session had been reserved for the discussion of the papers presented the day before, or any of the practices on the local property, or the pictures which were shown at this time portraying kinks in various Iowa shops. Some of the pictures had been taken without the knowledge of the master mechanic and were shown at this time to force him to his feet to describe the equipment or practice pictured.

In discussing the paper on overhead practices by Mr. Keith, H. Skelly, Davenport, asked about the experience had in the painting of iron poles, particularly as to whether better results could be obtained by letting this work out on contract or by having it done by the company's own men. He was of the opinion that it was better to let this work out because it relieved the company of all responsibility in case a pedestrian came in contact with the fresh paint. Others expressed the opinion, however, that it was much better for the company to do this work itself, as it could control its men and be as sure of a better job.

The question of the use of ¼-in. galvanized strand wire versus No. 6 solid wire for cross spans was brought up and Mr. Keith said that the solid wire was strong enough, but that he did not like to use it because it always looked as if it was kinked after it was up. One of the delegates said he had had a great deal of trouble with wood strain insulators pulling apart, and that he had therefore abandoned them for porcelains. Mr. Keith replied that he had had very good success with wood strain insulators and did not think he had lost a single one in Des Moines in seven years.

W. O. Jacobi, superintendent of electric lines, Omaha, referred to the practice of his company of butt-treating all poles and using poles having a large circumference at the ground line. A protecting sleeve is shrunk on all the steel poles and they are set in concrete, as Mr. Keith recommended in his paper. Mr. Jacobi said that he thought a saving could be made by using No. 4 E. B. B. galvanized iron wire in place of the $\frac{5}{16}$-in. stranded wire recommended by Mr. Keith, for he contended that it takes less time to make up the ends with this kind of wire in the cross spans. He said also that there is less chance of moisture remaining on and in the wire and causing corrosion. Furthermore, it is possible to determine more accurately the remaining strength of a solid wire than of a stranded wire, after it has begun to rust. In regard to sleeve splices, Mr. Jacobi said that his company was making its own out of ¾-in. round brass rods, 15 in. long, by drilling a hole, tapering each end and milling a slot near the center to meet the drill hole. These splices are installed without solder.

He compared a spring trolley switch which the Omaha company is making and using with that described by Mr. Keith. It consists simply of a No. 14 steel spring tongue, 1 in. wide, which is fastened to the frog by means of two bolts, for which two holes must be drilled in the frog. This steel spring tongue is bolted through the groove in Westinghouse trolley frogs.

The location of trolley frogs properly to serve all kinds of cars, including construction cars with the trolley stand over the front trucks, Birney safety cars with the trolley stand in the center of the car and the double-truck cars with the trolley stand over the rear trucks, was spoken of by Mr. Jacobi, who said that the only way this could be done was to "cut and try," finally placing the frog to favor the most common type of car using that route.

SUPPORTING TROLLEY SPAN WIRE FROM BUILDINGS

In discussing the recommendation of Mr. Keith to co-operate with owners of new buildings in order to place eyebolts in the building walls for supporting the span wires, and thus to remove the trolley poles from the street, it was found that a number of companies followed this practice. In Davenport, Mr. Skelly said that this was done on every new building erected along the car lines, use being made of bronze bolts, to avoid the rust streak on the wall which comes from the use of an iron eyebolt. He said that the number of poles used was being gradually reduced in this manner, thus cleaning up the street and saving the poles and relieving the company of the maintenance expense of the poles. In installing an eyebolt, the building owner is induced to sign a contract which stipulates that if at any time he wants the eyebolt removed, he must agree to give the company the right to set a pole, thus protecting the company against losing its pole rights in going to the eyebolt. He said that the simpler such a contract was the better, for there was always a good deal of hesitation in signing a contract in this connection.

Mr. Keith pointed out that in Des Moines the company gets a release from the owner of the building on which an eyebolt is installed against any damage which may result from the presence of the eyebolt. The practice of installing eyebolts whenever possible was also followed in Omaha.

DISCUSSION ON STOREKEEPING AND ON TRANSPORTATION

Mr. Kennedy's paper on storekeeping methods evoked lively discussion, a digest of which will be given in a later issue with an abstract of the paper.

In the discussion of Mr. Anderson's paper on transportation the author was asked about the frequency with which he made changes in the schedule of trippers. He explained that the change was not made more often than once in fifteen days and that he personally made the observations which determined these changes. In answer to another question he explained that in Davenport the conductors ring up both passes and cash fares and tickets on the cash side of the register, observing that this does not make possible a very good check on the conductors. It was explained that in Des Moines, where the city fare is 6 cents, and where 4 cents additional is collected beyond the city limits, both the 6-cent and 4-cent fares are rung up on the cash side of the register, involving a difficulty similar to that encountered in Davenport.

The remainder of the discussion, which continued through Friday morning and part of the afternoon, was inspired by the showing of a number of slides of kinks in various Iowa railway shops. Some of these kinks have already been pictured and described in ELECTRIC RAILWAY JOURNAL, but the majority of them will be published in a later issue, the delay permitting a better handling in the paper and an assurance of better half-tone cuts than could be secured if they were rushed through.

A LITTLE FUN IS INTERJECTED

The meetings of the association were held in the Masonic Temple and luncheon was served both days in a room adjoining the meeting room. On Thursday evening the members were treated to a banquet followed by a minstrel show put on by employees of the Omaha & Council Bluffs Street Railway. While the show was reported to have been entirely prepared in three days, it was thoroughly enjoyed by the delegates. After that, a troupe of professional entertainers provided an hour's amusement. Between the minstrel show and the vaudeville hit of the professionals, the film known as "The King of the Rails," the safety-car film and a short piece of film showing how the claim agent of the Tri-City Railway won a $20,000 injury suit were shown. The last named was the case of a former employee who, while under age, had received a slight injury. By the time he became of age, a number of years later, he claimed his right arm had become disabled. It was learned that he had taken a building contract and was actively engaged in doing the work himself. A motion-picture operator, on the pretense of showing building construction work, pictured this man doing the work himself, wherein any doubt as to the soundness of the man's right arm was completely dispelled.

N. S. C. Manager Reports

IN HIS report to the National Safety Council, General Manager C. W. Price summarizes the year's accomplishments as follows: (1) The *National Safety News* was developed from a one-page letter to a twenty-page magazine. (2) Local councils with permanent organization and paid staff were increased from seven to sixteen. (3) Great strides were made in public safety through the development of vigilance committees, chauffeurs' schools, local safety drives and safety education in public schools. (4) The engineering section was organized and assigned the development of important national codes. (5) Safety education, as suggested by the council, received greater attention from technical schools and colleges than ever before. (6) The contents of the council's library and bureau of information were enriched and the number of inquiries answered increased. (7) The service to members was enlarged by the addition of bulletins for the meat factories and rubber sections and by the issuance of sectional safe practices pamphlets. (8) The membership was increased to 4,051, a net gain of 290.

How to Construct and Maintain the Overhead*

Some Practices Proved by Experience Are Pointed Out—Locating Curves and Frogs, Methods of Repair and Special Material Designs Discussed

BY KIRK J. KEITH
Superintendent of Overhead Des Moines (Iowa) City Railway

A PRIMARY consideration in overhead work is the purchase and standardization of only the best of materials. The wood poles should be butt-treated to a point 1 ft. above the ground line. Tubular steel poles should always have the protecting sleeve (or dog collar) shrunk on the lower section of the pole at the ground line. Tubular, Bates or any other steel poles should be set in concrete 6 ft. in the ground with a rake of 6 to 8 in. A very good mixture is 1:3:5 of wet concrete. Always be sure that the pole is painted and free from rust before it is set. Wood poles should be set 6 ft. in the ground and well tamped, with a rake of not more than 10 in. Where poles are to be used for span construction they should have a good heel at the bottom and a good breast a little below the ground.

All poles should be set as nearly 100 ft. apart as possible and on property lines. At street intersections, where there is special work to be installed, it would be best to have the four corner poles set on the property lines. Of course this is not always possible. For example, there is a condition in Des Moines where the water hydrant is set on the property line with a catch basin 2 to 5 ft. from the hydrant, or *vice versa*, and an ordinance forbidding us to set a pole within 12 ft. of the hydrant. It can be readily seen that this makes it difficult for us to maintain our special work properly.

Often in city work, especially where a new building is being erected and the cellarway is excavated even beyond the sidewalk line, it is good practice to set at the point where the pole should be set an iron pipe a size larger than the outside diameter of the pole at the ground line, and to let the contractor build his wall around the pipe. This should be long enough to extend 1 ft. below the floor line. If the pipe is longer than 2 ft. it should be filled up to a point 6 ft. below the sidewalk line. After the wall is thoroughly set, the pole is set in the pipe and the space between the pipe and the pole filled with a rich mixture of grouting, an iron wedge being used between the top of the pipe and the pole to give the pole the proper rake and insure against crushing of the grouting.

A span-wire clamp, with a wood or porcelain strain in which to fasten the span wire, should be used on steel poles. There should usually be two insulators between the point of contact and the pole, but some cities have ordinances specifying more than two. The span wire should be either $\frac{5}{16}$-in. double galvanized strand or stranded copper-clad wire, and it should be pulled tight.

INSTALLING TROLLEY WIRE ON CURVES

Curves should be made up with straight-line clinch ears for round wire and on phono-electric wire it is better to solder the ears to hold them in place. With a trolley wire 19 ft. above the rails curves should be offset toward the inside of the center line of the track, $3\frac{1}{2}$ in. to each inch of the super-elevation of the outer rail, and held in place with single-body pull-offs if for one track and double-body pull-offs on the outside track and single pull-offs on the inside track if for double track. The number of pull-offs must, of course, be determined by the radius of the curve and the spacing of poles. The following table represents practice in this line:

Radius of Curve, Feet	Spacing of Pull-Offs, Feet	No. of Pulls Between Supports	Distance Apart of Poles, Feet
40	7	4	35
50	8	4	40
60	9	4	45
70	10	4	50
80	11	4	55
90	12	4	60
100	13	4	65
125	14	4	70
150	15	4	75
200-500	20	3	80
750	25	3	100

The locations of the trolley wire on curves given above will not hold true on city construction, as consideration must be given the elevation of the outer rail, the height of the trolley wire above the rail, the track gage, the radius of curvature, the distance from the center of the car to the pivot of the trolley base, the distance from the center of the car to the center of the truck, the horizontal distance from the pivot of the trolley base to the point of contact between trolley wheel and trolley wire. The offset of the trolley wire would be:

$$S = \frac{EH}{G} + R - \sqrt{R^2 + P^2 - Q^2 - L^2}$$

in which all values are in feet and:

S = radial offset of trolley wire toward center of curve.
E = super-elevation of outer rail.
H = height of trolley wire above rail.
G = track gage.
R = radius of curve.
P = distance from center of car to pivot of trolley base.
Q = distance from center of car to center of truck.
L = horizontal distance from pivot of trolley base to point of contact between trolley wheel and wire.

The trolley frog should be attached to the trolley wire at a point over, and as near as possible to, the track switch point, so that the trolley wheel will take either the main or branch line according to the route of the car. The closer the frog is set to the switch point, the less the danger of the trolley wire wearing out as it approaches the frog. On a 42-ft. 6-in. radius curve, my practice is to set the frog level, directly over the center of the heel of the track switch; on a 45-ft. radius curve, to place it about 6 in. ahead of the heel of the switch point, and on a 50-ft. radius curve, to place it 9 to 12 in. ahead of the heel of the switch and toward the switch point. As these distances may not hold in all cases, it is a good idea in installing the frog to clamp it on the wire only so tightly that it will not move, directly over the heel of the track switch; to let a couple of cars go through the switch, and to watch the trolley wheel to see which way the frog should be moved. Only one or two operations will be required before the frog can be set in a permanent position. It will be found invariably to be toward the point of the switch. Of course in most cases a frog set above a point where the distance between the outer rail of the branch track and the nearest rail on the main line is 1 ft., the trolley wheel will follow the proper wire, but it has a very heavy wearing effect on the wire approaching the frog, which makes frequent replacement necessary.

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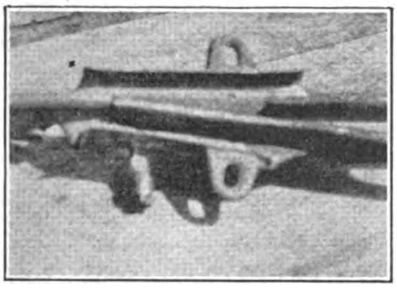
*Abstract of paper read at convention of Iowa Electric Railway Association, Omaha, Neb., Sept. 16-17, 1920.

Trolley wire should be guyed at each end of all curves and every half mile on tangent track. Care should be taken to see that strain guys have equal pulls and that the strain plate is not twisted out of line. Where possible the strain of these guys should be taken by anchor guys in line with the pull; if this is not possible, a head guy should be used to the next pole. Where the strain is not too great, the anchor should be of a mechanical type, but if there is to be a very heavy strain, the old deadman type is preferable. No two feeder lines should be tied together without the use of an automatic sectionalizing switch, except in cases where there are two or more lines which feed the same trolley section. The days of heavy feeder lines have been practically eliminated by the advent of the automatic substation. In Des Moines, where we operate 90.43 miles of line, measured on a single-track basis, we have only 460,000 lb. of copper in the system. I mention this fact to show that some of our troubles are gone forever.



SPRING TROLLEY FROG DESIGNED AND USED IN DES MOINES, IOWA

If the Keystone, or any of the other type of steel pole tops is used a very good double insulator arm may be made by using a steel plate ½ in. thick and 3 in. wide, the length being determined by the diameter of the top petticoat of the insulator. The plate is drilled with three 13/16-in. holes, one in the center and one at each end of the plate, using a Keystone truss pin at each end. The plate is bolted to the pole top at the center. On a 22,000-volt line, using Ohio Brass insulator No. 11,622, Keystone truss pin No. 44,109, the distance between the two end poles would be 12½ in.

TROLLEY BREAKS MEAN DELAYED SCHEDULES

We all know what trolley breaks mean to our operating department, so it is up to the line department to keep them at a minimum. In Des Moines the trolley wire in the business district is inspected every week and bad pieces of wire are replaced at once. We used to believe that we could not replace a curve in the daytime or when the cars were running, but would wait until night and then pay time and a half for the work. That was a mistake; we do not hesitate now to rebuild almost any special work in the daytime, and we do it at less than one-third the cost. Quite often it is done without the operating department knowing anything about it. We have some special work where the vehicular travel is so great that it is almost impossible to get on the street. Here, of course, the work must be done at night.

A SPRING FROG DESIGNED AT DES MOINES

To overcome trouble with the trolley frog at wyes, we have designed a trolley frog spring switch which has worked out well. The spring switch can be used with almost any type of frog. The switch tongue is made of hardened steel, ⅞ in. x 9/16 in. x 6 in., the point being slightly flattened and brought to a biased point. A plunger post is inserted 1 in. from the point on the top of the tongue. At the larger end, or heel, a pivot post ⅜ in. in diameter is inserted. Two inches of the curve lead on the frog is cut off and a hole is drilled in the top of the frog for the pivot post, and a slot is cut 5/16 in. in width on top and on the curve side of the frog. A piece of ⅜-in. gas pipe 3 in. long, with the bottom half cut off (about 1½ in.) is then welded to the frog directly above the 5/16-in. slot. Then the tongue is inserted in place and the pivot post riveted on the top of the frog, leaving it loose enough so that the tongue will work easily. A small coil spring, 2 in. long, with a plunger 1½ in. long, is placed in the gas pipe with the plunger up tight against the plunger post. The spring is pushed into the gas pipe, a cap is placed over the end of the pipe and the switch is ready to be installed. A photograph of this spring frog is reproduced herewith.

Lightning arresters are inspected four times a year, and defective ones are replaced with new or repaired arresters. The arresters at all of the substation entrances are inspected after every storm. We inspect our feeder lines four times a year and trim trees as needed. If the tree insulators have slipped out of place they are replaced. It is much easier to do this than to have the line broken down; besides, it is quite a saving in loss of current.

Most of our high-tension troubles are insulator troubles and caused mostly by lightning or the insulator being "shot." We inspect our insulators four times a year, using a field glass most of the time. If any cracked ones are found, they are replaced as soon as the current can be taken off the line. We have an arrangement with the consumers so that the current is taken off the line on Sunday mornings between the hours of 2 and 6. This generally gives us enough time to do our work.

Bulletin No. 3 on "More Transportation"

IN ITS series of bulletins on "More Transportation" the Association of Railway Executives is urging in Bulletin No. 3 the reduction of bad order cars to a maximum of 4 per cent of the total owned. The bulletin cites records showing that when Federal control began about 5.7 per cent of the cars were reported in bad order and at the end of Federal control 6.7 per cent were in bad order. The bulletin states that "the cure of this situation is one of the first and most important problems confronting us," and further on "that the conditions demand that all roads exhaust every possible effort in this direction.

It is by exerting efforts in such directions as this that transportation companies can maintain satisfactory service for the public.

Shop Kinks from Sioux City, Iowa*

A Number of Original Designs of Car and Shop Equipment Are Described and Maintenance Practices as Used by the Sioux City Service Company Are Outlined

BY C. M. FEIST
Master Mechanic Sioux City (Iowa) Service Company

IT HAS been the custom of our company for a number of years past thoroughly to repair, clean, retouch and revarnish the car bodies once every year. However, since so many automobiles and trucks operated by thoughtless drivers have come into common use, with resultant scratching and damaging of car bodies, and also because of the greatly increased cost of labor and material, we have adopted a new system of overhauling.

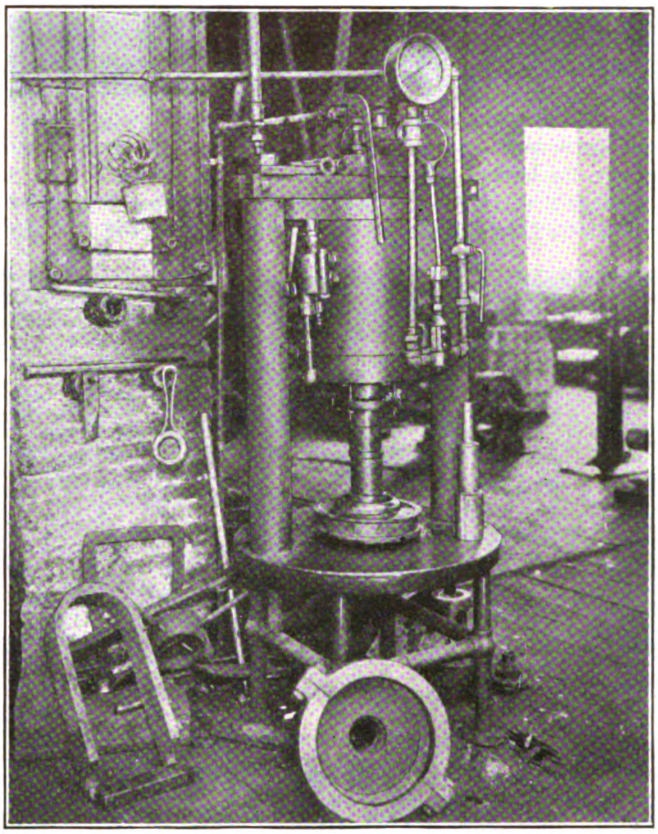
When a car body is newly built in our own shops we still follow the flexible system of painting such as the usual lead, color and varnish coats in order to preserve the wood and steel. Such jobs look well, barring injuries, from twelve to eighteen months, but if such a system of repainting and varnishing should be followed it would usually require one or two coats of color and two coats of varnish, which would delay getting a car body through the shop several days, depending on drying conditions between coats. We find, however, that in this age the general public gives no thought to fine finishes on a street car body. If the body looks fresh outside and is clean and comfortable on the inside, and the car can make the run to its destination without interruption, the average passenger is satisfied.

Our present system of general overhauling of car bodies is to run them through the shop about once every two years, at which time we make all necessary repairs, thoroughly clean the inside finish, including the seats, shades and floors, and wash the outside of the body and the trucks. After all parts are cleaned we apply two coats of railway enamel which has a wonderful covering quality. We stripe, letter and number on top of the second coat of enamel and apply one coat of paint on the roof, floors, trucks, etc. The window sills or arm rests, etc., are refinished if necessary. The car seat rattan is usually varnished and other parts painted.

This system of overhauling has given us very good results and has proved to be much cheaper, taking much less time, and every one in connection with our system seems to be well pleased, as such a job looks good for about two years.

MAINTENANCE OF ELECTRICAL EQUIPMENT

It has been our practice to follow the mileage basis for the care of equipment only in a small degree, and we recommend that inspections be made as often as possible in order to detect minor troubles which can be repaired at an early period at a small cost. This can only be accomplished by close, constant attention. The car operators, when turning in their cars at the close of the day's run, are requested to fill in a daily report blank, which is addressed to the master mechanic, stating the condition of the car they have been operating. These reports are collected and looked over by the night foreman at the barns. If repairs indicated on this report are of a light nature the work is done by the night crew at the barns and the report marked O.K. Should the operators' reports show work to be done beyond the ability of the night force the car is held for the general repair shop.



HOME-MADE PRESS USED FOR BROACHING AND PRESSING IN BEARINGS. HOUSING JIG AND REAMER ALSO SHOWN

Upon arrival of the cars from their respective runs they are first run over the pits before storing them away, where men inspect brakes, trucks, motors and air equipment to the best of their knowledge, make such repairs as they can and report their findings on a special blank. These reports are collected every morning and brought to the general repair shop for the pit foreman's and master mechanic's attention. After they have been looked over they are filed away and kept for two years for legal reasons.

The pit foreman keeps a complete record of the equipment on all cars. From this record he plans to have enough regular cars held for the shop in addition to those being held over from the barns each morning so as to keep his force busy every day. By this method all the equipment is being cared for in the main shop about once a month. One pit crew of two or three experienced men is set aside for general overhauling. This work is in force at all times. A car is brought over the pit and held until the entire equipment has been thoroughly inspected and overhauled. Street railway owners and operators may thank the railway equipment manufacturers for the splendid improvements which have been made in equipment within the last few years. It is now possible, with the aid of intelligent care, satisfactorily to operate and keep in motion a railway system at a nominal expense.

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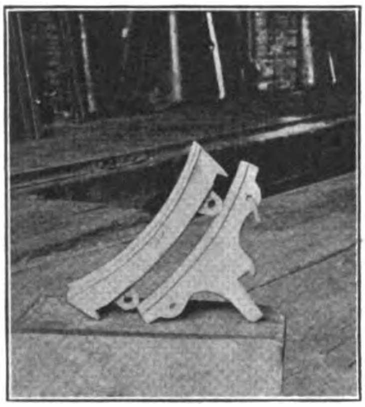
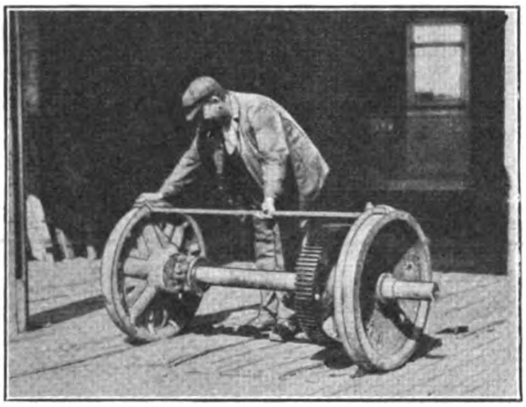
*Abstract of paper presented at Omaha meeting of the Iowa Electric Railway Association, Sept. 16, 1920.

When motors are in good operating condition they should perform their duty for a long time unless damaged in accidents. Should any trouble arise which an expert repair man cannot locate on the surface it might be well to test the fields for short circuits. With one or more partly short-circuited field coils motors will still operate after a fashion, but such field troubles and incorrect commutation will usually in time cause severe flashovers and burnouts.

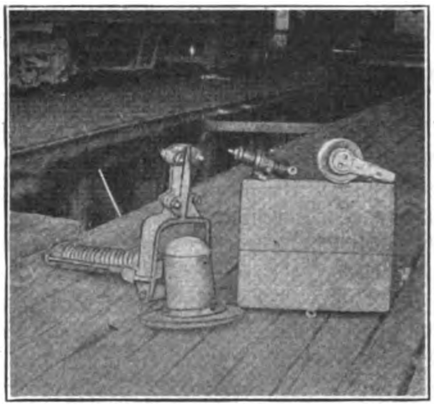
There are many other troubles which may develop in motors but they are more readily located by the average repair man. In this connection it is essential to maintain reasonably well fitted bearings on the axle as well as on the armature shaft in order to retain the intended alignment for gear, pinion and brush location.



SPECIAL BRAKE HEAD AND SHOE USED IN SIOUX CITY, IOWA



THE REVERSE FLANGE GAGE TEMPLATE IN USE IN THE SHOP



TROLLEY STAND, HARP AND WHEEL BEARING SAID TO GIVE LONG LIFE

THE TEMPLATE IN USE ON THE TRACK

The question of reclaiming bearings on old motors having badly worn armature bearing shells and housings came up in our shops. We decided to press a steel seamless tube over the bearings, cutting out the opening in accordance with the original shape for admission of waste packing and cutting new keyway. The thickness of tube selected was such as not to injure the housings when rebored and reamed to a new standard size. For this purpose a special lathe jig and reamer were made up in our own shop. This special job of refitting all armature bearings and housings in a certain type of motor was done during a time when the motors were being overhauled and required no extra work any more than to carry on hand an extra set of bearings and fitting up the housing for the next armature taken out of a motor.

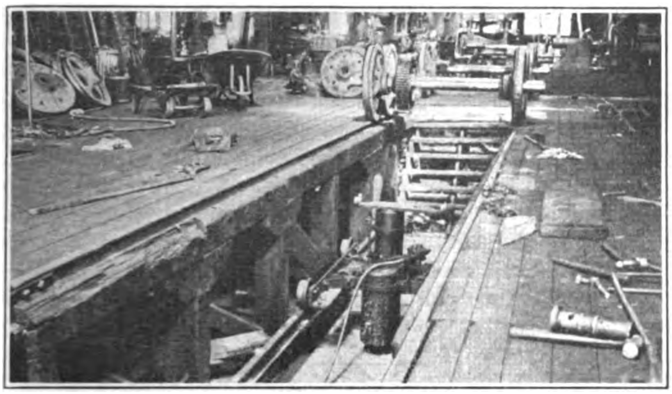
We believe that a high grade tin base metal should be used in rebabbitting bearings, even at a higher cost. We also recommend broaching the bearings after they are bored in order to produce a tense bearing, which will result in a much longer life. For this particular work a small vertical hydraulic press was designed and built in our own shop.

Pit Jacks Facilitate Motor and Truck Overhaul

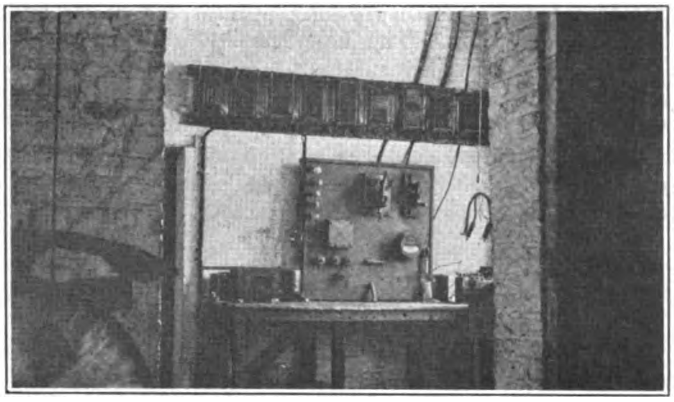
For the purpose of removing and replacing armatures and car wheels convenient pit jacks were built capable of handling 4,000 lb. These jacks operate on a track in the pits and are movable sideways in order to allow them to be placed under axle or armature for best balance. The jack cylinders are made up of 8-in. extra heavy pipe with suitable pistons traveling the extreme distance up and down required for the above-mentioned work. City water pressure is used to operate the jack, and occasionally for extreme lifts air pressure is added. The water from the piston is discharged into a tank so that it is not wasted, and this is forced back into the cylinder by means of the shop air pressure, for re-use.

Circuit breakers are thoroughly inspected about once a year and overhauled if this is found necessary. They are then reset to the desired amperage. This resetting can be done with the circuit breaker still on the car as well as on the test bench. In the pit foreman's workshop department we have installed a switchboard for this purpose. There are sufficient grids bolted to the wall and connected to a controller in several steps so that the current flow may be varied from 50 to 400 amp. The heavy test current is broken by tripping the circuit breaker, which also serves to protect the other shop circuits from interruption if too heavy a current is pulled at the test board, the controller in the circuit being used only to regulate but not cut off the current.

There is a great deal to be said with reference to the correct wheel gage. This can be best proved by fastening two short sections of good rail onto a board exactly 4 ft. 8½ in. apart and turning this device upside



COMBINATION HYDRAULIC AND AIR PIT JACK IN SIOUX CITY



CIRCUIT BREAKER TEST BOARD. THE REGULATING CONTROLLER DOES NOT SHOW

down on the set of wheels just pressed on an axle. Note the round throat of the wheel contour in relation to the round edge of the rail. If the wheels are pressed correctly there will result a free rolling set of wheels with the best possible traction. This would prove that the correct wheel gage should be 4 ft. 8¼ in.

A special wheel gaging template has been made up in our shops for testing purposes. This template has a reverse flange shape which can be laid on the track in frogs, crossings or curves to show the exact action of a wheel passing through. It has decided many debates between the track and repair shop departments when no one, as usual, wished to take the blame for car derailments.

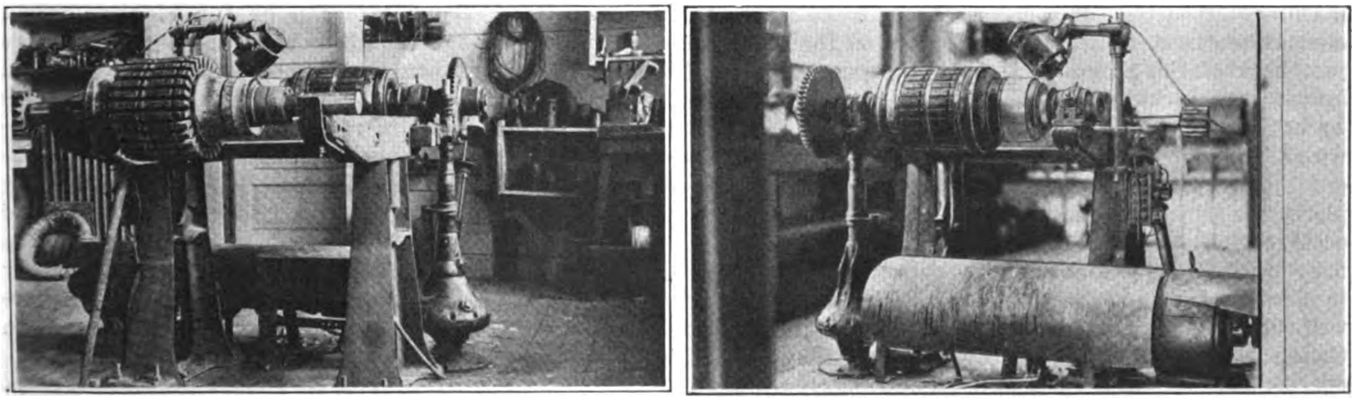
Worn pedestal jaws and journal boxes are very detrimental to the free running of a truck, as such a condition allows car wheels to run out of square. This adds a friction load, causes undue wear on wheels and rails and knocking when the truck enters crossings and frogs. We found it necessary to rebuild pedestals with a special gib plate to a new standard on our older trucks. In order to do this work correctly, the journal boxes are planed down on the sides. The manufacturer was requested to change the pattern of the boxes to conform with the new standard measurements, at the same time retaining a strong thickness in the walls of the new journal boxes in order to strengthen them and to give room for the special gibs.

As the standard shapes of brake shoes and heads usually recommended are inefficient and costly to maintain, I would suggest that a change be made in shapes and materials used, particularly in the heads. The standard shoe head carries plenty of metal in general, but is very small at the ends. Shoes soon become worn at one end and this allows them to climb up the wheels, causing the cars to jerk while stopping. The rapid wear at this end soon calls for renewal at a considerable expense.

Several years ago we made up complete brake shoe and brake head patterns. The brake head patterns were made to fit the brake beams in their former shape, but the face of this head was entirely changed to receive a new type brake shoe back. As a result we have at this time practically only one type of brake shoe. It fits the various heads and shoes can be replaced in about half the time required for the old style. These head castings are made of gray iron and weigh from 12 to 14 lb. each. The heads have two sockets instead of one for fastening the shoes. The latter are installed by slipping them in the heads all around, then setting the brakes, and while the pressure is on inserting the pins which lock the shoes in place. The heads cost us 4 cents a pound and resist the wear better than malleable castings.

We build a trolley base in our shops that is designed in line with the usual roller-bearing type but with an improvement. The turret castings are so designed as to carry oil, one filling lasting about two years. With this method of construction the central wearing post or bearing is entirely surrounded by and is floating in a perfect film of oil. The base thus functions freely and quickly in adapting its position to changes in the overhead position. In many bases, one oils them at the top and the oil eventually works through to the bottom and onto the car roof, leaving the bearing dry.

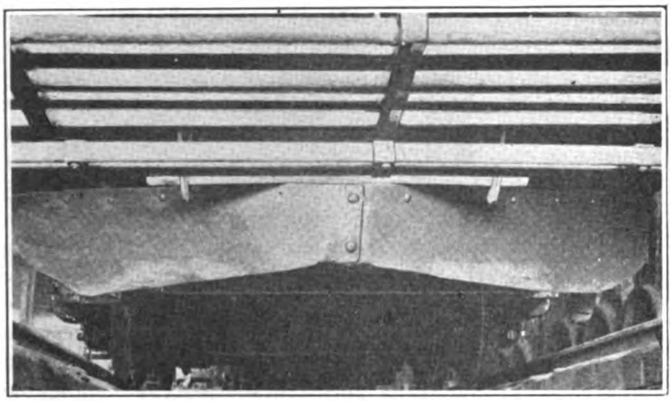
I have personally spent some money in the production of an efficient trolley harp, trolley wheel and its bearing. The object of the design was to provide sufficient bearing area and have a constantly dry conductive lubricant which would carry the current with the least



FRONT AND REAR OF ARMATURE BANDING MACHINE, WITH DRIVE IMPROVISED FROM AUTOMOBILE REAR AXLE resistance and thus insure long uninterrupted life and freedom in action. The harp carries a fiber washer on either side which insulates the wheel from the harp at the shoulders. These washers are thick enough so that they will outwear the wheel. The wheel bearing is 1⅝ in. long and contains enough oil to last the life of the wheel, so that it never needs to be lubricated except when newly installed.

SNOW-FIGHTING OPERATIONS

In climates where snow frequently interferes with the street car service snow-fighting equipment must be constructed to stand the strain of abuse and should be kept ready to be put in action whenever needed without constantly breaking down or wearing out. During the last twenty-five years several types of underplatform brooms and plows have been bought or built in our shops. None of these proved to be a great success. We next decided to try out a V-shaped tank-steel plow, having its nose suspended from or hinged to the car floor and depending upon its own weight to hold it down on the rail. This plow is light, inexpensive, does its work well and is carried on our cars the year round. When these wings are hooked up about 4 in. above the rail they serve as a splendid additional life guard. As this plow extends all the way across the track between rails, it serves also to remove some of the snow there, so that motors do not drag on it.



SNOWPLOW HINGED AT POINT, ITS OWN WEIGHT HOLDING THE WINGS DOWN ON THE RAIL

Our sweeper equipment consists of one rattan broom sweeper and four steel constructed combination sweepers and plows of an entirely new design. These machines are double-ended and have very efficient side wings for the purpose of pushing the snow that has been swept off the track a distance of about 7 ft. away from the outside rail. The revolving brooms on these machines are driven at a speed of about 300 r.p.m. by a separate street railway motor located on the platform just back of the broom and covered with a box. The broom speed is controlled by means of resistance and also by adjustable counter chain shaft sprockets. The side wings on these machines are of great advantage to our system, as other traffic on the streets constantly plows the snow back onto the rails. It is a common occurrence to see one or more of these big machines busy during the winter months, using the side wings to plow the snow back from the rail. This work is done without hindering the regular schedule cars in service. Owing to the design of these side wings they can be operated at the usual car speed. These machines were designed and built in our own shops and found to give much better service and to go through heavy snow when the regular rattan sweepers failed.

In connection with the usual tools and machinery in the armature room, an armature banding machine has been made up by using one end of an automobile rear axle as the drive with direct connection to a variable speed motor. The motor is direct connected to the automobile drive shaft and the axle drives the armature through a worm and gear. This device was inexpensive and it furnishes various speeds and plenty of power. Two coil clamping devices have been developed to force coils gently inward before banding.

Economies in the Transportation Department*

Turn-Back of Trippers and Frequent Revision of Schedule to Conform to Traffic Changes Recommended

BY EDGAR I. ANDERSON
Superintendent of Transportation Tri-City Railway & Light Company, Davenport, Iowa

IF A CAREFUL study of street railway conditions as they exist today were made, it would probably disclose the fact that there is hardly a road but what has lines on which business has fallen off at some hour of the day, so that the present schedule provides more service than is justified. This is more noticeable at night, as automobile owners use their machines most for their transportation needs combined with pleasure at this time of day, and these are the people who formerly patronized the street cars in the evening. For this reason schedules that have been in effect for years should be checked, as the cars may be carrying lighter loads than in the past and many of them can be pulled off on their last trips without complaint from the public.

Then, again, many times cars are operated at the request of patrons in a certain locality, but later these people move or purchase automobiles, and the traffic for which the service was provided no longer exists. Too often we do things because it has been done before, and many unnecessary cars are operated today because they were needed years ago.

TURN-BACKS, JUDICIOUSLY SCHEDULED, YIELD SAVINGS

Many times a system of turn-back of cars can be adopted to accomplish a substantial saving without serious detriment to the service. Every extra car should be operated only as far out as necessary on a line and then brought back to the traffic center promptly for another load. Some cars can be turned back sooner than others on the same line. To accomplish this the schedule maker should make personal inspections of traffic often, as conductors' trip reports do not show where passengers board and leave cars. When two or more lines use the same track extra cars can often be placed so as to relieve two lines.

In operating extra cars on two or more lines and turning them back at different points each trip the crew should have written orders, as these are generally too complicated for a train crew to remember. Without written orders the crew may go wrong or lose time on the road getting instructions from a supervisor.

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*Abstract of paper presented at Omaha meeting of Iowa Electric Railway Association, Sept. 16, 1920.

During the war the Tri-City Railway operated on the Davenport division forty-three regular cars and was required to run forty-five extra cars morning and night to the Rock Island Arsenal. This did not include the regular tripper service on other lines. These cars to the Arsenal were run from every line in the city, each car running only as far out on a line as it was necessary to secure a load, so that no extra mileage was run. To operate such a large percentage of extra cars and eliminate all overtime was no easy problem. Nearly all of the extra cars were operated in regular runs, but as more cars were added the runs had to be revised every fifteen days. It was necessary to keep these cars in regular runs to avoid overtime. There was no dead time in any of these schedules.

"KEEP THE CARS ROLLING" IS A GOOD SLOGAN

In making schedules for regular cars, lay-overs and dead time should be eliminated, as the wages of platform men today are such that there is no company that can afford any idle car-hours. Where delays are to be encountered, such as those at steam road crossings or in heavy vehicle traffic, too much slack time should not be allowed.

The Tri-City Railway operates forty-two regular and twenty extra cars daily on the Davenport division and pays no overtime except in case of wrecks or trolley breaks. It has no dead time or lay-overs in any schedule, under a nine-hour contract with the trainmen.

Schedules and time cards should be as self-explanatory to the trainmen as possible. The color scheme for timetables is a good idea, black for week-days, blue for Saturday and red for Sunday. A glance at a colored schedule or run will show the trainman whether he has the right one for that day of the week. As much information should be given as possible, such as direction of starting, miles in the run, time of starting, time run is completed, hours in run, and time extra cars are met on switch. This will save time on the road.

All bulletins and time cards at station and barns should be kept up to date. If old bulletins are allowed to accumulate on the bulletin board men will lose interest and will not consult the board daily. The Tri-City Railway bulletin boards hang from the wall and fold like the pages of a book, both sides of a board carrying bulletins and being covered with glass. The glass keeps them clean and no old bulletins are allowed to remain on the boards.

Recently the Tri-City Railway adopted a new form for car reports. This new form has meter readings on one side and car reports on the other. Every "run" has the mileage posted and each trainman has a book showing the miles between all cross-overs and junctions so that he can make a record of his mileage by full trips or for a turn-back. These reports are looked over by the night barn foreman for car defects and sorted in trays according to lines. The correct mileage for each run is then obtained by adding the mileage on the cards in that tray. Each card is then checked by the operating department to see that all turn-backs have been deducted from the mileage. After corrections are made, the cards are sent to the meter clerk, who makes up the monthly report of power consumption for each motorman, also the car-miles for the line and the total car-miles. The mileage is then sent to the store-room where the records are kept of wheel, gear, pinion and lubricant mileage.

This is the only mileage record that is kept, and as each report is checked it gives each department a correct mileage. It was quite a task to instruct the motormen so that these reports would be correct, but after thirty days there was only one incorrect report in three hundred coming in.

This simplifies the old system of having separate car reports and meter slips and of making out the car-miles at the barns to be sent to each department. Formerly the meter reports were not checked or corrected, and if the monthly report was wrong it gave a motorman a good excuse for his high power consumption.

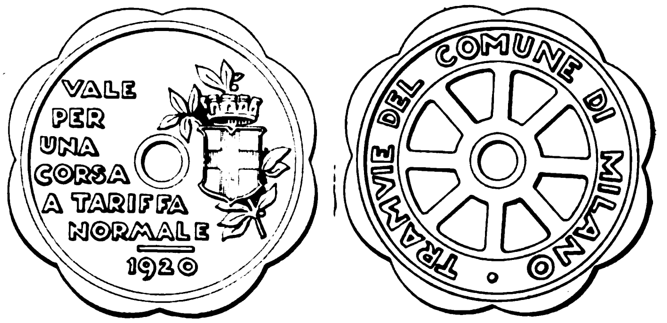
As power is one of the great items that go to make up the expense of operating a road, some device and system that will reduce the power consumption should be adopted, provided it is not too complicated for the trainmen to understand.

New Fare Tokens in Milan

Artistic Design Used for Bronze Tokens—Use of Tokens First Step in Modernizing System

THE accompanying illustration shows the new fare tokens which are now in use, since Aug. 12, on the lines of the Milan (Italy) Municipal Corporation Tramways: The tokens, which are of yellow bronze are coined in two sizes, the full fare about the size of the United States quarter and the half fare about the size of a 5-cent nickel.

The half fare is in force between 6 and 9 a.m. on all cars of the Corporation Tramways and the full fare, which is 30 centesimi, obtains from 9 a.m. till night time. Practically, conductors are allowed to accept two half-fare tokens or one half-fare token and 15 centesimi in coin in payment of one full fare and one full fare token in payment of two half-fare rides.



"Good for One Ride at Full Fare" "Tramway of the City of Milan"

FULL FARE TOKENS OF MILAN, ITALY

Indications are that this is but a first step toward the modernization of service, the management having already ordered fifty motor cars and fifty trailers of a larger capacity than the existing rolling stock and which will be equipped with double doorway rear doors and single doorway front doors, for cars of the double-end type, with folding controlled doors and steps. It is the intention of the management, in case the innovation of fare tokens should favorably impress the public, to try out the prepayment operation, following the successful system on the Rome Municipal Corporation's lines.

As can be easily seen, Italy apparently wants to go ahead in following American operating standards, and it is predicted that ere long the "safety car," perhaps even "Made in Italy," under the American patents, may be in operation on a number of the city systems.

American Engineering Council to Meet and Organize

First Meeting of the Operating Body of the Federated American Engineering Societies to Be Held in Washington November 18, 19 and 20—Epoch-Marking Event Will Attract Engineering Representatives from All Parts of the Country—Herbert Hoover to Address Meeting

LESS THAN two months will elapse before the first meeting of American Engineering Council, the representative and operating body of the Federated American Engineering Societies, organized in Washington June 3 and 4. The story of the organizing conference was related in these columns, issue of June 12, page 1213, and commented upon, page 1184. More than 110,000 engineers were represented by 140 delegates from seventy-one organizations. This new organization is the realization of long-held hopes and much-discussed plans to have a representative and all-inclusive body which would speak for all engineers and allied technologists, whenever their combined judgment was desired or useful and whenever they, themselves, desired to be heard.

As stated in the constitution, this organization of engineers is for service to the public welfare. It has been called an engineering organization, which is for engineers and things engineering similar to the Chamber of Commerce of the United States in the business and commercial world. Composed, as it is, of organizations of engineers, local and national, it for the first time provides adequate machinery for local engineering organizations to be heard in national affairs.

Running through all discussions about this new organization is the strain that this is the Age of the Engineer. It has been called by some the Iron Age, or the Age of Machinery, the Age of Electricity and what not, but such terms are now recognized as failing in significance. The engineer has been the one universal agent in this modern civilization or age; he has been the one who has made possible those products and facilities now recognized as necessities and conveniences, those things which mark this age as different in some way from previous ages. This organization is the result of the crystallization of that feeling plus the desire of the local and regional societies to have adequate voice and representation in any nation-wide organization which is intended to reflect or formulate the combined engineering judgment of the country.

First Meeting of
American Engineering Council
of
The Federated American Engineering Societies
Washington, D. C., Nov. 18-20
All Sessions in Small Ballroom, New Willard Hotel

Thursday, Nov. 18, 1920

MORNING SESSION

8:30 A.M. *Registration.*

10 A.M. *Opening Session of American Engineering Council of Federated American Engineering Societies.*

1. *Call to Order by Richard L. Humphrey, Chairman Joint Conference Committee.*
2. *Election of Temporary Chairman.*
3. *Election of Temporary Secretary.*
4. *Appointment of Temporary Committees:*
   - (a) *Program.*
   - (b) *Credentials.*
   - (c) *Constitution and By-Laws.*
   - (d) *Nominations.*
   - (e) *Plan and Scope.*
   - (f) *Budget.*
   - (g) *Resolutions.*

AFTERNOON SESSION

2 P.M. Address, *"Engineering Council," J. Parke Channing, Chairman.*

2:30 P.M. *Discussion of the field of activity for The Federated American Engineering Societies.*

Friday, Nov. 19, 1920

MORNING SESSION

9 A.M. 1. *Report of Committee on Nominations.*

2. *Election of Permanent Officers.*
3. *Report of Committee on Constitution and By-Laws.*
4. *Formal Ratification of Constitution and By-Laws.*
5. *Report of Committee on Plan and Scope.*

AFTERNOON SESSION

2 P.M. 1. *Report of Committee on Budget.*

2. *Report of Committee on Resolutions*

EVENING SESSION

8:30 P.M. 1. *Introductory remarks by the President of American Engineering Council.*

2. *Address by Herbert C. Hoover, President, A. I. M. & M. E.*

9:30 P.M. *Informal Reception and Smoker.*

Saturday, Nov. 20, 1920

9 A.M. *Organization Meeting of the Executive Board of American Engineering Council.*

The first meeting of American Engineering Council has been called for Nov. 18, 19 and 20 at the New Willard Hotel, Washington, D. C. Every member society has at least one representative on the council. The program of this first meeting, as proposed by the Joint Conference Committee, is given herewith.

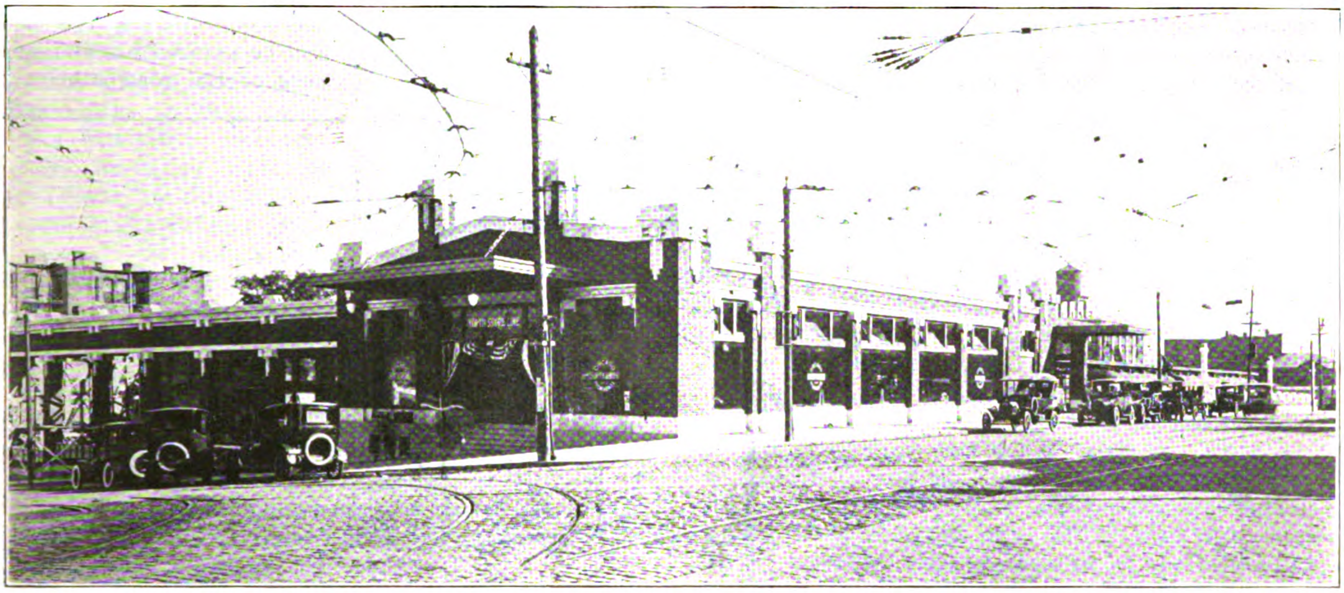
After the organization conference in Washington last June, the Joint Conference Committee of the four Founder Societies was appointed the *ad interim* committee of the Federated Societies. This committee has since issued bulletins from time to time, mention of many of which has been made in these columns, answering detailed questions as to the function and methods of operation of American Engineering Council. Copies of these may be obtained from the committee at 29 West Thirty-ninth Street, New York. They also tell of the past work of Engineering Council, which turns over its work and problems to American Engineering Council on Jan. 1, 1921, and of the important questions now before Engineering Council, which the new organization will have before it for consideration and solution.

Another aftermath of the Washington conference of June was the almost universal approval of the new organization, as reflected by the technical press of the nation. These editorial opinions and analyses of the Federated Societies were compiled and published as a booklet, called "Engineers Unite," by the McGraw-Hill Company. The opinions of engineers of the country, as reflected in this way, indicate the necessity for and interest in the proper functioning of the Federated Societies.

The Washington meeting will thus mark an important step in the engineering world and the beginning of the engineers' entrance into larger national affairs. Added to the interest of the business of the meeting itself will be the address of Herbert Hoover and other engineering leaders of national prominence.

New Terminal at Milwaukee Opened

Chicago, North Shore & Milwaukee Railroad Has Completed a Handsome Station at the North Terminus of Its Line Which Is Well Arranged to Serve Patrons and Unique in Inspection Facilities



THE NEW MILWAUKEE TERMINAL FRONTS ON SYCAMORE STREET AT SIXTH AVENUE, THREE BLOCKS FROM THE HEART OF MILWAUKEE

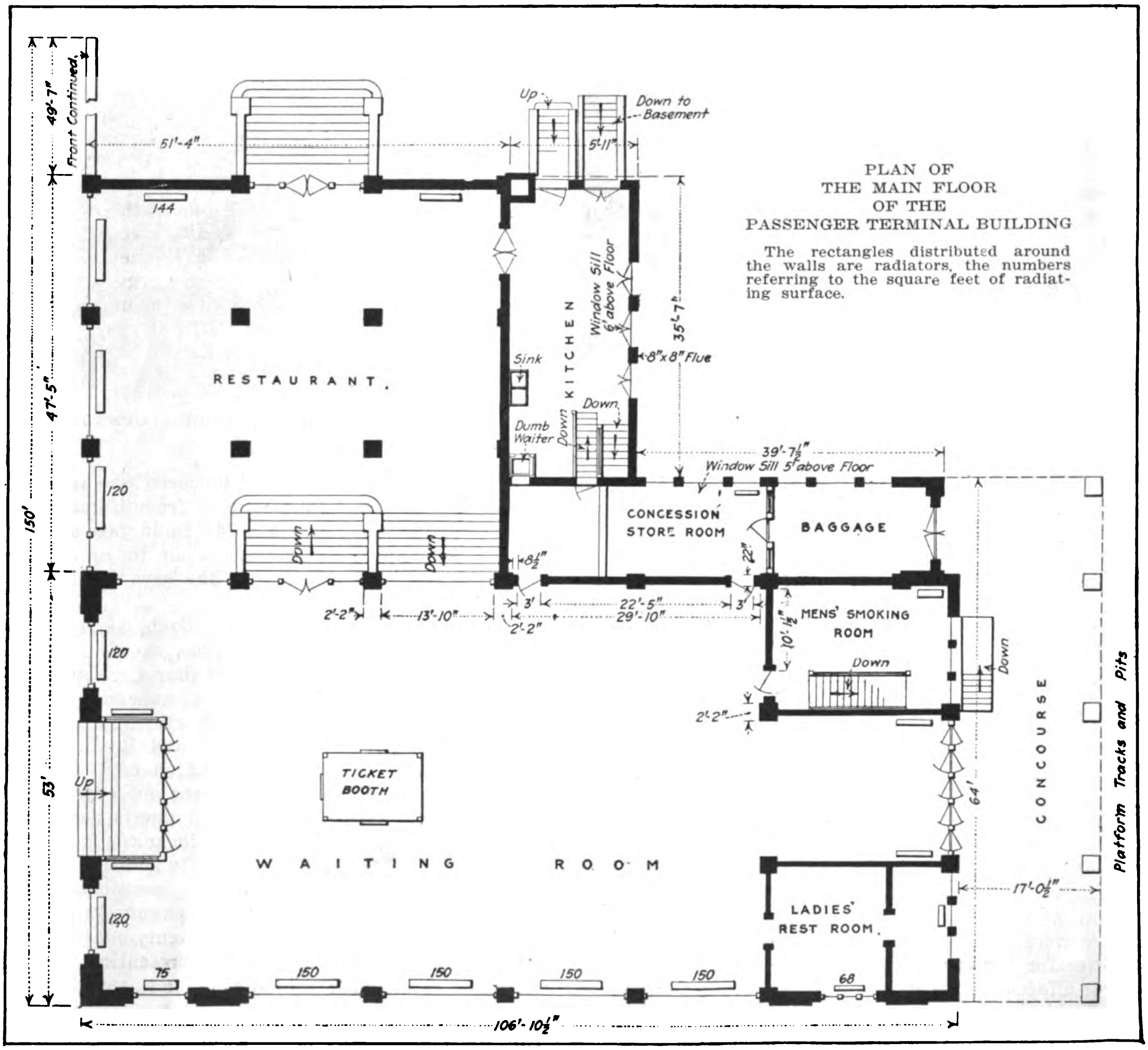
IN ORDER to secure adequate terminal facilities for the handling of its rapidly growing patronage and for the proper inspection of equipment, the Chicago, North Shore & Milwaukee Railroad purchased a site for, and recently completed the building of, a magnificent new station in Milwaukee, Wis. It is very well located at the northeast corner of Sycamore and Sixth Streets, one block south of Grand Avenue, which is the main business street of the city, and only three blocks from what is probably the center of the business district. Furthermore, Sixth Street is to be widened to 160 ft. and made the principal north and south thoroughfare of the city. Heretofore, the road has had a station which was satisfactory from the standpoint of the patrons, particularly the location virtually at the center of the business district, but unsatisfactory from the operating standpoint, since there were no terminal facilities for the cars except those afforded in the street.

For the formal opening of the new terminal, Britton I. Budd, president, sent out invitations to about two hundred business men, public officials, bankers, representatives of the chambers of commerce and other prominent citizens located along the line of the road to attend the ceremony in the new station. A special three-car train was run from Chicago to Milwaukee and luncheon was served in the "diner" to some eighty guests from Chicago and points en route. At Milwaukee Mr. Budd gave a luncheon at the Milwaukee Athletic Club to ninety-four guests, who went from there to the new terminal for the opening.

At the opening ceremony Phil Grau, secretary of the Milwaukee Chamber of Commerce, presided. Daniel W. Hoan, Mayor of Milwaukee; Walter Carlson, president Milwaukee Association of Commerce; Samuel Insull, chairman of the board North Shore Lines; Joseph R. Noel, acting president, and R. B. Beach, business manager Chicago Association of Commerce, and Mr. Budd addressed briefly the more than two hundred guests assembled. These included from Milwaukee, in addition to those already mentioned, five judges, twenty-four aldermen, twenty-one railroad men representing all the steam lines entering the city, the presidents of the Milwaukee Club, Milwaukee Athletic Club, City Club, congressmen and others. Similarly prominent men from other points along the line were present.

In his talk Mayor Hoan declared the new station to be the most modern and efficient railway terminal in America. In extending the greetings of the city to

BRICK AND WHITE STONE ORNAMENTAL WALL TO THE REAR OF THE STATION ALONG SIXTH AVENUE the railway officials, he said that he did so not only because of the excellent transportation facilities which the North Shore Line was giving to the residents of Milwaukee, but because of the splendid spirit of co-operation of the road's officials with the officers of the city. He remarked that if all utility managers would co-operate in the same spirit Milwaukee would be happy indeed. He spoke in a very complimentary way about the manner in which the North Shore Line had gone to unusual ends to relieve the distress in Milwaukee which prevailed during the railroad strike, and assured the company that the city officials were not unaware of what this company was doing for Milwaukee.


Front Continued
49'-7"
51'-4"
Up
Down to Basement
5'-11"
144
Window Sill 6' above Floor
KITCHEN
35'-7"
8"x8" Flue
Sink
Down
Dumb Waiter
Down
RESTAURANT
47'-5"
39'-7½"
Window Sill 5' above Floor
120
CONCESSION STORE ROOM
BAGGAGE
150'
Down
Down
8½"
22"
2'-2"
13'-10"
3'
2'-2"
22'-5"
29'-10"
3'
10'-1½"
MENS' SMOKING ROOM
Down
Down
120
2'-2"
TICKET BOOTH
Up
53'
64'
CONCOURSE
Platform Tracks and Pits
WAITING ROOM
17'-0½"
120
LADIES' REST ROOM
75
150
150
150
150
68
106'-10½"

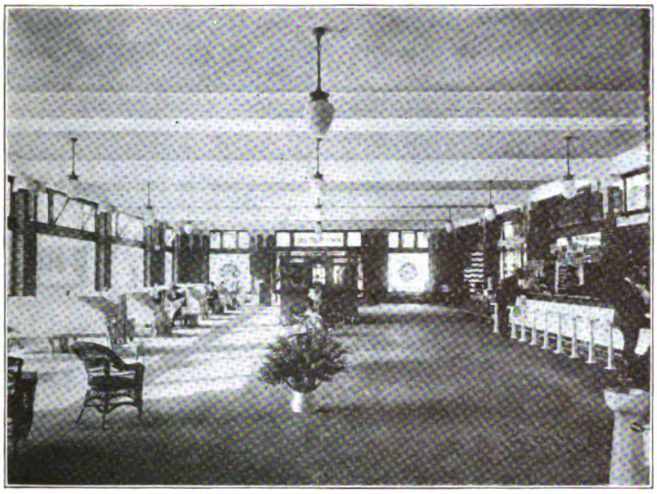
PLAN OF THE MAIN FLOOR OF THE PASSENGER TERMINAL BUILDING

The rectangles distributed around the walls are radiators, the numbers referring to the square feet of radiating surface.

In his brief address, Samuel Insull referred to the fact that the service on the North Shore Line is being perfected only through the expenditure of large sums of money, which can be obtained only as a result of holding the confidence of the people served. He said that in financing the improvements on the road the present management had had to cope with the disadvantage of the history of the road, it having gone through the courts, but that the officers were succeeding in developing a high-speed railroad, thanks to the co-operation of the city authorities all along the line and the state regulatory bodies, which had been very sympathetic and helpful when they had come to understand the policies of the road. He spoke with some pride of the fact that the North Shore Line was one of the very few roads in the country which had been able to continue the betterment work right through the period of high prices. He said that the policy pursued in the past had been to supply all equipment and facilities necessary to meet the traffic demands, and that the same policy would be continued, and he assured his audience that even though the business of the road continued to grow at the present rate, there would be provided ample means for handling it in the future. He concluded his talk by saying that the primary object of the management was to make the property a great financial success by establishing with the communities served a reputation for it as the "Road of Service."

Other speakers addressed many compliments to the operating officials for the splendid improvements which have been made in the operation of the road, and assured them of the whole-hearted co-operation which their policies deserve.

The opening of the new station marked the initiation of a new train service between Chicago and Milwaukee. A train known as the Badger Limited will leave Milwaukee daily at 4.30 p.m. and run through to Chicago in two hours and ten minutes. The running time of the other express trains of the North Shore Line is two hours and forty-five minutes, while competing steam lines cover the distance between Chicago and Milwaukee in two hours and ten minutes. The fare on the North Shore Line between Chicago and Milwaukee is $2.50, while the steam lines charge $3.30.


THE ATTRACTIVE MAIN WAITING ROOM WITH TICKET OFFICE IN CENTER, THE DOOR TO THE RIGHT LEADING TO RESTAURANT, A FEW STEPS BELOW

In general, the passenger terminal building, loading platforms and tracks and a new merchandise dispatch station occupy a strip of ground 420 ft. long by 150 ft. wide. It is a stub-end station, served by three tracks, two of which will accommodate five passenger cars and the third four, making a total capacity of fourteen of the standard passenger cars.

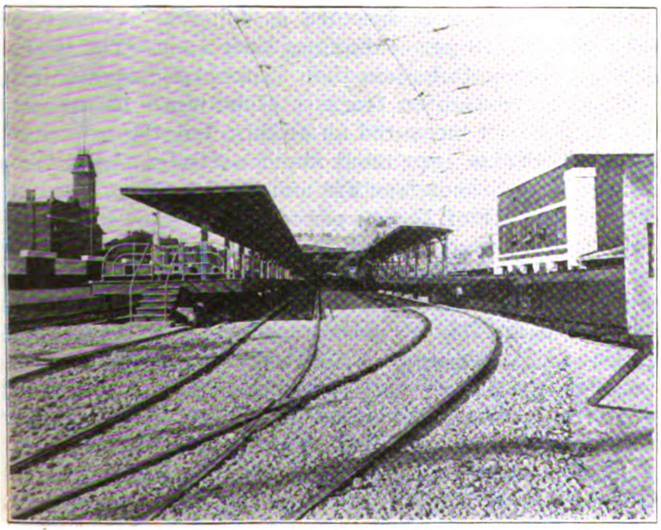
The passenger station is constructed of red tapestry brick with wide raked-out joints and all brick set with a template, giving a very attractive appearance. A composition wood and steel roof was used, the steel trusses having been erected in the areaway of the attic. The floor of the main waiting room was constructed of concrete covered with red tile, with variegated colored tile arranged in an art design. All of the white cement stone trim for the building proper and the ornamental wall extending along Sixth Street were cast on the job.

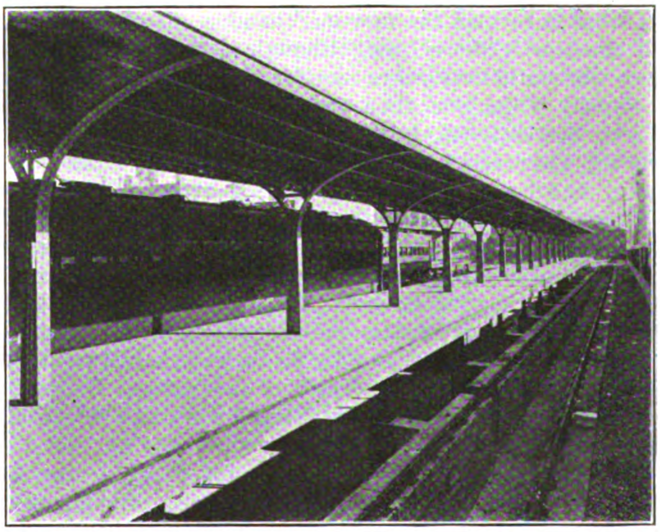
The smoking room and the ladies' rest room were finished off with terrazzo floors and likewise the stairs. The floors and walls in the toilet rooms were finished in white tile.

The main waiting room is made unusually light and attractive by the very large windows, extending practically from ceiling to floor along two sides. The ticket booth is arranged in a central position and heavy wood ornamental benches are distributed along the side of the room adjacent to the windows on the Sixth Street side. A confectionery and light-lunch concession, soda fountain, etc., occupies a position along the opposite side of the room, and behind this is a small room which serves as a storeroom and workroom for the concessionnaires and also as a parcel check room. A buff-colored beamed ceiling with ornamental lighting fixtures finishes off the waiting room.

On a slightly lower level, owing to the location of the building on a hillside, a fairly large restaurant has been built and equipped. This communicates with the main waiting room by a wide stairway and it is the idea that this restaurant will be used only at meal-times. Lunches will be served from the concession in the main lobby at other times. A feature of the arrangement is that the kitchen serving the restaurant will also communicate with the concession by stairway, so that hot meats from the kitchen may be taken directly to the workroom behind the concession, where sandwiches and the like may be prepared.

The basement of the station will be utilized at present as a storeroom, with the south end set aside as a tool-room and workshop for the shop department inspectors. These basement rooms in the south end of the building communicate directly with the pits serving the three terminal tracks. In the basement also are provided a trainmen's room and a locker and report room, employees' toilet and another toilet room for concession employees. For the trainmen there are stairways leading to their room from the platforms and from the track


THE TRAINS MAKE A REVERSE CURVE OFF SIXTH AVENUE INTO THIS STUB-END TERMINAL, IN WHICH THE THREE TRACKS PARALLEL SIXTH AVENUE. MERCHANDISE DISPATCH TERMINAL AT RIGHT


A VIEW SHOWING THE PITS AND PLATFORM CONSTRUCTION, ENABLING INSPECTORS TO PASS DIRECTLY FROM ONE PIT TO ANOTHER. THE SPACE BENEATH THE PLATFORM IS OPEN

level. The basement will be further finished off later on and a concession given to a barber shop and other patron conveniences.

In the areaway to the east of the station a space has been provided for the parking of ten or twelve automobiles so that any one may drive up to the station and leave his car off the street in a protected place while he goes to Kenosha, Chicago, or some other point on the line.

LOADING AND INSPECTION FACILITIES DISTINCT FEATURES

The south end of the main waiting room of the station opens through a group of doors onto a platform which connects with the two long loading platforms. Both these platforms are constructed of steel, one being an island platform 16 ft. wide with the overhead shelter centrally supported, while the other is a side platform 10 ft. wide with the roof supported on a single cantilever. Both of these platforms are supported on steel columns which rest on concrete walls, butt walls extending out from the track wall. The entire space underneath the platforms has been left open and openings provided at 50-ft. intervals in the track walls so that inspectors may pass from one pit to the others directly without the necessity to climb out of the pit or go around to the ends. The inspection facilities thus provided for looking after the equipment are a distinct feature of the new terminal. Two of these tracks are provided with a pit 260 ft. long, while the third track, which will generally be used for local cars, is provided with a pit 80 ft. long.

The rails for the terminal tracks are laid directly on the concrete walls which form the pit, without the use of any ties, giving full access to the equipment underneath the cars. The rails are set on ordinary tie plates, which in turn rest on ⅜-in. plates of lead used to protect the concrete from the impact of the wheels, the noise being somewhat deadened at the same time. Concrete stairways were built at the outer ends of all of the pits, while at the station end they communicate directly with the basement.

MERCHANDISE DISPATCH TERMINAL OCCUPIES ADJACENT POSITION

Adjacent to the new passenger terminal in Milwaukee is what is termed the new merchandise dispatch station of the North Shore Line, although a part of this building was built four years ago for the use of the express company which was then operating on the North Shore Line. Recently this building was extended 189 ft. to the north, after some old buildings belonging to the company had been wrecked and cleared away. This gives a freight station 341 ft. long and 30 ft. wide, arranged with two tracks which will accommodate twelve cars along one side of the building and a 20-ft. driveway in addition to the alley width along the opposite side of the building for teams and trucks. A central section of this building 51 ft. long by 60 ft. wide is of two-story brick construction. The first floor is open and is merely a continuation of the freight-handling floor. The second floor has been given over to office space.

This merchandise dispatch terminal may be seen to the right in one of the accompanying photographs. All merchandise dispatch business originating in or shipped to Milwaukee will be handled at this terminal, while the carload freight will be received at a station at Harrison Street, in the outskirts of the city.

B. J. Fallon, chief engineer, and A. U. Gerber, architect for the North Shore Line, are responsible for the engineering and architectural features of the new Milwaukee terminal.

Standardization of Overhead Line

A SUB-COMMITTEE of the Municipal Tramways Association has made a very interesting report on overhead line material and its standardization. The committee sent a questionnaire to all operating companies in England and found a remarkable condition in the industry as regards standardization. There were more than thirty different sizes and sections of trolley wire used; one firm alone manufactured fifty different sizes of insulated bolts; another firm had patterns for more than 1,000 different line ears, and in general a very great need for standardization was found.

The committee recommended No. 0 to No. 0000 as standard trolley wire sizes for future use, and as a result of many tests for strength, vibration and elongation it wrote a specification for the standard wire and groove. The committee also prepared specifications for overhead fittings and for steel span and guard wires, but was unable to recommend any insulator specification at this time. The trolley wire specifications conform to the standards of the A. E. R. E. A. in general, although the minimum tensile strength is less and the elongation differs slightly. For steel span and guard wires the committee fixed the tensile strength between the limits of 28 and 35 tons per square inch with an elastic limit not less than 35 per cent of the breaking stress. The breaking stresses of the various wires were specified as follows:

No. 8 S.W.G	1,261 to 1,576 lb.
No. 7/12 S.W.G	3,500 to 4,375 lb.
No. 7/14 S.W.G	2,100 to 2,625 lb.
No. 7/16 S.W.G	1,400 to 1,750 lb.

The wire must not show any copper after having been dipped three times in a copper sulphate solution, for one minute each time, at 60 deg. F., and the wire must also stand a bending test on a 1-in. thimble for all sizes excepting No. 8, which must stand the test on a 2-in. thimble.

In the specifications for the overhead fittings the gunmetal mixture is specified as follows: Copper, 88 per cent; tin, 10 per cent; zinc, 2 per cent. The tensile strength is not to be less than 15 tons per square inch, with an elongation on fracture of between 15 per cent and 20 per cent measured on an 8-in. length.

The malleable iron must stand a 90-deg. bend on a 1-in. radius without fracture and must have an ultimate tensile strength of 17 tons per square inch, with an elongation of 4 per cent in a 2-in. length. Hot galvanizing is to be used whenever galvanized fittings are to be used. The steel must show a tensile breaking strength between 25 and 35 tons per square inch, with elongations of 27 and 20 per cent respectively in a length of 2 in.

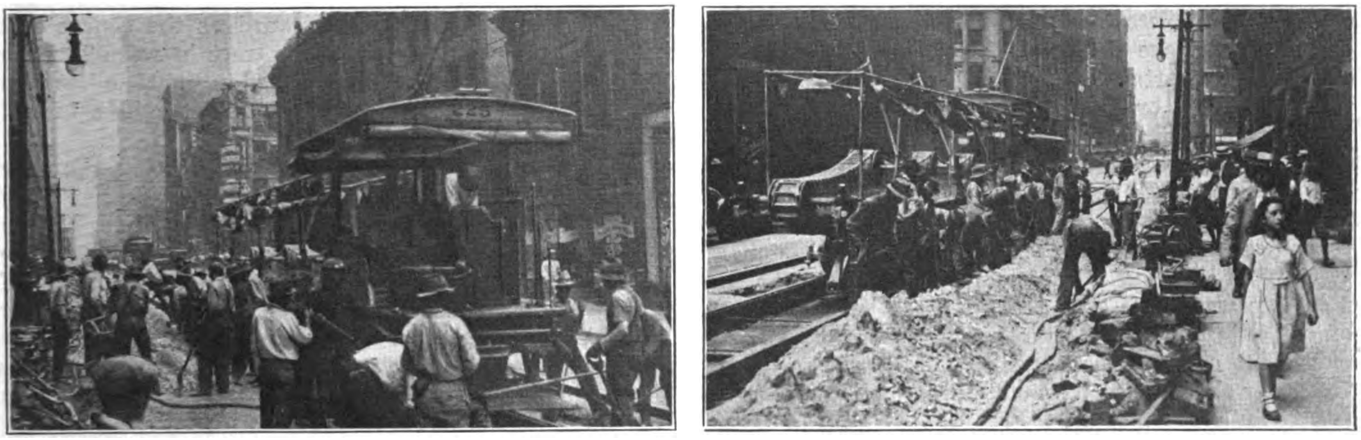
Composite fittings must stand a 2,500-volt insulation test after having been soaked in water for twenty-four hours and then dried. Double and single pull-offs must stand a straight pull of 1,500 lb. without distortion and a tensile stress of 4,000 lb. Straight line hangers must stand a stress of 3,500 lb. on the span wire. Globe insulators must stand a tensile stress of 5,000 lb. without fracture when heated to 100 deg. F. and the insulator bolts must be one-piece steel drop forgings.

Relaying Downtown Track in St. Louis

Machines Played Important Part in Job on Olive Street, Where New Rails Were Laid on Old Foundation and One-Half the Street Was Left Open

RAIL renewal recently became necessary on Olive Street from Twelfth Street to Broadway, a distance of 2,195 ft., or 4,390 ft. of single track, in the heart of the business district of St. Louis, Mo. One track at a time was rebuilt, keeping the other half of the street open for one-way car and vehicular traffic, that in the other direction being diverted to other streets. The density of traffic in this locality made it highly important that the work should be accomplished in as brief a period as possible, and to this end a very extensive use of machines was called into play.

The old track on Olive Street was laid in 1906, with 6 x 8 in. x 7-ft. cypress ties set in a concrete base. The rails employed were 112-lb. 9-in. girders, Lorain section 333. These were fastened to the ties with hook-head spikes and the joints were cast-welded.



TWO VIEWS OF THE CONTINUOUS CONCRETE MIXER AT WORK ON OLIVE STREET, ST. LOUIS

Examination of the track disclosed that the concrete base and most of the ties were in good condition and it was decided that the new rail should be relaid on the old foundation. While this complicated the work of bringing the new rails to alignment and grade, it saved the material necessary for constructing the concrete foundation and also the time and labor involved in removing this old concrete.

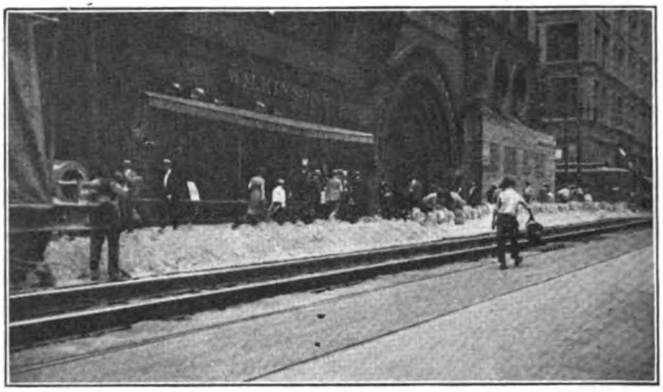
The first step in the reconstruction of the track was to tear up the old rails. This was done by a special rail-breaking car which the company has employed in this work for a number of years. This powerful machine consists of a 50-ton two-drum hoist. The two cables are hooked over the ends of the two rails and the hoisting machinery is set in operation. This lifts the ends of the rails and breaks them in 7-ft. lengths, the breaking point of the rail having first been determined by burning a slot in one side of the rail base. As the two pieces of rail are pulled up they are separated by using an acetylene torch to burn off the tie rods at both ends. The sections of rail were later removed from the street, either by loading by hand onto a work car, using two men on a rail piece, or by dragging the pieces up skids mounted on the side of a special car which was described in the ELECTRIC RAILWAY JOURNAL for Sept. 13, 1919, page 531. In preparing for the rail-breaking machine a section of the pavement, 1 ft. square, was removed at the rail every 7 ft., in order to permit hooking the cable tongs under the base of the rail. The notches in the rail base were then burned.

As the rails were pulled up from their bed in the concrete the amount of the concrete which came with them varied from almost none at all, outside of the actual rail base width, to a considerable piece. Now and then a tie would pull out with the rail, and these, as well as the few deteriorated ties, were replaced in laying the new rails with pieces of old T-rail, thus avoiding the necessity to pick out the old tie seat in order to insert a new wooden tie. These pieces of rail were simply suspended from the bottom of the new rail in the seat of the old tie by using the regular rail clamp and bolting it through the base of the cross-tie rail.

No effort was made to preserve the old wood-block pavement as the rails were pulled up, as it was thought necessary to renew this anyway. After the rails were out of the way, therefore, it was necessary to strip the trackway of the paving block and all loose material. A considerable amount of labor with hand picks was then necessary to break away the concrete base further where it interfered with a proper bearing of the new 132-lb. 9-in. girder rail, Lorain section 440.

The new rails were then laid in place and roughly aligned and graded by temporary spiking through a tie now and then. The next step was to complete the joints. The Nichol joint used consists of two heavy loose-fitting angle bars, which extend under the base of the rail and up under the head, riveted together through the web of the rail by means of 16-in. 1$\frac{3}{32}$-in. rivets. These rivets were heated in a small blacksmith's forge carried on the car on which was mounted the Hanna riveter. After the riveting was completed, the joint was filled with spelter, which not only serves to bring the angle bars into absolute contact with the rail but forms the bond as well. Tests made to determine the current-carrying capacity of these joints have shown the joint to have 120 per cent of the conductivity of the

MATERIALS SIDE DUMP SPREADER DISTRIBUTING A COURSE OF CRUSHED ROCK ALONG THE TOP OF THE SAND, PREVIOUSLY DISTRIBUTED IN THE SAME MANNER



MANNER OF DISTRIBUTING SAND, ROCK AND CEMENT IN PREPARATION FOR CONCRETE MIXER. AT THE LEFT ARE THE CEMENT SACKS THAT HAVE BEEN EMPTIED ALONG THE TRACK

rail. This Hanna riveter handles one rivet at a time and is capable of exerting an 80-ton pressure upon it. The United Railways has more than 10,000 of these Nichol joints in use, some of which have been in for eight years, and according to C. L. Hawkins, engineer maintenance of way, not one has ever broken down.

The task of bringing the rail to permanent grade and alignment was a particular job, under the conditions imposed from making use of the old concrete foundation. This was done by selecting certain ties on which the rail would rest at the proper grade, making use of a thin tie plate, and then adzing off other ties or building up above them with steel tie plates to obtain a uniform bearing of the rail on each tie. This involved more or less fitting and trying. For the purpose, tie plates of ¼ in., ⅜ in., ½ in., ⅝ in., ¾ in. and 1 in. thicknesses were supplied, all drilled with two diagonally opposite spike holes. Where two or three tie plates were used on one tie, it was necessary to place them evenly so that the spike holes would match up. Where the blocking up necessary was much more than 1 in. use was made of a 1 x 6 x 18-in. tie-board made of oak reinforced with two ¼-in. square rods with the ends bent over at the edges of the board, so that if the latter should split it would still be held together and form a substantial support.

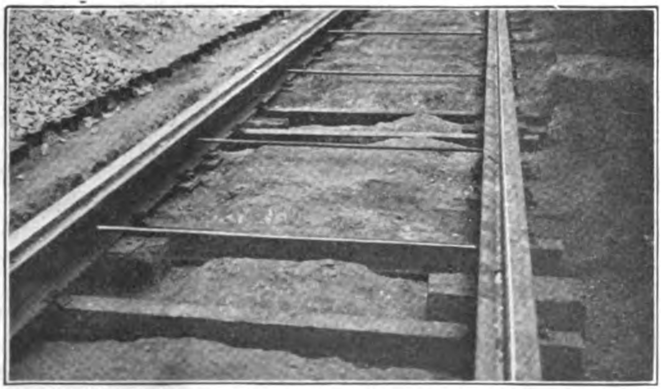
When the rail was at proper grade, ¾-in. holes were bored in the ties and 7-in. screw spikes driven through the rail clips and the tie plates. For boring the spike holes in the ties use was made of Duntley drills, and Duntley spike drivers were also used for screwing down the spikes, these small machines alone saving an immense amount of time and labor, according to the roadmasters, who were very enthusiastic about them.

Tie rods of ⅞ in. round section on standard 6-ft. spacings were used.

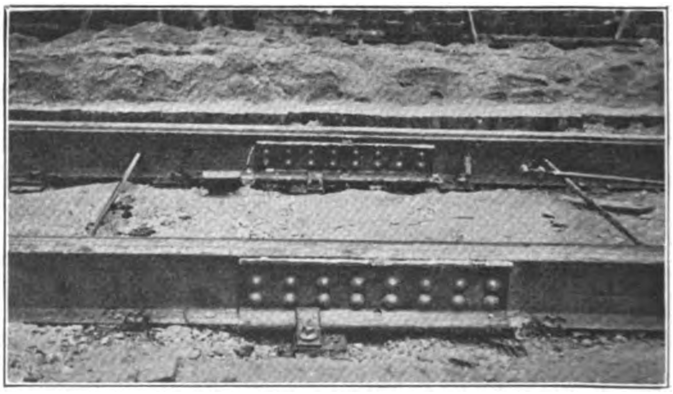
Concreting in followed the grading of the rails, and this was done with great rapidity through an efficient method of distributing the materials and the use of a continuous mixer, which is pictured herewith, though it has been in use by the company for a number of years and was described in this journal several years ago. This concrete mixer runs on the track that is to be concreted, gradually moving backward as the concrete is poured. The entire length of one track between Twelfth Street and Broadway was concreted in the time between 7 a.m. and 2 p.m. The capacity of the machine is said to be easily 450 ft. an hour.

Ahead of the concrete mixer a layer of sand, then one of crushed rock and finally cement are distributed along in a continuous pile in the proper proportions and in the quantity determined by the depth and width of the excavation. Then as the mixer proceeds a gang of men shovels these materials on the chain conveyor which carries the dry mix into the mixer. The materials are not dry mixed other than that which comes from simply shoveling the three materials collected in one pile onto the car.

The distribution of the sand and crushed rock was facilitated by two dump-spreader cars operated in a train, one of which was a trailer and the other a motor car. These dump-spreader cars are the newest addition to the company's track equipment, and while the officials feel that they are as yet somewhat crude in their work-

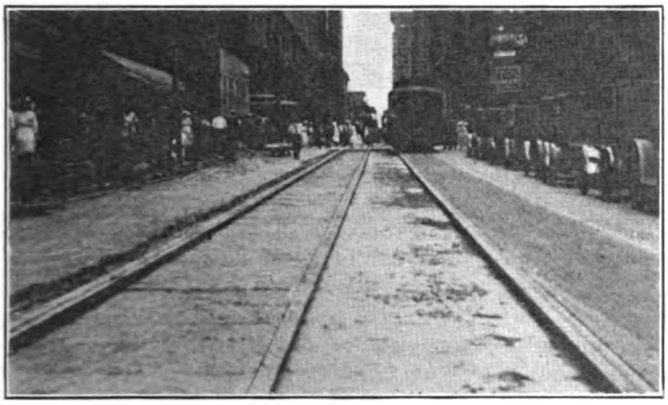


TIES THAT PULLED OUT OF THE CONCRETE FOUNDATION OR HAD DETERIORATED WERE REPLACED BY SECTIONS OF OLD T-RAIL



THE RIVETED AND SPELTERED JOINTS AND BOND WHICH HAVE GIVEN SATISFACTION FOR YEARS IN ST. LOUIS ing, they have greatly facilitated the work on this Olive Street job, and with some refinements are expected to be a big factor in the distribution of material in future trackwork. Each car comprises eight steel-lined boxes, each having a capacity of 64 cu.ft., which are so mounted on the car that when they are dumped the material clears the track on which the car is running by more than 3 ft. The operation in dumping the box is this: A heavy wood pin, which prevents the box from sliding to the right during transportation, is removed and a lock on the box is tripped. By a slight downward pressure on the top of the box end the box is caused to tilt to the right, when gravity causes it to slide outward sideways from the car until it reaches a limiting position, when it stops its sliding motion and the outer end pivots downward, dumping the material, as seen in an accompanying photograph. The car is then moved along slowly so that the material is distributed in the thickness, or quantity, required to give the 1 : 3.6 : 6.25 mix used. It is expected that a more detailed and complete description of this dump spreader will be available after it has been somewhat refined.

The concrete from the mixer was poured up to a level even with the tie rods and permitted to set. After this a 1-in. layer of grout was poured to form the paving foundation, the surface being smoothed off by pulling along the track a square drag, the four corners of which rest on the rails and the lower edges smooth off the surface of the grout at the proper level. The space underneath the flangeways of the rails was plastered full by hand with a 1: 1 mix, the same as that used for the paving grout. After this grouting was dry a layer of pitch was put over it and the paving restored.



APPEARANCE OF TRACK SURFACE ON OLIVE STREET AFTER THE NEW CONCRETE HAD BEEN POURED

In distributing the material along the track for the concrete a system has been worked out such that the receiver is enabled to judge with great accuracy the amount of material to be dumped per foot of track. This is accomplished by means of a set of tables, which have been worked out so that by proper reference to car number and proper column for depth and width of excavation one may read off the proper thickness of material for the particular mix employed.

While the reclamation of old Nichol joints forms no part of the Olive Street job, it is interesting in the light of showing what disposition is made of these joints when they are taken out upon rail renewal. The pieces of rail comprising a joint are taken to the track store yard and a rivet gun used to cut off the rivet heads so that the angle bars may be removed. Inasmuch as these angle bars do not have any direct contact with the rail, they are usually undamaged after a long period of service. The spelter which is used to make an absolute bearing between the plates and the rail is then recovered by melting. Since the present worth of the spelter recovered per joint is about $2 and that of the joint plates is about $6, whereas the cost of labor involved is well under $2, it is seen that it is very profitable to go to the trouble of reclaiming these old joints. After the spelter has been melted off the joint plates are sandblasted and then dipped in hot tar oil to protect them from corrosion while in storage. They are then sandblasted again to remove this tar oil before reusing.

The estimated cost of the Olive Street job described was $54,000. The total time involved in completing the eastbound track was six days. The completion of the other track was delayed by a pavers' strike.

Relation of Standardization to Accident Hazard

IN A PAPER presented to the Association of Iron & Steel Electrical Engineers in New York on Sept. 20, Walter Greenwood, Carnegie Steel Company, Youngstown, Ohio, made some comparisons of the number of accidents in steel mills resulting in personal injuries to determine if possible the relation of standardization in electrical equipment to safety. Similar conditions exist in railway shops. He said that the analysis of results is convincing that standardization does reduce the accident hazard. Standardization of parts increases the quality, convenience and uniform arrangement of the controlling parts. The maximum hazard is reduced by quality in that breakage cannot occur unless capacity is exceeded. Capacity cannot be overtaxed where control is properly regulated. The uniform arrangement of controlling parts manually operated reduces hazard by reducing the liability of operating the wrong movement. Convenience reduces hazard by making situations and parts easily accessible. Interchangeability reduces the hazard and it classifies with convenience. Going back from the operating end, interchangeability simplifies construction and through efficiency in construction of interchangeable parts hazard is again reduced. Collectively considered, efficiency in maintenance reduces hazard, and this efficiency is increased by standardization. The most popular demand for standardization is on account of economy in production and operation. Accident hazard reduction is equally important.

APPEARANCE OF TRACK AFTER GROUTING AND SURFACING (BETWEEN THE RAILS) READY FOR THE WOOD BLOCK PAVING

Novel Type of Paving Successful in Toledo

Alternate Rows of Brick and Wood Blocks Provide Composite Paving Having Merits of Both—In Use Since 1916

By A. Swartz
Assistant Manager of Railways Toledo Railways & Light Company, Toledo, Ohio

THE city authorities of Toledo use creosoted wood block for paving residential and business streets quite extensively. This class of paving has been used on a number of streets where the street railway tracks operate and the track strip has been paved with the same material. When the writer first came with the railway we were paving with wood blocks, using a nose block that fitted under the head of the rail. Without going into the details of the troubles that have appeared from various causes with our wood block pavement we tried an experiment which we thought would overcome some of these troubles.

We have very little complaint on the subject of wood block pavement and are thoroughly convinced of its practicability for street railway. We determined to lay a paving consisting of one row of vitrified paving brick and the next row of wood block, using nose blocks next to the rail. A strip of track about 300 ft. long was thus laid in the summer of 1916.

The blocks were laid on a ½-in. cushion of sand on top of a concrete foundation. The wood blocks were laid about ⅛ in. higher than the paving brick, with the idea that the edges of the wood block would mash down and cover the joint between the block and the brick, by way of protecting the brick from chipping on the edge.

This method was also intended to provide a foothold for horse traffic and at the same time furnish a paving which would be easily and quickly gripped by automobile tires in any kind of weather.

PAVEMENT IS GOOD FOR VEHICLES

There seems to be no question about the riding qualities, for vehicular traffic, of this type of pavement, and the surface condition of the paving during this tryout period has remained almost the same as when it was first laid. The wood block has mashed down and has provided an almost impervious pavement and we are very well satisfied with the results.

In the summer of 1918 we laid one block of this paving on double track in the busiest part of the downtown section, with results so far the same as we found on the original experimental strip. On the latter stretch of track we operate eleven lines of interurban cars, which involve the passing each day of 560 cars weighing an average of 70,000 lb. each, as well as five city lines operating 800 cars per day weighing about 36,000 lb. each. This gives a total of about 125,000,000 tons and 4,000,000 car wheels per year passing a given point on this track. This traffic is certainly heavy enough to demonstrate the qualities of the pavement with relation to the track.

This information is given to the readers of the ELECTRIC RAILWAY JOURNAL so that those who wish may profit by the experiment that we have been making.

There is another point in connection with this type of paving, namely: Every street railway is in a business way expected to give its patronage to various manufacturers and local dealers in all kinds of supplies. Paving supply companies expect railways to buy bricks and wood-block manufacturers expect them to buy blocks, and there is no reason why railways should not patronize both interests.

Financial Situation of English Municipal Tramways

ACCORDING to *L'Industrie des Tramways et Chemins de Fer* (the *Tramway and Railway Industry*), which quotes official statistics prepared by M. J. Beckett, general secretary of the Association of Municipal Tramways of Great Britain, many of the British municipal undertakings are in a precarious condition.

An examination of the results obtained during the fiscal year 1918-19 on the sixty-six municipal tramway systems leads to the following figures:

Receipts per car-mile	Number of systems
Between 13 and 14 pence	1
Between 15 and 16 pence	5
Between 17 and 18 pence	6
Between 18 and 19 pence	8
Between 19 and 20 pence	10
Between 20 and 21 pence	9
Between 21 and 22 pence	8
Between 22 and 23 pence	6
Between 23 and 24 pence	5
Between 24 and 25 pence	2
Between 25 and 26 pence	1
Between 26 and 27 pence	1
Between 27 and 28 pence	3
Between 30 and 31 pence	1
	66

Crowding and overloading are general on most systems at certain hours of the day and during week-ends. The growth in the number of passengers carried per car-mile is extremely marked from 1913 to 1919.

From the results of the year 1918-19, the last on which complete returns are available, it appears that:

Fifty-seven systems show a surplus, without its being possible to set anything aside as a reserve for replacements and renewals, of £1,381,153, while nine systems show a loss of £23,669, so that for all sixty-six systems the surplus is £1,357,484.

On the basis of the very low rate of 1d. per car-mile for renewals, the sum which ought to be set aside for renewals is £916,913. There remains then only a margin of about £440,551. From budget allowances for 1920-21 apparently only twelve systems will produce a surplus.

Food Prices Coming Down

ACCORDING to a report of the United States Department of Labor, recently issued, the average family expenditure for twenty-two articles of food decreased from July 15 to Aug. 15 in each of the fifty-one cities from which monthly prices are secured.

In Minneapolis the decrease was 11 per cent; in St. Paul, 10 per cent; in Detroit, 9 per cent; in Chicago, Cleveland, Indianapolis, Kansas City, Milwaukee, Omaha, Peoria and Springfield, Ill., 8 per cent; in Denver and Memphis, 7 per cent; in Butte, Cincinnati, Columbus, Newark, New York, Philadelphia, Pittsburgh, St. Louis, Salt Lake City and Seattle, 6 per cent; in Baltimore, Birmingham, Bridgeport, Buffalo, Dallas, Fall River, Louisville, Manchester, Rochester and Washington, D. C., 5 per cent; in Atlanta, Boston, Houston, Los Angeles, Mobile, New Haven, Portland, Maine, Portland, Oregon; Providence, San Francisco, Savannah and Scranton, 4 per cent; in Little Rock, New Orleans and Norfolk, 3 per cent; in Jacksonville and Richmond, 2 per cent, and in Charleston, 1 per cent.

PUBLICITY
for the Electric Railways

Publicity as a Byproduct in Toledo

The Railway Company Utilizes the Installation of Expensive Special Trackwork to Emphasize the Magnitude of Necessary Investment

THE Toledo Railways & Light Company has just completed the installation of an extensive piece of special trackwork at the intersection of Jefferson Avenue and Summit Street. This piece of work cost more than $30,000 and the company utilized the public interest in the job to advertise its cost. For this purpose a large sign was prepared, and mounted on a nearby trolley pole, with the total cost and some of the detailed costs tabulated thereon in bold letters. The sign and a part of the track layout are shown in an accompanying illustration.

The lettering on the sign is as follows: "This work will cost $30,479. Trackwork—materials $10,006, labor $7,950; paving—materials $2,734, labor $1,000; foundation—materials $3,950; labor $5,000; total $30,479."

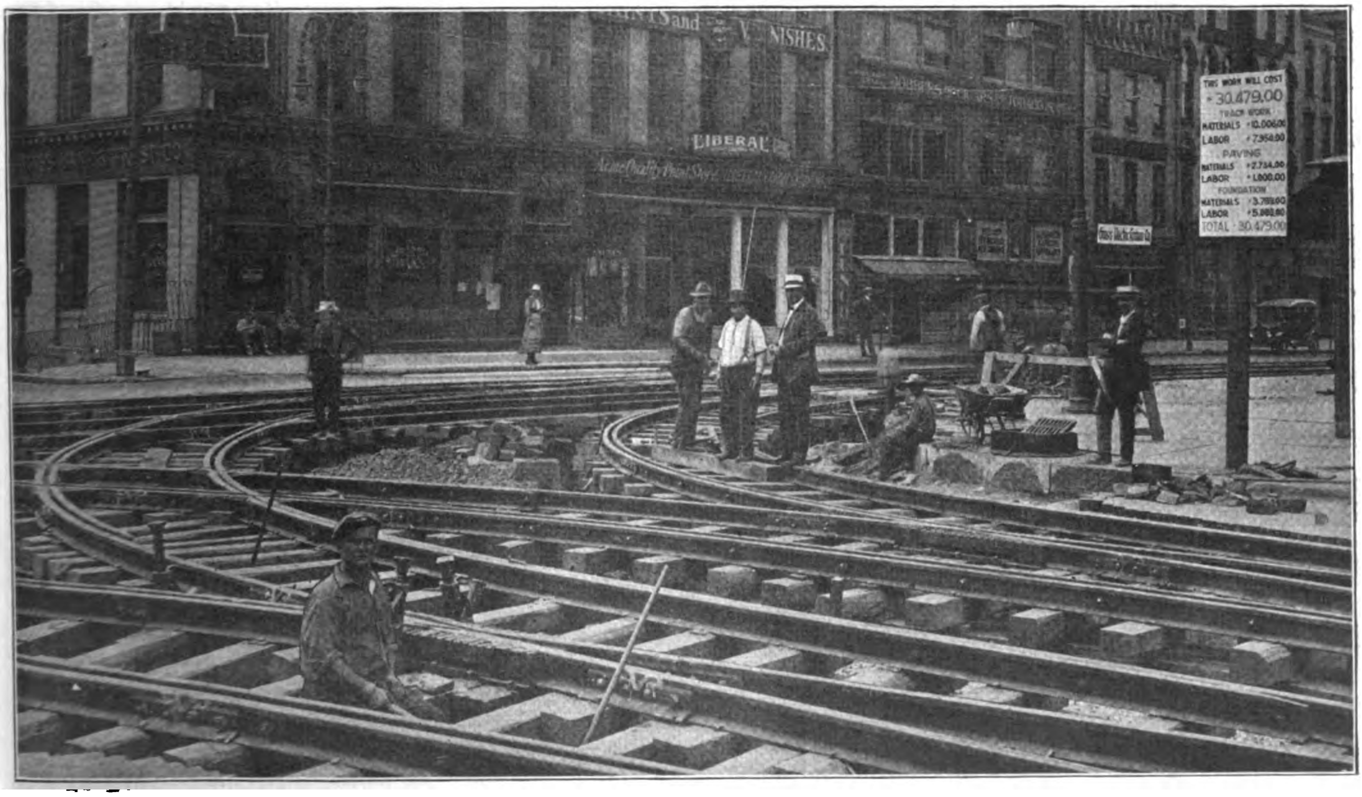
In order to utilize the advertising possibilities of this work still further, the company printed in the current issue of *Sparks*, the official organ of the Doherty Fraternity and Sorority, some data regarding the special trackwork which could be used by employees in conversation with patrons. The points made were briefly these: Installation similar to this one would have cost about $12,000 in 1915. This layout weighs, exclusive of straight rail, approximately 41 tons. Its cost delivered at the Central Avenue yards was 10.2 cents per pound. Four hundred and eighty-five ties, each costing about $1, including freight and unloading, were used. The layout contains 756 ft. of 100-lb. rail. This rail cost $1.09 per foot, whereas the pre-war price of such rail was about 50 cents. Each track bolt used cost 13 cents, as compared with 6 cents five years ago. Two thousand bags of cement were used in providing a foundation. Based on the average labor rate this job will represent a total of 25,364 man-hours, or 3,170½ eight-hour days.

Under present schedules 996 cars turn at this intersection daily and 1,203 cars pass through on Summit Street, making a total of 2,199 car movements per day over this special trackwork. These figures are exclusive of interurban and tripper runs which do not follow regular routes.

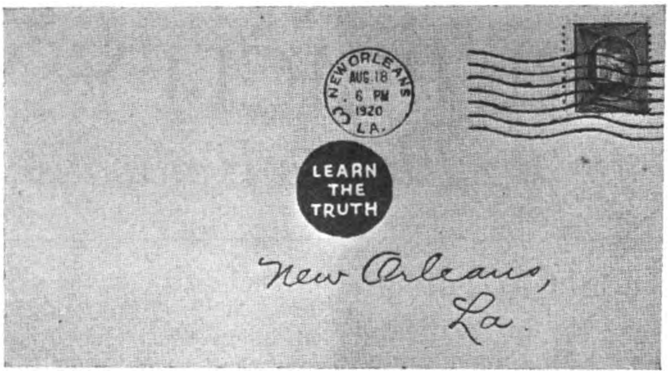
Do Persistent Publicity and an Advertising Slogan Pay?

PROPOUND this question to William J. Baldwin, director of publicity, New Orleans (La.) Railway & Light Company, and he probably would say, "Let's see if they do." Then, in all probability, he would reach down into a drawer of his desk, or into a pigeonhole, and pull out an envelope, facsimile of which is here shown.

Mr. Baldwin has never doubted the value of judicious advertising and an advertising slogan, but he just



ADVERTISING SIGN USED IN TOLEDO TO IMPRESS UPON PUBLIC THE COST OF A PIECE OF SPECIAL TRACKWORK could not resist the temptation to give his publicity work down in Crescent City an acid test. Accordingly, he wrote to himself. Instead of addressing the letter in the usual way, he clipped one of the little "Learn the Truth" slogans from a local newspaper, pasted it on the face of the envelope, wrote the words "New Orleans, La.," underneath the slogan, dropped the letter into a mail box and awaited results. The following morning the letter was duly reposing on his desk, having gone through the regular channels of Uncle Sam's post office and back to the writer. The significance is this: If nobody else in New Orleans is familiar with the railway's advertising slogan, Uncle Sam's postal forces are.



THIS ENVELOPE PROVES THAT ADVERTISING SLOGANS PAY

The "Learn the Truth" slogan was adopted by Mr. Baldwin when he first took charge of his company's publicity work, about one year ago. From that day until this the slogan has appeared in all of the company's advertising. It has become a household expression, a subject for jest and a purveyor of truth, so forcefully presented as to win for the railway company the confidence of thousands who formerly accepted the company's statements with a grain of salt.

So thoroughly established is this slogan, a stranger on entering the city could ask the first person he meets to direct him to "Learn the Truth" and straightway he would be directed to the offices of the New Orleans Railway & Light Company.

The Next Step in Publicity Work

Extraordinary Educational Power of Motion Pictures Should Be Capitalized by the Railways—A Nationalization of Such Publicity Suggested to Begin With and a Follow-Up Picture Dealing With Local Particulars

An Editorial Suggestion

WHAT is the next step in Publicity Work? What additional means can be utilized for putting the story of the electric railways and their transportation and economic problems before the public?

What about the motion picture? Does not the "movie" offer a tremendously powerful educational medium through which to reach the public and of which the electric railway industry should make full use? So far, this industry has made practically no use of the "movie" and yet many manufacturers and commercial organizations have seized upon this means of putting the story of their products or their business before the public.

The motion picture is a unique publicity medium. Unlike newspaper publicity, that put forth through the silent drama is read by 100 per cent of the subscribers, and, in addition, a much clearer comprehension of the theme is obtained by the average person when it is visualized in motion pictures. Furthermore, the percentage of newspaper subscribers who read publicity matter as printed in behalf of an electric railway is probably very small. Likewise, the number of passengers who will "take one" of the company's own leaflets from the little box on the car is a very small proportion of the total number of riders served.

This is not meant to be a disparagement of the good that can be derived from printed publicity, but what is meant is to point out what is believed to be a quicker, more direct, more perfect medium for use in the essential problem of gaining the confidence and co-operation of the public through understanding. It should be used not to the exclusion of printed publicity, but as a strong addition thereto.

An incident which brought this point out quite forcibly occurred in Detroit and was related in the ELECTRIC RAILWAY JOURNAL, May 22, page 1071. A few months ago, when the people of that city were about to vote on the question of whether the city should engage in the street railway business in competition with, or to the exclusion of, the Detroit United Railway, the Mayor became alarmed a few days before the election that his pet project was not going to carry. Some one conceived the bright idea of making a final presentation of the municipal plan in the moving picture theaters. A Chicago film company was hastily summoned and a thousand feet of film prepared.

This film flashed a map of Detroit on the screen and then showed by animated drawings just how workmen living in certain sections of the city have to take a very circuitous route with several transfers to get to work in another section. Then actual scenes were shown picturing greatly overcrowded cars, cars that would not stop and other exasperating things. By various scenes of this latter kind, the audiences got all worked up, so the report goes, against the alleged deficiencies and inadequacies of the company's service.

Then, reverting to the city map, the proposed municipal lines were built in before the eyes of the audience, which could hardly help but be impressed with what a great convenience these new short-cut lines would be in the daily transportation problem. In other words, the municipal plan was visualized for the public in its completed aspects as it never had been visualized from the printed descriptions. The people thought "what a fine thing that would be" and many attribute the positive vote to the effects of the film. Yet it cannot be contended that the people were not informed of the true outlook of the project, for the Detroit United Railway certainly laid bare the bones of the municipal plan with all the force at its command.

The main point of this Detroit incident is that the motion picture visualized the plan for the public and probably assisted in putting the bond election over, when it was thought to be lost. What the railways want to do is to use the power of the "movie" to put over the truth. Incidentally, such uses of the film as that in Detroit point to the desirability of the railways acting promptly to the features of the "movie" before opponents take advantage of them in any local controversy.

HOW CAN MOTION PICTURES BE USED?

The question immediately arises as to how motion pictures can be employed to present to the public the prosaic story of the electric railways. The first aspect of this question is obviously the film itself. Of course the success of any motion picture publicity will depend on the character of the film. And just now this part of the problem seems formidable, but that is because we in the railway business are not trained in motion picture psychology and technic. The planning and execution of the film should be left largely to the men who make that their business, although the intricacy of the railway problem will doubtless require the generous co-operation of the railway officials, at least for a time until the motion picture industry produces some man with a genius for this particular field. The fundamentals of such films can be set forth, however, and they are these—the films must be acceptable and interesting to the public; they must be acceptable to the motion picture theater managers, and they must carry their mission. Assuming, then, that good railway publicity films can be produced (not easily at first, perhaps, but if enough good heads get to work on the problem, a satisfactory result will be accomplished) a few suggestions may be in order.

It is rather costly to produce a film. The charges of the producer will vary per foot of film, depending on equipment and personnel needed, setting, the special lighting required, amount of art work, etc., averaging perhaps over $2 per foot. This makes this form of publicity prohibitive for the small railway companies and suggests a broader plan.

A great many phases of the street railway problem are common to practically all cities and will permit of uniform treatment. This points to the logic of some one undertaking to develop a thousand or two thousand feet of film, or perhaps a series of 1,000-foot pictures, dealing with these common aspects and then making this picture available for use in all the cities where there are street railways. Such a film would be solely a "good-will" picture, for that is the primary need in every city, and it would make no mention of fares or any subject which might not be timely from a local standpoint.

The distribution and showings could be arranged by one of the film companies or, more logically in this case, through the local railway company in each city. A showing of an educational film can be secured in almost any theater, sometimes without charge and sometimes upon payment of a small sum. If the railway used window posters advertising "William S. Hart in 'The Deep Purple' at the Blackstone Theater tomorrow," the theater manager would undoubtedly take advantage of that free advertising and be glad to run the railway film in return. Incidentally such car advertising would be ideal from the railway standpoint, for it would induce a large attendance at the theater showing the railway film and would cost but little.

No amount of time and thought would be too much to spend in producing this national railway film, in order to make it a picture which would "take" and at the same time really perform its mission.

There are half a dozen film producers eager to start such an undertaking, but who shall be sponsor for it? It might be taken up by the publicity committee of the American Electric Railway Association, or, better still, it might form a major part of the general publicity work of the Committee of One Hundred. If the right film is conceived and produced, it appears, and this opinion is shared by a number of railway executives with whom the proposition has been discussed, it would serve a tremendous influence in converting public distrust and condemnation into sympathetic understanding and approval. It has been estimated that such a film could be produced for from $3,000 to $5,000 and some 20,000,000 to 30,000,000 people effectively reached in the course of a few months by securing an adequate number of duplicate films or prints made from the original. The cost of these prints and the small theater expense would be in addition to the $3,000 first cost.

The uses to which such a film could be put are self-evident and this general film could be followed by films of local interest to bring out the details of local problems. What is an expenditure of $1,000 to $3,000 for a company, if it will gain the public's understanding and co-operation?

MOTION PICTURES HAVE BEEN USED

The proposed use of the motion picture in street railway work is not wholly without precedent. Last winter the New Orleans Railway, Light & Power Company used a motion picture film in several of the local theaters to present publicity matter on the railway situation. This film simply carried reading matter without trying to lend interest to the real message through pictures, or provide a story as the vehicle to "get over" the railway's true situation. Nevertheless, even this bold use of the movies was very helpful. The Kansas City (Mo.) Railway is having a film made the object of which is to give the local people a better understanding of the immense variety and extent of the plant that is required to enable the company to furnish transportation. The Chicago, North Shore & Milwaukee Railroad has had a film produced the object of which is purely to stimulate traffic through appealing to the interest of the public in speed and comfort and good scenery in traveling. By weaving in some romance of the historic Indian days that preceded the interurban line the film holds an audience and carries its mission.

There have been a few other instances where the "movie" has been employed by an electric railway, but there has been no real appreciation of the possibilities of the motion picture as a medium for reaching the understanding of the public. One prominent railway executive concluded a discussion of this idea by saying that "even though it might turn out a failure (and he didn't think it would), it is certainly worth trying, for it has such great potentiality, and we would be *doing something* and not just sitting by while the industry flounders." The crux of the idea is in getting the right kind of scenario and then in picturing it well. This is considerably more than a one-man or a one-mind job. That is why the association could well undertake the work, for it is organized to call in the best brains in the industry to co-operate with the scenario writers of the film producers to develop a masterpiece in educational films, for that is what is wanted.

The suggestion is made at this time in this preliminary way to invite criticism and suggestion—to learn something of the reaction of the men in the industry toward the various suggestions made herein and to arouse some discussion of new publicity machinery at the coming convention.

"No-Accident Week" Publicity

EARLY in the past summer a number of men interested in public safety and in the reduction of accidents in the industries and utilities organized the "1920 Safety Committee," and concentrated publicity upon the control of accidents during the week of June 6 to 12. Data have recently become available showing the result of this work. Hundreds of employers in New York and Pennsylvania co-operated, with the result shown in the accompanying table.

The data given are furnished by the Utilities Mutual Insurance Company, this being the best source of information by which to gage the result of the campaign. This company reports that whereas its data for this year cover about 46 per cent more employees than those for last year, the days of lost time are but one-fifth of what they were.

The costs given in the table are the total reserves set up for medical expense and compensation payments. Furthermore, fatalities are reduced to working days on the basis of twenty-five years, or 7,500 working days each, so that one fatality cuts a very large figure in the returns.

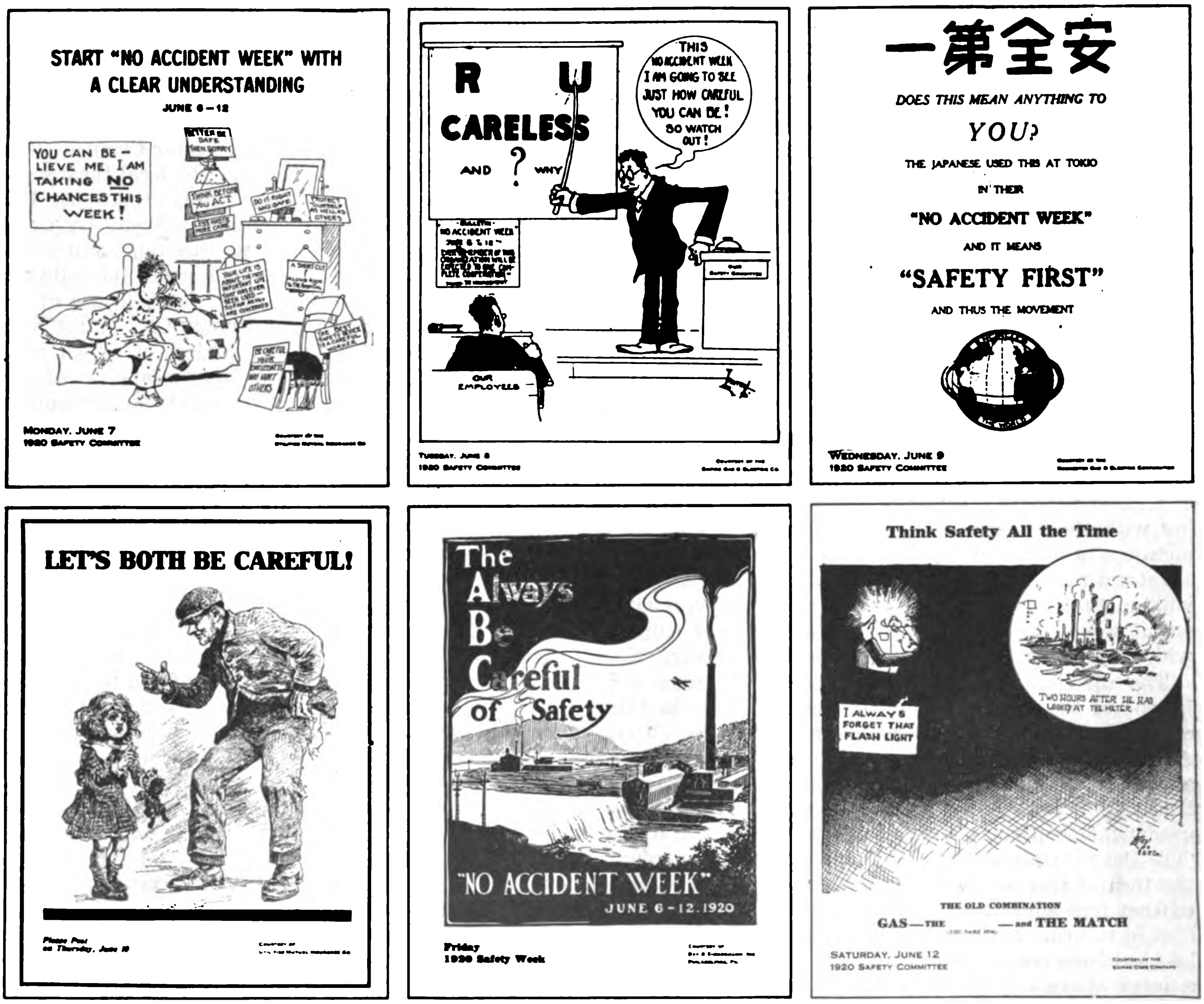
In studying the table it may be of interest to know that the number of employees covered by the 1920 report is about 15,000.

	June, 1919			June, 1920	
Week:	Days Lost Time	Cost	Week:	Days Lost Time	Cost
First	....	....	First	22,896***	....
Second	15,862**	$18,362	Second	7,752*	$6,260
Third	15,490**	15,319	Third	306	1,150
Fourth	8,029*	4,607	Fourth	210	1,102
Tota!s, 3 weeks	39,381	$38,388		8,268	$8.512

* One fatality. ** Two fatalitities. *** Three fatalities.

Special dodgers, bulletins and posters were used in connection with the campaign, samples of the bulletins being reproduced herewith. Four colored posters, 14 in. x 17 in. in size, were the main advertising feature in the campaign.

This information regarding the work of the 1920 Safety Committee has been furnished by G. R. Rinke, secretary of the committee, who is connected with the Utilities Mutual Insurance Company, New York City.


START "NO ACCIDENT WEEK" WITH A CLEAR UNDERSTANDING
JUNE 6—12
YOU CAN BELIEVE ME I AM TAKING NO CHANCES THIS WEEK!
BETTER BE SAFE THAN SORRY
THINK BEFORE YOU ACT
LESS HASTE MORE CARE
DO IT RIGHT AND SAFE
PROTECT YOURSELF AS WELL AS OTHERS
YOUR LIFE IS ABOUT THE MOST IMPORTANT LIFE THAT HAS EVER BEEN LIVED — SO FAR AS YOU ARE CONCERNED
A SHORT CUT ? ALONG RIGHT TO THE HOSPITAL
BE CAREFUL YOUR CARELESSNESS MAY HURT OTHERS
THE BEST SAFETY DEVICE IS A CAREFUL WORKER
MONDAY, JUNE 7
1920 SAFETY COMMITTEE
R U CARELESS AND ? WHY
THIS NO ACCIDENT WEEK I AM GOING TO SEE JUST HOW CAREFUL YOU CAN BE! SO WATCH OUT!
BULLETIN NO ACCIDENT WEEK JUNE 6 TO 12
OUR EMPLOYEES
TUESDAY, JUNE 8
1920 SAFETY COMMITTEE
安全第一
DOES THIS MEAN ANYTHING TO YOU?
THE JAPANESE USED THIS AT TOKIO IN THEIR "NO ACCIDENT WEEK" AND IT MEANS "SAFETY FIRST" AND THUS THE MOVEMENT
WEDNESDAY, JUNE 9
1920 SAFETY COMMITTEE
LET'S BOTH BE CAREFUL!
Please Post on Thursday, June 10
The Always Be Careful of Safety
"NO ACCIDENT WEEK" JUNE 6-12.1920
Friday
1920 Safety Week
Think Safety All the Time
I ALWAYS FORGET THAT FLASH LIGHT
TWO HOURS AFTER HE HAD LOOKED AT THE METER
THE OLD COMBINATION
GAS—THE —and THE MATCH
SATURDAY, JUNE 12
1920 SAFETY COMMITTEE

BULLETINS USED IN THE 1920 SAFETY COMMITTEE'S "NO-ACCIDENT WEEK" CAMPAIGN

American Association News

MOTOR BUSES AND TRUCKS, FUEL SUPPLY, FREIGHT AND EXPRESS TRAFFIC, LABOR PROBLEMS, ELECTRIFICATION, SUPER-POWER SURVEY AND AUTOMOBILE HAZARDS ARE AMONG THE TOPICS CHOSEN FOR CONSIDERATION AT ATLANTIC CITY

Atlantic City Convention Programs

American and Affiliated Associations Have Provided Programs Which Are Marked by Concentration Upon a Few Topics of Pressing Importance

THE following tentative program has been prepared. While this is revised up to the hour of going to press it is understood that some slight revision may still be necessary.

PROGRAM OF AMERICAN ASSOCIATION

MONDAY, OCT. 11

9:30 a.m. to 5 p.m.

Registration and distribution of badges at booth, right of entrance, Young's Million Dollar Pier.

TUESDAY, OCT. 12

9:30 a.m. to 12:30 p.m.

Meeting held in Greek Temple

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees.

(a) On resolutions.
(b) On nominations.
(c) On recommendations in the president's address.

Reports of committees:

(a) On compensation for carrying United States mail.
(b) On electrolysis.
(c) On national relations.

Address on "Problems of Fuel Supply," by Eugene McAuliffe, president Union Colliery Company, St. Louis, Mo.

Reports of committees:

(d) Committee of One Hundred.
(e) On publicity.

Discussion of the report of the Federal Electric Railways Commission.

WEDNESDAY, OCT. 13

9:30 a.m. to 12:30 p.m.

Meeting held in Greek Temple

Reports of committees:

(a) On fare systems.
(b) *Aera* advisory.
(c) On company membership.

Papers on "Possibilities of Transporting Other Than Passengers."

(a) Urban and suburban lines, name of speaker to be announced.

(b) Interurban lines, by Britton I. Budd, president Metropolitan West Side Elevated Railway and Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.

Paper on "Training of Electric Railway Personnel," by Martin Schreiber, manager Southern Division, Public Service Railway, Camden, N. J.

Address on "Settlement of Labor Disputes in the Interest of the Public and Its Influence on Fares," by Hon. Henry J. Allen, Governor of Kansas.

THURSDAY, OCT. 14

9:30 a.m. to 12:30 p.m.

Meeting held in Greek Temple

Report of committee on valuation.

Paper on "Rate of Return," by Cecil F. Elmes, engineer Sanderson & Porter, Chicago, Ill.

Paper on the "Place of the Motor Bus," by Frank C. Pick, commercial manager London Electric Railway, London, England.

Paper on "The Place of the Motor Bus as a Supplement to Electric Railways," by R. Gilman Smith, Milwaukee Railway & Light Company, Milwaukee, Wis.

Address on "The Motor Vehicle—Competitor or Ally?" by G. M. Graham, vice president Pierce-Arrow Motor Car Company, Buffalo, N. Y.

Address on "An Outside View of the Electric Railway Industry," by Melville E. Stone, general manager Associated Press.

Reports of convention committees:

(a) On recommendations in the president's address.
(b) On resolutions.
(c) On nominations.

Unfinished business.
General business.
Election of officers.
Installation of officers.
Adjournment.

PROGRAM OF ACCOUNTANTS' ASSOCIATION

MONDAY, OCT. 11

9:30 a.m. to 12:30 p.m.

Registration and distribution of badges at booth.

2 to 5 p.m.

Meeting held in Accountants' Hall

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:

(a) On resolutions.
(b) On nominations.

Joint meeting with Transportation & Traffic Association.

Report of committee on collection and registration of fares.

TUESDAY, OCT. 12

2:30 to 5 p.m.

Meeting held in Accountants' Hall

Reports of committees:

(a) Accounting-claims.
(b) Accounting-engineering.
(c) On standard classification of accounts.

Paper on "Cost-of-Service Accounting," by H. J. Davies, secretary-treasurer Cleveland Railway, Cleveland, Ohio.

Paper on "Accounting for Material Received and Used, Including Inventories," by R. A. Weston, certified public accountant, New Haven, Conn., formerly general storekeeper New York, New Haven & Hartford Railroad.

WEDNESDAY, OCT. 13

2:30 to 5 p.m.

Meeting held in Accountants' Hall

Paper on "Financial Problem Confronting Public Utilities During the Period of Reconstruction," by Harry E. Mendes, member of Touche-Niven & Company, certified public accountants, Cleveland, Ohio.

Paper on "The Accounting Profession," by George L. Vannais, certified public accountant, Hartford, Conn.

Reports of convention committees:

(a) On resolutions.
(b) On nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF ENGINEERING ASSOCIATION

MONDAY, OCT. 11

9:30 a.m. to 12:30 p.m.

Registration and distribution of badges at booth.

2:30 to 5 p.m.

Meeting held in Engineers' Hall

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of committee on resolutions.

Report of committees:
(a) On equipment.
(b) On heavy electric traction.

TUESDAY, OCT. 12

2:30 to 5 p.m.

Meeting held in Engineers' Hall

Meeting of purchasing agents and storekeepers.

Papers on "Standardization and Its Effect on Stores," as follows:

"From a Storekeeper's Standpoint," by P. F. McCall, storekeeper South Side Elevated Railway, Chicago, Ill.

"From the Purchasing Agent's Standpoint," by a purchasing agent.

Joint meeting with Transportation & Traffic Association.

Meeting held in Transportation & Traffic Hall

Report of committee on safety-car operation.

Address on "Electrification of Railroads," by A. H. Armstrong, chairman electrification committee General Electric Company, Schenectady, N. Y.

WEDNESDAY, OCT. 13

2:30 to 5 p.m.

Meeting held in Engineers' Hall

Reports of committees:
(a) On power distribution.
(b) On power generation.

Address on "The 'Super-Power' Line," by W. S. Murray, chairman Super-Power Survey, United States Geological Survey.

THURSDAY, OCT. 14

2:30 to 5 p.m.

Meeting held in Engineers' Hall

Report of committees:
(a) On way matters.
(b) On buildings and structures.

General business.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF TRANSPORTATION & TRAFFIC ASSOCIATION

MONDAY, OCT. 11

9:30 a.m. to 12:30 p.m.

Registration and distribution of badges at registration booth.

2:30 to 5 p.m.

Meeting held in Greek Temple

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees:
(a) On resolutions.
(b) On nominations.

Joint meeting with the Accountants' Association.

Report of committee on collection and registration of fares.

Joint meeting with Claims Association.

Report of committee on code of traffic principles.

TUESDAY, OCT. 12

2:30 to 5 p.m.

Meeting held in Greek Temple

Joint meeting with Engineering Association.

Report of committee on safety-car operation.

WEDNESDAY, OCT. 13

2:30 to 5 p.m.

Meeting held in Greek Temple

Report of committee on economics of schedules.

THURSDAY, OCT. 14

2:30 to 5 p.m.

Meeting held in Greek Temple

Reports of committees:
(a) On express and freight traffic facilities and costs.
(b) On merchandising transportation.

General business.

Reports of convention committees:
(a) On resolutions.
(b) On nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF CLAIMS ASSOCIATION

MONDAY, OCT. 11

9:30 a.m. to 12:30 p.m.

Registration and distribution of badges at registration booth.

2:30 to 4 p.m.

Meeting held in Claims Hall

Annual address of the president.

Annual report of the secretary-treasurer.

Report of the executive committee.

Appointment of convention committees:
(a) On nominations.
(b) On resolutions.

Reports of committees:
(a) On membership.
(b) On subjects.
(c) On safety.
(d) On ways and means.
(e) On statistics.
(f) On constitution and by-laws.

Joint meeting with Transportation & Traffic Association.

Report of committee on code of traffic principles.

Paper on "Automobile Hazards," by C. M. Talbert, commissioner streets and sewers of St. Louis and chairman of public safety section, National Safety Council.

TUESDAY, OCT. 12

2: 30 to 5 p.m.

Meeting held in Claims Hall

Paper on "Automobile Hazards," by Ralph Stickle, assistant superintendent accident department Cleveland (Ohio) Railway.

Written discussion prepared by L. H. Roche, general inspector associated bureaus Pittsburgh (Pa.) Railway; W. G. Fitzpatrick, general claims attorney Detroit (Mich.) United Railway, and J. H. Handlon, claim agent United Railroads of San Francisco, Cal.

WEDNESDAY, OCT. 13

2: 30 to 4: 30 p.m.

Meeting held in Claims Hall

Paper on "Accidents—Cause and Prevention," by F. E. Shumate, general attorney Atlanta Northern Railway, Atlanta, Ga.

Written discussion on "The Influence of Welfare Work," by R. N. Hemming, superintendent of transportation Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.

Written discussion on "Effect of Bonus System," name of speaker to be announced.

Written discussion on "Co-operation of Trainmen," by J. E. Duffy, general superintendent New York State Railways, Syracuse, N. Y.

Convention Entertainment

A fine entertainment program has been prepared under the direction of Martin Schreiber. Details will be given in a later issue.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Havana Has a Strike

Frank Steinhart, Ex-Soldier and Cosmopolite, Refuses to Pass Increased Wage Burden to Public

Frank Steinhart is again the talk of all Cuba and of those in the United States who are interested in affairs on the Island. He it was who made a success of the Havana Electric Railway and who later succeeded in bringing about the consolidation of the railway, light and power interests there as the Havana Electric Railway, Light & Power Company, of which he is now president.

OPPOSED TO FARE INCREASE

Mr. Steinhart has peculiar ideas about transportation service and peculiar ideas about fares and the burdens that labor should seek to impose on the public and on struggling enterprises. So when the motormen and conductors of the Havana company went on strike on Aug. 7, thinking that all the company had to do in order to meet an increase in wages was to advance fares to the public, Mr. Steinhart had a little surprise in store for them. He rejected their proposal. And in doing so he explained as follows:

> I am giving our employees all it is possible to give. The total wage increase granted them since Jan. 1 of this year has been $1,300,000. We cannot give more unless the fares are raised.
>
> However, I am opposed to an increased fare and will not accept one. I do not favor charging all of the public 1 or 2 cents a ride more to be turned over to a relatively few men and even partly into the company's coffers. I may be wrong in my ideas, but there must be an end to increasing wages and then increasing prices with the public bearing the burden. We must all strive to bring the cost of living down and I am willing to bear the brunt of making the start in this matter.
>
> In view of the prevalence of the jacking up of wages and then jacking up prices to a proportionate level it may seem that my ideas are wrong. But I have weighed this matter carefully and my action is based upon study of the situation. In the first place I have not seen any benefits from the practice of increases. The public pays in the rise in the cost of living.
>
> It might be well enough to raise the fares here to pay the increase the men demand, if that were the end. But it will not be the end. In January, for example, there may well be another demand for higher wages and that would mean raising the fares again. That can't go on forever and I am going to start fighting it right now.

Still the strike was on and not a wheel moved. The police arrested about thirty men as agitators. Two days after the strike started, the company began to put in effect a carefully worked out plan for restoring the service. New men were employed and these, together with inspectors and starters, took out cars under police protection. The company began to build up a new organization from the bottom. The new men were carefully picked; more were rejected than accepted. Fifty students who volunteered were rejected with the comment that this was not a "lark." The new men are said to have received less than the former employees.

The shop men went out in sympathy and then the taxi drivers. Mr. Steinhart held fast and increased his service. He uttered no word of denunciation of the strikers. The public backed him up. There was no excitement. Meanwhile the Government began deportation proceedings against fourteen Spaniards arrested in the strike. This started talk of a general strike. Mr. Steinhart did not alter his course. Finally a committee representing the associated unions called on Mr. Steinhart and asked him to intercede with the Government officials to halt the deportation proceedings because this would hamper efforts to settle the situation. Mr. Steinhart refused to "intercede," but agreed to convey the request to Secretary of Interior Charles Hernandez. The Secretary said he would put the cases over for one sailing. The next day the former employees began to apply for their old jobs. The railway strike was broken. The sympathy strikes collapsed.

P. R. T. Rejects Two Franchises

The Philadelphia Rapid Transit Company has rejected two franchises for the proposed Hunting Park-Erie Avenues and Roosevelt Boulevard extensions. The former was not accepted for the reason that the ordinance contained a specific provision for the completion of the project within twelve months from the date of approval, and provides for a bond in the sum of $50,000 conditional upon the carrying out of the terms of the ordinance. Since the company is not now able to build these tracks, and cannot build them until its financial position is bettered, it cannot contract to build them and give its bond for the faithful performance of that contract.

In the case of the Boulevard ordinance, the rejection was caused by the fact that the proposed line would not be expected to pay operating costs for several years. According to the ordinance, the city would have the right after ten years to order the company to remove its tracks and rebuild the line over an adjacent route. The salvage value of the tracks, if removed under the conditions of the ordinance, would barely pay the cost of restoration. These facts make the securing of money for this franchise impossible.

The company will accept the Sansom street, Twentieth to Twenty-second street ordinance, but will not be able to build these tracks until its financial condition has been bettered by the securing of additional revenue, for which application is now being made.

Work Going Ahead

Contracts for $1,711,570 of Construction Have Been Placed by Detroit Municipal Railway

The Detroit (Mich.) Municipal Street Railway is progressing with its track construction at various points. It has been announced by the Street Railway Commission that its working staff will lay the concrete foundations for the new lines at the rate of 1,200 ft. a day.

On the city's south line on Harper Avenue, where the Detroit United Railway owns the north track, the city tracks are down and the Department of Public Works is completing the final pavement. Bids have been asked for copper trolley wire sufficient for about 28 miles of track. Bids on supporting cable and a track welding machine are also asked and poles have been contracted for.

Although contracts for $1,711,570 worth of work and supplies have been awarded and bonds amounting to $1,750,000 have been authorized and sold, the track construction covered by existing contracts is only a small portion of the trackage proposed under the Mayor's municipal plan. No contracts have yet been let for the erection of carhouses or for the purchase of cars and other equipment.

RESIDENTS' PROTESTS UNHEEDED

On the advice of the Corporation Counsel the Street Railway Commission has declined to abandon its plan of constructing a part of the municipal system on Pennsylvania Avenue notwithstanding the protests of residents.

No final agreement has been reached by the city and the Detroit United Railway in regard to the construction of the proposed loop for turning Woodward Avenue cars at Elizabeth Street and Grand Circus Park. If a definite arrangement can be made, the Street Railway Commission will build the loop and rent it to the Detroit United Railway on a percentage basis of the cost of construction.

The session of the Street Railway Commission and officials of the Detroit United Railway held to discuss the track situation in the vicinity of St. Jean and Kercheval Avenues did not result in any definite agreement. It was decided, however, that a representative of the company would inspect the locality in company with a representative of the commission to see what could be done from an operating standpoint providing all other matters involved could be adjusted as between the commission and the company. The Detroit United Railway maintains it is necessary that these matters be first determined by agreement or in the courts.

Syracuse Survey Presented

$12,415,000 Fixed as Value of Lines—Ten-Cent Cash Fare Recommended—Service-at-Cost Considered

The value of the present property of the New York State Railways in Syracuse has been placed at $12,415,000 against $21,012,201 claimed by the corporation, and a 10-cent cash fare and a ticket fare of 7½ cents have been recommended under a service-at-cost plan by the Syracuse Street Railway Investigating Commission in its report to Mayor Harry H. Farmer. There are six findings and eighteen recommendations in the report. To bring the service in Syracuse to an adequate level, the report says, would require from $1,000,000 to $1,250,000. The return which the corporation is entitled to is fixed at 6 per cent and to improve the service the commission holds that the present system of fares and transfers and control of the lines must be radically altered. The report of the commission refers to and includes recommendations from a report and valuation submitted to it by the city's engineers, Ford, Bacon & Davis, New York. The report of the engineers covered valuation, at the figure recommended by the commission, new money requirements, recommendation as to the average fare, reduction of taxes, the use of one-man cars, rerouting plans and many details of traffic co-operation between company and city.

HIGHER toll charges are advocated for the suburban and interurban lines. The recommendation is made that the railroad be permitted to engage in package and express carrying business. It also is recommended that the company be permitted to operate buses as supplemental means of transportation. Consolidation of certain lines and abandonment of others proving unprofitable is urged and rerouting is suggested.

OPERATING ECONOMIES URGED

The skip-stop is advocated and the installation of a better sign system is recommended. Provision also is made in the recommendations for the purchase and operation on the Syracuse lines of one-man cars. The board would straighten the traffic in the congested down-town section and consolidate lines running in adjacent parallel streets.

Other recommendations made by the commission include that the regulation and control of service in the city should be through an advisory board of control and a street railway commissioner, subject to the jurisdiction of the Public Service Commission as provided by law; that the sprinkling tax now assessed as a cost of operation to the railway be abolished; that certain taxes and charges for maintenance and replacement of pavement now assessed against the railway be reduced; that a charge for transfers be permitted; that an extra charge for after-midnight service be permitted; that separate books of accounts and records of operation be kept in Syracuse, covering the Syracuse lines, and that the financial reports of the Syracuse lines be published at regular and frequent intervals.

EXTENSIONS BEING URGED

The company should make extensions and additions to trackage as soon as practicable, the report says, and it recommends that in the interest of speed, regularity of run and economy of operation fewer car stops be made; that the proposed Fairview carhouse, on which $50,000 already has been spent, be completed to provide ample carhouse facilities.

The proposed street railway commissioner would be named by Mayor Farmer and would be paid an annual salary of $10,000. The commissioner would be empowered to order capital additions, renewal and replacements, abandonment or replacement of property; routing or rerouting of cars; fix schedules, rate of speed, mode of operation, fix or approve car stops and direct generally everything that will improve service. All disputes are to be settled by arbitration. The commissioner would have power to employ accountants, engineers and other necessary assistants.

An annual budget of the railroad is made mandatory. The report says:

> On the first of December of each year the company is required to submit to the commissioner of street railways an estimate of its gross receipts and the cost of service for the ensuing calendar year. The budget of expenses must be itemized so as to show the amount expended for each expense involved in the cost of service, including operating, maintenance, taxes, amount of return to the company and all other expenses which the company and the commissioner of street railways agree shall be paid from the general fund provided in the agreement. No operating expenditures other than those specified in the budget can be made by the railroad company except with the approval of the commissioner of street railways. Any controversy between the commissioner and the company is to be settled by arbitration.
>
> ### ROCHESTER SERVICE-AT-COST PLAN FOLLOWED
>
> The agreement provides that there shall be deposited in an account to be known as the renewal and depreciation fund an amount equal to 2 per cent per annum of the capital value of the railroad property. The moneys in this fund shall be disbursed only for renewals and replacements as the commissioner of street railways shall direct, it being the intent that the cost of maintenance shall be paid as operating expense.
>
> It ought perhaps definitely to be made known that stocks, bonds or any securities issued by the company have had no part whatever in the valuation made by the experts and approved by he commission. The commission has not concerned itself as to those things, but only as to the property actually used and useful in the operation of the road.

The commission says that its proposed service-at-cost plan is modeled after that in effect in Rochester. The report adds:

> It is to be noted that the Rochester agreement makes the initial fare 7 cents with ten tickets for 65 cents, while our recommended agreement makes the initial fare 10 cents with six tickets for 45 cents.
>
> In comparing the initial fare in the two cities it must be borne in mind that the Rochester initial fare is based upon an estimated capital value so that the fare is likely to be changed as soon as the actual capital value has been determined. In Syracuse the initial fare has been based upon the actual capital value as found by Ford, Bacon & Davis, and the fare fixed in expectation of covering all the estimated obligations of the agreement for at least the first year, when it is hoped that increased patronage resulting from improved service will make the fare lower. Also Rochester is a larger city than Syracuse with many important conditions more favorable for low cost of street car service than Syracuse.

The committee which has reported was appointed by the Mayor some months ago. It was headed by Giles H. Stillwell. The company would of course continue to manage its own affairs, but would be guided by the Street Railway Commissioner, being subject to penalties if the orders of that official were not obeyed.

Hartford Mayor Appeals for Trolleys

Acting Mayor C. D. Allen of Hartford, Conn., has addressed to each member of the local Board of Aldermen a copy of a report dealing with the dispute between the Connecticut Company and the jitneys in Bridgeport. The report in question was presented to the Bridgeport Common Council by the local transportation committee. The question of bus regulation in Hartford will come before the Board of Aldermen of that city at its meeting on Sept. 27.

In calling the attention of the board members to the report, acting Mayor Allen said:

> I feel very sure that the enclosed report of the trolley-jitney committee of Bridgeport will be of much interest to you. There are several vital points brought out, as follows:
>
> The unfairness of competition, the trolley company being obliged to maintain right of way, pay portion of cost of bridges and pay a percentage of gross receipts to the city.
>
> Which method of transportation can serve Hartford best in winter?
>
> I would call your attention to the congestion of streets with trolleys, which has got to be relieved. There is a necessity that the jitneys combine so that the city may deal with one or more responsible parties or corporations rather than with any individual bus or jitney driver.
>
> The city would be saved money by the use of the trolley lines for carrying freight and express. This question not only affects the city but the surrounding towns which make Hartford their buying center.

Jolt for H. C. L. at Los Angeles

Arrangements have been made by the Los Angeles (Cal.) Railway whereby employees may share in purchasing a carload of government food supplies at reduced prices. The company explained that while it would be impossible to quote exact prices until the goods arrived and the freight and incidental expense could be determined, the maximum price of the bacon would be $2.90 per 12-lb. can, 19 cents per pound can for the roast beef and approximately 25 cents per pound for the corned beef, with corresponding prices for other products.

The Los Angeles Railway is financing the purchase of the supplies, which will involve about $7,000.

$12,000,000 for Improvements

Work Now Being Carried Out in Milwaukee Will Total That Amount —Separate Power Company

Announcement has been made of the incorporation of the Milwaukee Power Company. This company has been formed to finance a new $6,000,000 power plant now under construction at St. Francis, a suburb of Milwaukee, for the Milwaukee Electric Railway & Light Company.

SEPARATE COMPANY FOR POWER DEVELOPMENT

John I. Beggs, president of the Milwaukee Electric Railway & Light Company, is reported by the press as having stated that the formation of the new company was forced by the inability to obtain money to complete the plant, because bankers would make no loans upon secondary mortgages. The new corporation, which will have a nominal capitalization of $1,000,000, was not formed for profit.

The power plant as thus far completed is to be sold to the new company for what has been expended on it by the Milwaukee Electric Railway & Light Company. Power produced by the new power plant will probably be sold to the Milwaukee Electric Railway & Light Company under contract. The new company will issue bonds with the power plant as security.

Mr. Beggs is further reported to have said that the Milwaukee Electric Railway & Light Company contemplates expending approximately $12,000,000 on new projects. Of this amount half will be used for the power plant mentioned above, $1,500,000 for transmission lines to the various substations, $1,500,000 for new distribution lines and $3,000,000 for new cars.

PRESENT FACILITIES TAXED TO LIMIT

According to the reported statement of Mr. Beggs, the present power facilities of the Milwaukee Electric Railway & Light Company are being taxed to the limit. Equipment is being overloaded as much as 50 per cent at times and when poor coal is encountered it is with the greatest difficulty that the load is carried.

Lakeside, as the new power plant is known, it is claimed, will be one of the most modern electric plants in the country and one of the largest. It will use pulverized fuel and is thus expected to achieve marked economies. The first unit is expected to be completed in the fall of this year. It will add 40 per cent to the available supply of electrical energy of Milwaukee.

Utility Board Defended

During the first day's defense of the Board of Public Utility Commissioners of New Jersey, the official acts of which are being investigated by Governor Edwards at the instance of the municipal authorities of Jersey City, L. Edward Herrmann, counsel for the board, contended that in the performance of its duties the board had uniformly followed the state courts' rulings.

George L. Record, counsel for Jersey City, mentioned as his "basic and fundamental charge" that the Utilities Board does not represent the public, but "has deliberately taken the part of the corporations." The board, he said, has turned itself into a court instead of acting in its legal capacity as an administrative body.

One of the bulwarks of our system of government, said Mr. Herrmann at the conclusion of Mr. Record's comprehensive opening, has been that the courts shall pass upon the relative rights of parties to controversies. If regulation has failed it has done so because of abnormal conditions, not through any fault of the board. According to Mr. Herrmann we are passing through an era of unrest throughout the world, with dissatisfaction centering upon regulatory bodies. He said that any one who feels aggrieved over the board's acts, whether of omission or commission, should quarrel with the courts and not with the board. Mr. Herrmann further pointed out that the very statute under which the board functions provides for a review of its acts by the Supreme Court at the instance of any person or group who may have cause to complain.

$3,500,000 for Improvements in Pasadena

H. B. Titcomb, vice-president of the Pacific Electric Railway, Los Angeles, Cal., on Sept. 17, announced plans calling for an expenditure of approximately $3,500,000 for improvements covering virtually the entire northern division of the Pacific Electric Railway. The improvements contemplated include the transformation of the Southern Pacific Station at Colorado Street and Broadway, Pasadena, into a joint terminal for the use of both steam and electric lines, a tunnel under Raymond Hill in order to shorten the distance between Los Angeles and Pasadena, and changes that will affect the service between Los Angeles and Alhambra, San Gabriel, Azusa, Glendora, Arcadia and other Northern Division points. At present the Pacific Electric Railway has no terminal in Pasadena.

With reference to the tunnel, it is proposed to construct a bore from Fair Oaks Avenue to Broadway through which all interurban trains will pass, running up Broadway to the new terminal. If the building of the tunnel is not feasible a new line will be constructed on Glenarm Street or south of that street to connect with Broadway.

The general situation with respect to the operation of the Pacific Electric Railway in Pasadena and the tentative plans for the new work to be carried out there were described by Edward Hungerford in his article "California and Her Tractions" in the ELECTRIC RAILWAY JOURNAL for Sept. 11, page 490.

Property Owners Objecting

Residents of Highly Restricted Detroit District Protest Municipal Railway Construction

A suit which was anticipated following the delivery of an opinion by the Corporation Counsel to the Council of Detroit, Mich., to the effect that the Council had no power to change the routing of the municipal lines to streets other than those set forth in the ordinance, passed on April 5, has been filed in the Wayne County Circuit Court by 110 residents of Clairmount Avenue. The petition asks for an order to show cause why an injunction should not be issued restraining the city from building the Clairmount-Owen-Holbrook line.

BASIS OF COMPLAINT STATED

Among the points made in the complaint are that the ordinance passed on April 5 differs from the Mayor's statements relative to the plan for the proposed railway; that the ordinance is defective as to route in that it authorizes the building of a line through Hamtramck, a village which is entirely surrounded by the city of Detroit, without the consent of the residents of the village, and also that it authorizes the taking over of the Linwood Avenue line without providing for the purchase of that line from the Detroit United Railway. It is also contended that contracts made by the Street Railway Commission for material for use in the construction of the lines are defective.

Work has been started on another section of the municipal lines, the Charlevoix-Buchanan crosstown route. This will be the first line to be constructed on the west side of the city.

Through its publicity department the Detroit United Railway has summarized the results of the five months' effort on the part of the city to construct the municipal lines. The statement is made that none of the track work with paving is actually completed and none of the overhead system installed, so that the cars even if they were purchased and delivered could not be operated.

ULTIMATUM TO D. U. R.

The city's ultimatum to the Detroit United Railway to vacate St. Jean Avenue with its tracks and use instead the double tracks to be built by the city on that street will be answered soon by the company, it is expected. When the company was ordered to remove its track on St. Jean Avenue, it refused to comply on the claim that it was granted permission to build the line by the City Council in 1914. This track is used by the company for Y-purposes. The Street Railway Commission has informed the Detroit United Railway that it intends to go ahead with its double track on St. Jean as part of the municipal system, and that the company will be allowed to use the city tracks for Y-purposes if it desires to do so.

Einstein Theory and Strikes

Need Seen for Application of the Doctrine of Relativity to Life in Labor Disputes

Professional papers as well as the daily press have given attention to the Brooklyn strike. Among the interesting comments on the situation in Brooklyn and on collective bargaining in general is the following editorial from *Chemical & Metallurgical Engineering* for Sept. 15. It is entitled "A Little Homily on the Brooklyn Strike" and reads as follows:

> As these lines are written the Borough of Brooklyn is tied up tight on account of a strike of the street railway employees. They were under agreement not to strike—and the Mayor of New York went to their meeting and took from them a pledge to withhold all action until he should have had a conference with their employers. His Honor is a comedy character whose ambition seems to be to make the laborin' man feel sure that the Mayor is with him, right or wrong, no matter what he does—as long as he belongs to some union. Unless he has a big organization with many thousand votes behind him he is not a laborin' man—down at City Hall.
>
> #### Chaos and Brickbats
>
> At 2 o'clock a.m. when the night gang left work they had another meeting of their own, and they voted to strike, despite the previous resolution at the general meeting, because somebody is said to have said, which it is admitted was not true, that a number of men had been discharged. Then those who voted against the measure at the general meeting followed the strikers out. Now chaos reigns and brickbats fly.
>
> This speed on the trigger, this German military principle of smashing up everything and making the results as *schrecklich* as possible in order to give emphasis to an opinion, is both expensive and, in the long run, bound to be unprofitable. Now to be a street-car conductor is to engage in a respectable and honorable calling. The intellectual demands may be slight, but some of us do not respond successfully to intellectual demands, and it is well for the world that there are plenty of jobs that do not require the burden of thought. But a respectable and honorable calling does not warrant either one man or a thousand of them to throw a million people into misery and to rob them of their chance to gain a living. Surely the world is neither so stupid nor so bad as to make it necessary to paralyze a whole community every time a number of persons engaged in similar employment want something.
>
> #### Compulsion Inhibits Bargaining
>
> What we need is the application of the doctrine of relativity to life. Relativity teaches us first to consider the dimensions of ideas, and then to compute the effect of their application. That is Einstein's procedure, and it is a very good one. We talk of collective bargaining, and most of us are disposed to favor the abstract idea, but isn't it time we began to think of what we mean by collective bargaining? What is bargaining? It means to negotiate beforehand; to trade. Its dimensions which we must study, in order to understand the effects of bargaining, are service, or goods, and money. Bargaining means bargaining whether done by two persons or by many. Force or compulsion does not enter into it, because as soon as it does bargaining ceases.
>
> If A has a house and B wants to buy it they may bargain to reach an agreement and sale, but if B knocks A on the head and threatens to keep it up until he wants to pay we cannot call it a bargain. A strike is not a part of collective bargaining; it is compulsion, and compusion inhibits bargaining. Discharging one man or locking out a thousand is not bargaining, either. It is also compulsion.
>
> We are in favor of rapid and effective punishment of the employer who exploits labor; who tricks the men that work for him, or even who does not recognize his great obligations to those who cast their lots with him and throw their lives and fortunes into his enterprise. We believe that every employer is in bondage to his obligations and that the man who is unfair to those who work under him should be deprived of the privilege of administering affairs that involve the employment of men and women. But we are equally convinced that the man who works with his hands by the day is, also in bondage to his obligations. And if many of them form a union the union also has obligations, not only toward its members but to the general welfare. The doctrine of relativity applies here too, but we forget it in practice, and so, often, do the strike leaders. Just because we sport a union card is no reason why we should think we have privileges which are denied to others. Neither this nor the election to executive office by a board of directors will release us from our obligations.
>
> #### More Quantitative Thinking
>
> Relativity teaches us this, and it is very sound philosophy. We need more of it; and more quantitative thinking. Whenever the Rule of Wrath begins we lose our count, and then there is the devil to pay. Should we not profit by the example of Germany?

Amalgamated Rejects Arbitration Award

Motormen and conductors of the United Railways, St. Louis, Mo., have voted to refuse to be bound by the decision of the Missouri Public Service Commission against reopening the wage question. A letter has been mailed to the commission informing it officially that the commission's decision would not be recognized by the men. This letter is quoted as follows:

> We are in receipt of your notice of Sept. 4 of the action of the Public Service Commission in the case No. 3527 of Sept. 3. I am instructed by the members of Division No. 788 of the Amalgamated Association that we do not recognize the award as binding and just, inasmuch as the decision was arrived at, not by considering the evidence that was submitted in the case in compliance with the submission jointly signed by the receiver for the United Railways and the committee representing Division No. 788, but was based wholly on the fact that to have granted an increase to the members of Division No. 788 would mean an increase in tariff.
>
> The submission signed jointly by the receiver and the committee representing Division No. 788 was for the purpose of an adjustment of the wage disagreement fairly on the evidence in the case and was in no way contingent on the question of tariff.

Col. Albert T. Perkins, manager for the receiver for the United Railways, asserted that the company has no choice under orders of the federal court but to accept the decision of the arbitration board.

Wage and Fare Increases Recommended

The long-awaited report of the three masters in chancery on the problems of the New Orleans Railway & Light Company, New Orleans, La., has been presented in New Orleans by Judge Foster's appointees. It recommends raising wages of all trainmen, revalues the property at $41,500,000, recognizes the union and recommends an 8-cent fare instead of the present 6-cent fare but with tickets at 7 cents. The wage increase is less than the men asked when they went on strike in July. It represents an average of nearly 30 per cent. The rehabilitation of the lines and service are among the aims. The increase is retroactive to July 1. The increase in fares is subject to the approval of the City Commission of New Orleans. The report of the masters must have the approval of the judge. The masters began their inquiry several weeks ago, immediately after the men returned to work after a strike of almost a month.

Hydro-Radial Policy Stated

Canadian Premier Explains Government's Attitude on Hydro-Radial Railways in Ontario

At the annual meeting of the Ontario Municipal Association held in Toronto on Sept. 3 Premier E. C. Drury outlined the position of the Ontario Government with respect to the proposed construction of hydro-radial railways by the Ontario Hydro-Power Commission on behalf of the municipalities and the action taken by his government in halting further expenditure until the special commission under the chairmanship of Justice Sutherland has investigated the whole Hydro undertaking and made its report.

Delay Causes Criticism

Premier Drury said that the action of the government in holding up the hydro-radials pending an inquiry had caused much criticism. The inquiry was without bias to determine what was best to be done. The Premier said:

> Hydro-radials is not a hydro-electric development. It is a very different thing for a municipality to launch into the owning of expensive railways. The inquiry into one question does not mean we will not support the other. But the launching of the Government and municipalities into hydro-radials is a different thing. It has nothing to do with hydro development or distribution of power. We don't hold with the policy of saying that because the people have voted, we should go ahead. Ultimately the Government will have to support it.
>
> I am not saying the hydro-radials will be unprofitable. We are just investigating it, like any business man would do.
>
> This commission is investigating the hydro-radials. I said once in a joke they were mediocrities. This was used by one newspaper to hurt the Government. They are not mediocrities, but the best men we could get.
>
> If the report of the commission is that the policy is sound, we can finance it in much better shape. If the policy is not sound we shall expect the municipalities and the Hydro-Electric Commission to accept the reasonable conclusions as final in the matter.
>
> There have been two changes since the hydro-radials were considered. The Dominion Government has taken over the Canadian Northern Railway and Grand Trunk Railway. These were bankrupt roads. The trouble is we have too many railroads. The two lame ducks have been taken into the fold and the Government is trying to run them. We are finding ourselves with increased freight and passenger rates because of too many roads.
>
> When hydro-radials were brought forward it was said that competition would help us. Now we would only be competing against ourselves. Another reason for the inquiry is that ultimately the Government will be responsible for the money if necessary.
>
> #### Auto As a Freight Handler
>
> The third reason is that we are entering upon a period of road development, which is important to the rural sections and to the cities. This policy was necessitated by the change of transportation. As the auto has displaced the horse in a large degree, so motor trucks have displaced the railway for handling freight. That is the reason for good roads policy. The money spent on that will give better results than money spent on railways.
>
> This does not mean that we won't use electricity for freight and passenger service. The province can sell the electricity developed to the railways to electrify their roads. This whole matter has led us to say, "We want to be shown."
>
> We are not making any accusations against any one. And I don't think that Sir Adam Beck is objecting greatly to the investigation, or that there is much objection from that quarter. We are not opposed to hydro-electric development, but we have reasonable doubts about the advisability of going ahead with hydro-radials till we have looked into the matter a little further.

Denver Service Normal

Service is now practically normal on the lines of the Denver (Col.) Tramway. The company has recruited a full force of trainmen to take the places of the strikers, and has stopped hiring new men. G. Y. Harry, federal mediator, has left the city. Mr. Harry went to Denver several weeks ago, shortly after the calling of the walkout, to try to effect a settlement.

The members of the executive committee of the union, who had been sent to jail for contempt of court, were released on bail of $1,500 each on Sept. 18. Sporadic attacks on car operators by former employees of the company continue. The motorman and the conductor on a car of the Fairmont line were beaten and robbed by strikers at midnight on Sept. 18. After locking the men in the car vestibule and starting the car, the thugs made their escape. The car struck a switch half a mile further on and was derailed but was not overturned. Another attack was made on an "owl" car on Sept. 20, but no one was seriously injured.

News Notes

Strike Ends at Nashville.—The striking carmen of the Nashville (Tenn.) Traction Company returned to work on Sept. 23. The men walked out on Aug. 22, tieing up service throughout the company's system. The company restored partial service with aid of strike breakers. During the course of the strike one person was killed while riding on one of the company's cars.

One-Man Cars Win.—The employees of the Eastern Pennsylvania Railway, Pottsville, Pa., went on strike on Sept. 17 in consequence of a dispute over the operation of one-man cars, recently acquired. When the men reported for duty on Sept. 17 they refused to operate the cars. The officials of the company met this opposition without any signs of compromise. For five days the system centering in Pottsville and running through many towns in the coal region of Schuylkill County was tied up.

Wage Dispute Will Go to Arbitration.—Agreeable to the officials of the Boston & Worcester Street Railway, Boston, Mass., and the employees, the matter of the wage dispute is to be left to a board of arbitrators. Guy W. Cox, Boston, will represent the company, and James H. Vahey, Boston, will represent the men. The wage increase when granted will probably be retroactive to Sept. 1. The men asked for an increase in wages from 52 cents an hour to 95 cents, and a working day of eight hours in ten instead of nine hours in eleven.

Purchase Proposal Before Voters.—At the next election the voters of San Francisco, Cal., will have two amendments submitted for their approval. The first, in the form of a proposed charter amendment, will be the question of the city's acquiring the property of the United Railways under the "pay as you go" plan. The second of these provides for an increase of the interest rate on the city bonds. This course was determined on after a conference held in the office of the Mayor on Sept. 7. The proposals will be prepared at once by City Attorney George Lull and Attorney Robert M. Searles.

City Would Revoke Franchise.—City Counsel Charles E. Bird plans to apply to Attorney-General Thomas F. McCran for authority to bring a suit in the name of the State to require the New Jersey & Pennsylvania Traction Company, Trenton, N. J., to show cause why its franchise in the city of Trenton should not be revoked for violation of the franchise contract. The application grew out of the refusal of the company to arbitrate the recent differences with its employees over wages and other matters. It is contended that in the franchise of the company there is a paragraph which binds it to submit differences with its labor to arbitration.

Advance for Stockton Men.—The Stockton (Cal.) Electric Railway has announced increases in the salaries of all employees. Advances range from $12 a month for new platform men to $16 a month for men who have seniority with the company. Other motormen and conductors will receive an increase of $14 a month. New men who have been receiving 45 cents an hour will now receive 51 cents. Second-year men are paid 52 cents, third-year men 53 cents, while fourth-year men receive a monthly bonus of $5. All motormen and conductors who have been in the employ of the company for one year or more are allowed twelve days' vacation on pay.

Men Told to Arbitrate.—A committee representing the employees of the Grand Rapids (Mich.) Railway appeared before the City Commission on Sept. 2 to seek help in settling their wage demand. The commission was in favor of arbitration in view of the contract of the men which stated that wage controversies should be settled by arbitration. The committee was headed by R. L. Reeves. The members told the commission that if a rise in fare were authorized the company could undoubtedly meet the increased wage demands of the men. Commissioner Emery suggested a referendum at the November election if an agreement could not be reached between the men and company before that date.

Purchase of Road Urged by Council.—The Town Council of Port Colborne, Ont., has adopted a resolution urging the Hydro Commission to take over the Niagara, St. Catharines & Toronto Railway on these terms: That the commission assume the obligations stated to be outstanding against the company; that a bond of undertaking of the Hydro Electric Power Commission be given to the government in payment of the proposed purchase price and that this should constitute a first mortgage charge upon the railway; that the commission shall on behalf of the municipalities enter into priority agreements for the interchange of traffic between the railway and the Canadian National Railway.

Employees Ask Mayor's Aid.—A delegation of the Co-operative Welfare Association of the Louisville (Ky.) Railway, composed of employees of the various departments called upon Mayor Smith on Sept. 15 with a request to use his influence toward securing an increased fare for the company. The company is desirous of granting an increase in wages to its men, but the men themselves know that this is impossible with the present fare rate. J. P. Barnes, president of the railway, has announced a plan involving the purchase of fifty cars, the consolidation of power plants and an increase in wages for employees, dependent upon an advance in fares. It would require $60,000 a year to pay 1 cent an hour more to the 1,600 employees of the company.

Threat of Strike in London.—Dissatisfied over the payment of a bonus of 1 cent an hour on their wages for the month of July, trainmen employed on the London (Ont.) Street Railway threaten to strike. The bonus is the dividend from the $600 surplus the railway and municipal board is able to show on the business for July. The men only recently called off a strike when the company promised to give them a bonus based on the surplus each month. The employees were to receive 48 cents an hour and a division of the surplus remaining after operating costs and bond interest had been paid. The municipal board insists it also included redemption, and this the men dispute. If the board agrees to forego bond redemption the men claim their wages would be about 52 cents an hour.

Five Cents More for Wilmington Men.—The trainmen of the Wilmington & Philadelphia Traction Company, Wilmington, Del., have accepted the offer of the company of a wage increase of 5 cents an hour retroactive to Sept. 5. The new scale brings the rate to 56 cents an hour for the first three months' service, 58 cents for the next nine months and 60 cents for one year's service and thereafter. Thomas W. Wilson, vice-president of the company, says that a wage advance of 10 cents an hour was granted the trainmen a year ago at which time the company filed a petition with the Public Utility Commission for a fare increase. This was refused until a few weeks ago. However, during all this time the company has been paying the advance wage to the men without any increased revenue. Consequently a deficit of $95,000 now remains. He exhorted the trainmen to work in co-operation with the company in order to maintain efficiency of operation.

Financial and Corporate

Another San Francisco Plan

Nearly All Creditors Have Agreed to Reorganization Proposal Now Before California Commission

For the third time in four years a plan has been presented to the Railroad Commission of California for the reorganization of the United Railroads, San Francisco, Cal. The latest plan has the approval of 97 per cent of the creditors. Under it the present capitalization and bond issues of the United Railroads would be cut down from $81,945,600 to $47,516,000 and the Market Street Railway would acquire all properties now owned by the United Railroads. The plan was put before the State Railroad Commission on Sept. 10, in the form of an application for authorization to issue stock, bonds and notes, and to take proceedings pursuant to such reorganization plan.

OBLIGATIONS REDUCED

Contemplated reduction of obligations through means provided by the reorganization plan will mean a lessening in interest charges of from $1,685,650 to $843,000 a year. Mr. Von Phul, president of the company, explained that duplication of the plant would cost approximately $60,000,000 at this time and actual appraisal by engineers of the company places its present value at $52,210,195. Separate appraisal by engineers of the State Railroad Commission fixes the present value at $37,237,211.

The company, through lack of revenue, has defaulted in interest payments since Oct. 1, 1916 Negotiations looking toward possible purchase of the system by the municipality have been going on for more than three years.

Advocates of the reorganization plan told the commission that none of the other creditors of the United Railroads would be adversely affected by the proposed plan, because it contemplates that the new organization will assume current liabilities and obligations of the United Railroads.

FIXED CHARGES REDUCED

Under the proposed plan the Market Street Railway, which now has an authorized capital stock of $18,750,000, all of which is owned by the United Railroads, will be recapitalized, so that it will have an authorized capital of $32,150,000, divided into four classes of stock, and the Market Street Railway will issue $5,200,000 of notes, which will be secured by $5,200,000 of Market Street Railway bonds and the properties of the Sutter Street Railway, Sutro Railroad and San Mateo lines. It also will issue $3,525,000 of Market Street Railway bonds, all in exchange for the properties of the United Railroads.

In presenting the matter to the commission, officials of the company contended that the proposed new capitalization and bond and note issues of the Market Street Railway, aggregating $47,516,000, will be justified by the reproduction cost, less depreciation, of the properties of the United Railroads as they now stand, excluding all amounts for going value, franchises or intangible values of that nature. The aggregate amount of the proposed bond and stock issues, it was asserted, is also less than the cost value of the property, plus the amounts since put into the property.

P. R. T. Net Income Approaching Deficit

The Philadelphia Rapid Transit Company has a large decrease in its net income both for August and for the eight months ended Aug. 31. In August, 1919, the net income was $53,523, while for 1920 it became a deficit of $112,854. For the eight months the decrease was 59 per cent. A deficit has not been encountered as yet in the income statement beginning Jan. 1, but unless steps are immediately taken looking toward relief for the company in the shape of a fare change of some kind a deficit is apparently not far off.

PHILADELPHIA RAPID TRANSIT COMPANY INCOME ACCOUNT

Month of August	1920	1919
Operating revenue	$2,999,199	$2,916,816
Operation and taxes	2,348,570	2,093,034
Operating income	$650,628	$823,782
Non-operating income	55,252	43,462
Gross income	$705,881	$867,244
Fixed charges	818,735	813,721
Net income	*$112,854	$53,523
Deferred wage adjustment—one month	$187,500	
5% return on P.R.T. paid in capital—one month	125,000	
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5% return upon P.R.T. stock	$425,354	

Eight Months Ended August 31	1920	1919
Operating revenue	$24,760,738	$22,964,499
Operation and taxes	18,175,498	15,833,330
Operating income	$6,585,239	$7,131,169
Non-operating income	361,602	354,089
Gross income	$6,946,841	$7,485,258
Fixed charges	6,535,970	6,483,664
Net income	$410,871	$1,001,594
Deferred wage adjustment—three months	562,500	
5% return on P.R.T. paid in capital—eight months	1,000,000	
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5% return upon P.R.T. stock	$1,151,628	

* Deficit.

Dominion to Wait

Will Not at Present Accept Hydro Bonds of Municipalities for Purchase of Electric Railways

Some time ago it was announced that Sir Adam Beck was negotiating with the Dominion Government for the purchase by him on behalf of the Ontario Hydro Commission acting in the interest of Ontario municipalities of the holdings of the Dominion Government in the Toronto Suburban Railway, the Niagara, St. Catharines & Toronto Railway and the Toronto Eastern Railway, which were acquired by the Federal Government when it took over the lines of the Canadian Northern Railway system.

ALTERNATIVE PROPOSAL MADE

When the Ontario (Drury) Government announced its policy of having an independent inquiry by a commission into the economic feasibility of the hydro-radial projects in Ontario before guaranteeing bonds for the construction of these lines, proposals were made to the Dominion Government to accept hydro bonds of the municipalities without provincial guarantees in payment for the three electric roads.

The proposal met with some encouragement at the start and there was a prospect that it might be acceded to. The question was deferred until the return of J. D. Reid, Minister of Railways, from Europe. It is now suggested that the hydro proposition be allowed to remain in abeyance. It is stated that nothing will be done in the matter till the commission investigating the radial project shall have made its report. The appointment of this commission was mentioned in the ELECTRIC RAILWAY JOURNAL for July 24, page 197. It is composed of Justice Sutherland, T. A. Russell, Fred Bancroft, W. A. Amos and A. F. McCallum. The sittings of this commission are all public. The chairman is Justice Sutherland.

The opinion is expressed that an awkward situation might arise if the Dominion Government should accept municipal bonds over the head of the Province, which has the power to define, enlarge or restrict municipal borrowing powers. It is very doubtful, therefore, if the electric lines of the Canadian National system will pass to the Hydro Commission unless the condition is such as will meet with the approval of the Dominion and Provincial governments and the directorate of the Canadian National Railways, who are understood to have considerable influence in connection with the proposal.

PURCHASE PRICE $7,000,000

Nearly $7,000,000 is the purchase price quoted by the Federal Government for the sale of the three electric roads—$2,628,000 for the Toronto Suburban, $3,544,000 for the Niagara, St. Catharines & Toronto, and $708,000 for the Toronto & Eastern lines.

Big Reduction in Interborough Deficit

In Spite of Enormous Increase in Traffic on Subway Lines, Net Corporate Income Shows a Deficit of More Than $2,000,000

The annual report of the Interborough Rapid Transit Company, New York, N. Y., for the year ended June 30, 1920, shows a deficit after taxes and charges of $2,235,835, as compared with a deficit of $3,810,340 in the preceding year. The aggregate number of passengers carried on subway and elevated lines was 955,133,110, against 809,335,658 in 1919. The report places great emphasis upon the need of New York City for more subways. The present trunk lines have about reached the limit of their capacity and conditions will become almost unbearable before new lines can be completed, even if construction were to begin immediately. The 5-cent fare is inadequate, as the annual deficit shows.

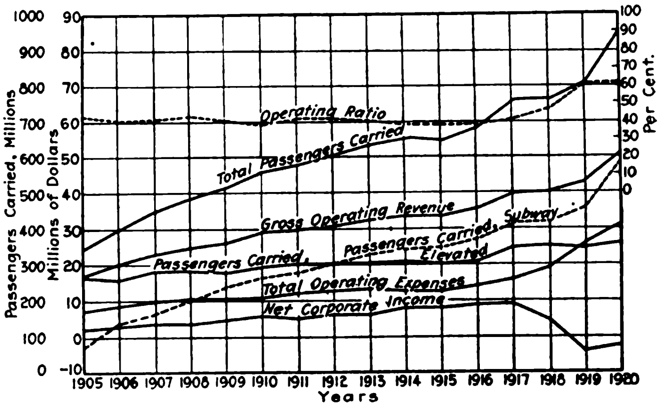
GROSS operating revenue for the year ended June 30, 1920, was $51,478,411, an increase over 1919 of $8,271,201, or 19.2 per cent. This result was caused by a gain of $6,990,765 or 28.4 per cent on the subway division, and a gain on the Manhattan railway division of $1,280,436 or 6.9 per cent. Operating expenses were $31,695,209, as compared with $26,233,326 last year, an increase of $5,461,883 or 20.8 per cent, of which $3,783,588 was on the subway division. This was caused by an increase of 3,755,213 car-miles operated, an increase of 2 per cent in the number of miles of road operated at the close of the year, and the continued tendency to increased cost of labor, coal, and other supplies.

The net operating revenue was $19,783,202, an increase of $2,809,318 or 16.6 per cent, the result of a gain on the subway division of $3,207,177 or 31.3 per cent and a loss on the Manhattan Railway division of $397,858 or 5.9 per cent.

The number of passengers carried was 955,133,110, compared with 809,335,658 in 1919, an increase of 145,797,452, or 18 per cent. This was the result of a gain on the subway division of 124,951,575 or 27.1 per cent and a gain on the Manhattan Railway division of 20,845,877 or 6 per cent. The gain on the subway division was the result of an increase of 79,840,319 in passengers carried over the lines constructed and equipped under Contract No. 3 and an increase of 45,111,256 in the traffic over the old subway lines.

During the year $7,619,911 was spent for maintaining the structure, roadway, power houses, electrical equipment and rolling stock, including strengthening of the elevated structure.

The net expenditures during the year amounted to $5,295,014, including the company's contribution toward new extensions, also the completion of miscellaneous work under way last year. Improvements on the subway included the installation of remote control circuit breakers, and the relocation of section breaks. There were put into service 7.78 miles of new a.c. cables and 2.11 miles of new d.c. cables. On the Manhattan they included the installation of interlocking plants, and signals connected therewith on local and express tracks, block signal system on express tracks, and signaling on local track curves on Second, Third and Ninth Avenue lines of the elevated.



COMBINATION CHART COVERING FIFTEEN YEARS

The operations of the last fiscal year demonstrate that even the subway itself, with all its congestion, cannot, on

INCOME STATEMENT* INTERBOROUGH RAPID TRANSIT COMPANY

Year Ended June 30	1920 Manhattan Railway Division	1920 Subway Division	1920 Total	1919 Manhattan Railway Division	1919 Subway Division	1919 Total	Total Percentage Change
Revenue from transportation	$18,469,433	$29,309,893	$47,779,326	$17,422,288	$23,052,286	$40,474,574	+18.1
Other street railway operating revenue	1,386,005	2,313,080	3,699,085	1,152,714	1,579,922	2,732,636	+35.4
Gross operating revenue	$19,855,438	$31,622,973	$51,478,411	$18,575,002	$24,632,208	$43,207,210	+19.2
Operating expenses:							
Maintenance of way and structure	1,250,892	2,150,362	3,401,254	1,159,024	1,499,086	2,658,110	+28.0
Maintenance of equipment	1,528,869	3,225,543	4,754,412	1,441,476	2,317,639	3,759,115	+26.4
Traffic	241	860	1,101	2,683	934	3,617	—69.5
Transportation expenses	9,777,378	11,512,603	21,289,981	8,323,457	9,527,755	17,851,212	+19.2
General expenses	976,342	1,272,119	2,248,461	928,788	1,032,485	1,961,273	+14.6
Total operating expenses	$13,533,722	$18,161,487	$31,695,209	$11,855,428	$14,377,899	$26,233,327	+20.8
Net operating revenue	$6,321,716	$13,461,486	$19,783,202	$6,719,574	$10,254,309	$16,973,833	+16.6
Taxes assignable to railway operations	2,186,645	436,765	2,623,410	2,251,981	882,175	3,134,156	—16.3
Operating income	$4,135,071	$13,024,721	$17,159,792	$4,467,593	$9,372,134	$13,839,727	+24.0
Non-operating income	73,523	534,846	608,369	112,358	494,944	607,302	+ 0.2
Gross income	$4,208,594	$13,559,567	$17,768,161	$4,579,951	$9,867,078	$14,447,028	+23.0
Income deductions	9,075,383	10,928,613	20,003,996	8,682,662	9,574,706	18,257,368	+ 9.6
Net corporate income	*$4,866,789	$2,630,954	*$2,235,835	*$4,102,771	$292,372	*$3,810,340	+41.3
Dividends	....	....	....	....	....	1,750,000	......
Net income	*$4,866,789	$2,630,954	*$2,235,835	*$4,102,771	$292,372	*$5,560,340	+60.0
Accruals under Contract No. 3 and related certificates	$7,088,164	$1,145,396	$8,233,560	$5,895,025	$1,605,046	$7,500,071	+ 9.8

* Deficit.

STATISTICAL INFORMATION INTERBOROUGH RAPID TRANSIT COMPANY

Year Ended June 30	1920 Manhattan Railway Division	1920 Subway Division	1920 Total	1919 Manhattan Railway Division	1919 Subway Division	1919 Total	Total Percentage Change
Miles of road	40.14	62.59	102.73	40.14	60.58	100.72	2.0
Miles of single track	135.18	201.26	336.44	135.29	195.13	330.42	1.8
Total passengers carried	369,034,477	586,098,633	955,133,110	348,188,600	461,147,058	809,335,658	18.0
Daily average passengers carried	1,008,291	1,601,362	2,609,653	953,941	1,263,417	2,217,358	17.7
Per cent expenses to earnings, excluding taxes	68.16	57.43	61.57	63.82	58.37	60.71	1.4
Per cent expenses to earnings, including taxes	79.17	58.81	66.66	75.95	61.95	67.97	1.9
Passenger revenue per mile of road	$461,500	$468,000	$465,000	$435,000	$381,000	$402,000	15.7
Passenger revenue per mile of single track	$136,500	$145,600	$142,000	$128,800	$118,000	$122,300	16.1
Passenger cars (motor and trailer)	2,213	1,816	4,029	2,217	1,806	4,023	....
Service cars	60	57	117	60	57	117	....
Total all cars	2,273	1,873	4,146	2,277	1,863	4,140	....

a 5-cent fare, earn the interest and sinking fund on the bonds and notes issued for its construction and equipment. While the net corporate income during the past year was $2,630,954 in excess of fixed charges, it would have to be more than double this amount to pay interest and sinking fund on other moneys invested, including approximately $100,000,000 by the city. The latter's debt for new subways amounts to between $200,000,000 and $250,000,000 and is constantly increasing.

The average yearly increase in passengers carried in the subway since 1905 is 16.4 per cent. The year previous to the opening of the present extensions constituting the "H" system the subway carried 418,337,666 passengers. For the following year 1919 it carried 461,147,058, an increase of 42,809,392 or 10.2 per cent, and during the past year 586,098,633, or an increase of 27.1 per cent. By taking the average yearly increase, if construction of new lines were inaugurated immediately, during the intervening period, estimated at four years, before operation of new lines could be commenced, there would be added to the number now carried each year 489,088,652 passengers, almost doubling the present number in the four-year period.

Frank Hedley, president and general manager of the Interborough, in commenting upon the future of the company, discussed the possible conditions if the Interborough went into the hands of a receiver. He said that if a receivership was followed by the cancellation of the elevated railroad lease, it would involve serious loss to the public both in transportation privileges and in money.

The Manhattan Railway is an integral part of the Interborough system and is being operated for the same fare as the subway. If the lease is broken and it is operated separately, the fare on certain of its lines may under its charter be increased to 10 or even 15 cents. In that event a large proportion of the passengers now using that line would undoubtedly attempt to use the subway. The result would be disastrous from the operating standpoint.

The subway has carried more than 4,000,000,000 passengers since it opened on Oct. 27, 1904, with a loss ratio of passengers on trains of less than two passengers to 1,000,000,000 carried.

In the accompanying chart, covering the operation of the Interborough from 1905 to 1920, are shown the yearly increases and decreases of several items. The operating ratio was about 40 per cent until 1918. It was 61.7 per cent in 1920. The total passenger traffic has been increasing considerably each year. In 1905, 339,104,820 passengers were carried; in 1915, there were 647,378,266, almost doubling those in 1905, and in 1920, only five years later, the passengers carried almost trebled those of 1905, reaching the total of 955,133,110. This increase in the number of passengers has been mainly due to the subway increase.

Riding Habit Shows Increase

Despite Increase in Average Fare, Passengers per Car-Mile Increase from 7.3 to 7.5

Conditions in the electric railway industry during the last six months are reflected in the accompanying tables of operating statistics compiled by the bureau of information and service of the American Electric Railway Association from the monthly operating reports of fifty electric railways. On the whole the tables are encouraging. While there is no indication that the electric railways will have to struggle with the difficulties and problems said to accompany a too sudden visitation of prosperity after lean years, there is evidence that by wise management and careful economy the companies may manage to keep themselves off the rocks until the slowly returning tide of good business conditions sets in and lifts them gently but none the less surely beyond the reach of possible default, receivership and foreclosure.

THE most favorable feature of these tables is the increase in the net income after all expenses and charges were paid. Table I shows that the net income, or profits, of these fifty companies increased from $3,506,965 in the six months ended June 30, 1919, to $5,511,757 for the same period in 1920. On a per car-mile basis, as shown in Table III, these profits amounted to 1.6 cents per car-mile in 1919 and 2.5 cents in 1920.

The ratio of net income to operating revenue is shown in Table I to have been 4.4 per cent in 1919 and 5.8 per cent in 1920. This means that out of every dollar taken in as revenue the company's share amounted to 4.4 cents in 1919 and 5.8 cents in 1920.

The increase in net income should be considered always in connection with this ratio of net income to revenue or one is apt to be led to misleading conclusions.

It should not be forgotten also that the increase is calculated over a year which was next to the worst one in the history of the industry, when the margin of profit was not far from the vanishing point. If the net incomes for the last five years of a group of companies is placed side by side, it will be seen at a glance that the industry was a long way from the normal conditions prevailing in 1914. However, any disposition to exaggerate the importance of the increase in net income should be immediately restrained by

TABLE I—COMPARATIVE SUMMARIZED INCOME STATEMENT OF FIFTY ELECTRIC RAILWAYS FOR THE SIX MONTHS ENDED JUNE 30, 1919 AND 1920

	Six Months Ended			
	June 30, 1920	June 30, 1919	Increase or (d) Decrease	Per Cent Increase
Railway operating revenue	$94,414,507	$79,032,511	$15,381,996	19.5
Railway operating expenses	72,208,325	58,901,475	13,306,850	22.6
Net operating revenue	22,206,182	20,131,036	2,075,146	10.3
(Operating ratio (per cent)	76.5	74.5	....	....
Net revenue: Auxiliary operations	$4,214,060	$3,423,253	$790,807	23.1
Taxes	5,868,809	5,248,082	620,727	11.8
Operating income	20,551,433	18,306,207	2,245,226	12.3
Non-operating income	2,084,354	1,861,676	222,678	11.9
Gross income	22,635,787	20,167,883	2,467,904	12.2
Deductions from gross income	17,124,030	16,660,918	463,112	27.8
Net income	5,511,757	3,506,965	2,004,792	....
Ratio: Net income to operating revenue	5.8	4.4	....	....

TABLE II—COMPARATIVE SUMMARIZED STATEMENT OF THE OPERATING EXPENSES OF FIFTY ELECTRIC RAILWAYS FOR THE SIX MONTHS ENDED JUNE 30, 1919 AND 1920

(Subdivided according to the Interstate Commerce Commission classification)

	Six Months Ended			
	June 30, 1920	June 30, 1919	Increase 1919-1920	Per Cent Increase
Way and structures	$9,062,506	$7,433,558	$1,628,948	21.9
Equipment	8,945,533	7,919,729	1,025,804	13.0
Power	9,762,125	8,829,480	932,645	10.6
Conducting transportation	32,261,860	25,671,933	6,589,927	25.7
Traffic	154,117	127,313	26,804	21.1
General and miscellaneous	9,174,637	7,666,861	1,507,776	19.7
Transportation for investment—Cr	51,834	41,084	10,750	26.2
Total operating expenses	a$72,208,325	b$58,901,479	$13,306,846	22.6

a Includes $2,899,381 undistributed expenses.
b Includes $1,293,689 undistributed expenses.

TABLE III—COMPARATIVE SUMMARIZED INCOME STATEMENT (ON A CAR-MILE BASIS) OF FIFTY ELECTRIC RAILWAYS FOR THE SIX MONTHS ENDED JUNE 30, 1919 AND 1920

	Six Months Ended			
	June 30, 1920 (Cents per Car-Mile)	June 30, 1919 (Cents per Car-Mile)	Increase or (d) Decrease (Cents per Car-Mile)	Per Cent Increase
Railway operating revenue	43.0	36.8	6.2	16.8
Railway operating expenses	32.9	27.4	5.5	20.1
Net operating revenue	10.1	9.4	0.7	7.4
Operating ratio (per cent)	76.5	74.4	.	....
Net revenue: Auxiliary operations	1.9	1.5	0.4	18.7
Taxes	2.6	2.4	0.2	8.3
Operating income	9.4	8.5	0.9	10.6
Non-operating income	0.9	0.9	..	....
Gross income	10.3	9.4	0.9	9.6
Deductions from gross income	7.8	7.8	....	....
Net income	2.5	1.6	0.9	....

a consideration of the ratio of the net income to the revenue. In spite of the increase in the net, this ratio amounts to less than 6 per cent and when it is remembered that out of this 6 per cent, sinking funds and other reserves must be credited, it can be appreciated that there is apt to be little left for dividends—nothing at all in fact for the common stock.

OPERATING RATIO INCREASES

Another significant feature of the tables is the increase in the operating ratio, which rose from 74.5 per cent in 1919 to 76.5 per cent in 1920. The cause of this is not far to seek—expenses are still increasing faster than revenues, as Table I clearly shows. Revenues increased 19.5 per cent while expenses were increasing 22.6 per cent. Only the increase in fares ameliorated the situation.

TABLE IV—COMPARATIVE SUMMARIZED STATEMENT (ON A CAR-MILE BASIS) OF THE OPERATING EXPENSES OF FIFTY ELECTRIC RAILWAYS FOR THE SIX MONTHS ENDED JUNE 30, 1919 AND 1920

(Subdivided according to the Interstate Commerce Commission classification)

	Six Months Ended			
	June 30, 1920 (Cents per Car-Mile)	June 30, 1919 (Cents per Car-Mile)	Increase, 1919–1920 (Cents per Car-Mile)	Per Cent Increase
Way and structures	4.1	3.5	0.6	17.1
Equipment	4.1	3.7	0.4	10.8
Power	4.4	4.1	0.3	7.3
Conducting transportation	14.7	12.0	2.7	22.5
Traffic	0.07	0.06	0.01	16.7
General and miscellaneous	4.2	3.6	0.6	16.7
Transportation for investment—Cr	0.02	0.02	....	....
Total operating expenses	*a*32.9	*b*27.4	5.5	20.1

a Includes 1.3 cents per car-mile undistributed expenses.
b Includes 6 cents per car-mile undistributed expenses.

Reference to Table V shows that the average fare of these fifty companies increased from 6.1 cents in 1919 to 7.0 cents in 1920 or 15 per cent. Without this increase in fares the moderate surplus now shown would have been a deficit too large for the industry to carry.

TABLE V—MISCELLANEOUS STATISTICS AND DERIVED RATIOS FOR THE SIX MONTHS ENDED JUNE 30, 1919 AND 1920, OF THE FIFTY COMPANIES SHOWN IN TABLES I TO IV

	Six Months Ended	
	June 30, 1920	June 30, 1919
Revenue passengers	1,306,067,021	1,246,096,316
Passenger revenue	$74,530,625	$60,930,523
Transfer passengers	324,472,362	311,825,847
Car-miles operated	219,447,784	214,708,299
Miles of single track	7,265	7,265
Average maximum number of cars operated daily (38 companies)	9,168	9,168
Ratio: Transfer passengers to revenue passengers (per cent)	24.3	25.0
Average fare per revenue passenger	7.0c.	6.1c.
Revenue passengers per car-mile	6.0	5.8
Total passengers (revenue and transfer), per car-mile	7.5	7.3
Car-miles per car-annually thirty-eight companies)	*38,500	*37,804
Car-miles per mile of single track—annually	*60,406	*59,102
Passenger revenue per mile of single track—annually	*$25,186	*$20,950
Passenger revenue per car-mile	41.7c.	35.4c.
Passenger revenue per maximum revenue car operated—annually	*$16,258	*$13,292

* Estimated figure for the year based on six months' report.

The electric railways continue, however, to pay their share of taxes. In 1919 taxes amounted to $5,248,082 and in 1920 to $5,868,809, an increase of 11.8 per cent. Table III shows this amounts to 2.4 cents per car-mile in 1919 and 2.6 cents per car-mile in 1920, a greater amount, it will be noted, than the net income. These companies paid more money to the government in taxes than they took out of the business in profits.

Fixed charges remained practically constant. There was an increase of 2.8 per cent in the actual amount, but the amount per car-mile, 7.8 cents, was the same in both years. This would indicate that very little new financing has been done by these companies, due, probably, to the high price of money.

OPERATING EXPENSES INCREASE

In Table II the operating expenses of these fifty companies are subdivided according to the main divisions of the Interstate Commerce Commission's classification of accounts, and the per cent increase of each item is shown. It will be noted that the cost of conducting transportation shows the greatest increase, 25.7 per cent, which, of course, was to be expected as it includes the wages of trainmen and consequently reflects the recent increases in the price of labor. It cost these fifty companies $6,589,927 more to operate their cars during the first six months of 1920 than it did during the same period in 1919.

The next item in point of increase was maintenance of way and structures, which increased 21.9 per cent. Maintenance of equipment, on the other hand, increased 13.0 per cent. Both increases were due to increased costs of labor and materials. The relatively greater increase in the costs of maintenance of way and structures was probably caused by the companies spending extra amounts on improving their lines this year to make up for deferred maintenance during the war period.

The actual cost of power to operate the cars of these companies for six months increased 10.6 per cent in 1920 over 1919. The cost per car-mile in 1919 was 4.1 cents and in 1920 4.4 cents, an increase per car-mile of 7.3 per cent.

The general and miscellaneous operating expenses, including the cost of injuries and damages and the salaries of general officers and general office clerks, increased 19.7 per cent. The cost per car-mile of this item was 3.6 cents in 1919 and 4.2 cents in 1920, the increase per car-mile being 16.7 per cent.

RIDING HABIT GROWS

In Table V are shown the revenue passengers, passenger revenue, transfer passengers, car-miles operated, miles of single track and number of cars operated daily. Following these are a number of ratios derived from the above data. The most interesting of these is probably the average fare per passenger, which, as before mentioned, increased from 6.1 cents in 1919 to 7.0 cents in 1920.

Another interesting fact brought out in this table is the increase in the number of passengers per car-mile from 7.3 in 1919 to 7.5 in 1920. This increase in the riding habit is especially significant at this time in conjunction with the increase in fare, and refutes the statement, often made, that higher fares would stunt the growth of electric railway transportation.

The ratio of transfer passengers to revenue passengers fell off slightly, from 25.0 per cent to 24.3 per cent, reflecting the elimination of fare transfers by a number of electric railway companies.

The number of car-miles per car and per mile of single track increased slightly, indicating more efficient use of the existing equipment.

Duluth Decrease Continues

A falling off of $21,918 was shown in the net income of the Duluth-Superior Traction Company, Duluth, Minn., during July, as compared with three years ago. Though the company's gross revenue gained $20,624, operating expenses scored an increase of $37,665. For the year to July 31, the net income of the system showed a decrease of $131,140, as compared with the same period in 1917, though the gross revenue increased $229,037.

Comparative operating figures of the railway for July and for the year to Aug. 31 as reported by the company were:

Month of July	1920	1917
Gross revenue	$163,339	$142,715
Operating expenses	125,609	87,944
Net revenue	$37,730	$54,771
Interest, sinking fund, and taxes	29,604	24,727
Net income	$8,126	$30,044
Year ended Aug. 31	1920	1917
Gross revenue	$1,145,487	$916,450
Operating expenses	922,048	577,340
Net revenue	$223,439	$339,110
Interest, sinking fund, and taxes	182,729	167,260
Net income	$40,710	$171,850

Conference Committee Appointed

At the annual meeting of the stockholders of the Union Traction Company, Philadelphia, Pa., on Sept. 15, the retiring directors were re-elected, except that John A. Murphy was chosen to fill the vacancy caused by the resignation of Thomas E. Mitten.

The directors met on Sept. 20 and reelected the retiring officers. Action was taken upon a letter received from the Philadelphia Rapid Transit Company asking for a conference with representatives of the board, to discuss the issuance of $6,000,000 equipment trust certificates. The following committee was appointed: Joseph Gilfillan, Charles Heed, Charles McManus and Arthur Morton.

After the meeting all inquiries were referred to Mr. Gilfillan. He said the sub-committee appointed is really a continuance of the old committee, and cannot consider or even discuss the rentals of the underlying companies. When asked as to what the sentiment of the board meeting was regarding the helping of the Philadelphia Rapid Transit Company over its present difficulties he said that "the United Traction is willing to go in and help the Philadelphia Rapid Transit all we can."

Financial News Notes

Midland Road Resumes.—The first car to be put into operation for passenger service on the Midland Railway, Staten Island, N. Y., which suspended in January, left St. George, S. I., at 8 o'clock on Monday, Sept. 20, for Four Corners.

Car-Finance Plan Before Commission.—The Empire State Railroad Corporation, Syracuse, N. Y., has asked the Public Service Commission for the Second District, for authority to issue $70,000 in equipment trust notes to enable the company to purchase three new interurban cars, one double-truck snow sweeper and one double truck snow plow.

No Payment on London Underground Incomes.—The New York Stock Exchange on Aug. 30 was informed that the profits of the Underground Electric Railways, Ltd., London, England, for the six months ended June 30, 1920, do not warrant the payment of any interest on the 6 per cent income coupon bonds, due in 1948, and therefore Coupon No. 25 has no value.

Syracuse Lines Valued.—The commission which has been considering the street railway situation as it affects the Syracuse lines of the New York State Railways has reported a present property value of $12,450,000 against $21,012,201 claimed by the corporation. It has also, in its report to the Mayor, suggested a 10-cent cash fare and a ticket fare of 7½ cents under a service-at-cost arrangement. The report is referred to at length elsewhere in this issue.

Memphis Went Behind.—The report of the Memphis (Tenn.) Street Railway for August will show a deficit of approximately $13,000 according to unofficial information. Officials of the company declare that had the 7-cent fare been effective throughout the month, however, a surplus of several thousand dollars would be shown. Approximately 4,500,000 passengers were carried during the month. This is regarded as good business for that particular month. Seven-cent fare became effective on Aug. 18, giving the company fourteen days under the increased rate during the month.

St. Louis Earnings Improve.—The United Railways, St. Louis, Mo., cleared $235,092 for the month of July, according to the monthly report of Rolla Wells, receiver, filed in the United States District Court. The receipts were $1,730,704, while disbursements were $1,495,612. The balance on hand July 30 was $585,602. On June 30 the balance was only $350,511. The receiver has deposited $83,165 for the payment of bond coupons, $50,000 of the amount being set aside to take care of the St. Louis & Suburban Railway consolidated mortgage bonds. Bond coupons due since the receiver took charge amount to $610,887, according to the report. A report for the Missouri Electric Railroad was also filed. It gives receipts at $22,650 and disbursements at $13,627.

Sale of Collateral Ordered.—The 181,860 shares of stock of the American Railways, Philadelphia, Pa., pledged as collateral for the 4-6 per cent bonds of the National Properties Company, will be sold at public auction on Nov. 8 at the Federal Building, Wilmington, Del., by special master. The proceedings in the case were instituted by the Continental-Equitable Trust Company, trustees for the bonds, at the request of the so-called Randolph committee. The order for sale was made by the United States District Court. The plan provides the usual authority for the committee to buy in the collateral at the sale for purposes of the proposed reorganization. The plan for the reorganization has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

$1,000,000 Reissue Proposed.—The Dallas (Tex.) Railway has applied to the City Commission for permission to reissue $1,000,000 gold certificate notes, which matured on June 15, 1920, and at that time were taken up by the General Electric Company. In its application for permission to reissue the notes, Richard Meriwether, vice-president and general manager of the traction company, explains that this note issue of $1,000,000 was originally sold to Scandinavian interests and bore 7 per cent interest. A bonus of $50,000 was paid to the Scandinavian interests, which brought the cost of the money to 9 per cent. The company can now reissue these notes and effect a saving of 2 per cent, Mr. Meriwether explained, by extension of date of maturity to Dec. 1, 1927, as the General Electric Company has agreed to carry these notes to this date at 7 per cent.

Seeks to Issue Bonds for Improvements.—The Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., in an application to the Public Service Commission for the Second District, asks for authority to issue $243,000 of 6 per cent mortgage bonds, to realize not less than $208,980 instead of $130,000 authorized by the commission in July, 1919, for new construction and betterments to its system between Poughkeepsie and Wappingers Falls. The company alleges that changes in the market prices of materials and labor have occurred since 1919 and that the estimated cost of $130,000 does not represent amounts which will in all cases be required to be expended for prosecution of the work. The company now asks that the $130,000 order be so amended as to permit the company to issue the larger amount of bonds, to be charged to the company's fixed capital.

Sale of Carhouse Properties Authorized.—For the benefit of the first mortgage holders Judge Julius M. Mayer in the Federal District Court at New York has issued a decree of foreclosure and sale directing the receiver for the New York Railways to sell five large parcels of property now in his possession. An upset price of $2,500,000 is put upon parcel A, which contains the entire block between Thirty-second and Thirty-third Streets and Fourth and Lexington Avenues; parcel B, comprising 711 to 717 East Eleventh Street; parcel C, most of the frontage between East Tenth and East Eleventh Streets, Avenue C and Dry Dock Street; parcel D, the block front on the west side of Madison Avenue between Eighty-fifth and Eighty-sixth Streets, and parcel E, a plot between Broad and Moore Streets, consisting of a storage warehouse building on a plot.

Redemption Plan Advanced.—Rolla Wells, receiver for the United Railways, St. Louis, Mo., has issued a circular to bondholders of the old St. Louis Railroad offering to replace the 4½ per cent bonds of the old company with three-year receiver's certificates bearing 7 per cent interest. The bonds aggregate $1,900,000. They matured on May 1, but under the terms of the mortgage, six months grace was allowed. This period of grace ends on Nov. 1, when the bonds must be paid if a foreclosure is to be avoided. The bonds are a lien on only one line, the Broadway line. Some opposition to the plan has been manifested by bondholders because the receiver proposes to pay only 4½ per cent interest upon the bonds for the period of grace instead of 6 per cent. Several bondholders contend also that the receiver's certificates should bear interest at 8 per cent or better instead of 7 per cent in view of existing rates for money on loan.

Traffic and Transportation

Retrenchment Ordered

Cincinnati Company Directed to Cut Non-Rush-Hour Service to Preserve 8-Cent Fare

Adoption by the Cincinnati (Ohio) Traction Company of a policy of retrenchment has been ordered by William C. Culkins, City Street Railway Director. Mr. Culkins has directed the railway to cut its non-rush-hour service to the bone and to introduce other economies of operation. These steps are necessary, states Mr. Culkins, if the company is to continue to operate on an 8-cent fare.

Increase in Budget Refused

The railway recently applied to Mr. Culkins for an increase in its operating allowances which, if granted, would have raised the total of operating expenses for the current year from $5,499,346 to $6,373,434. The company stated that this supplementary allowance was made necessary by the advance in costs incidental to the recent switchmen's strike and the award of an 18 per cent raise in pay to its employees. Mr. Culkins denied the company's request, ordering the reduction of service as an alternative. In taking this course he maintained that by adhering to a policy of rigid economy the railway would be able to care for the added operating costs at the present fare.

Under Mr. Culkins' plan service is to be adjusted to meet varying traffic conditions. A recent traffic survey showed that the number of cars operated during the non-rush-hour periods was unnecessarily large. The standard of service called for under the new ruling requires that during the non-rush hours there shall be provided in each half-hour period an average of as many seats as there are passengers. During the morning and evening rush hours sufficient cars are to be operated in each quarter-hour period to provide fifty seats for each eighty passengers on cars of the cross-seat type and fifty seats for each 100 passengers on cars of the longitudinal-seat type.

Mr. Culkins explained the reasons for his order as follows:

The change of a few minutes in headways during the middle of the day would produce no appreciable inconvenience, but would materially reduce the operating expenses on the whole system and benefit the car-riding public, who will, I am sure, co-operate cheerfully in the working out of any economy which does not reduce service below the standard established.

Economies Suggested

I call your attention to the matter of improved running time on many lines and adjustments on others and the substitution as soon as possible of double-truck for single-truck cars where conditions allow. As soon as finances permit cars should be equipped with fare boxes, and whenever necessary remodeled to standardize collection methods, and with recording meters for better control and saving of power. One-man car operation, through-routing, cross-town connections and other matters have been previously called to your attention, and the need of conservation is greater now than at any other time.

The total supplementary allowances requested would increase the total operating expenses for the year 1920 from $5,499,346 to $6,373,434 and require a total including taxes, rentals and other deductions of $9,628,111. The total receipts for the first eight months of this year were $5,809,471.

Traffic Increase Slight

It seems reasonable, however, in view of the fact that the unusual weather and other conditions in the past summer were abnormal, to expect an increase in traffic, but the number of revenue passengers for the last four months of 1920 will probably not exceed 42,500,000, or 2,500,000 more than in 1919. This would produce at an 8-cent fare approximately $3,440,000, or a total for the year of $9,249,000, or $379,000 less than the total allowance under the supplementary budget as requested. However, I am of the opinion that with the economies suggested the company will be able to pay the new wage scale and still materially reduce expenses so that it will be possible to avoid increasing the present rate of fare.

Safety Cars for Jersey

One-man safety cars have made their appearance on the lines of the Public Service Railway of New Jersey. Several months ago the company ordered 200 of these cars together with 100 trailer cars for use on the various parts of its system. The first batch of "safeties" has now arrived and the cars have been placed in service on three lines in Paterson, an industrial center in the northern part of the state. As more cars are commissioned for service they will be placed in operation in other cities served by the railway.

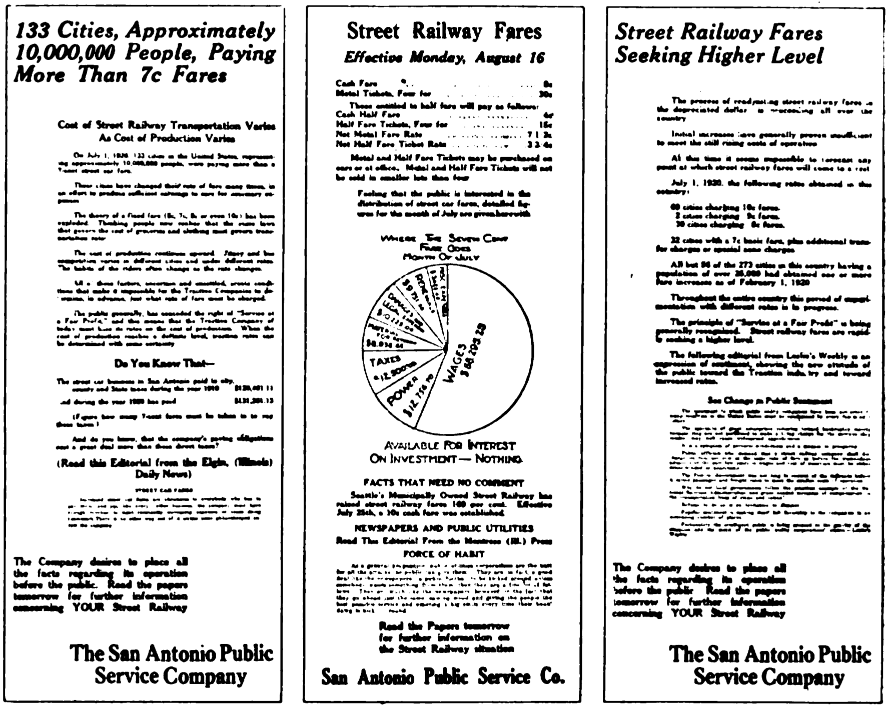
Publicity Work Successful

San Antonio Company Conducts Campaign of Education in Preparation for Fare Increase

A well-directed campaign of publicity played an important part in a recent increase in fare in San Antonio, Tex. The San Antonio Public Service Company announced early in August that it must have more revenue and that the rate of fare would have to be raised in consequence. The company proposed to replace the 7-cent fare under which it had been operating for several months with one of 8 cents.

Realizing the importance of having the support of the car riders of San Antonio, the railway management started an extensive advertising campaign.

In addition to the posting of notices of the proposed change in fare in its cars, it ran large advertisements in the San Antonio daily newspapers, explaining to the public just why higher fares were necessary.



133 Cities, Approximately 10,000,000 People, Paying More Than 7c Fares

Cost of Street Railway Transportation Varies As Cost of Production Varies

Do You Know That—

(Read this Editorial from the Elgin, (Illinois) Daily News)

The Company desires to place all the facts regarding its operation before the public. Read the papers tomorrow for further information concerning YOUR Street Railway

The San Antonio Public Service Company

Street Railway Fares

Effective Monday, August 16

Cash Fare	8c
Metal Tickets, Four for	30c
Those entitled to half fare will pay as follows:	
Cash Half Fare	4c
Half Fare Tickets, Four for	15c
Net Metal Fare Rate	7 1-2c
Net Half Fare Ticket Rate	3 3-4c

Metal and Half Fare Tickets may be purchased on cars or at office. Metal and Half Fare Tickets will not be sold in smaller lots than four

Feeling that the public is interested in the distribution of street car fares, detailed figures for the month of July are given herewith

Where The Seven Cent Fare Goes Month Of July

Available For Interest On Investment — Nothing

FACTS THAT NEED NO COMMENT

Seattle's Municipally Owned Street Railway has raised street railway fares 100 per cent. Effective July 25th, a 10c cash fare was established.

NEWSPAPERS AND PUBLIC UTILITIES

Read This Editorial From the Montrose (Ill.) Press

FORCE OF HABIT

Read the Papers tomorrow for further information on the Street Railway situation

San Antonio Public Service Co.

Street Railway Fares Seeking Higher Level

The process of readjusting street railway fares to the depreciated dollar is proceeding all over the country.

Initial increases have generally proven insufficient to meet the still rising costs of operation.

At this time it seems impossible to forecast any point at which street railway fares will come to a rest.

July 1, 1920, the following rates obtained in this country:

60 cities charging 10c fares.
2 cities charging 9c fares.
30 cities charging 8c fares.

32 cities with a 7c basic fare, plus additional transfer charges or special zone charges.

All but 56 of the 273 cities in this country having a population of over 25,000 had obtained one or more fare increases as of February 1, 1920.

Throughout the entire country this period of experimentation with different rates is in progress.

The principle of "Service at a Fair Profit" is being generally recognized. Street railway fares are rapidly seeking a higher level.

The following editorial from Leslie's Weekly is an expression of sentiment, showing the new attitude of the public toward the Traction industry and toward increased rates.

See Change in Public Sentiment

The Company desires to place all the facts regarding its operation before the public. Read the papers tomorrow for further information concerning YOUR Street Railway

The San Antonio Public Service Company

THESE FARE "ADS" GOT RESULTS

S. J. Ballinger, the company's advertising and commercial manager, was in charge of this educational work. Mr. Ballinger reports that there was little opposition on the part of the car riders to the increase in fare. The 8-cent fare took effect on Aug. 16. Four tickets are sold for 30 cents. Three of the "ads" used by Mr. Ballinger to tell his fare "story" are reproduced above.

In February last the company replaced the zone system with a flat 7-cent fare. Meanwhile the city sought an injunction in the federal courts, and being denied the relief sought, it appealed to the Supreme Court of the United States. The city's appeal is expected to come before the court at the December term.

P. R. T. Must Have More Income

Need for Fare Relief Urged by President Mitten in Statement Before Council Committee—Company "Severely Penalized"

Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, appeared before the members of the transportation committee of the City Council on Sept. 21 to amplify his letter of Sept 14 and to describe the present emergency which confronts that company. Acting under the provision of the 1907 agreement, which requires that fares may be changed from time to time only with the consent of both parties, the company has petitioned the city to assent to the collection of a straight 5-cent fare without transfer or exchange tickets. This is intended as a measure of temporary relief, to continue until the value of the company's property, for rate making purposes, can be finally determined, as required by law.

THE full inventory of the company's property was expected to be ready for presentation to the Public Service Commission on Sept. 23; the pricing of the parts is incomplete, but is expected to be accomplished with sufficient rapidity to keep ahead of the city and Public Service Commission representatives, so that there need be no delay. Verification of the valuation cannot be completed for rate making purposes for many months to come. Meantime, the company must have more money or go to the wall. A synopsis of Mr. Mitten's statement follows:

The company's operating statement, just made public, shows a deficit of $425,354 for the month of August. An accumulated deficit has been built up by months, in varying amounts, until the deficit now represents $1,151,628 for the eight months ended August 31. The operating deficit for the next twelve months will exceed $4,000,000, against which the straight 5-cent fare, without transfers or exchanges, is estimated to bring in about $350,000 a month. The need of increased earnings is two-fold: the amount required to pay actual operating costs being necessary in order that the cars may be kept running; the amount to pay the agreed 5 per cent dividend on P. R. T. stock is required in order that P. R. T. credit be sufficiently established as to make its guarantee on bonds issued for desired extensions of sufficient value to make them salable.

Benefits of Agreement Analyzed

Under the agreement of 1907 it was evidently intended that any change in fares should be justified before being agreed to by the city. The true test of a contract, after its having been in effect for thirteen years, and the fairness of its terms, is best determined by a review of the benefits actually received by each of the parties.

The 1907 agreement was accepted by the press and public representatives, after much publicity and investigation, as being the most perfect solution then possible.

The P. R. T. stockholder had already paid in $18,000,000 and was induced by the making of the 1907 agreement to pay in the remaining $12,000,000 of the $30,000,000 P. R. T. capital stock, in the hope and expectation that he would receive 6 per cent per annum on both the $18,000,000 which he had formerly paid in, as well as 6 per cent per annum on the $12,000,000 of new money which he was required to pay in under the terms of the 1907 agreement.

What has been the result to this hopeful P. R. T. stockholder? As against his having received 6 per cent per annum on the whole $30,000,000 of paid in capital, as he had been led to believe, and which would in total represent $24,000,000, he has actually received in dividends only $5,847,000. P. R. T.'s stock is, at present market, worth only $14 a share, or an aggregate of 8,400,000, as against its paid in capital of $30,000,000.

The P. R. T. stockholder has never received any return upon his $18,000,000 paid in prior to 1907, and has received an average of 3 per cent per annum upon the $12,000,000 paid in under the terms of the 1907 agreement. The entire $30,000,000 of capital stock, if sold on today's market, would bring back only $8,400,000, or $3,600,000 less than the money paid in by the stockholder after the making of the 1907 agreement.

What has been the result to the city of Philadelphia during this same period since 1907?

The city secured the completion of the Market Street elevated, by which West Philadelphia taxable values were increased considerably more than $100,000,000. This high-speed line is more than $5,000,000 short of having earned 6 per cent per annum upon its actual cost, but it has been, and is still supplying, a combined elevated and surface car ride for 5 cents, which cannot be continued. It has been urged that the city's consent to increased revenue should be withheld until a valuation is determined, or until something could be done to reduce the rentals to underlying companies. If the city now makes the mistake of refusing to consent to an immediate increase in revenue, P. R. T. must fail, and the city will have exchanged the substance of a management which has already saved millions in operating costs, for a shadow, which is represented in the hope of decreasing P. R. T.'s fixed charges, through the valuation of its property, or a reduction in underlying rentals, neither of which can possibly offset the loss which would follow a return to conditions of labor and management such as were formerly here.

Except for the good work of P. R. T.'s men there is no reason why the Public Service Commission would not before this have been obliged to give the same relief to P. R. T. by way of a 10-cent fare, as the commission has already allowed in Pittsburgh.

No other street-car company in the state has served its city during the war in any way to compare with P. R. T.

No other company serves its people so well and no other company has such a priceless asset to the city it serves as is represented in the loyalty and faithful service of P. R. T. employees; and yet P. R. T. is the only electric railway in Pennsylvania that has been thus far refused increased revenue at the hands of the Public Service Commission.

The Mayor and City Council have urged that the question of increased revenue is for the city to decide under the terms of the 1907 agreement. The company has met this suggestion by withdrawing its July application from the Public Service Commission, and now rests its case, hoping that the city, having assumed the responsibility, will rise to the emergency and assent to the temporary relief required to save P. R. T. from bankruptcy.

Seven Cents in Fort Wayne

The Indiana Public Service Commission, finding that the Indiana Service Corporation, Fort Wayne, has been operating the Fort Wayne city lines at less than a fair profit, has authorized a temporary fare rate of 7 cents with four tickets for 25 cents. The new rates are to stand for a period of sixty days from Sept. 15, pending the final decision of the commission, which will be made as soon as possible.

Robert M. Feustel, president of the company, states that all the employees of the company will be given a wage increase which will total about $150,000 a year. The men operating the city cars will be given a new scale of 46 to 53 cents an hour. They formerly received 40 to 45 cents. This advance in pay is being granted in spite of the uncertainty concerning the final decree of the commission because, Mr. Feustel says, the company believes that the employees are entitled to recognition for their loyal services during this abnormal period.

Mr. Feustel also expresses the hope that the new wage scale will alleviate the labor shortage from which the company has been suffering for some time. The shortage of men has been felt very keenly by the company and for several weeks there have not been sufficient trainmen to take out all scheduled cars. Track improvement work has also been hindered by the shortage of labor.

In its permanent order the commission is expected to authorize the service-at-cost plan for the local lines. In case this plan should be adopted the initial fare will probably be the same as the rate under the temporary increase.

Service Resumed in Bridgeport

Electric cars made their reappearance in Bridgeport, Conn., on Sept. 20. Their return marked the termination, temporarily, at least, of a long-drawn-out controversy between the Connecticut Company, operating the Bridgeport lines, and the local jitney drivers. It also marked the end of trolley-jitney competition in Bridgeport, a condition of the resumption of service by the company being that motor buses should no longer be permitted to operate in the principal thoroughfares served by the railway.

Bridgeporters were without trolley service for exactly eight weeks. Early in July the company announced that, unless jitney competition were curbed by the city authorities, it would be forced to cease operation of its local lines. The Bridgeport Common Council, after an investigation of local traffic conditions, passed an ordinance which, it was thought, would solve the problem by placing the buses under rigid control. This measure was declared illegal by Judge Banks on the ground that it delegated the power of the Council to regulate traffic to the board of police commissioners.

The company thereupon suspended service on its Bridgeport division. The Council took no immediate action looking to the passage of a new jitney ordinance free from the features ruled out by Judge Banks. Finally, acceding to popular demand for the restoration of trolley service, the Council passed an ordinance barring the buses from the streets containing electric railway tracks. The new law, which also became effective on Sept. 20, designates five routes which the jitneys are required to follow. The bus service is thus made complementary to rather than competitive with that of the railway.

An ordinance barring jitneys from certain streets was recently passed by the Board of Aldermen of New Haven. The measure designates eleven thoroughfares from which the buses are barred.

London Tubes Raise Rates

A bill has been passed by Parliament giving permission to the London Underground Railways to raise their fares. The powers granted to the companies under the new act will permit the continuance of the policy of preference to the long-distance passenger. Under the terms of the act the Underground systems are empowered to charge ordinary fare at a rate not exceeding 1½d. a mile or part of a mile with a minimum of 2d., while workmen's tickets will be issued up to 7: 30 a.m. on all the systems, and will be available for the return trip any time during the day, at a rate not exceeding the ordinary single fare on the double trip, with a minimum of 3d. (return).

In a recent statement issued by the companies, it is pointed out that these are maximum rates, designed to provide the companies with a reasonable margin within which to operate, without the necessity of constant reference to Parliament. Even for short trips in the inner areas it may not be necessary to make full use of the maximum charge. It is pointed out that the necessary increases will be imposed where they will be least felt, and the long-distance fare under the new schedule will still be found to work out at a very cheap mileage rate, both positively and relatively.

Transportation News Notes

Searchlight Trips Resumed.—The Niagara Gorge Railway, Niagara Falls, N. Y., has resumed the operation of searchlight trips through the lower gorge of the Niagara River. A flat car equipped with powerful electric searchlights accompanies passenger cars on the trip through the gorge.

May Raise Astoria Fare.—Guy Talbot, president of the Pacific Power & Light Company, Astoria, Ore., has announced that the company will shortly take steps to raise the fare on its Astoria lines. The new rate would be 7 cents. The company now charges a 5-cent fare.

Six Cents on Arkansas Lines.—The City Council of North Little Rock, Ark., has passed an ordinance authorizing the Intercity Terminal Railway to charge a 6-cent cash fare on its local lines. The company is now charging a 5-cent fare. Before becoming effective the increase must be approved by the Arkansas Corporation Commission.

Freight Rates Up in Minnesota.—Thirteen electric railways operating interurban lines in Minnesota have received permission from the State Railroad & Warehouse Commission to raise their freight rates. The advance in the charge for transporting milk is 20 per cent. Rates for other commodities are advanced 35 per cent.

Standees May Be Barred.—Standing between the seats of open cars on the New Bedford, Mass., lines of the Union Street Railway will become a misdemeanor if an ordinance now awaiting the consideration of the New Bedford Common Council becomes law. The proposed measure stipulates that no passenger can be permitted to "ride between the seats in open cars."

Asks Rise in Huntington.—A petition requesting permission to advance the basic fare in Huntington, W. Va., from 5 to 6 cents was filed recently with the State Public Service Commission by the Ohio Valley Electric Railway company. The company has applied to the Interstate Commerce Commission for an increase in its interstate rates. It recently raised the fare on its lines in Ironton, Ohio.

Suburban Fare Advanced.—Effective Sept. 9, the fare on the line of the Portland Railway, Light & Power Company between Portland, Ore., and Vancouver, Wash., was advanced from 15 to 17 cents. The increase was accomplished by increasing the fare between Columbia Boulevard and Vancouver from 7 to 9 cents. The new fare is less than half of that charged by the jitneys, which have maintained a rate of 35 cents each way for several months.

Would Charge Ten Cents in St. Joseph. — The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has applied to the State Public Service Commission for permission to raise its fare from 7 cents to 10 cents. The application is in the form of a supplementary petition filed with the commission at the opening of a hearing upon a previous application by the company for a 9-cent fare. Attorneys for the company stated that a 9-cent fare, if it is granted, would not prove adequate.

Ten Cents in Sydney.—A 10-cent cash fare was placed in effect on the lines of the Cape Breton Electric Company, Sydney, N. S., on Aug. 15. Tickets are sold by the company at the rate of four for 30 cents. The fare was formerly 6 cents. The increase was authorized by the Nova Scotia Board of Public Utility Commissioners in an order handed down on Aug. 5. The company conducted an extensive advertising campaign, prior to putting the new rates into effect.

"Safeties" Soon on Dallas Lines.—Four of the fifty one-man safety cars recently ordered by the Dallas (Tex.) Railway have been shipped from the factory in Philadelphia, according to notice received by Richard Meriwether, vice-president and general manager, and are expected to arrive in Dallas before the end of September. These cars are expected to arrive in Dallas in time to be put in service for the Texas State Fair which will open Oct. 9 to continue for fifteen days.

Will Halt Transfer Abuse.—To halt the abuse of the transfer privilege on its lines, the Los Angeles (Cal.) Railway is introducing a new form of transfer throughout its system. The modified transfers are designated by letters corresponding with the various lines. The key-letter will be so large that it can be noted at a glance and will stop misuse of the transfer privilege, which has cost the company an average of $2,000 per day. The new transfers have already been placed in service on five of the company's lines.

Ten - Cent Fare Stands.—Ten cents will continue to be the cash fare charged by the Michigan Railway on its lines in Battle Creek, Mich., for at least sixty days longer. The State Public Utilities Commission at a recent hearing granted the company permission to retain the 10-cent fare temporarily. The city of Battle Creek had sought to have the rate reduced. The fare was raised by agreement among the commission, the city and the company last June. Traffic for the month of July showed a falling off of 24 per cent as compared with the traffic for the same month a year ago.

Six Cents in Sioux City.—Six cents became the fare charged by the Sioux City (Iowa) Service Company on Sept. 10. The company was recently authorized by the voters to raise its rate from 5 cents to 6 cents. The increase had previously been recommended by a committee of citizens after a careful investigation of the company's needs. New tokens and fare registers ordered by the railway are not expected to arrive until October. In the meantime the old tokens are being sold at the rate of seventeen for $1. The company recently raised the wages of its employees.

Tokens in Dallas.—The Dallas (Tex.) Railway has installed new fare boxes in all its cars for handling metal tokens and pennies. The old boxes were not designed to register pennies, and changes were necessary. Conductors were supplied with pennies and the company has insisted on payment of fares in the form of a nickel and one penny up to this time, but now fares may be paid in any manner desired and 6 pennies dropped into the fare box if the patron desires. The company has put on sale metal tokens in packages of twenty for $1.20. These may be purchased at all the leading department and drug stores in the city, as well as at the offices of the company.

Would Raise Saginaw Fares.—Russell B. Palmer, general superintendent of the Saginaw-Bay City Railway, Saginaw, Mich., recently appeared before the City Council of Saginaw to ask that the company be allowed a material increase in fare. Mr. Palmer asked the Council for permission to submit figures to show that the present 6-cent fare is inadequate. While asking for no set increase, the company's petition declared that the 6-cent fare, declared insufficient two years ago in a report presented by Dean Mortimer L. Cooley, was not bringing sufficient returns to pay operating expenses and taxes, to say nothing of maintenance, depreciation or interest on the investment.

Fare Rise Urged for New Orleans.—An 8-cent cash fare is recommended for the New Orleans Railway & Light Company, New Orleans, La., in the report of the three special masters who have been inquiring into the company's financial condition. The masters have just completed their investigation and in their report have approved an increase in the wages of the company's employees amounting to approximately 30 per cent. They began their work shortly after the conclusion of the strike which tied up electric railway service in New Orleans two months ago. Their report will now be submitted for approval to the Federal District Court, which is in charge of the railway's affairs. The fare is now 6 cents.

More Penn Lines Raise Rates.—Several electric railways operating in Pennsylvania have filed with the State Public Service Commission notice of their intention to increase their fare. The Highland Grove Traction Company, McKeesport, will raise its fare from 5 cents to 10 cents. The Lancaster & York Furnace Street Railway, Millersville, proposes to replace the present 5-cent fare with one at 6 cents. The Lehigh Valley Transit Company, Allentown, and the Conestoga Traction Company, Lancaster, will increase their express rates approximately 19 per cent. The Reading Transit & Light Company, Reading, plans to raise its rates for milk transportation and other freight rates.

Kansas City Rise Waits.—Pending a decision by the Missouri Public Service Commission, there will be no increase in fares on the lines of the Kansas City Railways. The commission considered the railway's application for a rate advance at a hearing ending on Sept. 8, and took the matter under advisement, giving the company ten days in which to file a brief and the city twenty days more in which to file a rebuttal. The company is seeking authority to introduce a flexible-fare system, under which the fare would advance from 8 cents straight to 10 cents cash or three tickets for 25 cents. Representatives of the city government appeared at the hearings to oppose the increase, contending that the company's difficulty was due to over capitalization.

Hearing Soon on Connecticut Fares.—The question of whether or not the Connecticut Company, New Haven, Conn., shall be allowed to increase its fare beyond the 7-cent rate authorized by the State Public Utilities Commission two months ago, will come up for settlement before the commisson at a hearing on Oct. 1. At the time the 7-cent fare was authorized the company informed the commission that this rate would be insufficient to meet its operating expenses, but the rate was allowed to stand until the commission should have an opportunity to make a more thorough study of the company's needs. Individual trustees of the Connecticut Company have expressed themselves as being in favor of a 10-cent fare. They contend that any rate less than a dime will prove insufficient to meet the financial requirements of the system.

Mayor Bars Brockton Buses.—Jitney buses will not operate through the streets of Brockton, Mass., for some time to come, if Mayor William L. Gleason has anything to say on the subject. Mayor Gleason has announced that so long as he remains the city's chief executive, the buses, which were barred from the streets on Dec. 1 last, will not be permitted to return. Announcement of the Mayor's attitude is in answer to a demand that buses from the town of Whitman be allowed to enter the city, owing to the recent increase in fares by the Eastern Massachusetts State Railway. Mayor Gleason calls attention to the fact that last fall, when the jitney controversy was before the public, there was an almost unanimous vote in favor of the electric railway and that as a result licenses of 300 jitney operators were revoked.

Traffic Declines as Fares Go Up.—Many commuters who in going to their daily work in Boston and other cities of Massachusetts formerly used the lines of the Eastern Massachusetts Street Railway are now riding on the steam roads. The falling off of traffic on the electric railway followed an advance of its fare throughout its entire system, made necessary by the recent advance in the wages of its employees amounting to $1,400,000 a year. In most cases the fare on the electric lines was raised from 10 cents to 15 cents in each zone, transfers being abolished. The results of the fare raise are indicated by the case of a steam train leaving for Boston from a nearby city at 6:25 a.m. on Sept. 15. This train carried 146 passengers, whereas formerly the average had been from twenty to thirty passengers.

P. R. T. Seeks Public's Support.—Patrons of the Philadelphia (Pa.) Rapid Transit Company are being given the opportunity to learn at first hand the manner in which they will be affected by the proposed abolition of transfers on the P. R. T. system. Thomas E. Mitten, president of the P. R. T., has adopted the policy of laying the company's case directly before the car-riding public through the medium of advertisements in the Philadelphia newspapers. The company on Sept. 17 printed a full-page map of the city showing the P. R. T. routes to bring out the fact that the great majority of car riders would continue to ride for a nickel. In commenting upon this feature of the contemplated rate change the company pointed out that the discontinuance of transfers would release the equivalent of 300 cars for improved service.

Busmen Unite in Muskegon.—Twenty-four persons operating motor buses in Muskegon, Mich., have incorporated under the name of the Michigan Jitney Bus Company. The new concern is capitalized at $200,000, of which $103,000 is given as the value of the thirty-seven buses owned by the company. Definite routes for the various cars have been mapped out and each bus will operate on schedule time. Snow plows will be purchased, it is said, to keep the routes clear in winter. The fare charged will be 6 cents. No transfers will be given. Each bus will be operated from the outskirts of the city to the main business section. The present rate of fare of the Muskegon Traction & Lighting Company is four tickets for 30 cents or 10 cents cash. The incorporators made the claim that about 60 per cent of the business in Muskegon was now being handled by the buses, which before the incorporation operated individually.

California Buses Ask Rate Increase.—Three motor bus companies operating a system of lines in southern California have applied to the State Railroad Commission for an increase in passenger fares amounting to 20 per cent. The rate advances, if allowed, will affect approximately 90 per cent of the motor buses serving the southern section of the state. The applications for relief were heard by the commission in Los Angeles on Sept. 8. The companies applying for higher fares are the Motor Transit Company, the White Bus Lines, and the Pickwick Stages Company and affiliated lines. These three systems and their affiliations are largely under the control of the Motor Transit Company, the parent organization. They operate 126 autobuses over a system of public highways covering more than 650 miles. This mileage extends from Bakersfield on the north to San Diego and Imperial Valley points on the south. The lines carry 200,000 passengers per month and operate a monthly car mileage of 600,000 miles.

Ten Cents Asked in Albany.—The United Traction Company, Albany, N. Y., has filed a petition with the Public Service Commission, Second District, asking that its fare rate be fixed at 10 cents within local zones, and 20 cents on its through zones as they exist at present. The company also asks that unless the city of Troy waives a franchise restriction, the company be permitted to create a new zone or zones, including the territory within Troy, and that such rates be established within such zone or zones as may be "just and reasonable." The company has suffered a deficit from operations from 1914 up to July 1 of this year, of $420,671.65, of which $100,000 was incurred the first six months of this year. The company granted its motormen and conductors an increase in wages of 15 cents an hour on July 28, this increase being retroactive to July 1. The increase raised the wages from 41, 43 and 45 cents an hour, to 56, 58 and 60 cents an hour. The 15-cent increase will mean an additional expense to the company of $600,000 a year. The new agreement is limited to four months, which will make the expense to the company $200,000 up to Nov. 1.

Personal Mention

Veterans Honor General Harries

Brig.-Gen. George H. Harries, formerly president of the American Electric Railway Association, was elected commander-in-chief of the Military Order of the World War at the convention of that body at Detroit, Mich. General Harries recently resumed his duties as a vice-president of the Byllesby Engineering & Management Corporation, Chicago, Ill., after serving with distinction with the National Army in France and later as head of the American Commission which had charge of the repatriation of war prisoners.

General Harries' military career dates back to the frontier wars with the Indians, when he served as a scout under Generals Miles and Crook. In the Spanish-American War, as colonel of infantry volunteers, he participated in the siege of Santiago, Cuba. In the World War as brigadier general of the National Army he was in the thick of things at Verdun.

Later he served at Brest during the embarkation of troops for the return to the United States. He was then appointed American commissioner on the repatriation of allied prisoners of war, and was the first American to reach the goal coveted by the soldiers of all the allied nations. Nine months of distinguished service at Berlin during revolutionary turmoil brought to him decorations from several countries, including that of Commander of the Legion of Honor and the Distinguished Service Medal.

W. F. Anderson has been appointed auditor of the Manhattan & Queens Traction Corporation, New York, N. Y. Mr. Anderson is a graduate of Rensselaer Polytechnic Institute, Troy, N. Y. For several months he has been connected with the Doherty Training School for electric railway students at Toledo, Ohio. The New York & Queens Traction Corporation is one of the Doherty properties.

T. H. Mann, terminal freight agent for the Pacific Electric Railway, Los Angeles, Cal., has resigned. Mr. Mann plans to become associated with the Los Angeles office of a steamship company. He has been connected with the Pacific Electric Railway for more than twelve years. He was formerly employed by the old Los Angeles & Redondo Railway, which later became a part of the Pacific Electric Railway system.

Edward T. Moore, formerly vice-president and general manager of the Dallas (Tex.) Consolidated Street Railway, has been elected president and a director of the Simms Petroleum Company, New York, N. Y. Mr. Moore was manager of the Dallas traction system for fifteen years prior to the consolidation of the lines under the Strickland-Hobson management in April, 1917. Following this consolidation, Mr. Moore went to New York.

B. S. Hanchett Retires

Veteran Operator Resigns as President of the Grand Rapids Railway—Succeeded by B. C. Cobb

Thirty-seven years after taking up street railway work at Grand Rapids, Mich., Benjamin S. Hanchett has retired as president of the Grand Rapids Railway. B. C. Cobb, of the firm of Hodenpyl, Hardy & Company, investment bankers, and vice-president of the Grand Rapids Railway, has been elected Mr. Hanchett's successor. No change in the policy of the company is contemplated under the presidency of Mr. Cobb, who in addition to his duties as vice-president has been chairman of the operating committee of the railway for several years.

B. S. HANCHETT

Mr. Hanchett's retirement marks the close of a ten-year period during which he has successfully administered the railway's affairs as its president. Ill health and a desire to take a complete rest were responsible for his resignation. For the time being Mr. Hanchett will withdraw from public life and will take a long vacation in an endeavor to build up his health, which has not been rugged for several months.

Mr. Hanchett was born in 1869. At the age of fourteen years he entered the employ of the Grand Rapids horse-car system as an office boy. Soon thereafter he was promoted to the position of assistant book-keeper, and then to book-keeper. In 1888 he was made chief clerk of the company. Subsequently, he was made paymaster of the company and later was elected secretary. When the Valley City Street & Cable Railway purchased all the local lines in Grand Rapids and changed the motive power from horses to electricity, Mr. Hanchett was elected secretary and assistant treasurer of this company.

In 1900 the railways in Grand Rapids were taken over by the Grand Rapids Railway, and Mr. Hanchett was elected secretary-treasurer of the new company. In March, 1904, he was appointed general manager to succeed the late Hugh S. Johnson and was continued as secretary-treasurer of the company. The great growth of the system and the perfecting of the system were accomplished under Mr. Hanchett's management. He became president of the company in 1910.

Mr. Cobb, who succeeds Mr. Hanchett is president of the Northern Ohio Traction & Light Company., Akron, Ohio., and is also an official of a number of other traction and power properties throughout the country, representing Hodenpyl, Hardy & Company. Mr. Cobb was born in Boston, Mass., in 1870. He attended the Boston Latin School, and later went to Andover Academy. Mr. Cobb has been in public utility work for about twenty-four years. He began his career in the office of the Grand Rapids Gas Company in 1894. Four years later he became general superintendent of the Detroit (Mich.) Gas Company. Three years thereafter he left Detroit to become vice-president and general manager of the Saginaw-Bay City Railway & Lighting Company. In 1906 he became a member of Hodenpyl, Hardy & Company, with headquarters in New York City.

B. H. Hart, who has been superintendent of maintenance of way of the Texas Electric, Dallas, Tex., with headquarters in Sherman, Tex., has resigned to become superintendent of maintenance of way of the Gulf Coast Lines with headquarters at Kingsville.

Charles T. Doerr has been appointed purchasing agent of the Alabama Power Company, Birmingham, Ala. Mr. Doerr was formerly purchasing agent of the Birmingham Railway, Light and Power Company. Later he served with the Air Nitrates Corporation.

Orrin E. French has been appointed general assistant to P. F. Sheehan, manager of the Brockton Division of the Eastern Massachusetts Street Railway, Boston, Mass. Mr. French is a veteran employee of the Bay State system. Prior to his recent promotion he was foreman of the North Abington carhouse.

Irving S. Fairty, Assistant City Solicitor of Toronto, Ont., has been appointed solicitor to the Transportation Commission recently appointed by the Toronto City Council to take charge of the affairs of the Toronto Railway when the franchise expires in 1921. Mr. Fairty has been connected with the city's legal department since June, 1912.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Big Market for Car Seatings Anticipated

Seat Demand Light, but Good Orders for Repair Material—Steam Roads Expected to Buy Heavily

Manufacturers of car seats report only a fair volume of business at present. The buying of new seats is very small but orders for seating material, such as rattan, are fairly good. Many car builders are now making their own finished seats and this partly accounts for the light demand for that product. On the other hand, a growing volume of orders for bus seats is reported. Electric traction companies are buying seatings for repair purposes only as absolutely needed. Manufacturers say there is an increasing tendency to replace rattan material with slat seats. This is especially true regarding safety cars. Buying on the part of the steam roads has not developed heavily as yet. A big market is anticipated in that quarter as repairs to the seat equipment of steam roads have been at a low ebb. Some producers think it may still be some time before the influence of this buying is felt, but others are optimistic over the prospect of its appearance within the next two or three months. The needs of electric traction companies will be well taken care of in any case, it is said.

The buying of seating material by steam railroads is not expected to affect seriously the supply available for traction companies, it is stated. It may affect production, it is true, if manufacturing facilities should become almost entirely absorbed, but this is not thought to be probable. Furthermore, conditions of raw material in the two markets do not greatly overlap, as steam railroads mostly require plush and imitation leather for seats, while electric traction companies generally use rattan or wood.

MANUFACTURING CONDITIONS IMPROVING

Manufacturing conditions in general are improving at present. No fault is found with domestic labor conditions, though prices of native labor in the Far East, where the rattan is obtained, are said to be high compared with other years. Some manufacturers say rattan is scarce and that ship bottoms to transport the material are difficult to obtain. Other producers are not meeting with these difficulties. As a consequence, the condition of rattan seating material stocks varies considerably. Delivery conditions generally are said to be improving. On wooden seats manufacturers say there is no shortage. On the other hand, reports agree that the supply of plush and imitation and real leather is very low. To obtain deliveries by next spring on steel seats covered with this material, orders will have to be placed the latter part of this year. Deliveries cannot possibly be made under about four months, according to one large producer, and this figure runs up as long as six months. Deliveries of finished rattan and wooden slat seats range from four to eight weeks, while the rattan covering itself can be obtained from stock up to two or three weeks. No cancellations have been received.

One of the large manufacturers of this material says the price trend is upward and that higher quotations would not be surprising before long.

Transportation Holding Up Wood Tie Deliveries

Stocks at the Camps Good—Current Orders for Repair Work Only, but Heavier Demand Expected

Demand for wood ties is fairly good at present, but a much larger volume of orders is expected to develop soon, it is stated. This expectation is based on the estimated purchases which steam roads are expected to make. The buying movement from this quarter that was anticipated when the carriers received financial assistance in the form of rate increases has not as yet affected the tie market appreciably. Producers seem to be optimistic regarding the outlook, however.

Normal demand for railroad ties from all interests is about 100,000,000 to 125,000,000 annually, according to the United States Forest Service. During the war and the period of Federal supervision the carriers of the country reduced roadbed extensions and repairs to the level of absolute necessity. Tie purchases were therefore at a minimum. In 1918, according to the same source of information, purchases were slightly under 77,500,000 ties and in ten months of 1919 slightly over 84,500,000. Because of this curtailment in demand during the past few seasons producers are looking for a growing market in spite of present light orders. Buying on the part of electric traction companies is also rather light just now. Producers report that orders from electric railways are almost entirely for repair purposes.

A feature of the demand is the growing influx of Douglas fir ties into Middle Western and Eastern States, according to the Forest Service. These are regions which in the past have largely been supplied by oak cut along the right of way. The excessive cost and uncertainty of an adequate supply of such ties have brought about this change in the source of supply. On the whole, sales thus far this season have not been up to the normal standard of other years, according to representative producers. No cancellations have been received, however.

There are plenty of ties available at the tie camps, but a shortage of cars has made it largely impossible to market them. Shipments of pine ties as a rule can be made from stock, but deliveries are ranging in the neighborhood of two to four weeks. Many customers are specifying treated ties in their orders and this process adds about 75 to 80 cents to the cost of the tie. The creosote oil used in treating the wood is very scarce at present. About 30 to 40 per cent of the ties are now so treated, it is reported. Prices are holding steady, a standard 8 ft. x 6 in. x 8 in. yellow pine tie being quoted at about $2.80.

Favorable Conditions in Brake Shoe Production

Deliveries Are Good and Raw Material Situation Is Improved—Possibility of Higher Prices

Deliveries of brake shoes, according to information obtained from one of the leading producers in this line, are being made in good shape and are continuing to improve. Shipments of coal, coke, pig iron, etc., have been slow heretofore, but supplies are now arriving in better time as the freight situation continues to clear up. Raw material requirements of manufacturers are anticipated in advance and reserve stocks of material are kept on hand. This aids in maintaining the supply of the finished product.

The season has been a normal one as regards sales. Orders on behalf of new rolling stock have been a negligible factor in the business. Orders from electric traction companies are apparently being placed only as absolutely needed. The buying movement of steam railroads that has been anticipated since their recent rate increases does not seem to have made itself felt appreciably as yet. Manufacturers are optimistic regarding the future development of this business, however, though they seem to think it may be some time before the buying program of the carriers throughout the country, calling for expenditures of more than

$750,000,000, is put into operation. About a fourth of the total expenditures, it is estimated, will go for rolling stock, including repairs to existing equipment. No matter how large the orders that may develop in the future from steam roads, manufacturers state that they will be able to take care of the needs of electric traction companies.

Prices on brake shoes have held steady for the past two months. The price tendency, in the opinion of one of the prominent manufacturers, seems to point to further advances being made. This view, it is stated, is based on the prevailing high prices for such material as pig iron, coke and coal. The labor situation in this field is now reported satisfactory.

Definition of Utilities Entitled to Assigned Coal Cars

New Order Aims to Eliminate Abuses of System—Scope of Privilege Is Restricted

Public utilities which are entitled to receive assigned cars for their coal supply are defined by the Interstate Commerce Commission in a new service order. The new order has been worded in an effort to eliminate certain abuses alleged to have been taking place under the old order. It is claimed that assigned cars were being furnished to activities which could not be classed properly as public utilities.

Under the new order assigned cars are limited to those utilities which serve the general public directly under a franchise. When a utility is not owned by a public agency the application for a permit to obtain assigned cars must be approved by the Public Utilities Commission or the Railroad Commission of the state in which the plant is located. The text of a portion of the new order, which the Interstate Commerce Commission designated as Service Order No. 16, is as follows:

> It is ordered, That effective Sept. 19, 1920, and until further order of the commission, all common carriers by railroad within said territory to the extent that may be necessary in order that public utilities which directly serve the general public under a franchise therefor with street and interurban railways, electric power and light, gas, ice, water and sewer works; also ice plants which directly supply the public generally with ice; also hospitals, schools and other public institutions of the United States, state or municipal governments, may be kept supplied for current use but not for storage, exchange, or sale, be, and they are hereby, authorized to place, furnish and assign cars to coal mines for the transportation of such coal in addition to and without regard to the existing ratings and distributive shares for mines upon said railroads; provided, no cars shall be so placed, furnished or supplied by any such carriers without written application therefor, showing that such coal is needed solely for the current use of the applicant and not for storage, exchange, or sale, in order that applicant may continue its public service in daily operation, which application, in the case of public utilities not owned by some governmental agency, shall be approved by the public service commission or railroad commission of the state in which said plant is located if there be one, and all such applications shall be concurred in by the delivering railroad; and provided, further, that such coal shall not be subject to reconsignment except to public utilities or public institutions as above described, and that a written report of the cars placed hereunder shall be made to the Interstate Commerce Commission by the railroad placing the cars as often as once each week.

New One-Man Car Manufacturer

Theodore A. Brewster, former chief draughtsman and engineer for the St. Louis Car Company, has announced the organization of the Missouri Car Company, a $500,000 corporation, which plans to manufacture one-man street cars. The company, according to Mr. Brewster, will purchase ten acres in the new industrial district in North St. Louis and within the next two or three months will start construction of the first of five units of its manufacturing plants. The first plant will cost about $250,000 and will employ 500 people. This plant, with a capacity of 600 to 800 cars a year, will be completed in eight or ten months, it is stated, and the first cars will be on the market in less than a year. The car to be manufactured will weigh 14,000 lb. A patented truck claimed to eliminate swinging and jolting has been purchased. The officers of the new company are: T. A. Brewster, president; J. J. O'Brien, vice-president and treasurer, and G. Elmo Holke, secretary. The company will have its offices in the Central National Bank Building, St. Louis.

Issue of $1,090,000 in Notes to Pay for 139 New Cars

Milwaukee (Wis.) Electric Railway & Light Company has sold an issue of $1,090,000 ten-year 8 per cent sinking fund equipment trust gold certificates at par and interest through W. A. Read & Company. The notes are dated Oct. 1, 1920, and are issued under the Philadelphia plan against 139 new standard steel street railway cars. The cost of these will be $1,560,000. An initial payment of $470,000 has been made by the company. At the time of going to press the certificates were quoted at $101.

Rolling Stock

Havana Electric Railway, Light & Power Company, Havana, Cuba, announces that it expects to purchase twenty or more 6-yard steel dump cars for coal and construction materials.

Brockton & Plymouth Street Railway, Plymouth, Mass., is reported to have ordered four more safety cars. At least one new snowplow will also be purchased, it is reported.

Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., in its application to the Public Service Commission for authority to issue new bonds for extensions and improvements, has included seven safety cars in the contemplated additions.

Empire State Railroad Corporation, Syracuse, N. Y., has asked the Public Service Commission for the Second District for authority to issue $70,000 in equipment trust notes to enable the company to purchase three new interurban cars, one double-truck snow sweeper and one double-truck snowplow.

Burlington (Iowa) Railway & Light Company will replace the fifteen cars now in use on the system with Birney type safety cars. Six of the safety cars were expected to be put into operation the latter part of this month and these will be followed by nine others, it is reported. Delivery of the new cars, which were built in St. Louis, was promised in August, but shipment was delayed.

Franchises

Knoxville Railway & Light Company, Knoxville, Tenn.—The Knoxville Railway & Light Company has received a franchise to enlarge its system by constructing new and additional tracks on Wall Avenue, Broadway and Fifth Avenue, Walnut Street and Asylum Avenue. Reference to the plans of the company for these improvements was made in the ELECTRIC RAILWAY JOURNAL recently.

Track and Roadway

Trinidad Electric Transmission Railway & Gas Company, Trinidad, Col.—The Public Utilities Commission of Colorado has refused a permit to the Trinidad Electric Transmission Railway & Gas Company to remove its tracks on Pine Street from State to San Juan Street.

Pacific Electric Railway, Los Angeles, Cal.—The State Railroad Commission has approved changes in the trackage of the Pacific Electric Railway in Long Beach. The relocation of the tracks and the construction of crossings at grade over the Southern Pacific and the San Pedro branch of the Los Angeles & Salt Lake Railroad were made necessary by the construction of the flood control channel by the Los Angeles County Flood Control District.

Brockton & Plymouth Street Railway, Plymouth, Mass.—The Brockton & Plymouth Street Railway has started upon plans for a new power house to be located in Kingston.

Springfield (Mass.) Street Railway.—The Springfield Street Railway is starting to lay double track on Front Street. The road is being torn up and the work is being hurried to completion. Permission to lay this double track was granted the Springfield Street Railway some time ago.

Eastern Massachusetts Street Railway, Boston, Mass.—If the City Council of Chelsea acts favorably on the petition of the Eastern Massachusetts Street Railway for the establishment of a prepayment area in Chelsea Square, the company will start at once on the construction of a station in the square. The station plans show a platform 35 ft. x 80 ft. This station will be used as a transfer point and all traffic from the north will make a stop at Chelsea Square, the passengers transferring to cars for Boston. The cost of this undertaking will be more than $100,000.

Syracuse & Suburban Railroad, Syracuse, N. Y.—The Public Service Commission, Second District, under an order issued Sept. 3 has directed the Syracuse & Suburban Railroad to reconstruct its track in Genesee Street in Fayetteville and locate it in the center of the street and conform to the new grade. Rails and ties to be used shall be subject to the approval of the commission, the company to submit within fifteen days specifications covering the rails and ties. The company is to notify the commission in ten days whether the order will be obeyed. Fayetteville trustees asked for an order requiring rebuilding of the tracks and their removal to the center of Genesee Street, the road now being located on the northerly side of Genesee Street, in part. Genesee Street is a part of the state highway system and its improvement is under way and the change to the railroad tracks is in connection with the paving operations. Reference to the action of the Fayetteville trustees was made in the ELECTRIC RAILWAY JOURNAL for Sept. 4.

Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y.—In an application to the Public Service Commission for the Second District to issue $243,000 of bonds, the Poughkeepsie & Wappingers Falls Railway outlines a new construction program. This plan includes the laying of double tracks with concrete pavement, ballast and steel ties between the carhouse and Cherry Street, about 381 ft., and between the east side of Cherry Street on Main Street to Grand Avenue about 3,600 ft. Single track will be replaced on Main Street between Grand Avenue city line and the Arlington switch with tee rail, rock ballast and ties. Overhead trolley equipment will be reconstructed in Main and other streets. The company will also repair its distribution system on Main Street, River to White and on the north side install ties and raise tracks with cinder ballast in Grand Avenue, College Avenue to Driving Park. New ties will also be installed between Lynch's and Allendale.

Cleburne, Tex.—Business men of Fort Worth have shown interest in the proposed interurban line from Cleburne extending westward into the West Texas oil fields, and it is indicated that the Fort Worth Chamber of Commerce may undertake to aid in the financing of the project. Present plans call for an interurban line originating at Cleburne, where a junction will be made with the Fort Worth-Cleburne line of the Tarrant County Traction Company, thence extending westward, touching Glen Rose, Stephenville, Lingleville, Gorman, Hico, Dublin, Cisco, Desdemona and other oil field towns. Several meetings have been held in various towns along the proposed route, and the preliminary work looking to the raising of a fund of $1,500,000 is already under way. In the Jan. 3 issue of the ELECTRIC RAILWAY JOURNAL a reference to this proposal was made and again in the June 19 issue reference was made to the election of a chairman of the Cleburne Interurban Association.

Power Houses, Shops and Buildings

Public Service Railway, Trenton, N. J.—Thomas N. McCarter, president of the Public Service Railway, Newark, N. J., has announced that the contract for the erection of a trolley terminal at the Federal Street ferry, Camden, N. J., has been signed. Mr. McCarter says there will be two trolley approaches from Delaware Avenue. The cars will discharge the passengers when entering the terminal, turn a loop and run to a loading platform. There will also be an extra spur track for car shortage to meet rush-hour needs. The new terminal will do away with the "bull pen" now used by the trolley company at that point.

Bryan & College Interurban Railway, Bryan, Tex.—The Bryan & College Interurban Railway will purchase current from the city of Bryan for the operation of its cars at 4 cents to 5 cents per kilowatt-hour, according to amount of current used.

Trade Notes

National Association of Railroad Tie Producers will hold its third annual meeting in San Francisco on Jan. 27 and 28, 1921.

The Flexible Steel Lacing Company, manufacturer of Flexco lamp guards, Flexco-Lok lamp guards, alligator steel belt lacing, etc., is now in its new factory at 4607-4631 Lexington Street, Chicago, Ill.

The American Wood Preservers' Association has set the dates of Jan. 25, 26 and 27, 1921, for its seventeenth annual meeting, to be held in San Francisco after convening with the engineers of southern California in Los Angeles on Jan. 24.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces that a special stockholders' meeting will be held at the East Pittsburgh office on Nov. 18, for the purpose of considering an increase in capital stock from $75,000,000 to $125,000,000 and increasing the company's indebtedness by $30,000,000.

Dwight P. Robinson & Company, with which is consolidated the former corporation, Westinghouse, Church, Kerr & Company, has announced the appointment of Cail C. Thomas as Western representative, with offices in the Electric Equipment Building, Los Angeles, Cal. Mr. Thomas was formerly professor of mechanical engineering at the Johns Hopkins University, Baltimore, Md.

J. H. Cain, formerly with the Shore Line Electric Railway, Norwich, Conn., has become connected with the Railway Audit & Inspection Company, Philadelphia, Pa. He will serve as the general representative for New York State and New England.

Greene, Tweed & Company announce arrangements to manufacture their line of automatic lubricators in their new plant at Newark, N. J. In the future all shipments will be made from there and all repairing will be done there instead of at 109 Duane Street, New York, as formerly.

National Association of Purchasing Agents, which will hold its annual convention at Chicago on Oct. 11, 12 and 13, announces that the program of its standardization conference, which will be held at the same place on Oct. 9, will include discussion of standardization of catalogs, invoices and shafting sizes and pricing on the decimal system.

The Roller-Smith Company, 233 Broadway, New York City, announces that its Philadelphia representative, the Perkins-LeNoir Company, has added to its sales force G. C. Unger. He will devote his attention to the various lines of electrical and control apparatus handled by the Perkins-LeNoir Company and will specialize in the Roller-Smith products.

Charles E. Patterson, comptroller of the General Electric Company, has been elected vice-president of the company. Mr. Patterson was previously associated with the New York Central Railroad and the American Locomotive Company. He aided in the development of the Interstate Commerce Commission's accounting system for railways, and was appointed chairman of the standing committee of the Electrical Manufacturers' Council which evolved the standard accounting cost system for the electrical manufacturing industry. In 1901 he became comptroller of the American Locomotive Company. In 1909 he joined the General Electric Company for the purpose of introducing a modern accounting system. In 1913 he was elected comptroller of the company. Mr. Patterson was born in 1866. He will still retain the title of comptroller of the General Electric Company, acting as vice-president in charge of accounting.

New Advertising Literature

Instruments.—The General Electric Company, Schenectady, N. Y., has issued bulletin No. 46,017, to supersede bulletin No. 4,879, on direct-current instruments.

Ammeters and Voltmeters. — The Roller-Smith Company, 233 Broadway, New York City, has recently issue bulletin No. 430, covering its direct-current switchboard-type voltmeters and ammeters; also bulletin No. 450, describing its alternating-current switchboard-type voltmeters and ammeters.

Condulets.—The Crouse-Hinds Company, Syracuse, N. Y., has recently issued a new bulletin on condulets for steam and electric railroads, for car wiring, locomotive wiring, signal-tower battery charging, etc.

New York, Saturday, October 2, 1920

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Volume 56 *Number* 14

Mass Transportation Number

Transporting People in Large Numbers

THIS issue is devoted primarily to the discussion of a number of important city traffic problems. For this reason the name "Mass Transportation" has been selected. The topics treated are rapid transit lines, schedules, speeds, safety car, interurban, bus and commuter traffic on electrified steam railroads. The best way of hauling passengers in large numbers is one of the biggest problems in the transportation world today. We hope that this issue will help in its solution.

The Status of the Motor Bus

SO MUCH has been said and written about the motor bus as an auxiliary it is well to review the general situation. Undoubtedly the experience of the last few years has shown that the motor bus has a place in mass transportation and that its development has only been started. We believe also, however, it has been shown that the street railway companies are the proper agencies to develop the bus. The bus business is 90 per cent transportation, and logic and economics indicate that its development should be entrusted to competent transportation management.

If bus service is to be given in a city in which there is an electric railway system, it should be rendered by the electric railway because the latter already has a transportation organization that is acquainted with the needs of the community; because it can use the motor bus in its proper field and extend its use if developments warrant such extensions, and because thereby it can preserve its investment in street railways against pirate attacks by stock-jobbing motor bus companies.

At the present time motor buses cannot supplant the trolleys for the same length of haul, fare and operating conditions because the cost per passenger-mile is greater for the bus; because streets are not wide enough to accommodate the number of buses required for rush-hour traffic; because, inherently, large crowds cannot be handled with the same speed and comfort in small trackless vehicles, and finally because power is constantly becoming relatively cheaper for the railway due to the increasing cost of gasoline.

Motor buses have a certain field at the present time that should be recognized and developed. The motor bus makes transportation available in thin territory at a minimum capital cost. The motor bus can give a de luxe service on certain streets on which the trolleys cannot operate. The motor bus can give service on lines that operate only part of the year, such as lines to shore or summer resorts. The motor bus can be used on streets on which trolleys do not operate, to give added direct routes to passengers and to relieve surface traffic congestion. In every case the initial capital cost is lower but the operating cost will usually be higher than in the case of a trolley line, so that the rates of fare should be separate and distinct from that of the trolley line. We also question the advisability of free transfers as this would tend to maintain the old practice which companies had of extending lines without increasing fares.

The bus business is growing rapidly, but there remains room for great improvement in methods and vehicles. The motor bus is neither a street car nor an automobile and requires specialization in design and operation. Given the proper vehicle, the use of the bus then involves the fundamental problems of any system of transportation, and the street railway is the existing transportation authority to use the bus.

Strike Demonstrates Need for Rerouting

ONE of the interesting sidelights of the Brooklyn Rapid Transit strike was the discovery by the public of new routing possibilities. The improvised automotive passenger carriers and jitney buses sought out the short cuts immediately, being limited only by paving conditions. A large portion of the Brooklyn public also became acquainted with the just-opened extensions of the Interborough much more rapidly than if they had been solicited only by advertising, for people are astonishingly slow to try new though faster routes. However, the most striking change was that many people learned perforce that there was no sense in traveling along two sides of a triangle when they could reach their destination by the third side. Strange as it sounds, many learned for the first time that they were living directly opposite their work in the Thirties and Forties of Manhattan and that there was no reason why they should ride to downtown New York before going to uptown New York.

It is only fair to point out, however, that the public is not wholly to blame for failing to take the theoret-

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
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ically shortest route indicated on the map of the railway system. The trouble in almost all of our large cities is that they developed from competitive systems, some of which have too much and others too little trackage for the inevitable shiftings and growth of population. As each constituent company has its own franchises, most logical treatment of the system as a unit in the light of existing conditions is attended with great difficulties, both within and without the organization. The legal staff is always concerned about any changes that may impair franchise interests, the owners of the underlying companies tend to oppose anything that diminishes the physical and operating value of their particular property, while a distrustful administration, like Mr. Milton's Cerberus, may have well-toothed jaws agape for any action that looks like "putting something over on the peepul." To all this there is but one solution that will go to the root of the matter and not hack around the twigs. That solution is to determine, first, the most satisfactory and economical routing and then work toward that.

Take Advantage of the Speed Fiends

WHEN we read of Ralph de Palma going 400 miles at the rate of 80 miles per hour we inevitably compare this with some speed experienced by ourselves in an automobile or train and then there wells up in our minds an envious desire to emulate de Palma and experience his sensations as we conceive them.

The American, thank heavens, likes speed. Why not capitalize more on this? Speed is a panacea for many railway ills. Earnings depend on the car-miles, but expenses, on the other hand, depend on the car-hours. If each car-hour can produce more car-miles than now expenses are relatively reduced. High schedule speed possibilities are at the base of the street railway structure. To increase schedule speeds involves such factors as rerouting, better track and rolling stock maintenance, double berthing, improved loading methods, use of skip-stops, signals, traffic regulation at street intersections, etc. It is not idle to predict that the transportation agency that offers the highest speed service will predominate in the future, and we believe that the possibilities of higher schedule speeds are not fully realized in the street railway industry.

Inherently the street car is capable of a schedule speed comparable to that of a private automobile due to its quick acceleration and the ease with which it is controlled, and it ought to be possible for the street car to attain the same average speed in city traffic. It is up to the traffic experts to give the vehicle opportunity to realize its speed possibilities. There is no fundamental reason opposing the speed increase, and we venture to say the present rate of speed is due only to the fact that transportation, like Topsy, "just growed" without any determined or intelligent effort to shape its growth as a co-ordinated unit that involves city planning, pedestrians, automobiles, street cars and everything that makes for congestion of traffic on the surface of streets. We heard a railway manager say the other day, "With just a reasonable degree of effort and at but little expense we increased our schedule speed in the congested districts from 2 to 6 m.p.h." The point is, higher speed is possible. Furthermore, it is a practical means of meeting jitney competition. Finally, it pays.

Certain Criticisms of the Federal Report Considered

COMMENTS on the report of the Federal Electric Railways Commission in the daily press, on the whole, have been very favorable. There has been a general recognition of the existence of an electric railway problem and a disposition to believe that the unanimous decision reached by the commission after its long and painstaking inquiry must be justified by the facts. The report is recognized not as an answer to the electric railway problem, but as an analysis with recommendations, which will prove a valuable aid in the various local situations.

But there has been some criticism of the report in the public press, and, from this, some criticism of the railways which cannot be minimized simply by neglecting it. What criticism there has been is usually based on the argument that the railways are saying their 5-cent franchise contracts should not hold, now that 5 cents is not profitable, whereas they fought for the inviolability of the contract when the 5-cent fare was supposed to be a money maker. There is also the statement that the present plight of the railroads was largely brought about by themselves because of overcapitalization, neglect to provide for depreciation, payment of excessive dividends in the past and the commitment of other financial errors.

Those who take the first position and claim that a franchise, which was accepted perhaps under conditions of four or five decades ago, is an inviolable contract which the company must carry out to the letter, and presumably forever if it is a "perpetual" franchise, should bear in mind certain things. One of these is that the railways also at one time believed that there was such a contract or bargain relation between themselves and the communities which they served, but this idea was largely dispelled when the states generally appointed public service commissions to regulate utility service and establish fair and reasonable rates therefor. At first and naturally the companies were opposed to such a radical change in their status, but the commissions were established, and the railways thereby changed from enterprises largely private in their nature to real public utilities. The change was undoubtedly desirable from all points of view, and the power of the state, acting through a commission to increase fares, in spite of limits mentioned in the original franchises and against the protests of the municipalities concerned, has been generally upheld by the courts.

But let us assume for the sake of argument that there is a franchise contract not rendered inoperative as to fare provisions by the creation of a utilities commission or by some other turn of events. Let us assume also, as is the case at present in practically all cities where the fare has not been raised, that owing to the increased costs of operation the company can supply transportation only at a loss. The railway becomes in consequence an unprofitable enterprise without credit, possibly in the hands of a receiver and utterly unable, of course, to make extensions or other improvements which the community really needs. In these circumstances, the only logical policy to follow for any city which wishes to grow and prosper is one which will put the utility on a real business basis. Thus it is obviously in the interest of every community to replace any "contract" to supply electric railway service at an unremunerative rate, if such a contract exists, with one which will enable the city to get what it wants upon payment of a reasonable fare.

As for overcapitalization and payment in the past of excessive dividends, they hardly affect a settlement which is based not on capitalization but on the value of the property used and useful in the public service. Recognition of this fact ought to do away with any misunderstandings on the relation of capitalization to income.

In its working out, some holders of stock may find that they have paid more than their holdings are now or ever were worth, and some will have to suffer therefrom. The sooner that railway companies, who need to do so, can effect such financial reorganizations as are necessary to convince the public that they are not paying excessive returns on some old investments, the better for both railways and public. But the prime factors the public is interested in, service and rates, are not affected by the nominal capitalization.

Finally, there is no doubt that past neglect of the companies to provide for depreciation and obsolescence has undoubtedly been a costly error, but it, too, is one from which the present stockholders rather than the public will suffer in connection with any fare based on the present value of the property.

Henry Ford's Price Bomb

HENRY FORD'S mid-September announcement of a return to pre-war prices is of almost as great significance to the majority of electric railways as it is to the majority of automobile manufacturers. We can let the latter do their own worrying, but what does it mean to us? Obviously, that electric railways in all but a few large cities will have to run their undertakings on strictly business principles. The idea that the sky's the limit as regards fare increases must give way to the cruel fact that a great many people don't have to ride and that they and many of their friends and acquaintances can walk or else ride in their own vehicles. No matter how widely railway operators may differ as to the results of fare increases, it hardly needs to be argued that there is an economic limit. That limit is not far away when less than $500 will buy a touring car which is sickeningly cheap to run and maintain. Of what value are service-at-cost or sliding scale fares if the patron may take such easy recourse to something else?

But, of course, if we are willing to run the electric railway on business principles we will see in this reduction of automobile prices only another incentive to give the community what it must have in any case, *i.e.*, co-ordinated, rain or shine transportation. It may be a novelty to us to see the individual manufacturing his own transportation, as it were. It's no novelty to the great baking companies which have succeeded in proving to millions of housewives that it is preferable to be able to buy their bread and cake at any time in any quantity than to go to the trouble of home baking, even if Madame Housewife does make fancy pastry now and then. Have we no parallel arguments to offer as to the difference between using an automobile every day and using it only where the electric railway is unavailable or inconvenient? If we have not, then we deserve to be condemned for expecting prosperity to come of itself.

Making Short Walking Distances Seem Long

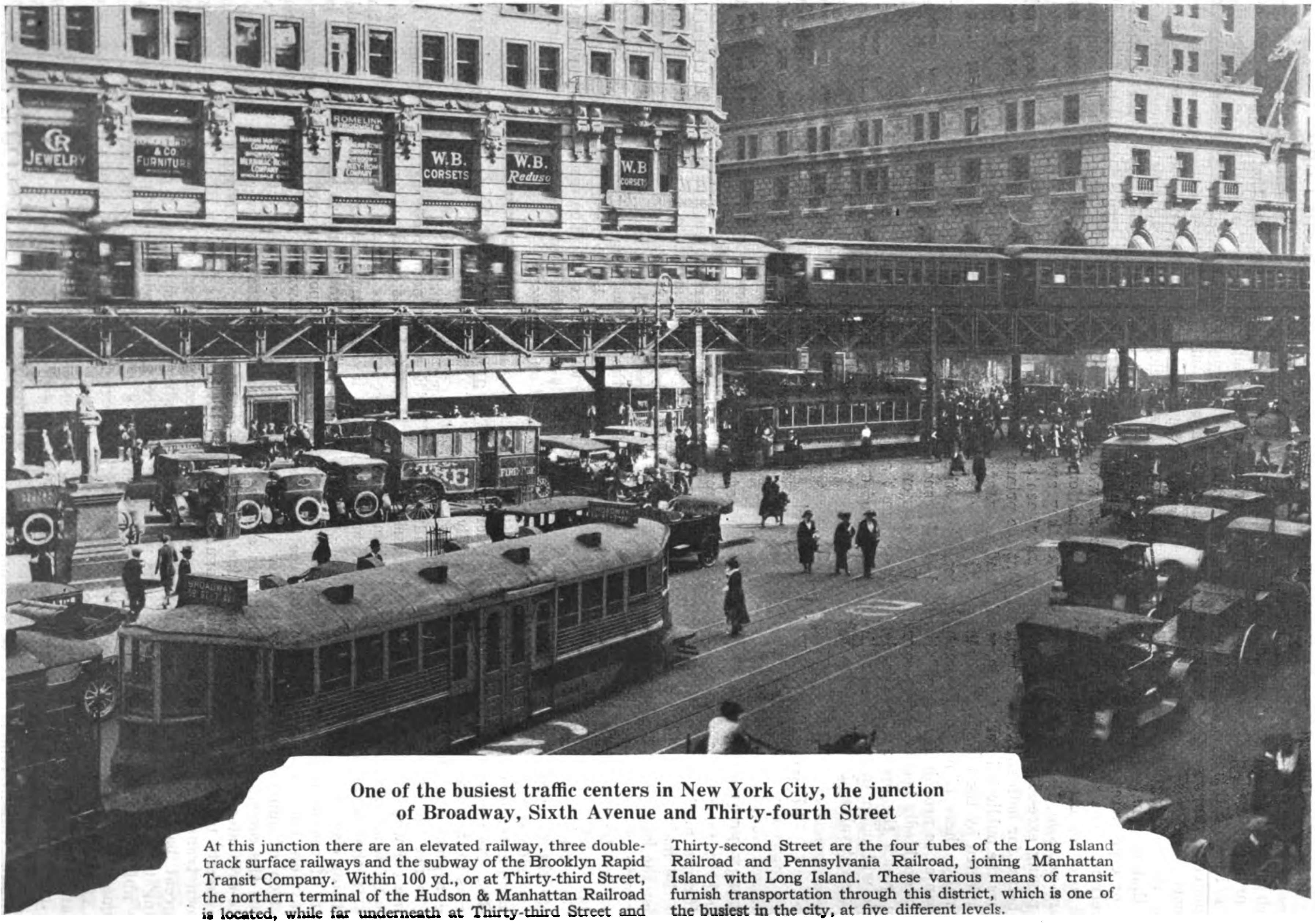
ONE of the most unfortunate results of the American unit-fare practice was that operators had no way of learning whether any noteworthy percentage of their public was riding easy walking lengths. However, as we have pointed out from time to time, higher schedule speed and frequency of service are also major factors in the development of short riding, although only a costly traffic survey would "legally" prove that statement on a unit-fare system. It seems fanciful to believe that a person traveling part of a mile would be influenced by a difference in schedule speed amounting only to the saving of 2 or 3 minutes, yet that is human nature, else why do thousands of people brave apoplexy or heart failure to catch one car when there is another right behind? The temptation to save time first and then dissipate it afterward appears simply irresistible. That frequency of service also builds up short riding will hardly be disputed, even by the most conservative, for the records of safety car operation on shorter headways can lead to no other conclusion.

Perhaps, if a philosopher or psychologist were asked to analyze the reasons that lead walkers to become riders, he might tell us that all distance is purely relative; that if a man were walking a mile against a procession of horse-drawn trucks he would not feel that he was going either a great distance or that he was moving much slower than the other traffic. Contrariwise, if a man is walking the same distance against a flight of fast cars or automobiles shooting by him at the rate of one a minute he will get the idea subconsciously that he is in the same class with the snail and the tortoise. What is more natural than that he should think the distance longer than it really is and that he should desire to board one of the vehicles whose speed is offending his ego? The capitalization of this principle is worth the careful consideration of every transportation purveyor.

Advantage to One Side Is Disadvantage to the Other

ONE strong point made by the proponents of the motor bus as an advantage which it possesses over the trolley car as a transportation agent is that there is no investment in property not easily removable, in case conditions should prove unfavorable. This is undoubtedly an important benefit for the operating company, as is shown by the ease with which certain municipal buses were taken off in New York City when the court ruled that they were operating illegally, and also when the city's Staten Island line was discontinued.

But how is this freedom of action so far as regards the community served? With an electric railway on the streets a community is pretty sure of continued service, as otherwise the company would have to abandon a large proportion of its investment. There is consequently much greater assurance to property owners that they may develop their property with the expectation of continued transportation service than if, owing to changed business conditions or other circumstances, the company could remove its entire investment in a day. These facts should be borne in mind by every city when considering the relative advantages of railway and bus service.



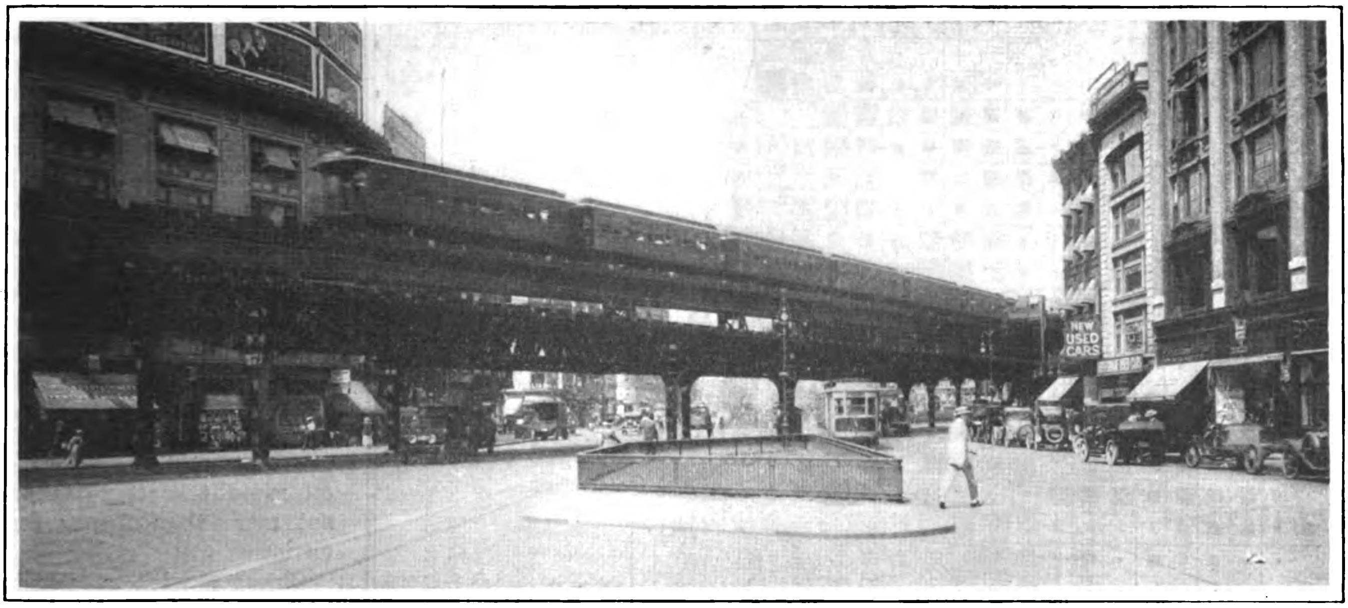
One of the busiest traffic centers in New York City, the junction of Broadway, Sixth Avenue and Thirty-fourth Street

At this junction there are an elevated railway, three double-track surface railways and the subway of the Brooklyn Rapid Transit Company. Within 100 yd., or at Thirty-third Street, the northern terminal of the Hudson & Manhattan Railroad is located, while far underneath at Thirty-third Street and Thirty-second Street are the four tubes of the Long Island Railroad and Pennsylvania Railroad, joining Manhattan Island with Long Island. These various means of transit furnish transportation through this district, which is one of the busiest in the city, at five different levels.

Capabilities of each transportation agency outlined. Effect of geographical distribution on transportation conditions. Trend in rapid transit development

Functions of Rapid Transit Lines in Cities

By Henry M. Brinckerhoff
of Parsons, Klapp, Brinckerhoff & Douglas, Consulting Engineers, New York



View on Broadway near Sixty-fifth Street, New York, where the Manhattan Elevated crosses the West Side division of the Interborough Subway

THE average visitor and most residents if asked how the people habitually travel about New York City will answer, "The vast majority on the subway and elevated lines, a smaller proportion on surface cars and a few on buses." This popular conception of the situation is largely due to constant newspaper discussion of subway congestion and the vivid impression made by long crowded trains following one another in quick succession at subway and elevated stations during rush hours.

Studying the statistics over a period of years, we find, on the contrary, that the surface car has borne the great burden of transporting the bulk of the citizens of our large American cities and that only in the past few years has even New York carried one-half of the total daily passengers on its rapid transit systems. This division of the growing New York travel during the past forty years is interesting, particularly as related to the population of the city. Other cities in the United States are now approximately the size that New York was thirty or forty years ago and, growing rapidly, they have ahead of them the probability of the same or similar traction problems.

In 1880 we find that 79 per cent of the passengers on the transportation lines of what we now call Greater New York were carried by surface cars, the population then served comprising about 2,000,000 people.

In 1900, twenty years later, the ratio was still 70 per cent surface car passengers to 30 per cent carried on rapid transit lines, while the population served had grown to about 3,500,000.

Almost another score of years brings us to 1919, when, after the expenditure during this latter period of more than $550,000,000 for subways, third tracking and extending elevated lines and additional rapid transit equipment, we find 43 per cent of the passengers still paying their nickels for rides on surface cars.

This condition is not peculiar to New York, as we shall see by a study of the history of transportation in other large cities.

In Chicago in 1906, with a population of about 2,000,000, 75 per cent of the revenue passengers were carried by the surface cars, and in 1919, with the population increased to about 2,800,000, 75 per cent of the people are still patrons of surface car lines.

In Philadelphia the Market Street elevated-subway line, with its free transfers between rapid transit trains and surface cars, makes a good showing in passengers carried per car-mile, but as part of the entire city lines it carries not more than 10 per cent of the passengers served by the whole system.

In Boston the surface-subway-elevated lines are so interconnected and the movement of passengers is so complicated by transfer privileges that a division is difficult. However, the proportion of the passengers actually handled here by surface cars is still large.

Turning to England, where the conditions of city development have been quite different, we see in London

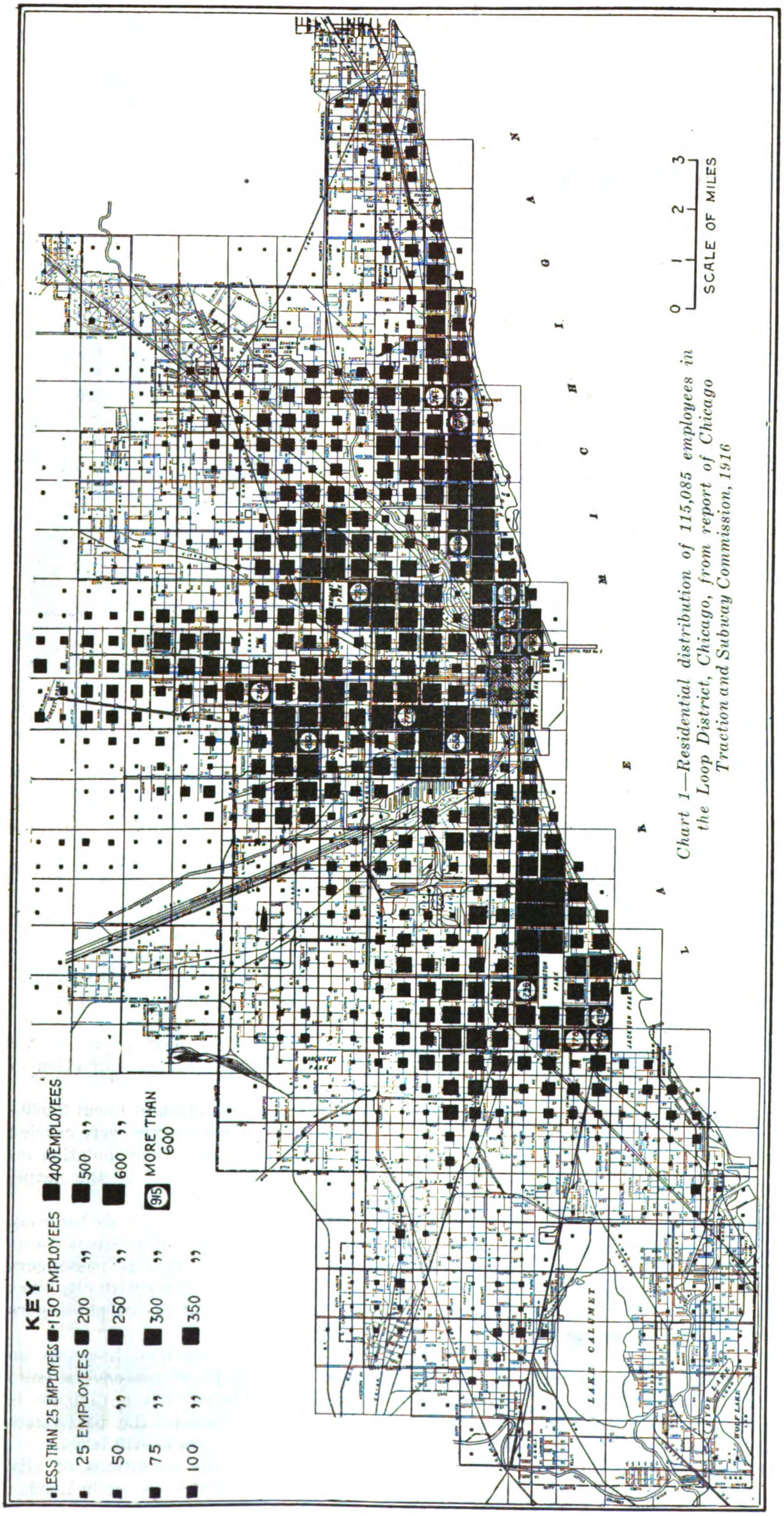


Chart 1—Residential distribution of 115,085 employees in the Loop District, Chicago, from report of Chicago Traction and Subway Commission, 1916

an even wider variety in the division of the passengers among the different classes of carriers, but still the rapid transit not in the majority. Here the motor bus (successor to the time-honored horsedrawn vehicle) assumes imposing proportions. The ratios of passengers carried may be taken as about 27 per cent on tram or surface cars, 33 per cent on motor buses and 40 per cent on rapid transit trains.

Greater London, with an area of almost 700 square miles and a population of about 7,250,000, carries one-third of its traveling public about the city in motor buses operated in crowded, heavily trafficked streets.

Greater New York at the other extreme, with a population of almost 6,000,000, distributed over about 327 square miles, or one-half London's area, carries 55 per cent of its city riders on rapid transit lines and not more than 2 per cent on buses.

Chicago, with a population of almost 3,000,000 and an area of about 200 square miles, carries 75 per cent of its travelers by surface cars, while Detroit and Cleveland, now at the 1,000,000 mark in population, are entirely dependent upon surface car transportation.

With such contradictory general facts before us we must apparently go to a more detailed analysis of conditions to draw any valuable lesson from past experience in the large cities of the world. In doing this the first question that presents itself is whether the study of existing systems will be of fundamental value in guiding us to a solution of modern transportation needs in a large city in accord with present-day thought.

Here appears to be the crux of the question. The existing transportation facilities in large cities are the result of private initiative; building for years along lines where greatest pecuniary profits were to be reaped. Only recently has this guiling motive been supplemented by effective public control, and this has often been directed to meet certain specific needs rather than a general solving of the whole problem.

We are today at a point where a broader view must be taken of city transportation planning in the interest of the traveling public's needs and convenience. The public must pay for the service directly or indirectly, but it must get what it pays for. The idea of the most profitable type of location of lines is therefore no longer absolutely controlling and we are face to face with the problem of supplying transportation to our large cities, as recognized a public necessity as water supply, paving and sewerage. The fact that an adequate circulatory system for a city's red-blooded working units is as necessary for civic growth and health as is a sound arterial system for the human body is becoming more generally recognized. In the solving of this problem city and company must co-operate to overcome the physical, financial and legal obstacles that will be met.

The time has come when a hearing can be obtained for an analysis and discussion of the complex elements of transportation from the viewpoint of the needs of the city as a whole. The purpose of this article is to point out the uses of subway and elevated lines with such a broad view of the situation in mind, but in doing so references to other forms of city transit are necessary to maintain a balance and completeness in the picture.

The real need for extensive transportation facilities in a large growing American city arises principally from the desirability, or often the necessity, for the individual workers[1] to

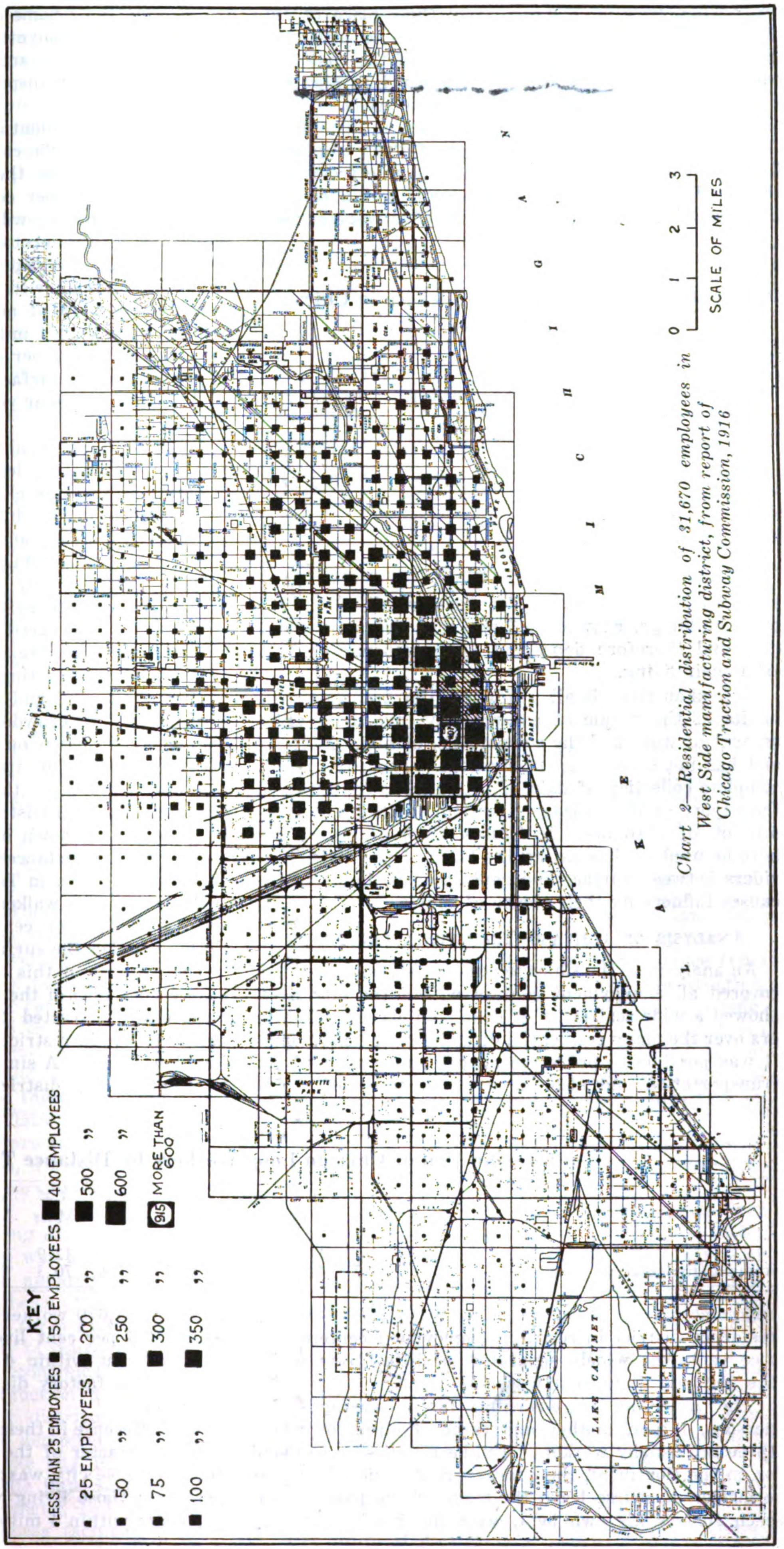


Chart 2—Residential distribution of 31,670 employees in West Side manufacturing district, from report of Chicago Traction and Subway Commission, 1916

live beyond walking distance from their place of employment. The hauling of these people to and from their work constitutes the great bulk of the rush-hour traffic, hence a careful study of their riding habits is a valuable index to their transportation needs.

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[1] The term workers is used in this article to denote any wage earner or person having regular employment or business and consequently regular habit of travel.

A canvass of the principal factories of the city of Cleveland showed that 52 per cent of their employees lived beyond the walking distance of 1 mile from their shops. Detroit showed 71.8 per cent, and a canvass in Chicago, locating the homes of 350,082 wage earners from all classes of shops, factories, retail stores and office buildings, showed 75.6 per cent living beyond 1 mile and therefore dependent upon transportation to earn their living.

TABLE I

Occupational Distribution of Workers in Chicago Loop District

Occupation	
In office buildings.....	32,113
Department and retail stores..............	32,755
Clothing manufacturers	10,045
Banks and general offices.............	26,622
Printers and engravers.	3,304
Miscellaneous.........	4,378
Wholesale dry goods. ..	5,868
Total..............	115,085

Tranportation Used		Per Cent
Elevated R.R....	64,847	56
Surface cars.....	43,344	38
Steam suburban.	3,921	3.4
Walkers........	2,973	2.6
Total.........	115,085	100

An exhaustive detail study of the transportation habits of the people of a large city involves a great amount of work and the co-operation of many interests and has not often been undertaken. The most recent complete collection of data of this kind is contained in the report of the Chicago Traction and Subway Commission of 1916 and the figures there developed will here be used as illustrating the basis of the division of riders between surface and rapid transit lines and the causes influencing their choice of routes.

ANALYSIS OF CHICAGO TRANSPORTATION NEEDS

An analysis of the Chicago residential canvass, which covered all employment centers within the city area, showed a wide scattering of nearly all classes of workers over the many residential districts of the city. Thus it was possible to prove the almost universal need for transportation and also the great diversity of routes and combinations of car lines used by people in a single residence district in reaching employment centers, and vice versa the widely separated localities from which the factories drew their workers.

TABLE II

Classification of Chicago Loop Workers by Distance Traveled

	Total	0–1 Miles %	1–2 Miles %	2–3 Miles %	3–4 Miles %	4–5 Miles %	5–6 Miles %	6–7 Miles %	7–8 Miles %	8–11 Miles %	11–14 Miles %	Over 14 Miles %
	115,085	3.7	11.0	11.4	15.6	15.7	12.9	10.5	7.6	6.2	1.7	3.7
Accumulative total, per cent........	......	3.7	14.7	26.1	41.7	57.4	70.3	80.8	88.4	94.6	96.3	100.

The American wage-earning family averages five persons, father, mother and three children, of whom three are usually workers. Unlike families in England or on the Continent, the children in America do not as a matter of course learn the trade of the parents, but each follows his own bent, with the result that they travel from their home center in many different directions seeking employment. It is the aggregation of many thousands of such families which creates the diversity in the transportation demands of our large cities.

The Chicago residential canvass when compared with a simultaneous traffic count on surface and rapid transit lines showed that the origin and destination of the daily trips of 50 per cent of the individuals composing the rush-hour crowds had been determined. As an indication of the probable proportion of these rush-hour travelers who require rapid transit, a charting by ¼-mile districts showed that 44.3 per cent made trips to and from work of more than 3 miles and 31.6 per cent of more than 4 miles. The rapid transit lines of the city carried 22 per cent of the total traffic against 78 per cent on the surface cars on the weekdays checked, while for the calendar year the ratio was 25 per cent to 75 per cent.

Adopting the generally accepted idea that more than 3 miles constitutes a legitimate rapid transit ride, the inference is that the elevated lines were inadequate or some other elements influenced the result beyond the mere question of distance. It was found that the principal element was "time," and its closely related factor "direct routing." By means of transfers from line to line the surface system offered routes particularly crosstown, which saved time over less direct although higher speed rapid transit lines.

To determine the time factor the Chicago Loop District was selected and 115,085 workers of all classes employed in this crowded city center were located as to residence, as shown on Chart 1, on which each black square indicates by its size the relative number of workers residing in that ¼-mile area who were employed in the Loop District. These for our purpose can be classified as shown in Table I.

Analyzed by distances from home to work, the division was as shown in Table II.

Deducting the walkers in the last tabulation, it is seen that 39.1 per cent rode 4 miles or less, which closely matches the surface car percentage shown above.

The analysis of this office and retail district canvass gave a good idea of the division of riding of the classes most easily attracted to rapid transit by reasons of ability to live in restricted residence districts and working short hours. A similar analysis of the immediately adjacent factory district west of the river (Chart 2), including 31,670 workers, showed 16.7 per cent walkers, while 53.6 per cent lived within the 3-mile limit and 69.8 per cent within 4 miles of their shops, 83.3 per cent in this factory district being dependent on transportation.

The difference in these two sections lay almost entirely in the character of the people employed. The average for the whole city was: Walkers (under 1 mile), 24.4 per cent; those living within 3 miles from work, 55.7 per cent; within 4 miles, 68.4 per cent; the per cent of workers daily using transportation being 75.6 per cent. When rapid transit routes are laid out, therefore, the character of the population to be served is an important element to be considered.

A special inquiry into time-saving covering 6,000 of the above workers in the Loop District (Chart 1) supplied the data for the curve shown on Chart 3. The individuals inquired of for this purpose were selected because they were as conveniently located for reaching either surface or rapid transit lines. They were also distributed over a wide area and at varying distances up to 16 miles from the Loop. This chart therefore gives a good idea of how people of this class divide on the question of time saving in a city like Chicago, other conditions being substantially equal.

TRANSFER FACILITIES

When the original Interborough Subway was laid out many loud criticisms were made of the local and express transfer stations, voicing the idea that on short trips people would not trouble to change cars. Today exchanging from local to express trains and back again for a saving of even a couple of minutes is so common as to have become almost a vice of the New Yorker.

On one surface car line in Detroit a traffic count showed that 85 per cent of the passengers either transferred to or from other lines, only 15 per cent of those carried starting and ending their journey on the line itself. At the City Hall in Detroit the Woodward Avenue line received or delivered 57,817 transfer passengers daily who utilized ninety-two different combinations of routes at this point. A similar condition exists at the Public Square in Cleveland, where 79,451 transfers were observed in twenty-four hours, more than 100 different combinations of lines being used.

The Chicago investigation showed clearly that the transfer privilege at more than 545 intersections of surface lines was a great factor in determining the routing of passengers; from 10,000 to even 25,000 transfers occurred daily at single intersections. Many groups of large numbers each were found who took the first leg of their journey on a nearby surface line and transferred to another surface car, running parallel to a rapid transit line, for a 4, 5 or 6-mile ride.

Careful study of complete twenty-four-hour checks of passengers on the surface and elevated lines of Chicago clearly demonstrated that these two large competitive systems serving a population of more than 2,500,000 distributed over 200 square miles of territory, due to their lack of co-ordination, did not function in such a way as to give the best service of which they were capable.

When the problem of enlarging the Chicago city transportation system as a whole was attacked by the commission it became still more apparent that additions to the existing systems on a basis of unified operation not only gave more capacity for a given expenditure but provided a greater variety of convenient routes to riders and would also be more economical to operate.

Transportation is a necessary function of a city's life as a whole. It is not confined to districts, classes of people or occupations. It is as democratic and cosmopolitan as the population of the city itself. Such being true, a division into separate lines serving only portions of the city is purely artificial, and the result of a system of development of these facilities by individuals largely influenced by hope of profit and with capital limited by the assurance of a return on their investment has been piecemeal construction.

When taken up from the viewpoint of the interests of the entire city's traveling population the proper arrangement to accomplish a complete solution is a single unified system the elements of which will each give the maximum of service at the least cost, both capital and operating. It is not within the scope of this article to discuss the many legal, financial and other obstacles to accomplish a general unification of all transit facilities. However, the function of subway and elevated lines is so dependent upon their relation to the other modes of transporting city passengers that whether they should properly be considered as competitive independent systems or should function as part of a harmonious whole seems to warrant the foregoing discussions.

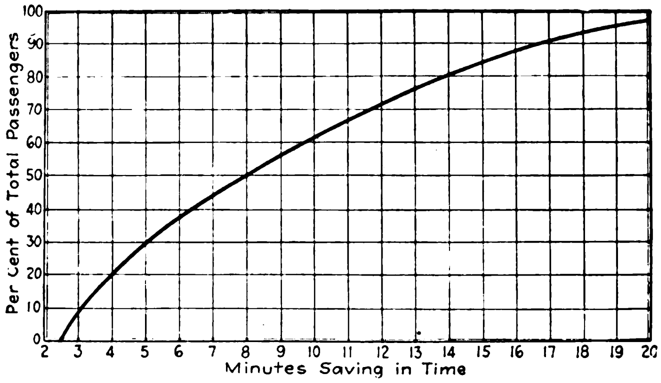


Chart 3—Percentage of total passengers using rapid transit for various savings in time when both surface and rapid transit lines are available

(From report of Chicago Traction and Subway Commission)

MOTOR BUS, SURFACE, ELEVATED AND SUBWAY LINES

In order to consider the relative value of these four kinds of service in a complete unified city system it is simpler to compare ratios of cost or performance freed from local conditions. Present cost of construction, operating expenses, etc., are so abnormal and are changing so frequently even on the same system that direct comparisons are misleading without a multitude of explanations. For our purpose the following general statistics are typical of good American practice on average large city systems:

Maximum Passenger-Carrying Capacity per hour.—One way, one track: Bus, 1; surface, 1.7; elevated, 6; subway, 7.

This means that large two-car units on surface lines will carry a little less than twice the bus line under similar street conditions. The elevated with eight-car trains will supply six times and a subway with ten-car trains seven times the bus line passenger capacity. This is on the basis of allowing for standees, large cars and maximum peak load conditions.

Speed in Miles per Hour.—Average city conditions (Fifth Avenue Coach Company, 8½ miles per hour): Bus, 1; surface, 1; elevated, 2; subway, 2. The surface cars and buses are about equal in average speed and the elevated and subway twice as fast.

From these two items it is plain that where large crowds are to be handled and the haul is long the subway and elevated are immensely superior, having seven times the capacity of a bus line and twice the speed. As the presence of large passenger crowds means usually street congestion, these types have the additional advantage therefore of not occupying street space.

Cost of Operation per Car-Mile.—(Fixed charges excluded.) Subway, 1; elevated, 1.2; surface, 1.8; bus, 2. Here the economy of train operation with infrequent stops and on an easily maintained unobstructed right of way places the subway at the top of the list.

Operating Cost per Passenger Carried, 1919 figures. —(Fixed charges excluded.) Subway, 1; elevated, 1.2; surface, 1.4; bus, 2.6. This proportion is taken from averages of the actual 1919 figures of American systems so far as they can be brought into direct comparison. In these figures there is of course reflected the length of haul, in which regard the rapid transit lines have the worst of the bargain as they carry their passengers probably twice as far as the surface and three or four times as far as the bus lines.

Capital per Mile of Line.—Bus, 1; surface, 2; elevated, 12; subway, 36. Here the bus line makes the best showing, with the surface line at double the cost and the subway three times that of the elevated.

The completion of the third track on the Ninth Avenue line added greatly to the carrying capacity.

SUBWAY, ELEVATED AND SURFACE LINES COMPARED

On the face of these figures the subway costs thirty-six times as much as the bus lines and has only seven times the passenger capacity. If, however, the two are compared by requiring the buses to move the subway load, seven lines of buses would be required and a total street width of 230 ft., or four times the width of Fifth Avenue at Forty-second Street. If this widening were charged against the bus system the cost would be fabulous. Similarly, if a subway were built to carry a load of 7,000 passengers per hour, one train every ten minutes would carry them and the fare would have to be ridiculously high to cover the enormous fixed charges. The fact is that such direct comparisons are futile and go to prove that each of these systems has a limited field of its own. Each type should be used for the service to which it is peculiarly adapted and if properly incorporated as part of a single system will reach its maximum effectiveness and efficiency.

In view of these comparisons, it is quite apparent that subways should be confined to the main arteries of the city system and so far as possible to the densely trafficked districts. As the elevated form of structure supplies the same passenger capacity and speed as the subway the logical plan in the interests of economy is to come to the surface with the subway and extend the service by elevated wherever the building and property damage is not too great. Much talk was indulged in a few years ago advocating the taking down of the elevated railroads in New York, but today with the express service on the third tracks no one could conceive of abolishing this system and replacing it with subways at three times the cost.

When people speak of subways they visualize the New York ten-car train system in rush hours and when they mention elevated lines they think of the old Ninth Avenue, New York, or the Chicago Union Loop lines with their unsightly appearance and noise.

It is a pity that this latter conception cannot be supplemented with more up-to-date possibilities. In a city like New York, with its multiplicity of traction companies, its narrow and infrequent north and south streets and its unprecedented volume of rush-hour traffic, four-track subways paralleling one another may be justified, but in other cities whose rapid transit history is still to be written quite another procedure is not only possible but necessary.

Subways as such have no inherent virtue. They are, as we have seen, three times as costly to build as elevated lines and eighteen times as costly as surface lines. Why then should we not take the surface line, which usually exists and which the subway will parallel, and leaving it on the surface of the street as a local service transfer vertically to the subway express service below.

CONSOLIDATION OF VARIOUS SYSTEMS DESIRABLE

By utilizing the surface lines as local and feeder lines and transferring long-haul passengers down to subway or up to elevated express trains a vast saving can be shown over the building of a competing rapid transit system. This latter, if competitive, must draw its patrons from the limited territory immediately adjacent to its own lines. This lack of transfer surface feeders is one of the causes of the beehive type of apartment housing in New York.

In a radial city like Chicago or Detroit the building of rapid transit lines to all outlying sections is financially impossible. The intermediate areas between trunk lines will be well served by surface lines with transfers to these rapid transit lines.

Such a single system, it can be shown, will give greater facilities than two competing systems and at a far lower cost per capita.

The consolidation of city systems has been frowned upon by some people because it creates a monopoly, but with proper public control this is just the very element necessary for success in giving all classes of people the vast multiplicity of services called for by the activities of a big city.

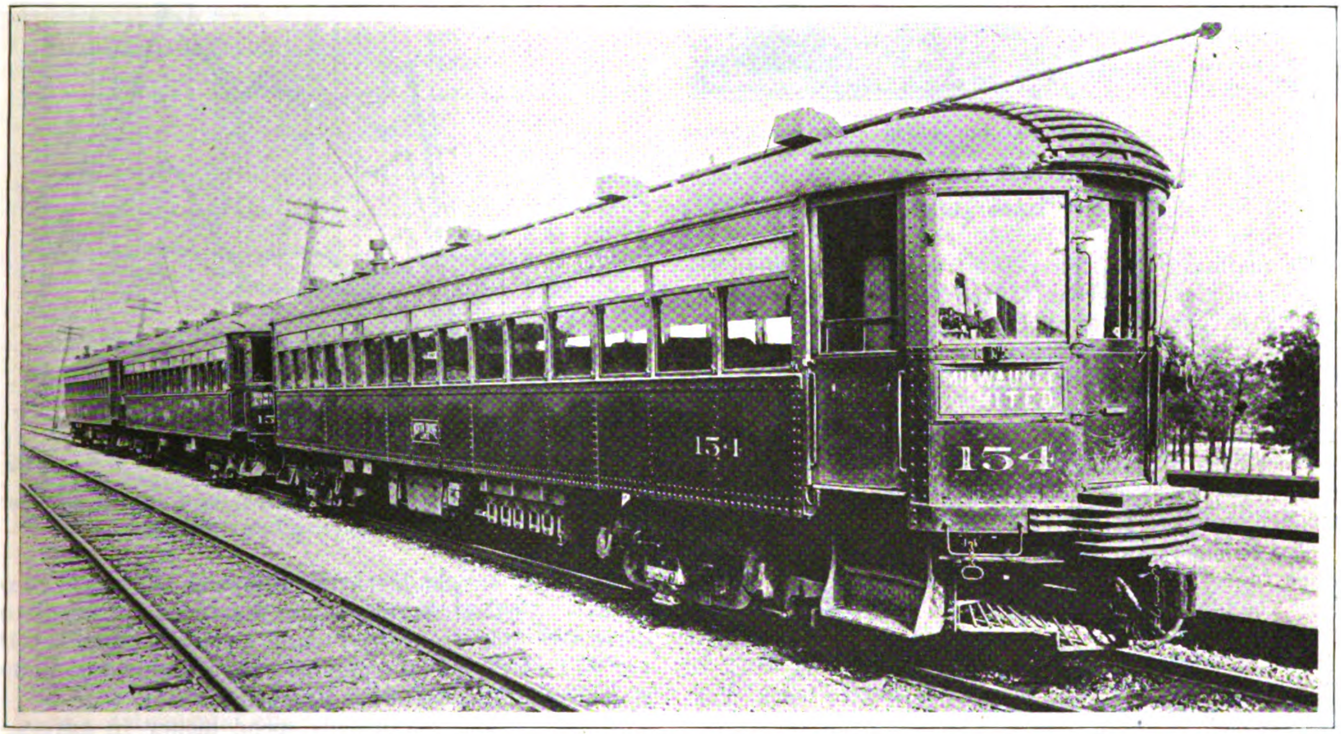
The dismemberment of some of the consolidated New York Traction groups is an object lesson pointing the way in the opposite direction. Subways and elevated lines are necessary parts of the traction system of a great city, but they should have combined with them surface and bus lines as feeders, all functioning as part of a single system.

The operating policies that attract patrons are discussed. Better freight service at higher than steam road rates makes wonderful opportunity

The Possibilities of Interurban Railroads

By Britton I. Budd

President Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.



The North Shore all-steel car limited trains have won many new patrons

THE success of an interurban railroad is measured by the quality of the service it is in a position to give the public. To meet the competition of the steam railroad the interurban line must have many of the characteristics of the steam road and adopt many of its practices and methods. Men in charge of operation of interurban railroads must get away from the idea that they are operating a street car line. That idea has too long retarded their growth and development in many localities.

The traveling public in this generation demands speed. The cost of transportation to most people is a secondary consideration. They are willing to pay a reasonable price if they are given the service they demand. On the other hand if they are not given the service they will not patronize a road no matter how low its rates may be.

In order to give the service demanded the interurban railroad entering cities of considerable size must have suitable trackage rights and adequate terminal facilities. Most of the interurban railroads in the country today lack such facilities, and that is the greatest handicap in the way of their development. It is one of the problems which must be solved if the interurban railroad is to develop and increase its usefulness to the public.

This serious handicap of the interurban railroad is generally due to bad engineering in the early days of the electric line. In making that statement I mean no criticism of the early engineers. The bad engineering to which I refer is more often the result of the early engineers having been compelled to follow the line of least resistance and select the most inexpensive route than it is to their lack of foresight or poor judgment. But the fact remains that the trackage facilities of interurban railroads in most cities necessitate low rates of speed and thus throttle the possibilities for expansion.

The operating and engineering methods and practices of street railway companies are not applicable to an up-to-date interurban railroad. The operating methods of a well-conducted steam railroad are greatly superior to those of the average electric railroad. The latter have been developed from the experience gained in street railway operation and still partake of some of the characteristics of the horse-car days.

The character of the service demanded by the interurban railroad is very similar to that of the steam railroad and the same methods of operation must be adopted if the support and approval of the public are to be attained. On entering a city an interurban railroad should not give a local service. The route of least obstruction, where the highest speed can be maintained,

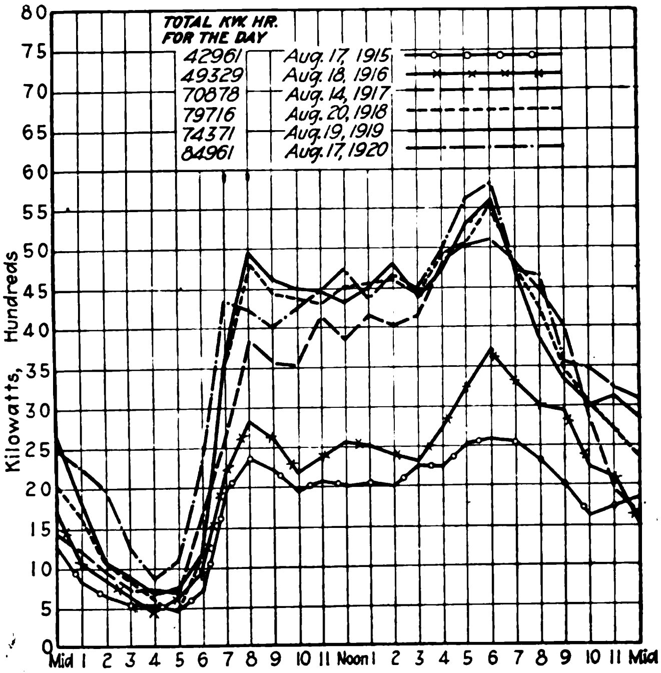
One of the automatic substations which have contributed vitally to the character of service

should be selected and stops should be reduced to a minimum.

To maintain the high rate of speed essential to the success of the interurban railroad today great attention should be given to tracks and roadbed. Short radius cross-overs, turn-outs, wyes and sidings should be avoided. They consume time, rack the equipment and make the passenger uncomfortable. The automobile has produced a change in the mind of the public with respect both to speed and comfort, and the electric railway must, as nearly as possible, measure up to the modern standard of comfort and speed.

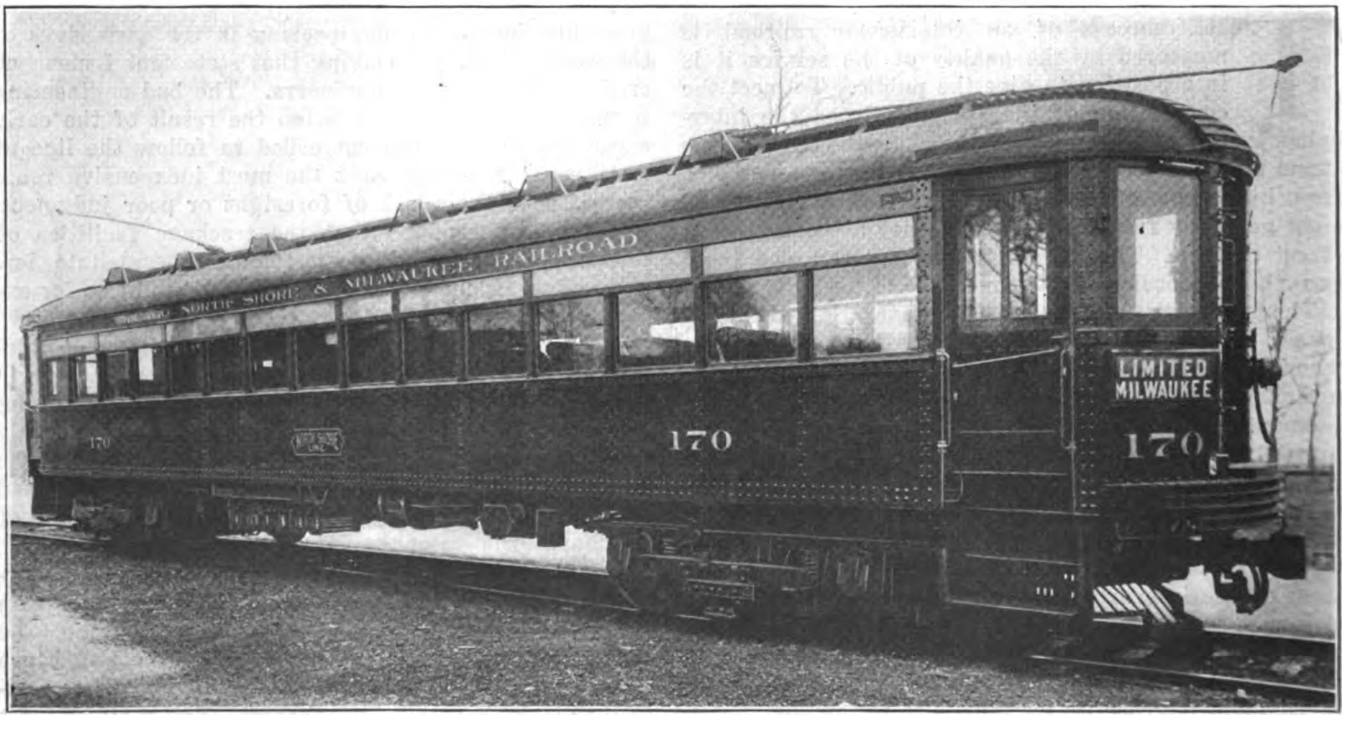
The roadbed of an interurban railroad is of the utmost importance where high speed is required. It is the very foundation of the business. The roadbed should never be neglected. In building many of the electric lines not enough attention was given to the work of tiling and ditching. The result is defective track, making high speed impossible and contributing to the loss of patronage that necessarily follows.

The public is more sensitive to track conditions than most operating officials realize. If the roadbed is not well maintained by constant tie and rail renewals, good ballasting and thorough drainage, its condition soon becomes a matter of comment and discussion among patrons. If the public forms an opinion that the track is not what it should be the company will find it extremely difficult to overcome that prejudice. It is extremely important that such an impression should not be formed, and the only safeguard against it is the proper maintenance of the roadbed.

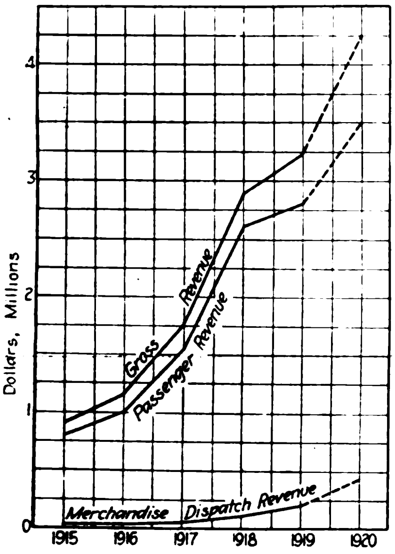


The load curves indicate the growth as well as the character of the business of the road

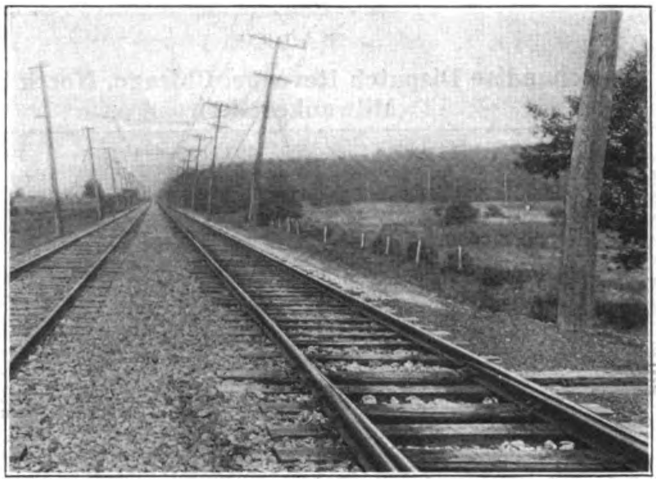
Most interurban railroads spend money in advertising. While I am not opposed to newspaper advertising



All-steel car designed to give the speed that has been an attractive feature of the North Shore service and publicity of all kinds, I am convinced that the best form of advertising is giving the public real service. Glowing advertisements may, and I think they do, help to draw business, but unless a company actually "delivers the goods" it will not hold the business which its advertising may bring. Pleased patrons talking among their friends of the good service given by an interurban railroad are worth a great deal more to a company than paid advertisements. The public cannot be fooled by alluring pamphlets. They demand service, and when they are given that their good will and patronage will follow. An interurban railroad operating any considerable distance should make an effort to fit its service to meet the transportation needs of the people of that particular section. In order to obtain the business of traveling men it may require provision for carrying baggage. It is not infrequent that considerable business is lost to interurban railroads due to lack of this accommodation. This is true of theatrical folk as well as traveling men. Dining car service is also a requirement of business men and traveling men, for it economizes their time. If dining car business is attempted it should be the effort to furnish exceptional service and satisfactory meals. If this is not done, instead of attracting patronage it will have a detrimental effect. Only experienced chefs and waiters should be employed and the strictest attention should be given to the sanitary condition of car kitchens.



The merchandise dispatch has increasing importance in rapidly growing revenues

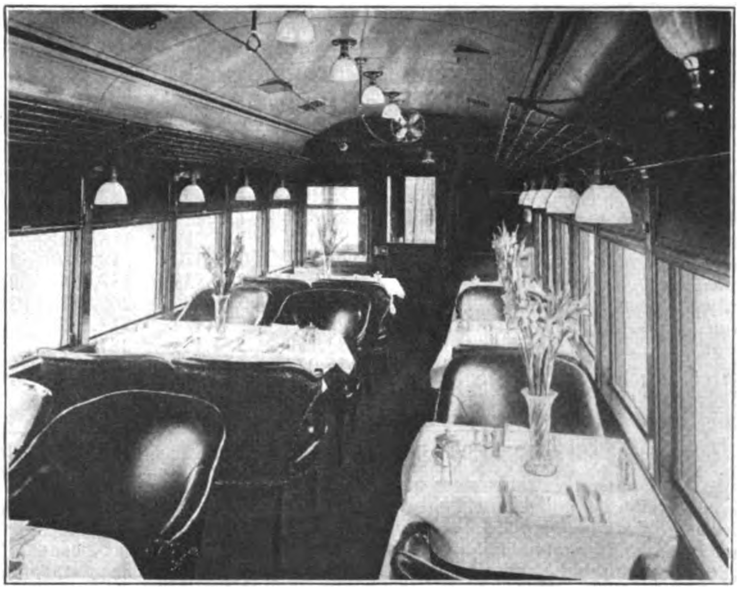


The kind of roadbed that makes possible the kind of service that sells

The electric railways of the country have suffered and still suffer from a great many circumstances over which they have no control. But they also have suffered from causes that are within their control. Certainly the industry has enough to meet in the way of real problems without having to meet needless criticism. No matter how poor a property may be, how inadequate its facilities or how much it may be hampered for lack of money, it still can be operated efficiently, at least as efficiently as the circumstances will permit, and give reliable service.

Transportation of merchandise can be conducted successfully on an interurban railroad at rates higher than freight rates on steam railroads, provided the service is better than that on the steam road. It is not necessary for the interurban road to have a pickup and delivery service in order to obtain higher rates from shippers if the quality of the service warrants the higher charges. There are so many objections to a railroad carrying on a pick-up and delivery business that it is not necessary to go into the subject in detail. In the handling of merchandise the interurban railroad must adopt the most up-to-date methods of soliciting, billing, notifying the shipper and adjusting claims

The cars have a comfortable seating arrangement and an inviting interior



An excellent dining car service has attracted many business men who might otherwise patronize steam lines

TABLE I

Merchandise Dispatch Revenue, Chicago, North Shore & Milwaukee Railroad

	1915	1916	1917	1918	1919	1920
Jan.	$521	$853	$315	$7,502	$9,303	$26,354
Feb.	495	1,159	244	13,028	6,504	32,547
March.	590	652	2,381	7,132	8,515	33,341
April.	390	1,186	2,220	8,259	12,340	40,179
May.	1,734	2,720	2,732	7,700	18,658	36,157
June.	1,949	2,986	3,298*	8,405	16,433	39,770
July.	1,906	3,684	4,255	9,520	17,008	39,329
Aug.	1,738	2,511	5,689	10,483	19,063	. . . . . .
Sept.	1,706	4,415	3,965	10,562	20,009	. . . . . .
Oct.	4,640	3,827	8,821	11,455	26,863	. . . . . .
Nov.	9,221	3,572	8,616	12,127	22,153	. . . . . .
Dec.	1,896	1,555	6,666	10,278	22,382	. . . . . .
	$26,786	$29,120	$49,202	$116,451	$199,231	$247,677

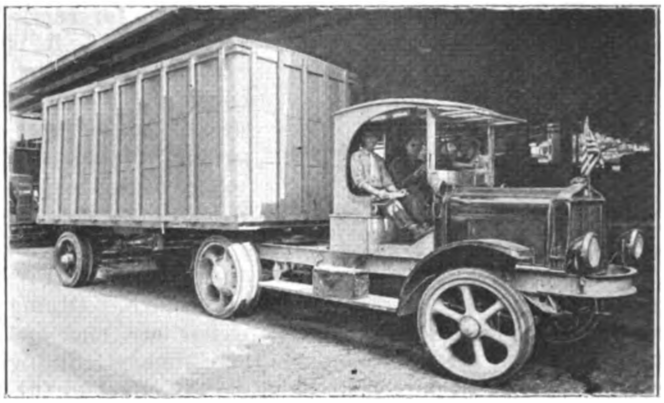
* Operation of merchandise shipments was begun in June, 1917, between Milwaukee and North Chicago. This service was extended to Evanston in December, 1918, and to Montrose Boulevard, Chicago, in November, 1919.

promptly. My experience is that the shipper does not object to paying a higher rate than is charged by a steam railroad, provided his goods are handled in a more expeditious way than the steam road can handle them, and there is no doubt in my mind that the interurban can do that if it is efficiently operated. No road can expect to charge higher rates and give a "Toonerville Trolley" service. It is such methods that have discredited the electric railways and made some of them a joke in the mind of the shipper. What has been said of passenger service applies with equal force to merchandise. The shipper demands service and he is willing to pay for it. The electric railway is reliable 365 days in the year and if it maintains a high standard of efficiency it will get business.

There are wonderful possibilities for the interurban railroads to develop a merchandise service. It is quite possible for them to interchange with other electric lines, even when there is no physical connection, although that necessarily means some delay and adds to the expense. Where physical connection can be made and a through service operated it is of great advantage to the companies as well as to the communities they serve. With the present shortage of steam railroad equipment, terminal facilities, etc., a great opportunity is offered the electric lines to demonstrate what they can do.

It is well known that the motor truck has its limitations. In a northern climate there are weeks and sometimes months when it cannot operate. Even under the most favorable circumstances for the motor truck, the electric railway can transport merchandise cheaper when it has to be carried any considerable distance. The motor truck is a good auxiliary to the electric railway and I see no objection to the electric railways maintaining trucks of their own to transport merchandise to receiving stations where the volume of business justifies it.

The problem of maintaining highways for motor trucks, with loads of from 1 ton to 25 tons, can be met in part by the electric railways, and the truck manufacturers and municipal, county and state highway officers are coming to a realization of this fact. Wherever possible, the electric railway should feature the slogan, "Use the Electric and Save the Highway."



Tractors with trailers have made possible a downtown station in the merchandise dispatch business

It is a mistake for the interurban railroad in large communities to centralize its merchandise business too much. Terminal property requires a large amount of capital and when the business is centralized it brings congestion in the trucking, a condition common on the steam roads where it is not unusual for a truck to waste three or four hours trying to make a delivery. The electric lines should be in a position to offer the shipper as an inducement the assurance that his truck or team can go to a convenient receiving station, unload and get away in a few minutes. That is one of the strongest talking points in getting business, and if centralization is going to destroy that feature I do not believe it would be wise. A better plan, I believe, is to locate at various points receiving stations, consisting of a platform, a driveway for trucks and a small office, where shipments may be accumulated and then transported by truck to a point to be loaded on cars. This is being done in Chicago and nearly 200 tons a

TABLE II

Passenger Revenue, Chicago, North Shore & Milwaukee Railroad

	1915	1916	1917	1918	1919	1920
Jan.	$52,296	$58,842	$81,654	$100,218	$206,022	$205,085
Feb.	48,391	58,000	72,106	111,892	182,325	216,218
March.	57,106	64,077	81,872	139,414	197,847	234,297
April.	64,296	74,041	93,016	136,919	186,381	242,764
May.	71,702	83,705	111,287	181,370	218,889	291,704
June.	66,936	88,655	139,858	248,535	237,044	276,542
July.	91,367	127,030	185,471	326,906	269,983	382,491
Aug.	88,947	111,552	193,786	352,474	314,102	. . . . . .
Sept.	76,858	107,630	183,139	284,325	281,549	. . . . . .
Oct.	70,293	91,229	137,073	245,649	244,329	. . . . . .
Nov.	63,259	85,585	135,815	251,342	241,746	. . . . . .
Dec.	59,701	83,247	127,308	222,484	229,768	. . . . . .
	$812,152	$1,033,593	$1,542,385	$1,601,528	$2,809,985	$1,849,101

In 1915 passenger rates were on a 5-cent zone basis, length of zone being approximately 2½ miles. In February, 1917, fares were changed to a basis of 2 cents a mile. In October, 1918, interstate and Wisconsin intrastate fares were increased to 2½ cents a mile, Illinois intrastate rates remained at 2 cents. Fares were increased to 2.7 cents a mile on interstate and Wisconsin intrastate business on Sept. 1, 1920.

day are accumulated at one of these stations.

The rehandling of shipments, of course, should be reduced to a minimum. As to how far a container method will solve this problem I am unprepared to express an opinion. If a majority of shippers shipped from 2 to 5 tons in a container, I can readily see how it could be handled with economy. This, however, is not the case in most instances, so that a container would be only partially filled, or, it would contain several shipments which would require rehandling.

The North Shore Line, operating between Chicago and Milwaukee, has developed in one and one-half years a fast merchandise express business which now exceeds 10,000 tons per month, with a gross revenue of $50,000 per month. The type of equipment used is shown in an accompanying engraving, together with pictures of one of a fleet of White tractors and trailers used in moving shipments from receiving stations to terminals.

The remarkable growth of the business of the Chicago, North Shore & Milwaukee, as shown in the accompanying tables, forms an interesting commentary on the results which have accrued from operation of the road on the policies as outlined in the foregoing. With the problem at hand that of building up the property, the service given on the North Shore Line has been maintained in the lead of traffic, the effort then having been made to bring the business up to the service. The manner in which the riding has followed the improvements in service has been truly a revelation, it being sometimes difficult to analyze the source of all the business. Since 1915 the number of passengers carried has doubled, the number of passenger car-miles operated has been increased nearly two and one-half times and the revenue from passenger service quadrupled.

TABLE III
Gross Revenue, Chicago, North Shore & Milwaukee Railroad

1915	$911,670
1916	1,157,191
1917	1,751,373
1918	2,899,975
1919	3,237,921
1920	4,250,000*

* Estimated on basis of eight months actual.

TABLE IV
Passenger Car-Miles Operated, Chicago, North Shore & Milwaukee Railroad

	1915	1916	1917	1918	1919	1920
Jan.	187,397	201,855	273,213	313,948	473,644	510,459
Feb.	166,861	189,395	236,565	325,515	429,620	474,978
March.	187,322	205,720	269,339	402,953	476,672	535,054
April.	208,352	218,681	306,000	421,763	448,004	532,131
May.	237,981	261,277	342,896	410,145	487,806	593,620
June.	241,881	264,598	339,216	460,191	492,408	566,002
July.	264,220	335,061	455,374	556,795	533,050	646,704
Aug.	265,944	321,984	466,857	542,451	572,857	......
Sept.	256,421	314,661	459,187	513,005	559,081	......
Oct.	245,483	295,963	443,162	494,366	563,121	......
Nov.	236,120	286,812	418,207	501,164	563,903	......
Dec.	225,162	282,665	400,182	499,824	514,045	......
	2,721,144	3,178,672	4,410,198	5,442,120	6,114,211	3,858,948

The gross revenue of the property at the present time includes about $600,000 a year miscellaneous revenue in addition to passenger and freight, and this gross revenue has grown in five years from less than $1,000,000 a year to $3,230,000 in 1919, and beginning with September of 1920 the gross revenue of the road is at the rate of $5,000,000 a year.

A very interesting thing about this statistical picture of the North Shore road is that, from a beginning of practically nothing in 1915, the total merchandise despatch business of the property has been developed until at the present time it is running about $50,000 per month and constantly growing. In fact, the amount of this business available seems at the present time to be limited only by the company's ability to handle it. While it is overshadowed by the passenger business at present, it should be noted that no particular effort along this line was begun until 1918. This class of business now, however, is showing a growth which promises to give it an increasingly important part in the total earnings statement. The great bulk of this business is made up of less than carload shipments of merchandise that come under the first, second and third class of commodities. The above table of figures on merchandise dispatch revenue includes the l.c.l. business only. No particular solicitation of the lower rate materials or carload shipments is made at the present time, for the entire resources of the property are kept more than busy on the higher rate merchandise l.c.l. shipments. The rates for these shipments on the North Shore road average 30 per cent higher than the similar rates on the competing steam lines. In view of this rate comparison, the fact that the electric line is offered more business than it can handle would seem to demonstrate that shippers are willing to pay a higher rate for a superior service. Plans are being formulated for securing more equipment and to increase the company's facilities so that it will be able to handle the growing volume of this profitable business.

TABLE V
Number of Passengers Carried, Chicago, North Shore & Milwaukee Railroad

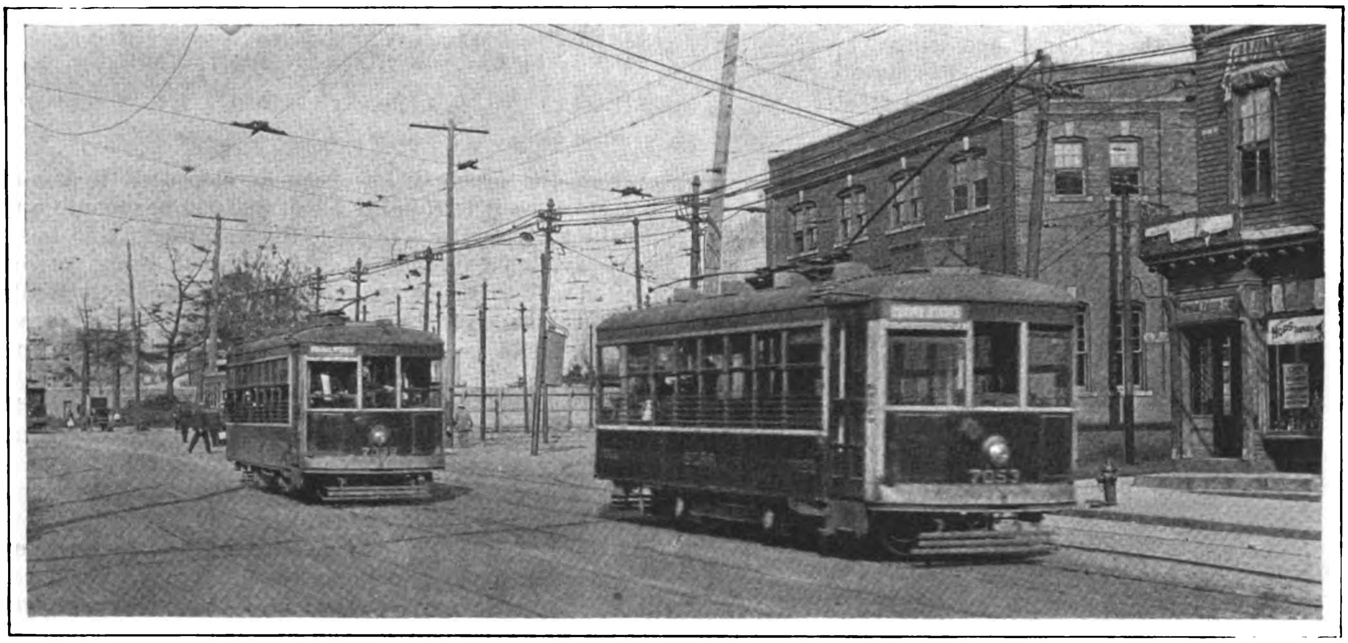
	1915	1916	1917	1918	1919	1920
Jan.	485,680	539,553	626,244	688,717	1,015,278	963,734
Feb.	455,053	515,874	555,664	721,648	887,197	993,768
March.	573,802	556,204	571,264	827,919	970,405	1,109,603
April.	548,475	580,250	643,825	783,517	942,078	1,066,838
May.	603,211	642,743	795,007	955,129	1,067,230	1,168,124
June.	571,151	641,649	918,133	1,129,696	1,092,289	1,101,538
July.	649,803	742,161	1,002,546	1,239,591	1,140,590	1,267,301
Aug.	642,593	701,463	1,044,615	1,305,555	1,146,834	....
Sept.	581,717	634,722	898,194	1,098,741	1,027,972	....
Oct.	604,694	653,901	816,230	920,109	1,048,824	....
Nov.	551,001	620,681	798,068	1,041,263	1,036,827	....
Dec.	545,338	630,468	767,178	978,938	1,050,910	....
	6,812,518	7,459,669	9,436,968	11,690,823	12,426,434	7,670,906

Safety cars reduce injuries to passengers, they provide safer, better paid and more interesting work for the employees, and they are popular with the public

Results of Safety Car Operation

By J. C. Thirlwall

Railway and Traction Engineering Department General Electric Company



The safety cars on this street in Brooklyn do a good business

THERE are in service today more than 3,000 safety cars, one-man operated; there are on order and in the course of construction about 900 more, and the writer believes this is only a good start. Their value to the industry is only beginning to be appreciated, and eventually, we believe, there can be and will be some 18,000 to 20,000 in service in this country and Canada.

As nearly as the benefits already accruing from existing installations can be approximated it may be said with a fair degree of certainty that the 3,000 cars now are increasing the net income of the roads which operate them more than $12,000,000 a year; that they have materially improved the public relations of the great majority of the roads using them, and they have provided more comfortable, more interesting and better paid work for more than 5,000 platform men. Against this splendid showing there are practically no offsetting disadvantages. Some few roads have criticised the maintenance, some have felt that changes in the doors or seating arrangement could be made to advantage, some think the ends of the cars must be strengthened against collision. But no general criticism of the design or equipment has been made, and the volume of repeat orders coming in from all sections of the country is the best testimony of the general satisfaction which the standard car has given.

The progress of the safety car idea has been remarkable. Starting late in the fall of 1916, or just four years ago, the Stone & Webster management placed twelve or fifteen cars in service at Fort Worth, Bellingham and Everett. Within six months it was convinced that it had discovered a big new principle of operation. A number of car and equipment engineers agreed and proceeded to advertise the idea. But by the end of 1917 there were less than 100 safety cars in operation, the installations were small and the whole matter was still in the experimental stage. However, it was during this year that the Stone & Webster operators standardized on a car which was slightly different from Mr. Birney's original design and which with only slight modifications in equipment and dimensions has since been accepted as a standard by the industry as a whole. By the end of 1918 there were between 500 and 600 of these cars in service, and their successful operation in cities of considerable size, such as Seattle, Portland, Houston, Dallas and Kansas City, had given an immense impetus to their general use. By the end of 1919 there were approximately 150 cities in which the safety cars were running and about 1,600 cars were in service.

Today the number of cars in service has nearly doubled, and the number of cities in which they are used is well over 200. When existing orders are completed, within a few months, approximately 250 cities will be using 4,000 of these cars.

The writer has had the good fortune to have been able to observe at first hand the development of safety car operation in the majority of the larger installations,

and his impressions of results are based on his personal observations and on conversations with an unusually large number of operating officials, public service commissioners and engineers, city officials and car riders. He has, as a result of such talks and experience, been absolutely convinced that the light-weight, one-man operated safety car is the best vehicle yet developed with which to meet the average and normal passenger transportation conditions in every city; that it can be operated more economically per passenger handled than any other type of car; that with it a better and more generally satisfactory service can be offered to the public for any given expenditure than with any other type; that it is extremely popular with the riding public, not only because of the improved service that has usually accompanied its use but because of its design and riding qualities, and that its general adoption and wider use hold out better prospects of financial rehabilitation to the average road than does any other physical change that can be made in the operation of the electric railways.

But to confirm these general impressions and to secure accurate and up-to-date data on results actually obtained, particularly in regard to the effect on net income resulting from the use of these cars, a questionnaire was addressed to some forty-odd companies, in every section of the United States, these companies being the ones which were known to have been operating safety cars for one year or longer, prior to June, 1920. Thirty-eight companies, owning more than 1.200 cars, answered, and the summary of their replies and the data submitted form the basis of this article. The thanks of the writer and of the ELECTRIC RAILWAY JOURNAL is extended to the companies named in Table I, which were kind enough to report the questions submitted.

A good indication of the feeling of the operators of the above properties is that at the time the above list was compiled nineteen of the companies had orders in for approximately 350 additional safety cars and at least five others were prevented from ordering more only by difficulties in financing the purchase.

As stated previously, all of these companies had been operating safety cars for periods of from one to three years, a long enough period to enable them to judge with reasonable certainty the capabilities and effectiveness of the car and the results of the service rendered and to ascertain the operating cost as compared with other types. Unfortunately, comparatively few companies have thought it necessary to segregate their cost accounts as between the safety cars and their other equipment.

COST OF SAFETY CAR OPERATION

However, nine companies, operating 307 cars, submitted complete figures segregated into the five chief operating accounts and comparing the cost per car-mile of the safety car and of their two-man cars, and four other companies, operating 227 cars, gave comparative figures on certain items, such as power and maintenance.

TABLE I

List of Thirty-eight Companies Which Have Operated Cars Prior to June, 1920

Name of Company Location	No. of Safety Cars Owned	Number Operated	
		Average	Maximum
Brooklyn Rapid Transit, Brooklyn, N. Y	206	168	192
Kansas City Railways, Kansas City, Mo	95	69	75
Third Avenue Railway, New York City	90*	64*	80*
The Connecticut Company, Bridgeport, New Haven, Hartford, Conn	76	65	67
Seattle Municipal Street Railway, Seattle, Wash	65	28	40
Tacoma Railway & Power Company, Tacoma, Wash	62	44	58
Trenton & Mercer County Traction Corporation, Trenton, N. J.	60	45	55
Terre Haute Traction & Light Company, Terre Haute, Ind	56	48	52
Northern Texas Traction Company, Fort Worth, Tex	50	30	50
Tampa Electric Company, Tampa, Fla	30	31	36
Colorado Springs & Interurban Railway, Colorado Springs, Col	35	11	29
Illinois Traction System, Quincy and Decatur, Illinois	34	31	34
Pennsylvania-Ohio Electric Company, Newcastle and Sharon, Pa	32	21	27
Houston Electric Company, Houston, Tex	31	27	31
Eastern Texas Electric Company, Beaumont, Tex	30	12	26
Birmingham Railway, Light & Power Company, Birmingham, Ala	25	11	20
Philadelphia Rapid Transit, Philadelphia, Pa	25	16	22
Portland Railway, Light & Power Company, Portland, Ore	25	20	25
Puget Sound Power & Light Company, Bellingham, Wash	24	16	20
Virginia Railway & Power Company, Petersburg, Va	22	17	22
El Paso Electric Railway, El Paso, Tex	20	18	20
Cumberland County Power & Light Company, Portland, Maine	15	12	14
Bangor Railway & Electric Company, Bangor, Maine	15	10	12
Saginaw-Bay City Railway Company, Saginaw, Mich	14	11	13
Texas Electric Railway, Waco, Tex	14	13	14
Dallas Railway, Dallas, Tex	12	8	11
Springfield Traction Company, Springfield, Mo	12	12	12
Austin Street Railway, Austin, Tex	10	9	10
Lincoln Traction Company, Lincoln, Neb	10	9	10
Louisville & Southern Indiana Traction Company, New Albany, Ind	10	10	10
Nashville Railway & Light Company, Nashville, Tenn	10	10	10
Chicago, South Bend & Northern Indiana Traction Company, South Bend, Ind	10	9	10
Columbus Railroad, Columbus, Ga	8	6	8
Hot Springs Street Railway, Hot Springs, Ark	7	7	7
Oklahoma Union Railway, Tulsa, Okla	6	5	5
	1,255	923	1,127

* The one-man cars of the Third Avenue Railway are not the standard Birney type of safety cars. They are, however, light-weight cars, with safety features, and are, therefore, included. All other cars listed above are of the standard type.

They all agree remarkably closely in the proportionate saving of the safety car as compared with their heavier two-man type, although the total costs of the various roads vary widely due to differences in wage scales, cost of power, schedule speeds, etc.

For instance, one road on the Pacific Coast reports the total cost of operation for its two-man cars as 44 cents per car-mile and for its safeties as 24 cents per car-mile, a reduction of 45 per cent. The records of a road in a smaller city of the Middle West show the same relative figures to be 20.2 cents and 11.5 cents respectively. This corresponds to a reduction in operating expenses of 43 per cent.

The averages of all the figures submitted are as given in Table II.

TABLE II

Operating Costs in Cents per Car-Mile

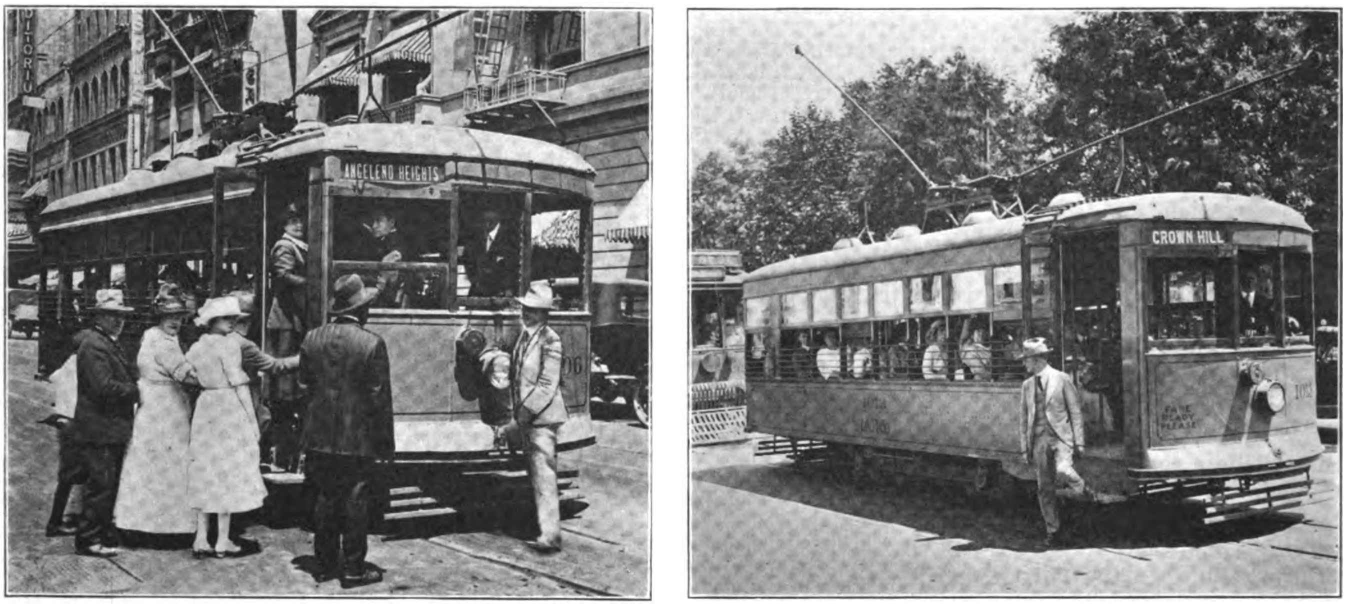
	Safety Cars	Two-Man Cars	Saving Per Cent
Maintenance of way and structures	1.6	3.3	52
Maintenance of equipment	1.7	3.6	53
Power	1.9	3.8	50
Transportation	8.4	13.9	40
General	2.4	3.2	25
Total operating cost	16.0	27.8	42.5

The percentage of reduction in the individual items and in the total cost per car-mile agrees closely with other data previously obtained by the writer. The variations between records of the various roads are slight, and the records are based on a sufficient number of cars, operating under widely varying conditions, to be representative. Undoubtedly, the averages, as shown in Table II, can be duplicated by any road and, for equal car mileage, any urban electric railway can secure a reduction of approximately 40 per cent in its operating cost or it can operate 80 per cent more mileage with safety cars than with heavy two-man equipment with no increase in operating expense. It therefore follows that increases in service, or mileage, amounting to 30 per cent, 40 per cent or 50 per cent can be made and still save materially in the operating accounts.

The great majority of installations have been upon the latter basis. Of the thirty-eight companies reporting, only ten made car-for-car replacement. They are in general the smaller cities and own only 124 cars, or less than 10 per cent of the total. Three companies owing 137 cars report 100 per cent increase in service, or two safety cars operated for every two-man car displaced. The remaining twenty-five companies, owning approximately 1,000 safety cars, all show increases in service ranging from 20 per cent to 80 per cent, and averaging 50 per cent.

The effect on riding or on the gross passenger receipts varies quite widely. Some companies report receipts advanced in full proportion to the increased mileage. One company with 100 per cent more service found only 20 per cent more riding. Others report increases, but say that other factors, such as change of fares, fluctuations in population, etc., make it impossible to tell what effect the improved service had on the volume of traffic. Nineteen companies give figures which, averaged, show that with a 52 per cent increase in miles operated they secured a 37 per cent increase in revenue passengers carried. This agrees fairly well with the data presented by H. G. Bradlee at the November, 1918, convention of the American Electric Railway Association.

The companies reporting used about 70 per cent of the cars they owned in all-day service, and in rush-hour service an additional 20 per cent. The average receipts per car-mile were 28.5 cents; the average speed 8.4 m.p.h. The average operating costs were 16 cents per car-mile for the safety cars and 27.8 cents for the two-man, heavier types. The average effect on net income, therefore, for the roads using the safety car on an improved service basis is shown by Table III, based on a 100-car installation.



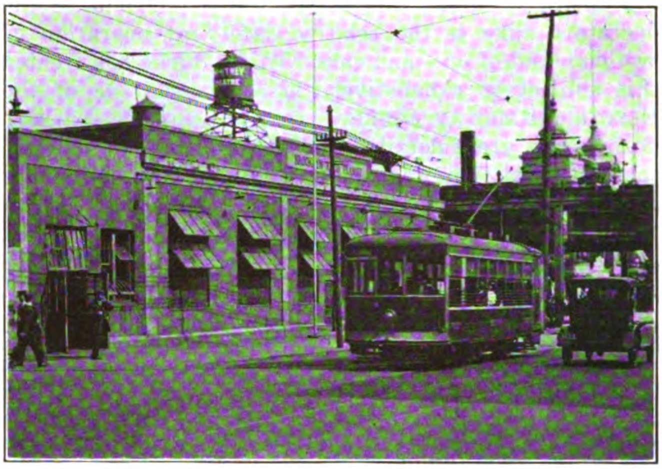
Although in operation only a short time in Los Angeles, safeties are as popular there as elsewhere

These figures represent almost exactly the average results reported by the companies which gave increased service. After replacing two old cars with three safety cars, and increasing mileage, which is the measure of service, 52 per cent, they still save one-eighth of their former operating cost and raise their gross passenger revenue 37 per cent. The net result is an increase in net income of more than $3,700 for each safety car purchased, or more than 50 per cent per annum on their present selling price.

SAVINGS FOR A CAR-TO-CAR REPLACEMENT

It is harder to calculate what the roads are saving that are able to make a car-for-car replacement. The properties which have kept records are all in fairly large cities, and all report an improved service. Of course, even in the larger cities there are some lines where traffic is so light that the safety car can be readily applied on existing headways and schedule speeds, and on such properties, using the relative costs of operation

Safety car at loading platform, Kansas City



They pass without trouble under elevated structures

of the foregoing tabulation, the results of car-for-car replacement would be as shown in Table IV.

In the smaller cities, where car-for-car replacement would be the normal rather than the exceptional procedure, wage costs are usually below that of the larger communities and, in most cases, single-truck cars of moderate weight are used. Under these circumstances, the savings in power, maintenance and platform costs are less, but if we may take the figures from Terre Haute as typical, where the average cost per car-mile for the safety cars is 11.5 cents and for the two-man cars, most of which were single truck, is 20.2 cents, the saving per car purchased on a car-for-car replacement basis, and making the same mileage as in the table above, would be slightly more than $3,200 per car annually. Of course, in the case of Terre Haute, this plan was not followed. A liberal increase in numbers of cars and in the schedule speed was made, and it is gratifying to note that the increased traffic which resulted has paid a far more liberal return on its investment in new equipment than could have been secured by straight replacement. The company's records show an increase in net income of more than $4,000 per car and good results in the improvement of public relations.

TABLE III

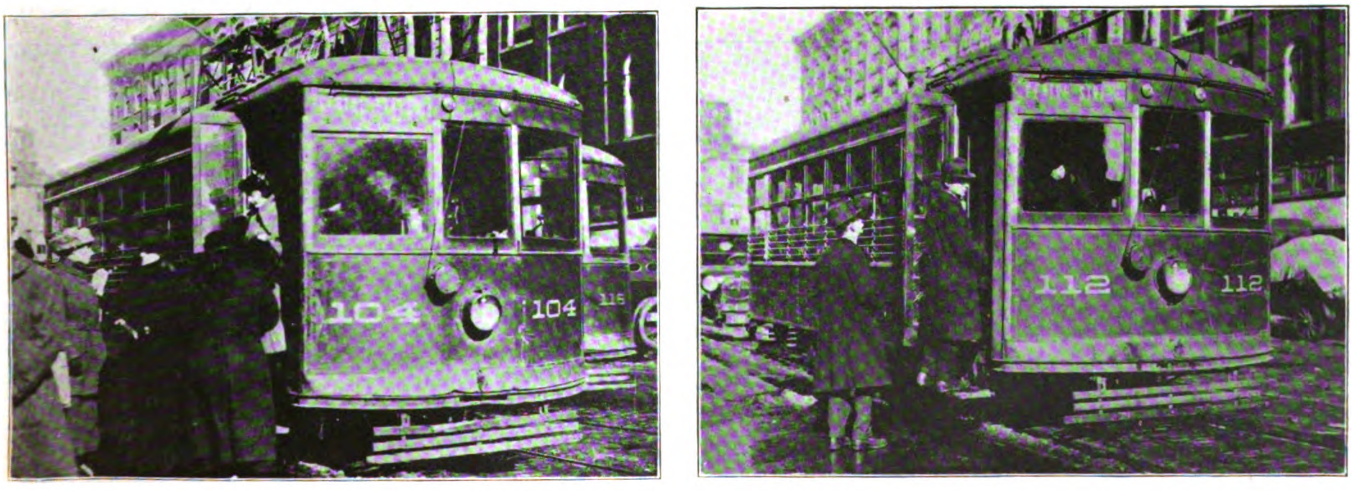
Comparative Costs and Receipts on 2 to 3 Basis

	Two-Man Cars	Safety Cars
Total cars required	67	100
Cars operated sixteen hours daily	46	70
Cars operated four hours, except Sundays	13	20
Car-miles per annum	2,393,000	3,644,000
Increase in service		52 per cent
Receipts per annum, at 31.7 cents per car-mile	$758,130	....
Receipts per annum, at 28.5 cents per car-mile		$1,038,540
Increase		37 per cent
Annual operating cost at 27.8 cents per car-mile	$665,254	....
Annual operating cost at 16.0 cents per car-mile		$583,040
Decrease		12.5 per cent
Operating ratio	87.5 per cent	56 per cent
Net income	$82,876	$455,500
Increased net income		$372,624
Increase per car purchased		$3,726

TABLE IV

Estimated Saving on Car-for-Car Replacement

	Two-Man Cars	Safety Cars
Total cars required	100	100
Cars operated sixteen hours daily	70	70
Cars operated four hours daily, except Sunday	20	20
Car-miles per annum	3,644,000	3,644,000
Annual cost of operation at 27.8 cents	$1,013,030	
Annual cost of operation at 16 cents		$583,040
Annual saving per car purchased		$4,300



Trenton, N. J., has sixty of these cars in daily operation

A point of great interest to the public and to the operators alike is the relative safety of operation of two-man and of one-man cars. W. H. Burke has treated this subject so exhaustively in a recent issue of the ELECTRIC RAILWAY JOURNAL that it is unnecessary to go into any great detail. He demonstrated conclusively that the safety car was well named, that it actually does have fewer accidents than the older cars handled by two men and that personal injuries both of the public and employees are reduced by its use. But some figures along a similar line, derived from the reports of a greater number of companies, may be of interest. The questionnaire sent out in the inquiry on which the present article is based called for the relative number of accidents involving personal injuries, both in terms of car-miles operated and of passengers carried. Fourteen companies operating 560 safety cars replied with definite figures. Only one showed any increase in such accidents, one reports no change and twelve report a material reduction. The average of the replies on this subject can be grouped as shown in the above table.

ACCIDENTS INVOLVING PERSONAL INJURY

Total accidents per 1,000 car-miles		Passengers Carried per Injury	
Safety Cars	Two-man Cars	Safety Cars	Two-man Cars
0.39	0.59	123,000	49,000

These figures are even more favorable than Mr. Burke's, his data being based on all accidents, whether involving personal injury or not. In addition to the fourteen roads which gave statistics on this subject, seventeen others expressed opinion, and only two of these claimed any increase in personal injuries. The balance report "personal injuries reduced." "step accidents less," etc., but a number say in effect "personal injuries less, but property damage more." In fact, after reading all the replies, the conviction is unescapable that collisions with other vehicles, especially automobiles, are more frequent with safety cars than with heavier types, and that the damage done to the safety car is greater. This condition may and probably will be minimized by changes in the platforms and brake rigging of the cars during the past year. The car builders have made a considerable improvement in these two details, largely as a result of complaints of collision damage.

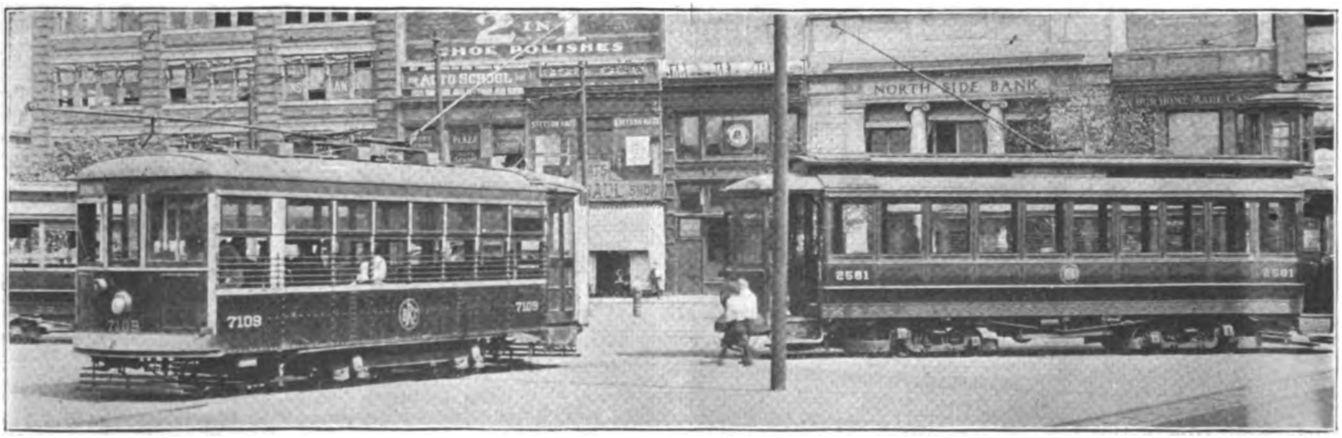
WHAT ARE THE LIMITING FEATURES

The replies to a question as to what are the factors limiting the use of one-man cars were nearly all alike in the trend of thought. There seems to be a general conclusion that there are no limiting conditions in cities up to 150,000 unless it be lines crossing a great number of steam road crossings, or a line carrying an unusually large factory load. For all cities, the almost universal answer was that the only limiting factor was track saturation or traffic density, and various operators differ in their ideas as to where this density forces the use of larger two-man cars. One or two believe that lines having normal headways of less than four minutes are unsuitable for the safety car. But a manager in one of the very biggest cities, who has had a wide experience in operating safety cars, says that, on lines with loops at both ends, he "sees no reason why they could not be operated on a thirty-second headway" and that on lines where the car operator has to change ends he is now operating on two-minute headways with satisfactory results. Perhaps a consensus of opinion would be that where, on two to three minute headways, the average maximum load on the safety car exceeds fifty passengers a larger car can be used to greater advantage.

CONCLUSIONS DERIVED FROM STUDY

To the writer all these facts make the conclusion inevitable that the safety car has been such a tremendous success that no urban electric railway in North America can afford to neglect its possibilities; that its use will be very rapidly extended until the bulk of the all-day runs, or basic schedules, in every city will be handled with these cars. Summarizing all of the foregoing data, which only confirm observations and predictions made by the writer for the last three years, we can confidently say that the safety car will, on the average, produce sufficiently more net income to pay for itself in less than two years; that its effect on the finances of a company becomes more pronounced as wages and fuel costs increase, and that no other change in the physical equipment of any road can possibly be made that will so favorably or so extensively affect the operating ratio of the entire property. To many railways its use to the maximum extent will spell all the difference between prosperity and bankruptcy. To many others it will give the ability to pay a liberal return to the stockholders and enhance the value of all their securities. For thousands of platform men it will provide safer, better paid and more interesting work. And to millions of city dwellers, it will offer a more comfortable, a more frequent and more satisfactory service.

And by all of these groups there will be voiced the sentiment, tersely expressed by a good friend of the writer's in Texas, one of the pioneers in the safety car movement, "It is good enough for us!"



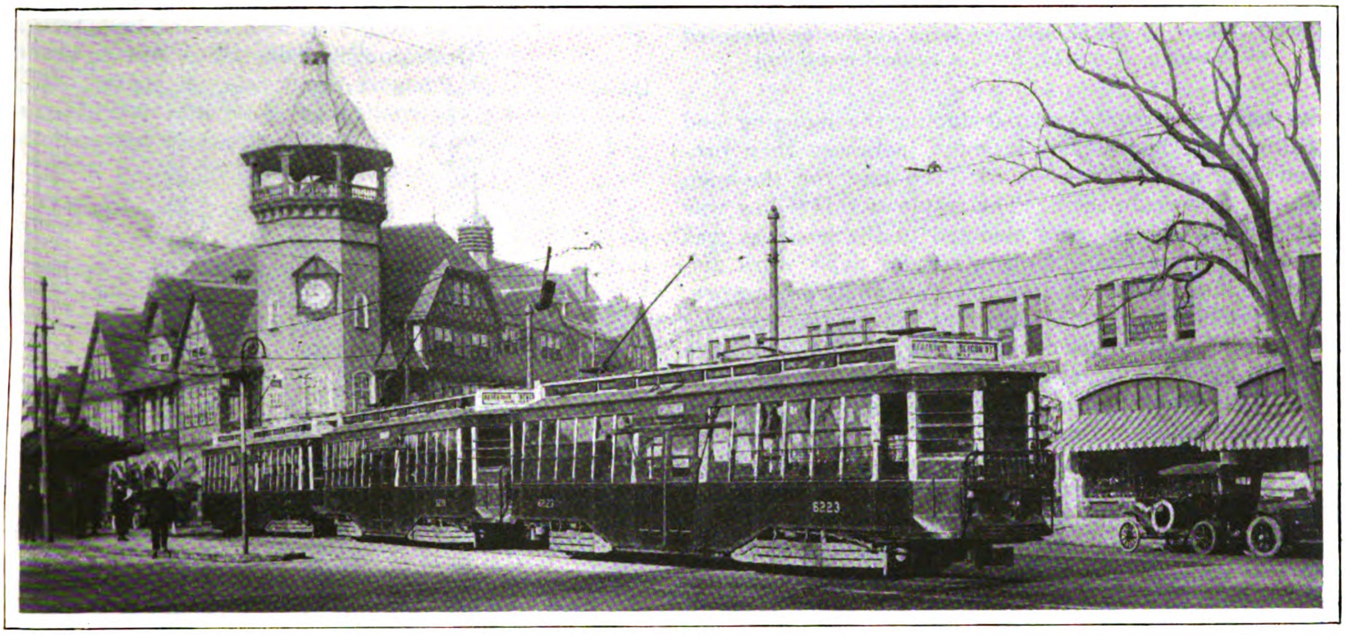
Cross-seat safety car and longitudinal-seat two-man car at Williamsburg Bridge Plaza, Brooklyn

Close relation of efficient schedules to economical operation. The eight-hour-day problem as worked out on the Boston Elevated Railway

The Scientific Arrangement of Schedules

By Edward Dana

General Manager Boston Elevated Railway



Three-car trains used on Reservoir-Beacon Street subway route, Boston. During rush hours these trains operate on a four-minute headway on this route

THE public usually measures street railway service by the trip. The study of traffic has to do with the number of trips operated and their arrangement through the various hours of the day according to the time they start. The science of schedule construction has to do with the arrangement of these same trips, which the traffic survey has definitely established into hours of labor for the men engaged in platform service.

Many people fail to appreciate the complex nature of this whole problem and the fact that, while certain general principles apply, almost every group of trips which has to be arranged as a schedule offers its own particular problem. In consequence, it is neither accurate nor fair to compare schedules in different localities without a complete knowledge of all the factors.

The relation of proper schedules to economical and efficient operation has always been an important matter. The increased cost of labor, with the advance in the price of coal, however, today makes every car-mile operated play an important and vital part in the situation, especially as it applies to fares. The aim of the company should be to draft a schedule scientifically arranged to provide just the proper amount of service to meet the traffic requirements over each route and over each portion of that route. Any more service is wasteful and affects the cost of operation. Any less service is likewise wasteful, by reason of its inadequacy and consequent irregularity, overcrowding or delay, resulting in loss of business and additional expense.

The task of arranging such an ideal schedule for week-day, Saturday, Sunday and holiday time-tables, as well as to meet the varying traffic fluctuations during the seasons by placing in operation short line service, varying the headway or adding trailers, is one of the most important elements today in operating any street railway system.

The second phase of the task is to arrange the work of platform men so as to provide for their working as closely as possible to the stated maximum number of hours as well as to perform the work within another definitely stated period of elapsed time.

The growth of the labor organizations and the enactment of local laws governing hours of labor have resulted in the necessity of a thorough knowledge on the part of not only the operators of street railways but labor executives as to the fundamental principles of schedule construction. In the past street railway companies, believing that they were making an arrangement of trips in the most economical manner, required men to work platform time of ten, eleven or twelve hours, and spread time of from twelve to twenty hours. It is true that thereby the crew force was reduced, which must be the goal in the interests of all concerned under any circumstances, but the distribution of the work was unequal and unfair. In those days there was no guarantee or minimum wage per day, and the result was that after all possible trips were crowded into schedule runs of long platform as well as outside time, proportionately few trips were left. But the trips that

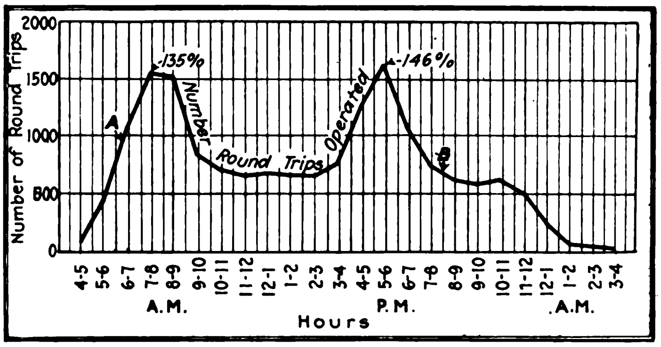


Chart I—Showing distribution of trips on Boston Elevated on Monday, April 12, 1920, a typical week day

were left were trips operated during the morning and evening rush hours, and in most instances they provided only a few hours' work each day for the men required to operate them. The result of this policy was that neither class of men engaged in the business was satisfied. Those men having a regular day's work disliked the long hours required to secure their day's work, and those having only a few trips during the morning and evening rush hours could not earn a sufficient wage to remain in the business. The result was a labor turnover of very substantial proportions, running in some instances to the equivalent of a complete reversal of the force during the year.

Failure to analyze the schedule problem was one cause for this, and while the street railways believed the trips were arranged in the most economical manner as far as cost was concerned, actually when one considers what the expense was, due to accidents and supervision to handle such a labor turnover, it is very easy to see that this was a "penny wise, pound foolish" policy.

It is hardly to be wondered at that when both types of men, namely, the so-called regular men as well as the extra men, were restless that attention was drawn to the subject of hours of labor on street railways and changes made designed to improve conditions.

During this period of the industry street railway executives were arguing that the old time schedules could not be changed without prohibitive costs, and labor executives were demanding working conditions that absolutely failed to fit the nature of the industry, and

TABLE I

Details of Trips Shown in Chart I

Hours	No. of Trips	Per Cent of Trips	Per Cent of Passengers	Average Revenue Passengers per Trip
4–5	81	0.47	0.23	27.55
5–6	453	2.67	1.72	37.22
6–7	1,064	6.27	6.15	56.77
7–8	1,546	9.11	9.94	63.15
8–9	1,507	8.88	8.91	58.07
9–10	841	4.96	4.02	46.92
10–11	701	4.13	3.81	53.32
11–12	657	3.87	3.76	56.26
12–1	677	3.99	3.92	56.98
1–2	650	3.83	4.69	70.81
2–3	650	3.83	4.84	73.19
3–4	757	4.46	4.84	62.81
4–5	1,253	7.39	8.10	63.46
5–6	1,621	9.55	12.40	75.20
6–7	1,048	6.18	5.47	51.25
7–8	737	4.35	5.00	66.58
8–9	619	3.65	2.77	43.94
9–10	580	3.42	2.69	45.54
10–11	616	3.64	3.36	53.50
11–12	517	3.05	2.15	40.77
12–1	248	1.46	0.74	29.46
1–2	64	0.38	0.23	35.11
2–3	43	0.25	0.16	36.02
3–4	36	0.21	0.10	29.33
	16,966	100.00	100.00	982,154*

*Total revenue passengers

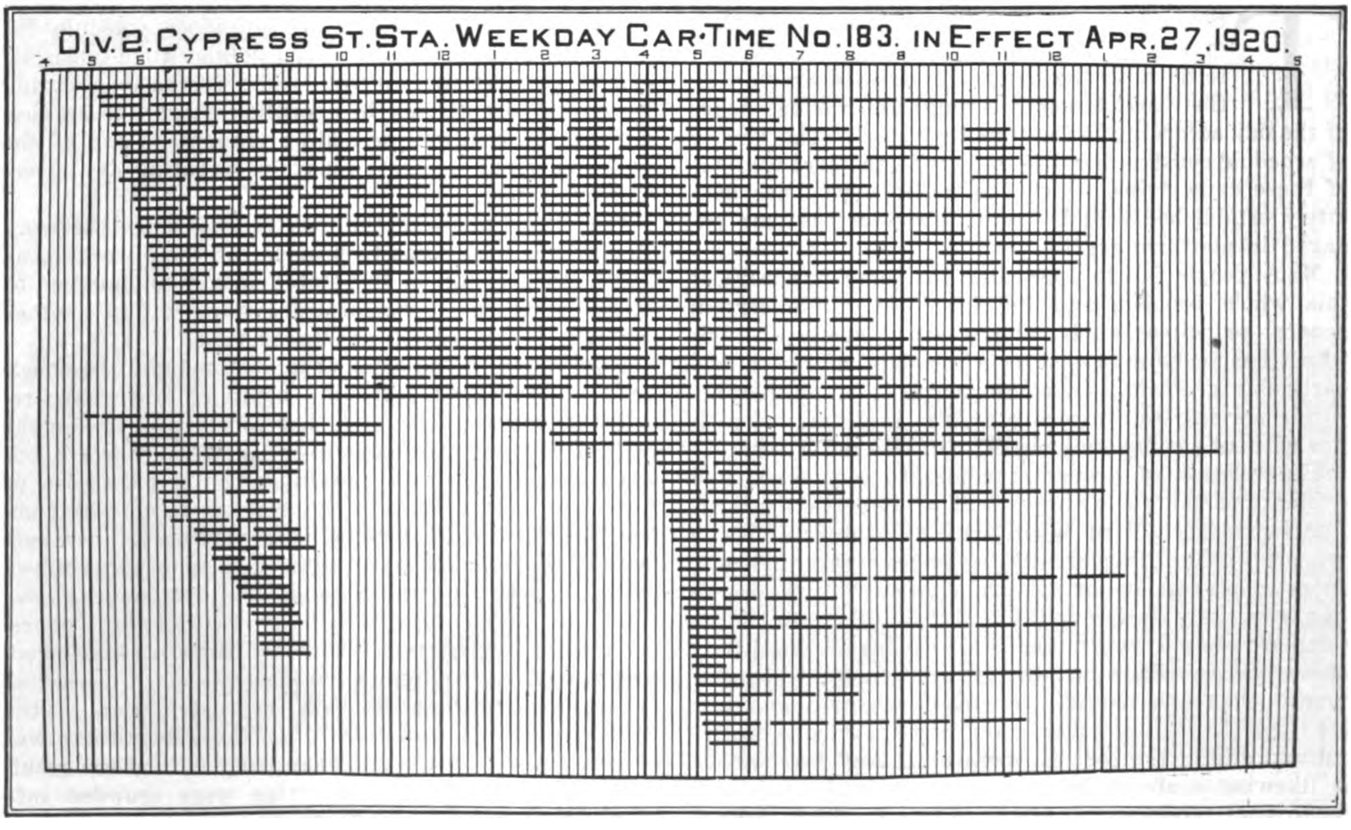


Chart III—Showing car-runs from Cypress Street carhouse April 27, 1920, based on trip schedule shown in Chart II in extreme cases would actually require double sets of men to perform the work in each rush hour. Meanwhile, but little study was given to the real economics of schedules, to devise ways and means with the smallest possible number of men or so to arrange the work as to provide as nearly as possible an equitable division of the work and yet impose no severe hardship on any group in the service because of spread of hours on platform service.

Many persons in those days discussed this confusing subject at length without a very definite idea of what it was all about. Today conditions are gradually becoming standardized, and the importance of a thorough knowledge of the subject by the executives of both the railway as well as the labor organization is appreciated. As arbitration becomes more frequent it is absolutely necessary that this subject be shorn of its mystery and both men and management talk the same language with reference to it, otherwise mistakes will surely occur from the decision of a neutral party who through no fault of his own has not had the fundamental economics of schedule construction properly explained both as regards fair working conditions as well as the ultimate cost to the car riders. A consideration, therefore, of the essential factors in schedule making is necessary.

TABLE II

Division of Schedule and Additional Runs by Platform Hours and Spread Hours

	Platform Hours							Spread Hours					
	6-6½	6½-7	7-7½	7½-8	8-8½	Total Runs	Eight Hours or Less	8-9	9-10	10-11	11-12	12-13	13-14
Conductors													
Schedule runs ..	1	44	440	863	134	1482	147	126	514	171	91	190	243
Additional runs ..			1	149		150	10		6	15	76	36	7
Motormen													
Schedule runs ..	1	45	399	845	151	1441	159	127	554	200	59	128	214
Additional runs			1	43		44	9			2	16	11	6

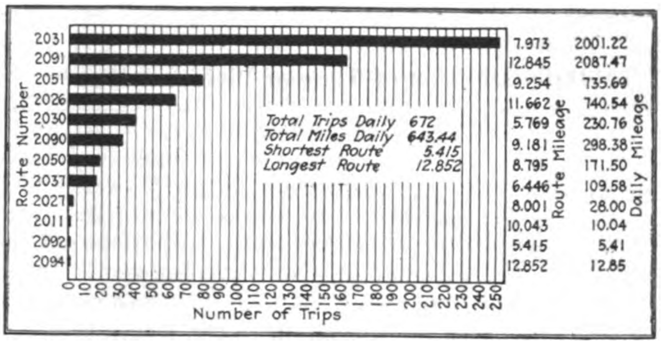


Chart II—Showing trips by routes from Cypress Street carhouse on April 27, 1920

TWO FACTORS IN SCHEDULE CONSTRUCTION

Two underlying factors in schedule construction are most important. The first of these is the relation between the base or normal schedule and the peak demanded in the rush hours, or, in other words, the percentage of excess of service in the rush hours over the non-rush hours. The second of these factors is the spread of hours which are required to insure the morning and evening rush hour trips in excess of the base schedule being operated by the same men. Both of these factors vary in different cities and even in different carhouses in the same cities. Cars serving a factory section of a city must, of necessity, have different hours than those serving a residential section where lawyers or bankers predominate.

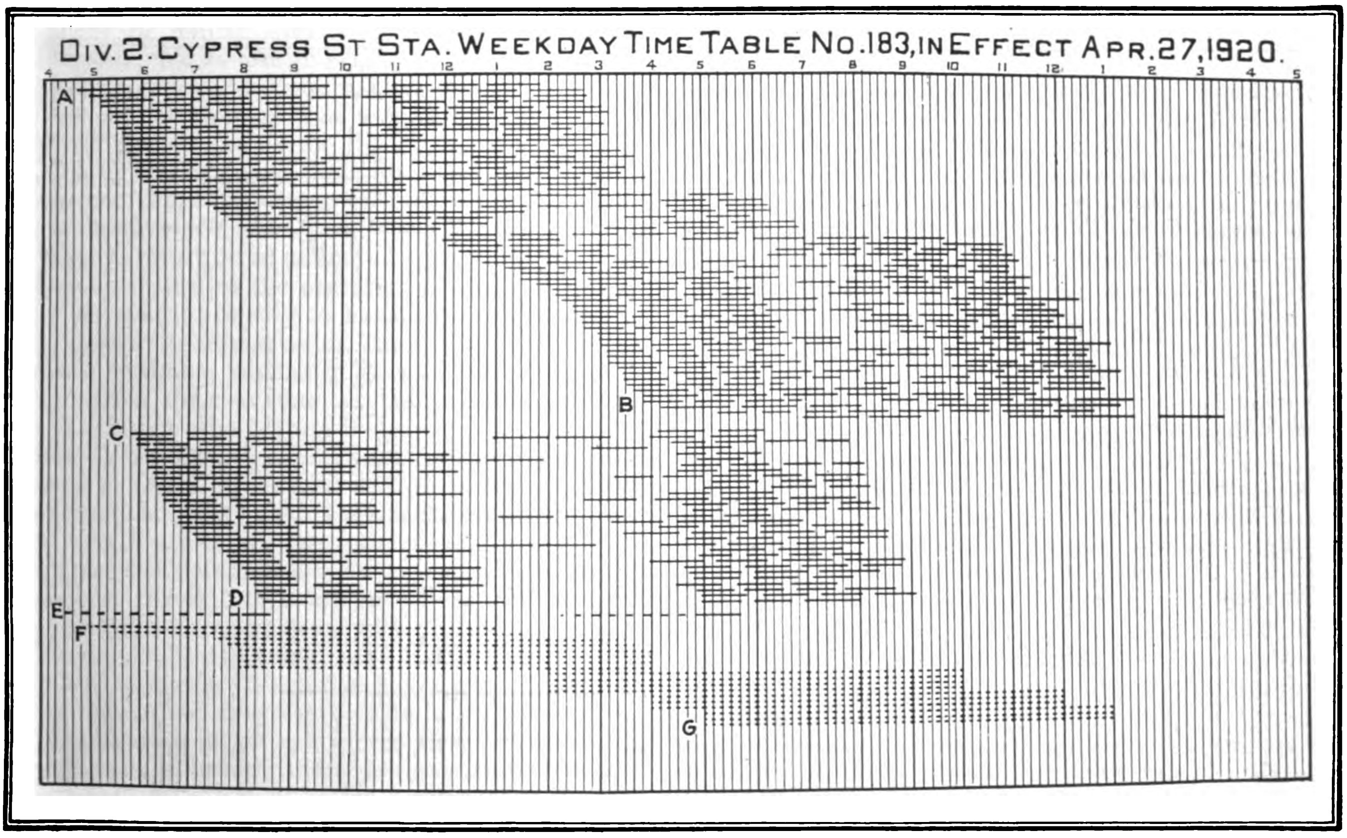


Chart IV—Showing crew-runs from Cypress Street carhouse, April 27, 1920, based on car-runs shown in Chart III

TABLE III

Daily Division of Time of Platform Men

	Total Hours	Per Cent of Total Hours
1. Actual platform time used on schedule (running time multiplied by the number of trips, plus layover time actually used)	19,733	.7126
2. Layover time on schedule between trips (considered as platform time)...........	3,250	.1174
3. Signing trips—putting up car, etc........	664	.0240
4. Extra time (three-piece run) ten minutes bonus paid...........................	13	.0005
5. Time added to bring platform time to pay period............................	732	.0264
6. Men on additional runs doing other than schedule work during their cover period..	125	.0045
7. Time allowed on additional runs to equal eight hours' pay.....................	794	.0287
8. Penalty time allowed for spread of outside hours............................	611	.0221
9. Time of cover men other than substitution for schedule runs..................	773	.0279
10. Time paid for to bring cover men to eight hours' pay.........................	806	.0290
11. Overtime paid schedule men in addition to schedule pay time...................	88	.0031
12. Overtime paid cover men in excess of eight hours' pay.......................	91	.0033
13. Time delayed paid for..................	13	.0005
Total hours..........................	27,693	100.00

In order to understand these two factors the reader is referred to Chart I, which happens to show the total trips operated on the Boston Elevated Railway during each hour of the day. It will be noted that the trips required in the morning rush hour are 135 per cent greater than the base time-table requirements, and those in the evening rush hour are 146 per cent greater. It will also be noted that from the point marked *A* to the point marked *B* the necessary span of outside hours is approximately fourteen hours. These two factors in Boston make it absolutely necessary that a certain percentage of the men operating cars must have their day's work spread over a period not to exceed fourteen hours or else more men will be required to perform the work than is a fair and equitable burden upon the car rider. Even with a spread of fourteen hours many men will receive a day's pay, but are not required except for a portion of it, and if still more men were added much more time would have to be paid for to run the same amount of service. In short, in Boston the demands of the business require a minimum spread of fourteen hours on a certain percentage of the runs. Table I gives the information about the trips shown in Chart 1.

To appreciate the details which the schedule constructor faces, a glance at Chart II is sufficient. This chart indicates the relative number of trips on the several routes operated from a single carhouse. It also shows the different lengths of these routes and the total miles operated daily in covering the total of 672 trips. It will be observed that there are trips on long routes and trips on short routes and that the lengths and numbers of trips vary greatly on each of the routes. Some of the routes start from the point where the cars are stored, namely, the carhouse. In consequence, all cars that happen to be in the carhouse cannot be freely used, but a separate group of cars have to be "pulled out" and placed in service on such a line. This adds to the complications, for it is not a simple problem to combine trips into schedule runs if the terminals of the lines are widely separated.

The first important task in schedule making is to

TABLE IV

Distribution of Entire Operating Force of Conductors, Motormen, Guards and Brakemen as of September 14, 1920

	Rated at Station not Including Learners		In Other Depts. or Misc. Work Entire Day *		Sick, Off, Suspended, etc., Entire Day *		Working on Schedule or Additional Runs Entire Day		Men Listed for Scheduled Runs or Additional Runs Getting Off a Portion of Their Work		Reporting as Cover Men		Men Performing Work in Addition to Day's Work on Runs or Cover Work	
Stations	Cond.	M'men	Cond.	M'men	Cond.	M'men	Cond.	M'men	Cond.	M'men	Cond.	M'men	Cond.	M'men
Park St........	189	161	7	6	21	14	148	132	7	3	6	6	0	0
Milton........	169	146	3	3	23	12	134	119	1	2	3	10	1	0
No. Point......	147	147	3	7	24	11	115	117	0	1	5	15	2	0
Lenox St......	160	159	3	7	23	14	121	125	2	1	11	12	8	5
Jamaica Plain..	134	122	5	13	10	6	105	97	7	6	7	2	2	0
Reservoir......	123	90	2	3	15	5	94	68	4	2	8	12	..	..
Watertown.....	103	93	1	3	16	12	73	66	2	2	11	10	..	..
Sewall St......	113	123	2	5	18	7	90	92	2	4	1	15	1	2
Bennett St.....	160	173	6	14	20	13	116	131	5	3	13	12	5	5
No. Cambridge.	184	142	3	12	18	7	155	110	3	4	5	9	1	0
Eagle Street....	139	117	3	1	13	9	107	89	6	2	10	16	4	4
Clarendon Hill.	133	110	4	3	12	8	109	91	1	1	7	7	0	0
Salem St.......	130	130	1	7	15	10	105	104	4	5	5	4	3	2
Sullivan Square.	82	85	1	5	9	4	70	69	0	1	2	4	0	0
Everett........	47	47	0	1	6	3	31	37	3	5	7	1	0	0
Total........	2,014	1,849	44	90	243	135	1,578	1,447	48	42	101	135	27	18

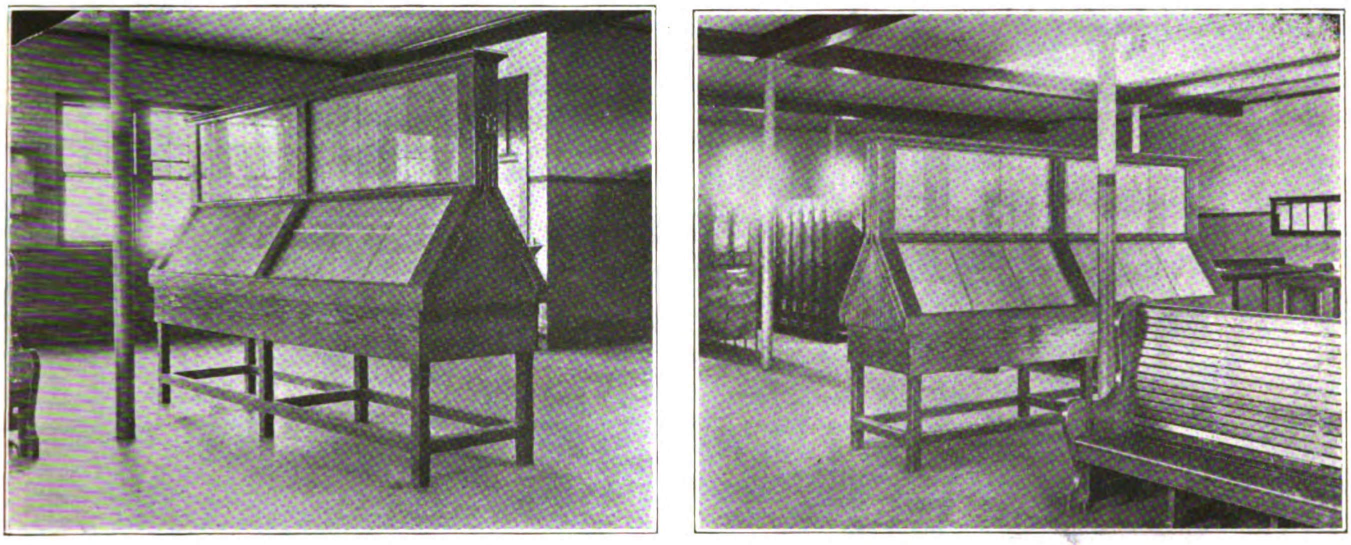
Rapid Transit	M	G	B	M	G	B	M	G	B	M	G	B	M	G	B	M	G	B	M	G	B	M	G	B
Sullivan Sq....	64	59	165	1	2	3	4	5	45	54	47	108	1	1	3	4	4	6	5	4	6	10	0	0
Dudley St.....	65	58	163	4	3	6	4	3	35	52	44	117	1	0	3	4	2	4	0	3	15	0	0	0
Cambridge...	47	44	48	1	1	4	3	1	8	36	36	22	3	4	6	4	2	8	0	0	0	0	0	0
Total......	176	155	376	6	6	13	11	9	86	142	127	247	5	5	12	12	8	18	5	7	21	10	0	0

* These men are not available for car service during the entire day.

arrange the work of the cars and is commonly known as the car time. Chart III shows the same trips indicated in Chart II, arranged throughout the various hours of the day as the work of the various cars comprising the rolling stock at the particular carhouse.

It will be noted that here the same character of peak load condition is apparent. The lines that cross the entire sheet indicate base schedule cars or cars from which is secured maximum service, while during the hours from 6 to 9 a.m. and from 5 to 6 p.m. additional cars are required for a relatively small amount of work. In fact, five cars are required in the afternoon rush hour to perform but a single trip daily.

The arrangement of the car time as shown graphically requires careful and painstaking study in order that the service may be performed with the least amount of investment in rolling stock and, consequently, power requirements, and failure to arrange the trips so that a minimum of cars will be required may mean a very considerable capital investment as well as operating loss.



Views in lobby of Clarendon Hill carhouse, showing bulletin board for display of time-tables

The traffic study determines the number of trips operated, the length of them, their exact starting time to produce the proper headway and the use of one-man cars, trailers or three-car train service. It is in this field that there is almost unlimited opportunity for constant study to insure the operation of that amount of service necessary properly to handle the traffic and no more. The car time represents the arrangement of the necessary minimum number of cars to render the service, and from the car time is arranged the hours of labor of the men who operate the cars.

Chart IV shows the arrangement of the same trips as shown in Chart III without disturbing their location from hour to hour into day's work for the platform men. From *A* to *B* are shown the runs of eight hours' platform time, completed within eleven consecutive hours' actual time. From *C* to *D* are shown the runs of eight hours' platform time completed within fourteen consecutive hours. In Boston 60 per cent of the runs are completed within eleven consecutive hours and 40 per cent between eleven and fourteen outside hours.

E represents a single run of the class known as additional runs, of which there are relatively few and which do not form a part of the percentage governing scheduled runs. These runs provide a definite full day's work, but not entirely of platform work. This particular run has but two definite trips, one at 8 a.m. and one at 5 p.m. During the rest of the time, shown in the chart as a dotted line, the crew is on hand to perform such work as may be required.

From *F* to *G* are indicated the periods of work of all men not having schedule runs. These periods are for eight hours' straight time and the men assigned perform such work as may be required, but remain available the entire period and receive pay for the full eight hours. These assignments also vary from day to day, both as to the number of them and the time they start and finish, depending upon the men absent from schedule runs and the traffic conditions of the particular day. They are known as cover periods and the men assigned are called cover men.

While this arrangement of work guarantees to all men working eight hours' pay, it meets the requirements of traffic with a minimum number of men and is sufficiently flexible to meet varying traffic fluctuations. It has an advantage both to the men and the company in that all schedule trips are operated each day by the same men, and the cover men have from day to day a definite assignment, as compared with the previous arrangement of work for extra men which was never the same and shifted daily from early trips to late trips, so that the extra man's time was almost never his own.

The number of runs and their spread of outside hours, as well as platform hours, are shown in Table II. When the schedules are completed it becomes important to know the exact number of man-hours utilized daily by platform work, and Table III indicates the subdivisions of time into its various factors.

The distribution of the entire uniform force is indicated in Table IV, showing various locations from which men are rated and the number actually working on runs, doing miscellaneous work, absent, etc.

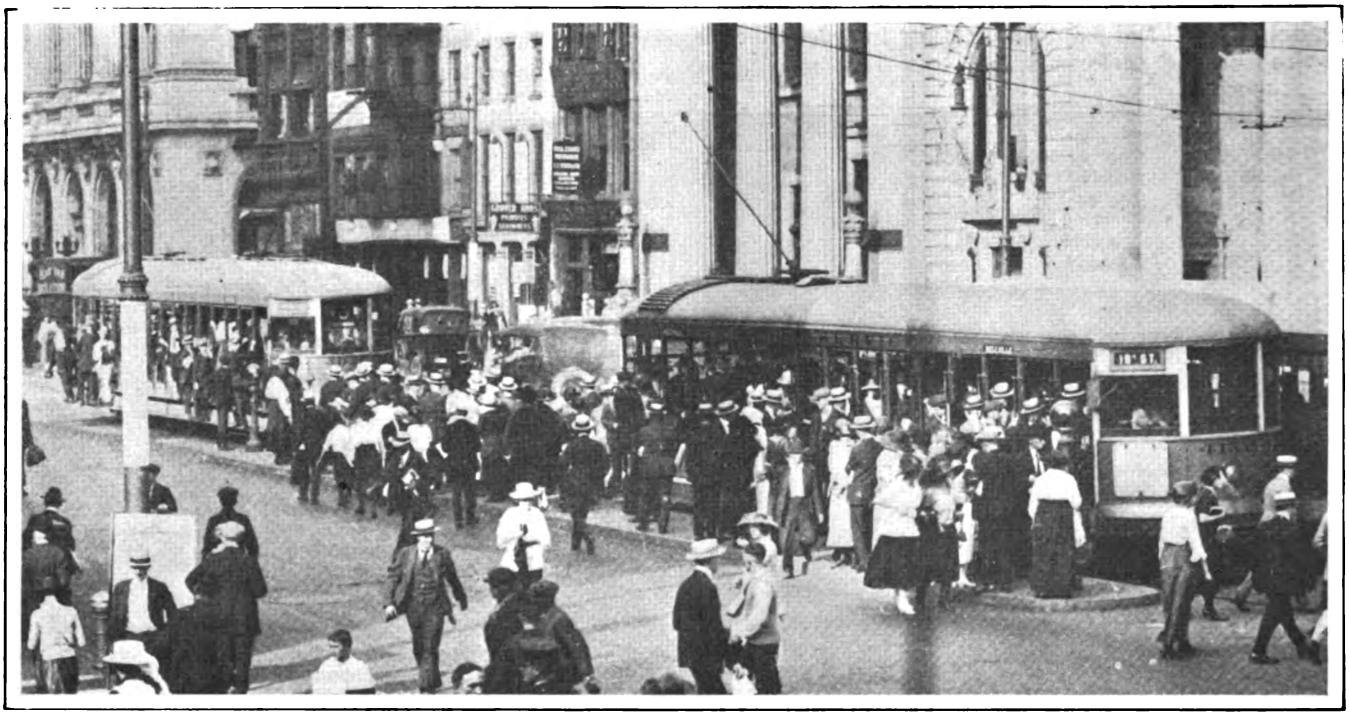
Given reasonable working conditions which fit the peculiar nature of the street railway industry and fair compensation, it seems to me the time has arrived when the rank and file of the employees on the platforms ought to exert every effort to assist in the efficient and economical operation of street railway properties in the interests of the car riding public. Whatever they do to increase production by the elimination of lost motion and inefficiency will surely result in mutual benefit to men, management and car riders.

Present and future tendencies. Problems and methods of attack. Results of the application of transportation fundamentals in American cities

Surface Transportation in Congested Districts

By *John A. Beeler*

Consulting Engineer



A double berth loading platform on Broad Street, Newark, N. J., which economizes stopping time

THE function of any transportation system is to give service, and in that word are centered all the operating problems of the transportation industry. The word "service" today in connection with transportation means good service, *i.e.*, the transportation of people quickly with comfort and safety and at a reasonable charge.

Good transportation service is as absolutely necessary to the growth and prosperity of any city today as air, water or light. In fact, transportation to a large community is second only in importance to air and water.

Good transportation service is essential to business prosperity and it is safe to say that 80 per cent of the mercantile business of the country is located along car lines. The merchants of Bridgeport, Conn., recently discovered that a cessation of street car service meant a material loss in their receipts even though, apparently, jitneys handled the traffic adequately. Other cities have furnished similar examples.

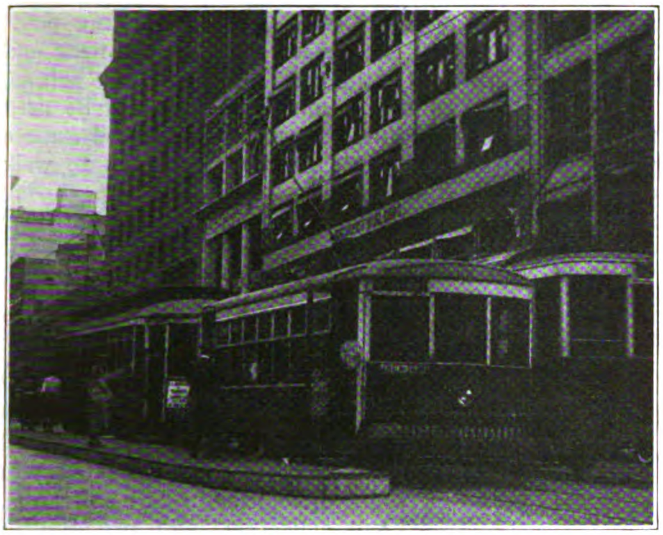
When municipalities realize this fact and also that the relief of traffic congestion in congested districts is a primary element in good transportation there will be a great improvement in the community prosperity. Street cars will be given the right of way over general traffic because an increased speed for street cars means an increase in speed of all street traffic.

On the other hand, the railways themselves must understand they are now dwelling in a competitive age, that the private automobile and the motor bus have come to stay and that the pedestrian is always to be reckoned with. The street railways, although they have been unjustly handicapped in many ways because the other modes of transportation have been favored by their failure to overcome local conditions of congestion, have themselves accelerated the development of the motor bus and the private automobile and have encouraged the pedestrian as competitive transportation agencies.

There is today more opportunity for improving the handling of traffic in our cities than in almost any other field of endeavor. The conditions in every city differ in detail, but the general methods for improving service are fundamental. The specific application of the needed remedies must be preceded by a correct diagnosis of the troubles. In the following paragraphs an attempt will be made to point out some of the points of attack in an effort to improve the transportation conditions in a city.

A Traffic Study Essential

One of the first essentials for improving the service is to secure the co-operation of the municipal and railway authorities in an open-minded study of the situation. This study should not be confined to the railway service but should cover the traffic systems as a whole. The speed of all cars on all lines, the headway, the reg-



Kansas City has put in a number of temporary loading platforms

Instruction sign giving directions for boarding cars in Kansas City

ularity of operation, the habits and customs of the passengers, the traffic conditions in congested districts and at busy intersections, the routes, the tendency in city growth and development are all factors to be considered.

The prime requisites of service that are demanded today by the public are dispatch, regularity and frequency, and the more methods of transportation available the more transportation will be used. The luxury of yesterday becomes the necessity of today. Time saving is demanded in all branches of industry. A few years ago comparatively few people rode on the Twentieth Century Limited. Today this is one of the heaviest trains between New York and Chicago, and two or three sections are frequently required. Time is money now more than ever. Cutting down wasted time means not only decreased expenses but increased receipts per car-mile because more passengers are attracted to the cars.

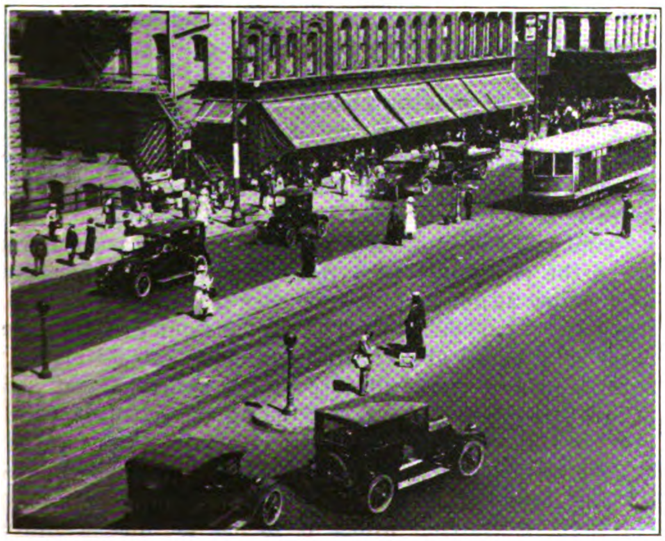
The development of transportation methods follows closely the development in the speed of transportation vehicles. Take the horse car, the cable car, the electric car, the automobile, the elevated and the subway. Each has shown an increase in speed over its immediate predecessor.

Quicker transportation does not mean higher maximum speed, but it can be obtained by a lessening of road delays, overcoming congestion, more direct routing, quicker loading and unloading, and regularity of service. These will be considered briefly in the order named.

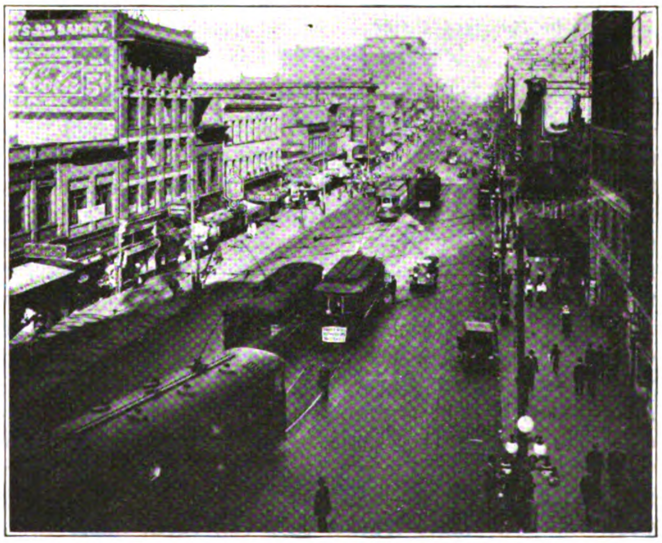
CUTTING DOWN ROAD DELAYS

Much of the time lost by cars through road delays would be avoided if all companies realized the value of seconds. Many of them do not seem to understand that a stationary car costs almost as much in operating expenses per car-hour as a moving car. Transportation service and income depend on the distance moved by each transportation unit in unit time. Receipts are proportional to car-miles, but expenses are very nearly proportional to car-hours. One company may be prosperous while another is bankrupt, even though they may have earnings at the same rate per car-mile and make the same number of car-miles per annum, because the cars of the first company average more miles per car-hour than those of the second company. A difference of one mile per hour may make or break a company.

A simple and direct attack can be made on this cause



The loading platforms in Newark, N. J., are lighted by lamp posts at each end



The "car-always-in-sight" principle is illustrated in this view from Vancouver, B. C.

of delay by determining from the studies of the speed made on the different routes what schedules are too slow and then applying remedies to each route that will relieve conditions. Waste time may be due to many factors, such as too many so-called safety stops or fire stops, stops too close together, stops in wrong locations, unnecessary positive stops. One of the greatest factors of road delay is the so-called safety stop. At grade crossings where the conductor dismounts and flags the street car across the railroad tracks much time frequently is wasted. This is anything but a safe method, as experience has demonstrated that nine times out of ten the conductor simply goes through the motions, thus relieving the motorman of responsibility. In one instance, which came under my notice recently, a car stopped at a crossing and the conductor walked across the track to a distance of about 25 ft. on the other side, where he pulled a lever that operated a derail which permitted the street car to cross the railroad. After closing the derail on looking up he was amazed to see a freight engine and caboose between the street car and himself. Where the view is unobstructed it is much safer to place the responsibility undividedly on the motorman. A railway flagman or gateman, who is familiar with operating conditions and schedules, is the safest man to rely upon if a grade crossing has to be flagged. These old railway men know when to expect the trains, they can detect the rumble of the approaching train on the rails, they are not dazzled by the change from light to dark as is the street car conductor.

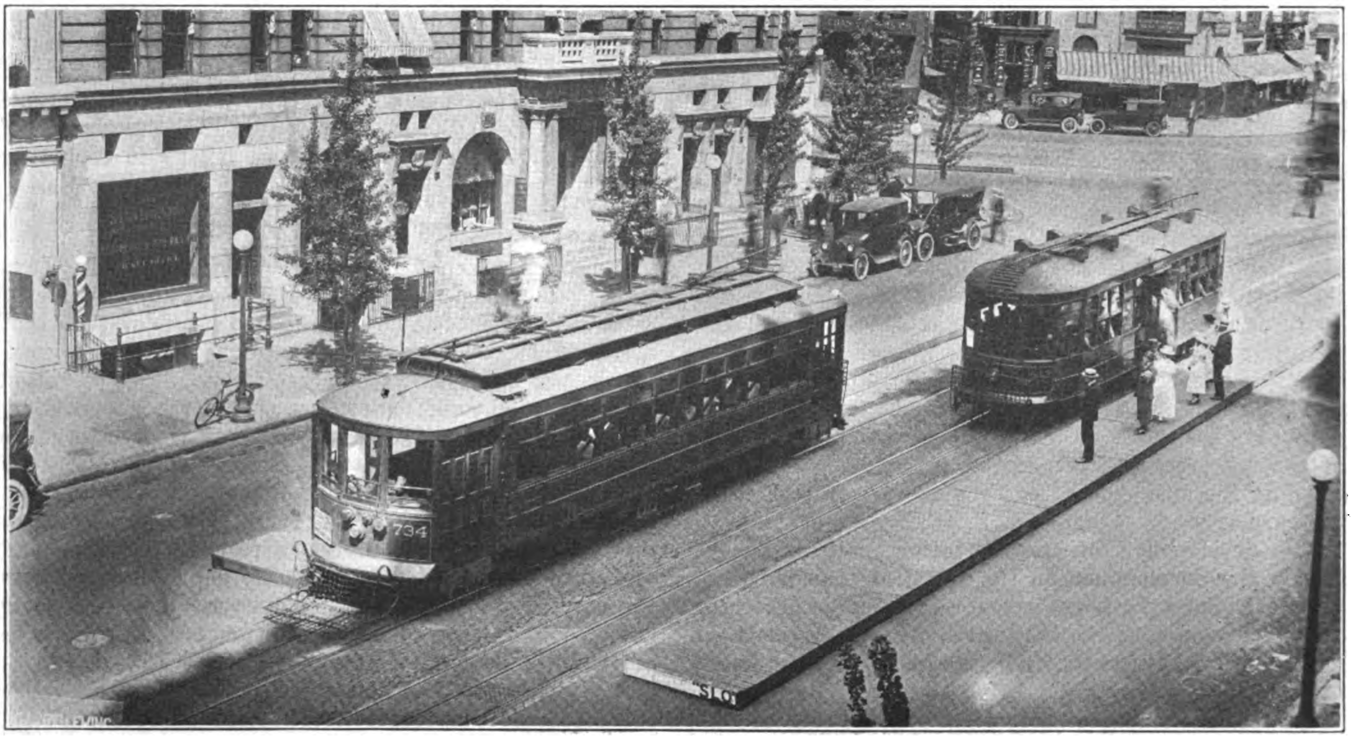


Photo by Harris & Ewing.

Loading platforms at New York Avenue and Fourteenth Street, Washington, D. C.

Another element that causes waste road time is slipshod instruction of trainmen in handling of cars, especially in accelerating and braking. A normal rate frequently found is 1 m.p.h.p.s. when it should be nearer to 2 m.p.h.p.s. Stops may also be placed in the wrong position. On single tracks, cars can often make their stops on the sidings, yet more frequently they stop on either side of the siding and block the line. Frequently much congestion is caused for the reason that stops are made by cars before passing the diverging point in the lines. Instead of passing through the neck and out beyond, they stop in the neck, delaying those behind.

Electric switches and automatic signals can be used to advantage to save time. Recently I observed a place where it required a minute for the motorman to walk over, throw a hand signal and return to the car. Today a minute is worth 5 cents, as the average car-hour expense is at the rate of $3 in these days of high wages. The saving of a total of five minutes on a line with a five-minute headway will permit the saving of $15,000 per year and make available one car for additional service.

TIME CAN BE SAVED IN FARE COLLECTION

The introduction of fractional rates of fare instead of the even 5-cent fare has caused a loss of from ½ to 1½ m.p.h., due to increased difficulties in fare collection. Metal tickets, front end collection, and prepayment areas rightly placed may help to eliminate this loss. The method of making change is an important factor. In general, with fare boxes, it has been demonstrated that where a metal ticket is returned to the passenger to place in the box with change for the balance due, collections are accelerated.

Front end collectors at points where many passengers board the cars and prepayment areas, where they can be installed at not too great expense in central localities, facilitate car movement. The prepayment area for the passenger means also that he has a centralized loading point where he can wait in comfort, secure a seat and usually be more sure of cars being on schedule time. For the railway company it often obviates the necessity of issuing paper transfers and thus saves expense, delay and improper use of the transfer privilege.

On many systems where it is not possible to have such stations in central areas they can be installed to advantage in suburban centers. Trunk lines can enter these terminals and feeder routes using safety cars or motor buses can be used to distribute the traffic in the suburb. The use of a terminal station is not usually advisable where cars have to go considerably out of their way or through congested districts to enter it.

SPEEDING CAR MOVEMENT IN CONGESTED DISTRICTS

Where the streets are taxed to capacity, one of the first remedial steps to be taken is to restrict the parking of automobiles. This should be done without fear or favor, and the loading and unloading of heavy trucks should be reduced to a minimum, especially during the rush hours.

Traffic regulations are difficult to enforce but they are essential to expedite car movements across intersections and between loading points in the congested districts. The street car should have the right-of-way over general vehicular traffic as it carries more passengers per unit, and its passengers use it from necessity more than for pleasure. Another reason is that the street car is on fixed tracks and cannot dodge in or out of the traffic stream. Experience has proved that an increase in street car movement means a similar increase of vehicular traffic movement and that all traffic is expedited by co-ordinating its movements with those of the street car. In one city where the speed of the street cars in the congested district during the rush hour was increased 68 per cent, the actual number of street cars passing through the district per unit time increased 58 per cent. This gave an actual increase of 58 per cent in the service rendered during the rush hour and did not require a single additional car.

Double berthing of cars helps to speed up traffic as it gives schedule leeway and permits of passing at intersections more than one car at a time. It is particularly beneficial when there is a very frequent headway. Actual trial has demonstrated that the more opportunity there is for double berthing the less the necessity for it, as cars more quickly resume their normal spacing.

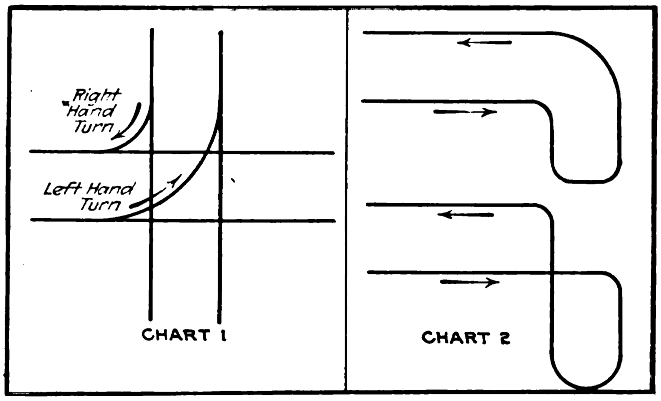
Much can be done also with the spacing of car stops. Too close spacing of stops will demoralize schedules, especially during the rush when all stops are being made and when service is most needed. Extra cars then added usually will then simply make extra stops and not add to the capacity of the line. They may be in the neck of the traffic bottle or too near the point of greatest vehicle congestion.

Custom fixes methods for doing things and often is hard to overcome. Where a merchant objects to a beneficial change in street conditions, such as a change of a stop, he must be shown that what he objects to from a selfish standpoint is really a benefit to him, because it means an increase in the number of people who can travel to and from his store in comfort and not a mere congestion of people at that point. To reduce this congestion means a greater number of cars per hour and faster service. A decrease in the trip time means an enlarged area available for his customers.

SKIP STOP VERSUS EQUALIZED STOP

The theory underlying the skip stop for both congested and outlying sections of the city is good so far as it means the elimination of unnecessary stops. The name "skip stop," however, is unfortunate because it gives the impression that the public is being deprived of a convenience. This handicap in its name, combined with poor judgment in the establishment of stops, largely explains the unpopularity of the system in many cities. A better name for a plan of re-establishing stops is "equalized stops." The stops should be placed where they will serve the greatest number and as nearly as possible on the basis of equal spacing. This is a fundamental requirement for good service. The number of stops per mile not only limits the speed but controls the amount of service possible to render with a given equipment. When stops occur eight to the mile, which is about right for urban service, the motorman must apply the brakes, bring the car to a stop, open the doors, wait until the passengers are on or off, close the doors, accelerate the car and get it back to speed, and do all of this once in every forty-five seconds, when the average speed between stops is 10 m.p.h. It can be readily seen that it is very difficult, where the number of stops made actually exceeds eight, to give good service. To eliminate every other stop is irrational as often stops have been placed at greatly varying distance, and some have been incorrectly located, so that conditions might be made worse instead of being improved by such a method for fixing stops.

In one large city where the stops were placed on an average of 700 ft. apart in the congested districts and in some instances 1,000 ft. not one complaint was received from the public, for the reason that congestion was relieved and service greatly bettered.



Diagrams showing the effect of turns and loops on traffic

PRINCIPLES OF CAR ROUTING

A great improvement in traffic conditions can be obtained in most cities by properly rerouting the cars. The routes in many cities were established more than a generation ago, and through the development of cities and of transportation agencies, conditions have utterly changed in many localities. Often rerouting combined with a rescheduling so as to fit the cars to the traffic requirements will release many cars for additional service where badly needed. This enables the cars to serve the public better and at the same time increases the earnings. In one large city, for instance, without any change in tracks or equipment, a general adjustment of stops and loading methods generally enabled 100 cars to do the work for which 113 were formerly required. This was followed by a new routing schedule which further increased the capacity of the original 100 cars, enabling them to do the work of 126. This was equivalent to a gain of twenty-six additional cars for each one hundred operated without any increase in investment or fixed charges.

The fundamental purpose in determining car routes is to secure *direct* routes. That is to say, the object is that the maximum number of passengers should reach their destination quickly and as far as possible without transfer. In through-routing the purpose is to balance traffic through the center of the city and thus save car mileage.

Car mileage in the congested district can also often be saved by a rearrangement of tracks and loops. Frequently a through routing can be effected in the congested district where lines are equally balanced, much delay avoided and substantial savings effected.

The effect of right-hand and left-hand turns depends on the width of the street and the traffic conditions. In general a left-hand turn delays cars on the other tracks and a car takes 20 to 40 per cent more time to make such a turn than to turn on a right-hand curve. In a recent test the average time on a left-hand curve was fourteen seconds as compared to ten seconds on a right-hand curve. This time element is important as time cannot be made up readily in congested districts.

Chart I shows the effect of the right-hand and left-hand curves under the conditions assumed. The car must travel a greater distance in the intersection and also tends to impede other car movements across the intersection on the other tracks.

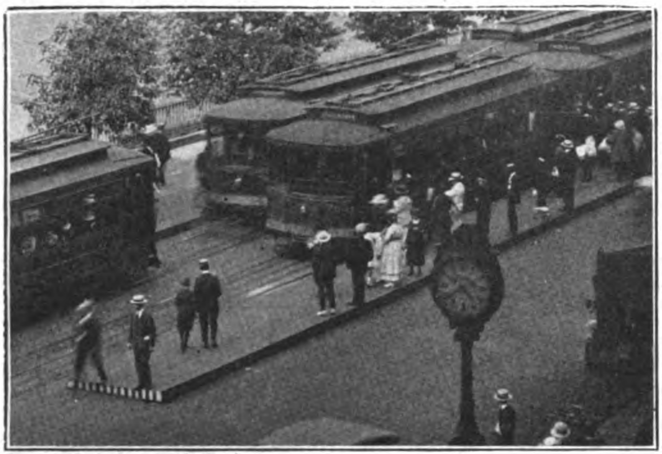


Photo by Harris & Ewing

Loading platform at Ninth and F Streets, Washington

Chart 2 has been drawn to illustrate two methods of providing for loops in a congested district. The relative merits of the two methods depend upon the extent of the congestion at the corners where the turns occur. In general, the number of left-hand turns should be reduced to a minimum, and at many of the congested street intersections in large cities all left-hand turns for vehicles other than the street cars have been prohibited in order to expedite traffic.

LOADING AND UNLOADING

The possibility of the loading platform in relieving street congestion in cities has not been realized or utilized to the extent it should have been. The loading platform functions to relieve congestion on sidewalks, speeds up street car schedules, and makes for the comfort, convenience and safety of the public.

The car patron standing on the leading platform is safe from the moving crush of vehicular traffic and out of the way of the pedestrian. He escapes a last minute dash through the street vehicles, and general street traffic can move while the street car stands still without danger or detriment to the car patron. From the railway standpoint the possibility of the loading platform is also important. It saves at least ½ second per boarding passenger exclusive of the time saved by the car waiting while passengers cross the traffic stream to reach the car.

The loading platform is not suitable to very narrow streets, but if the distance between the car tracks and the curb on one side is wider than is absolutely necessary to accommodate one line of moving vehicles and not wide enough for two, space that otherwise would be practically wasted is often available for a loading platform. For instance, in a street where there is 13½ ft. between the sides of the car and the curb and only 8 ft. is required for the line of moving vehicle traffic, there is available 5½ ft. of waste space. A width of 3½ ft. can be utilized to advantage in this case for a loading platform, leaving 10 ft. available for vehicular traffic, which is ample to give satisfactory clearance.

Successful loading platforms range from a minimum of 3½ to 6 ft. in width. The usual width is about 5 ft. They should equal one car in length or the length of two cars at double berthing point.

The loading platform should be at least 9 in. high to avoid danger from vehicles and to offer to its patrons a feeling of security and distance from the moving vehicles near the platform.

The loading platform functions properly when the people are on the platform before the car arrives. Double berth platforms are best and are successfully used in many cities at heavy traffic points.

Much can be done in speeding the loading and unloading of passengers, also, by a proper design and arrangement of car doors and steps. In general every entrance and exit to a car should permit a double file of passengers in order to avoid delay.

Most street car schedules have been made by a cut and try method, and the tendency has been to add time as congestion increased instead of attempting to relieve the congestion and tighten the schedule. Without increasing the maximums, it is sometimes assumed that the higher the average rate of speed the more numerous the accidents, but this is not borne out by the facts. I recall one instance where a change in speed from 8 to 10 m.p.h. was accompanied by a reduction in accident cost of from 4 per cent to 1 per cent of the gross receipts.

Faster and more regular schedules mean more business. A pedestrian looks on a street car with contempt if he is walking faster than the car is moving, but often will ride a short distance if the cars move much faster than he can walk. Greater regularity in schedules is equivalent to additional cars. A difference of one minute each way on a ten-minute headway for two successive cars means that they are 20 per cent off the schedule spacing, while with a five-minute headway they would be off 40 per cent.

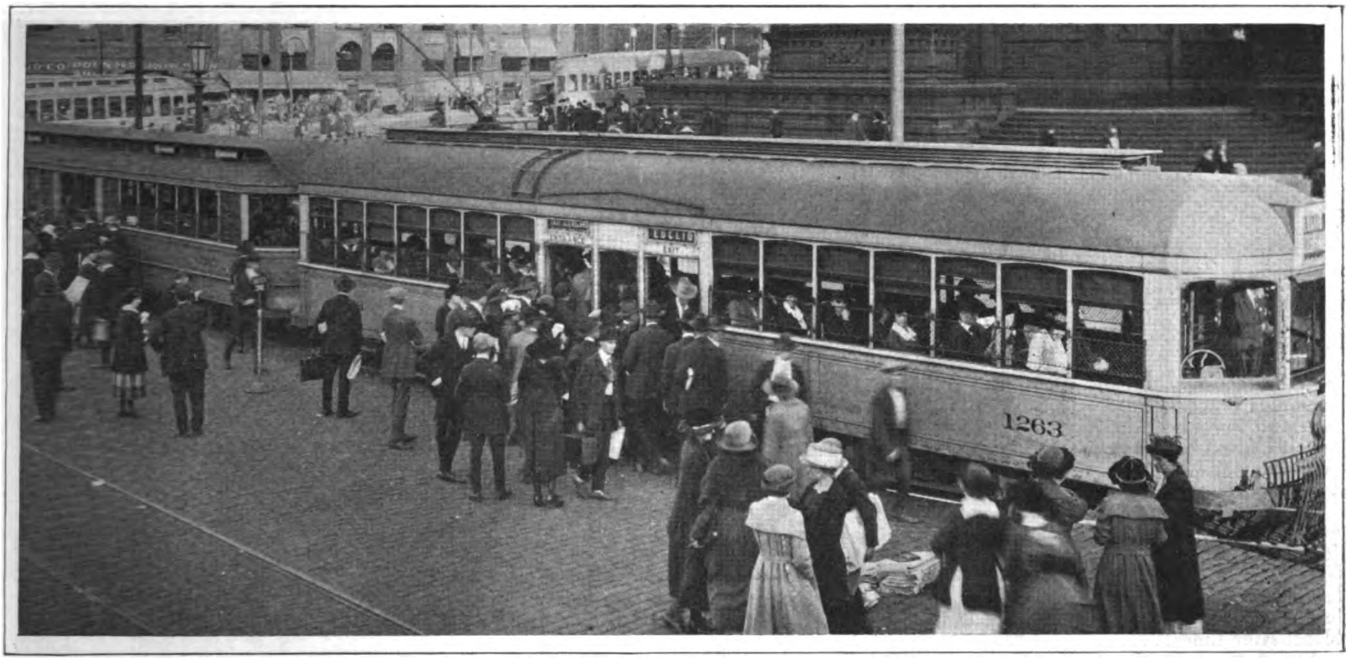
The secret of maintaining a good schedule is in keeping every one concerned attending to business, and no one item is more essential than to maintain correct running time for cars throughout the system. This involves a good method of time checking at terminals and on routes as well as accurate watches for trainmen and inspectors. The inspector should check the trainman's time whenever he boards a car. There are today too many starters not starting, inspectors not inspecting and dispatchers not dispatching on railway systems all over the country.

Increase in car speeds can be accomplished only by detailed attention to several sources of delay which are enumerated and commented upon

Increasing Schedule Speed on City Railways

By Victor B. Phillips

Assistant to the Vice-President Cleveland (Ohio) Railway



Cleveland Railway's older type of train with center-entrance, center-exit motor car

QUITE aside from the advantage of faster and therefore better service to car riders, higher schedule speeds may be urged on the grounds of substantial money savings. Two items of cost, namely, platform labor and fixed charges on rolling stock, bear a very simple and fixed relation to schedule speed. For given traffic conditions it is necessary to supply a certain number of car-miles in order properly to handle such traffic. If by means of higher speeds it is possible to make a car and its crew cover twice as many car-miles in a given time it is evident that the cost of platform labor and the fixed charges on cars will be cut in half. Inasmuch as these charges constitute more than one-third of the total cost of operation, maintenance and all fixed charges, it follows that any substantial reduction in these charges is a matter of importance.

In the case of the Cleveland Railway, for the year 1919, with a schedule speed of 10.82 m.p.h. (without layovers), platform labor cost 11.9 cents per car-mile and fixed charges on cars, including interest at 6 per cent per annum, amounted to 2 cents per car-mile. The latter figure includes only 1 per cent for depreciation due to obsolescence, as it is considered that depreciation in general is a function of car-miles and that obsolesence is of relatively little importance.

It is, of course, quite likely that the cost of equipment maintenance per car-mile would be materially affected by change in schedule speed. The cost of painting per car-mile would be somewhat less, inasmuch as the condition of paint is a function of time rather than of mileage. On the other hand, it is likely that damage to car bodies from collisions would be substantially greater with the higher schedule speeds. On the whole, it may be said that the cost of equipment maintenance per car-mile will not be appreciably changed by an increase in schedule speed.

To what extent accident claims would be increased by higher speeds is problematical. Where increases in schedule speed are contemplated, this item should be given consideration. Examination of accident and traffic statistics for the Cleveland Railway over that period during which schedule speeds were increased fails to show any marked increase in accidents from this cause.

Fig. 1 shows graphically the relation between schedule speed and the cost of platform labor plus fixed charges on cars per car-mile.

There are many ways of increasing schedule speed. In any particular analysis the cost of putting into effect any one or several of these means of increasing speed must be deducted from the savings mentioned above. The more important of the many ways of increasing speed are the following:

1. Increase in rate of acceleration.
2. Increase in maximum speed.

3. Increase in rate of retardation.
4. More rapid loading and unloading.
5. Reduction in number of stops.
6. Elimination of delays due to street traffic.
7. Use of loops rather than switches and Y's, especially in congested districts.

The above will be considered in order.

In Fig. 2 are shown a number of speed-time graphs based upon actual tests made on the Euclid Avenue line of the Cleveland Railway system. They are shown one above the other so as to have a common base line of time. The total area under each of these graphs represents distance. Graphically, our problem is to increase this area as much as possible.

TABLE I

Statistics of Train Operation by Seventeen Companies

Name of Company	All Day-Train Operation as Well as Rush Hour	Make-up of Train	Seats per Motor Car	Seats per Trailer	Average Schedule Speed of Train in m.p.h. Rush Hour	Average Schedule Speed of Train in m.p.h. Non-rush Hour	Average Schedule Speed of Single Cars in m.p.h. Rush Hour	Average Schedule Speed of Single Cars in m.p.h. Non-rush Hour	Maximum Number of Trains Past Any Point per Hour per Track
Boston Elevated Railway	Yes	M. C. & T. M. U.	52; 56	62	9.92	9.92	9.92	9.92	102
All Brooklyn Surface Lines	Yes	M. C. & T. M. U.	48 M. U.-58 ea.	62	8.72	10.47	8.72	10.47	...
Capital Traction Company	*No	M. U.	48	48	8.50	8.50	8.50	8.50	...
Cincinnati Traction Company	Yes	‡M. C. & T.	35	60	8.40	.....	8.77	8.95	8
Cleveland Railway	Yes	M. C. & T.	56	60	10.28	10.91	10.30	10.82	35
Detroit United Railways	Some lines	M. C. & T.	43	56	10.25	10.25	10.25	10.25	63
Louisville Railway	*No	M. C. & T.	45	45	10.15	.....	10.15	10.15	10
Memphis Street Railway	†Yes	M. C. & T.	44	56	10.13	†10.36	10.36	10.80	17
Milwaukee Elec. Ry. & Lt. Co.	*No	‡M. C. & T. ‡M. U.	46-59; 59 52-52; 48	54-59; 59 46-54; 56	9.22	.....	9.22	9.75	...
Montreal Tramways Company	†Yes	‡M. C. & T. M. U.	42	45	8.59	9.40	8.59	9.46	30
New Orleans Ry. & Lt. Co.	Yes	M. C. & T.	44	62	9.02	12.03	8.07	9.06	10
New York State Railways, Rochester Lines	*No	M. C. & T.	48	52	8.40	.....	8.40	8.80	130
Omaha & Council Bluff Street Railway	*No	M. C. & T.	47	60	8.77	.....	8.77	10.50	8
Peoples Railway, Dayton, Ohio	*No	M. C. & 2T.	44	60 each	8.88	.....	9.00	9.00	...
Pittsburgh Railways	*No	M. C. & T.	42; 56	60	9.35	.....	9.35	9.42	35
Public Service Railway	*No	M. U.	50	50	8.75	.....	8.75	9.30	...
United Railways Company of St. Louis	Yes	M. C. & T.	57	68	10.08	10.54	10.08	10.54	12

* Operate during rush hour only.
† Operate on regular schedule Saturday and Sunday only.
‡ Motor car with trailer equipped with control apparatus.

M. C. & T.—Motor car and trailer.
M. U.—Multiple unit.

GETTING THE CARS UNDER WAY MORE QUICKLY

Acceleration may be increased in three ways, namely, improvement in line voltage, use of more powerful motor equipment and use of lighter cars.

To illustrate: The diagrams in Fig. 2 represent conditions at the rush hour in Cleveland, at which time line voltage is considerably lower than at other times and at which time trailers are used. To show the effect of increasing the voltage and taking off the trailers, the graph B' has been drawn and superimposed on B. Graph B' has been so laid out on this chart that the distances between stops, as represented under each cycle of the two graphs, are the same for B and B'. The braking rates are the same in the two cases.

From this chart it is found that the more rapid rate of acceleration represented in B' results in an increase in schedule speed from 9.92 m.p.h. to 10.59 m.p.h. The difference in voltage which was in part the cause of the more rapid acceleration in this case was 54 volts. The corresponding increase in speed represents a saving in platform and fixed charges of approximately 1.1 cents per car-mile.

Regarding the matter of weight, in the last few years some improvement has been effected in the design of street cars whereby the weight of the car is materially reduced for the same carrying capacity. This reduction in weight has been effected largely by a better distribution of steel and has amounted to as much as 15 per cent of the weight of the motor car.

One of the arguments in favor of the modern one-man car has been its greater rates of acceleration and braking, which have been possible on account of the light weight of the car per passenger carried. This last is especially true during the non-rush hours when cars are not loaded to capacity.

NOT MUCH CHANCE TO INCREASE MAXIMUM SPEED AND BRAKING RATE

It will be seen from the speed-time graphs in Fig. 2, which are based on average data for a number of runs, that cars do not reach the maximum possible speed. Under average conditions the motorman starts coasting and then applying the brakes before sufficient time has elapsed to permit such maximum possible speed to be attained. For this reason, under the traffic conditions which usually obtain in city streets, there is little to be gained by equipping cars for a maximum speed which is almost never reached.

Due to the high schedule speeds already in effect in

Cleveland, the rate of retardation represented by the speed-time graphs shown in Fig. 2 is very nearly the maximum obtainable, and presumably this is rather generally the case. Of course, the effect upon schedule speed of an increase in the rate of braking has already been indicated in the example of increased acceleration cited above. This effect upon schedule speed is precisely the same for the two cases.

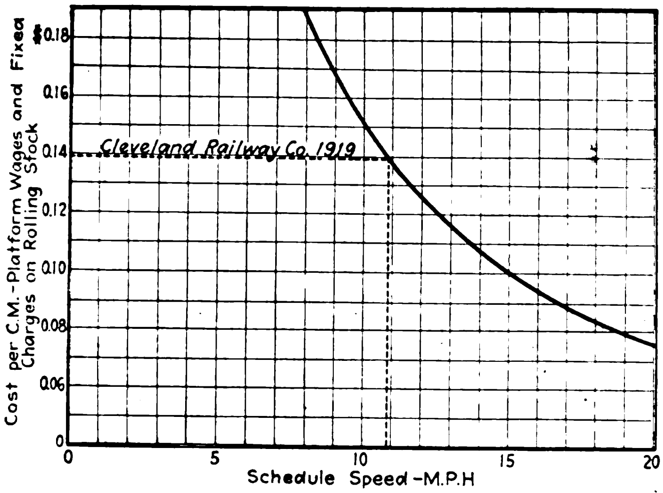


Fig. 1—Curve showing decrease in operating costs produced by increase in schedule speed

MORE RAPID LOADING AND UNLOADING IS IMPORTANT

The relative importance of rapid loading and unloading in its effect on schedule speed can readily be seen by referring to the diagrams in Fig. 2. The average length of stop on the Euclid Avenue line of the Cleveland Railway during the rush hour is 7.43 seconds in the congested district and 6.9 seconds in the non-congested district. Both of these figures are somewhat less than those which obtain in other cities where similar conditions exist.

In Cleveland a large amount of time has been saved by operating cars leaving the congested district as pay-leave cars and those coming toward the congested district as pay-enter cars. By this arrangement fares are collected in the outlying districts where people get on and off cars in relatively small numbers. A train comprising a center-entrance and center-exit motor car and similar trailer can be loaded with a total of 200 passengers in one minute by using the pay-leave system. This rate of loading is regularly accomplished on the Cleveland Railway system in the case of cars loading at the Public Square during the rush hour. On the cross-town lines where there is no single congested district, but instead are numerous points where heavy loading and unloading occur, the Peter Witt car and Peter Witt system of pay-as-you-pass is used. On these lines it has been found that this system is by all odds the most satisfactory and saves a great deal of time. In general, the more important methods of speeding up loading and unloading of passengers are as follows:

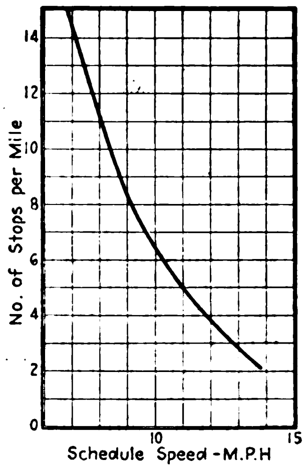


Fig. 3—Stops per mile plotted against schedule Speed

1. The pre-sale of tickets and tokens in a large number of conveniently located stores.
2. The pre-collection of fares by passing passengers through a gate or even by using a portable fare box and stand placed on the streets at the more congested loading points.
3. The use of tokens or tickets where the fare is an odd number of cents.
4. Various arrangements of loading stations, such as safety islands, platforms, the queue system, aisles, etc.
5. Various arrangements of car entrances, exits and location of fare box.

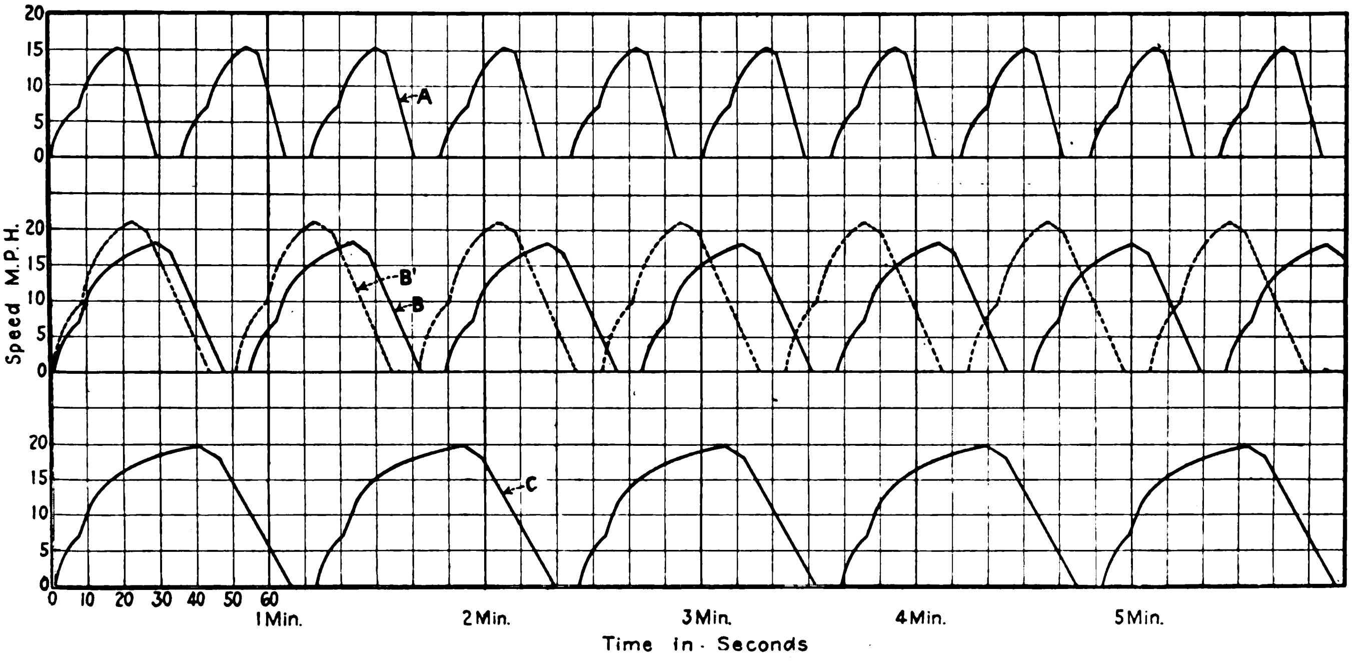
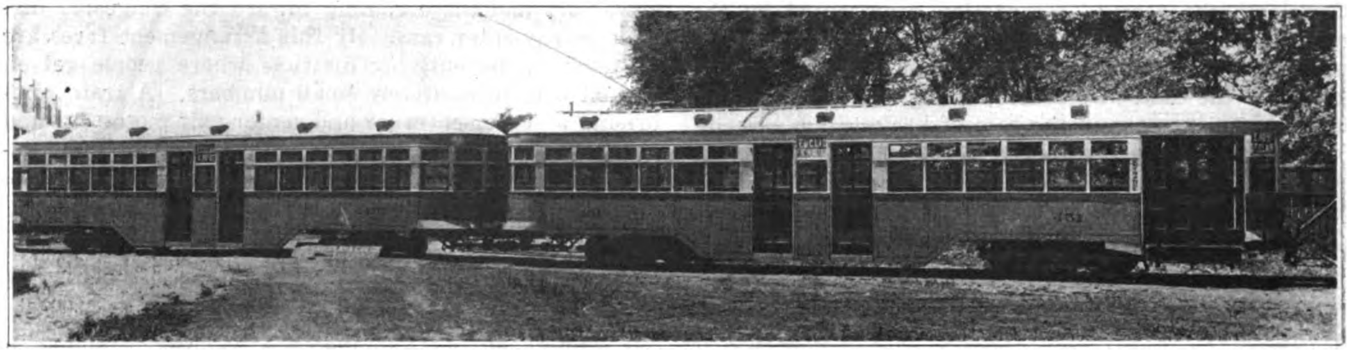


Fig. 2—Time-speed graphs for the determination of the relation of schedule speed and the frequency of stops



Latest type of train used by Cleveland Railway

It is difficult, in an article such as this, to generalize or to present specific data that will be of general value regarding the effectiveness of these several means of speeding up the loading and unloading of cars. Each depends upon local conditions.

The pre-sale of tokens and tickets in stores has been used to good effect in Baltimore. The pre-collection of fares by means of portable fare boxes and stands placed on the streets at the congested loading points is now being successfully used in Kansas City. The Cleveland Railway in certain cases is using the pre-collection system, notably during the hours of congested traffic at amusement parks and in certain factory districts.

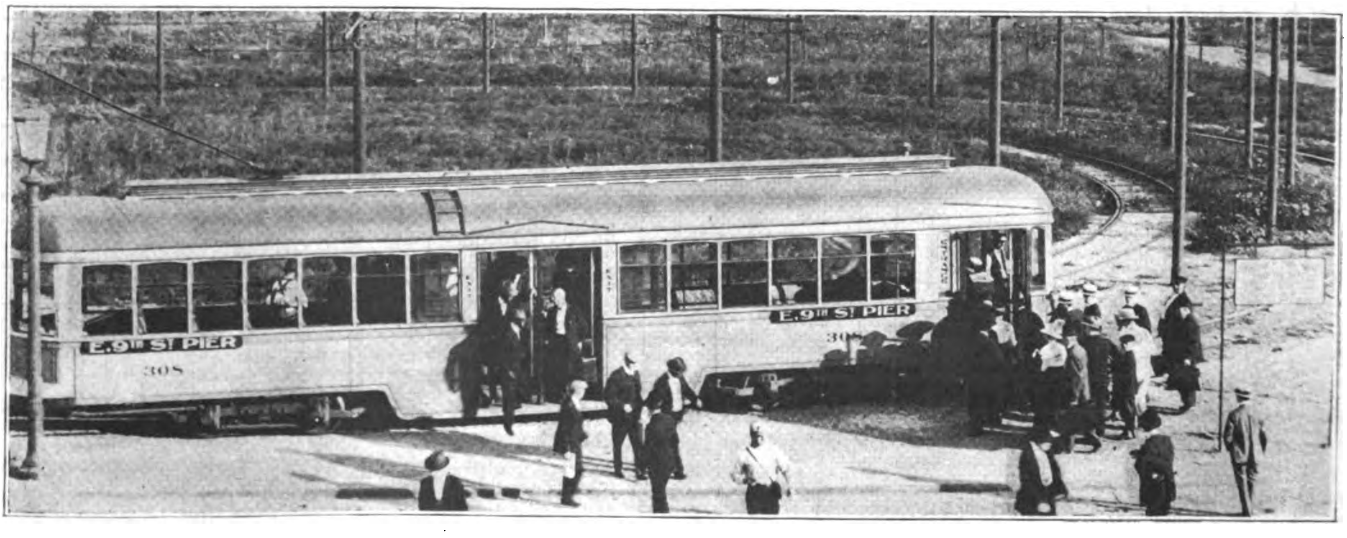
With regard to the arrangement of car entrances and exits, the writer believes that the Peter Witt car represents the last word. Cars of this type recently purchased by the Cleveland Railway are provided with a wide front entrance which permits the simultaneous loading of two streams of passengers. In these same cars a panel has been introduced between the center-exit doors, the fare box being placed between these doors. Passengers from the front half of the car are unloaded by the forward center exit door, paying as they pass the fare box. Passengers from the rear half of the car are unloaded by the rear center exit door. Passengers passing from the front to the rear of the car pay as they pass the fare box. These passengers are generally the long-ride passengers, and in this way the long ride and short ride passengers are kept separate, as is desirable.

Several years of experience with center-entrance, center-exit cars, in which there is a well in the center of the car opposite the doors, has developed many unsatisfactory features to this arrangement. It has been found that the well, with step leading to the forward and rear parts of the car, is the cause of much confusion around the doors and fare box. In this type of car accidents during boarding and alighting and those involving falling inside the car are double what they are for the Peter Witt type.

Graphs A, B, and C in Fig. 2 have been laid out with a view to showing the effect upon schedule speed of frequency of stops. In all three graphs the same acceleration rates have been used. Braking rates are somewhat greater in the case of graph A as compared with graph B, and in the case of graph B as compared with graph C. This must necessarily be the case inasmuch as the somewhat slower rate of braking must be used in braking from a higher maximum speed.

By comparing the areas under the three graphs, the relation shown in Fig. 3, between the number of stops per mile and schedule speed, has been determined for the particular conditions obtaining during the rush hour for a motor car with trailer on the Euclid Avenue line of the Cleveland Railway. It will be seen from the shape of this curve that the schedule speed is affected relatively more as the number of stops per car-mile is reduced. In other words, the slope of the curve is greater at the right. The reason for this is that where the number of stops is comparatively small, cars have more opportunity of reaching a high maximum speed.

By considering the curve of Fig. 3 in connection with the curve of Fig. 1 it may be seen that reduction in the number of stops per mile from eight to four will effect an increase in schedule speed from 9.2 m.p.h. to 11.8 m.p.h. and that this effects a saving of approximately



Older type of front-entrance, center-exit car loading and unloading

3.6 cents per car-mile in the cost of platform labor and fixed charges on rolling stock.

It is to be borne in mind that reduction in number of stops will to some extent decrease the number of short-distance rides.

It is probable that delays due to street traffic may be materially reduced in some cases by the rerouting of cars so as to use those thoroughfares where street traffic congestion is less. Notable results have been accomplished recently along these lines in Kansas City, where a very marked increase in schedule speed has been effected.

During the past winter, the making of good schedule speeds in Cleveland was seriously interfered with by vehicular traffic on the car tracks. After several of the heaviest snowstorms the city authorities were totally unable to clear even the main thoroughfares of snow. The railway company, however, did succeed in keeping its lines open and the space between its tracks continually cleared.

The result of this was that practically all vehicular traffic took to the car tracks, thereby delaying schedules. As was natural, blame for these delays was placed by the public upon the railway company. It is worth consideration that every effort be made to promote co-operation between city authorities and electric railway companies to the end that main thoroughfares throughout their entire width be cleared of snow. It is right and proper that every pressure be brought to bear upon city authorities to clean streets more expeditiously after snowstorms.

LOOPS HELP IN THE CONGESTED DISTRICTS

The Cleveland Railway has used with great success a system of loops in its downtown congested district. These loops are so arranged on the Public Square that there is no interference between cars of different lines. All cars coming into the Public Square by way of Euclid Avenue use a single loop. This loop is not used even in part by the cars which enter the square by any other street than Euclid Avenue. The same thing holds true of all the other streets leading into the Public Square. This system has been effective not merely in elminating delays due to interference between cars of different lines but also by greatly facilitating the loading of cars. Congestion in the downtown section of Cleveland has also been mitigated to some considerable extent by the looping back of cars at the edges of this district, and in this way the reduction of the number of cars actually entering the congested district has been achieved.

INCREASED POWER DUE TO INCREASED SCHEDULE SPEEDS NOT IMPORTANT

Nothing has been said in the foregoing with reference to the increased power required to increase acceleration and attain higher maximum speeds. The writer has no precise data with which to calculate these additional power requirements. It has been found that cars operated during the rush hour on somewhat slower schedule speeds use slightly less power than do these cars during the base schedule. This difference, however, is quite small. The cost of energy per car-mile is relatively a small part of the total cost of operation, not more than 7 or 8 per cent. For this reason it may be considered that additional power requirements for higher schedule speeds are practically negligible so far as cost is concerned.

EUCLID
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EUCLID
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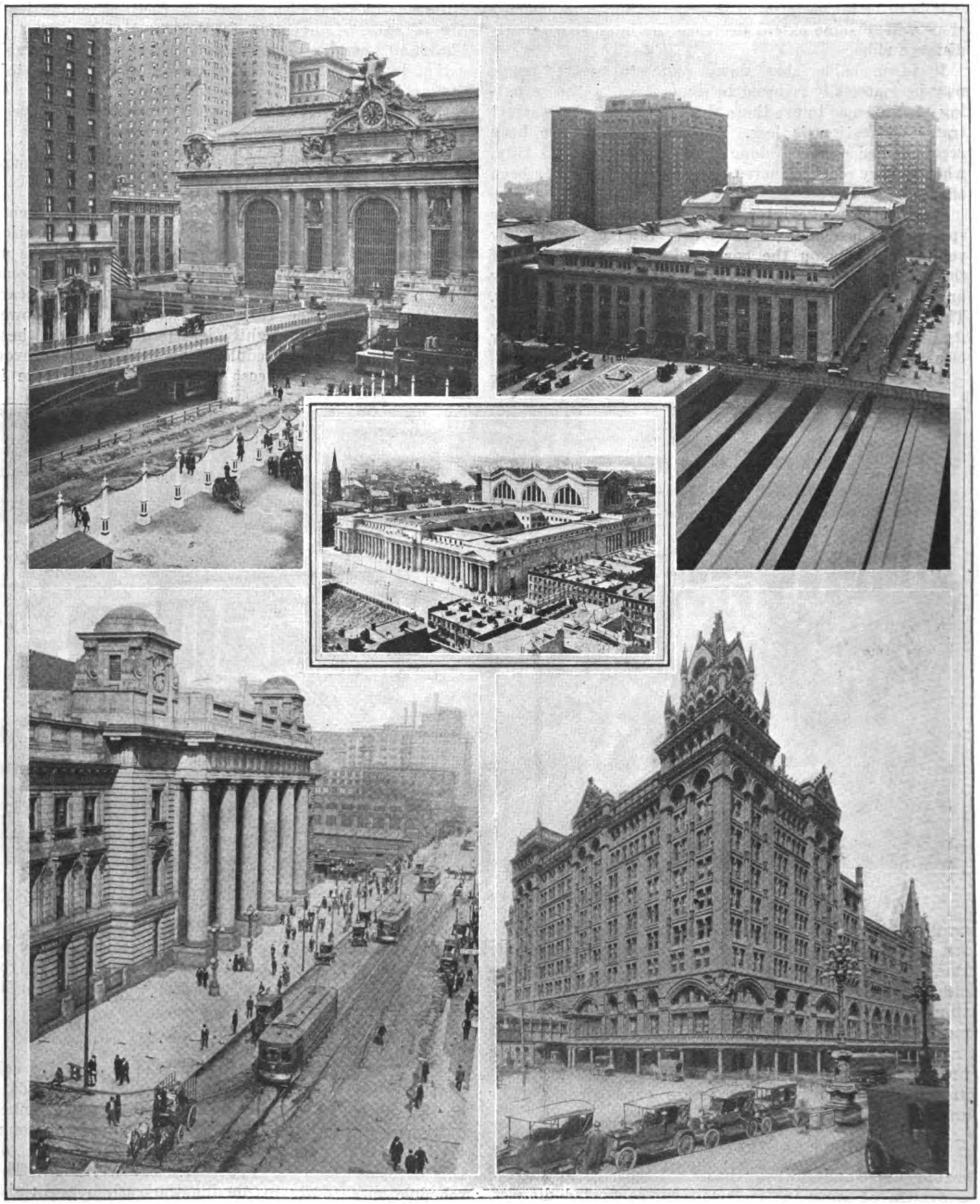
468

Train of new type in action, at Public Square, Cleveland

The ELECTRIC RAILWAY JOURNAL has recently collected by means of a questionnaire considerable data on the subject of train operation from a large number of representative street railways throughout the country. The figures brought out by a compilation of this data, as given on page 658, are interesting. The schedule speed of trains during the rush hour in sixteen cities varies, the minimum being 8.40 m.p.h. and the maximum 10.28 m.p.h. So far as the effect of the use of trailers upon schedule speed is concerned, it is probable that the above figures indicate very little, inasmuch as traffic conditions in the streets during the rush hour are much more of a limiting factor than is the use of trailer cars.

Four great railroad terminals handling congested suburban traffic



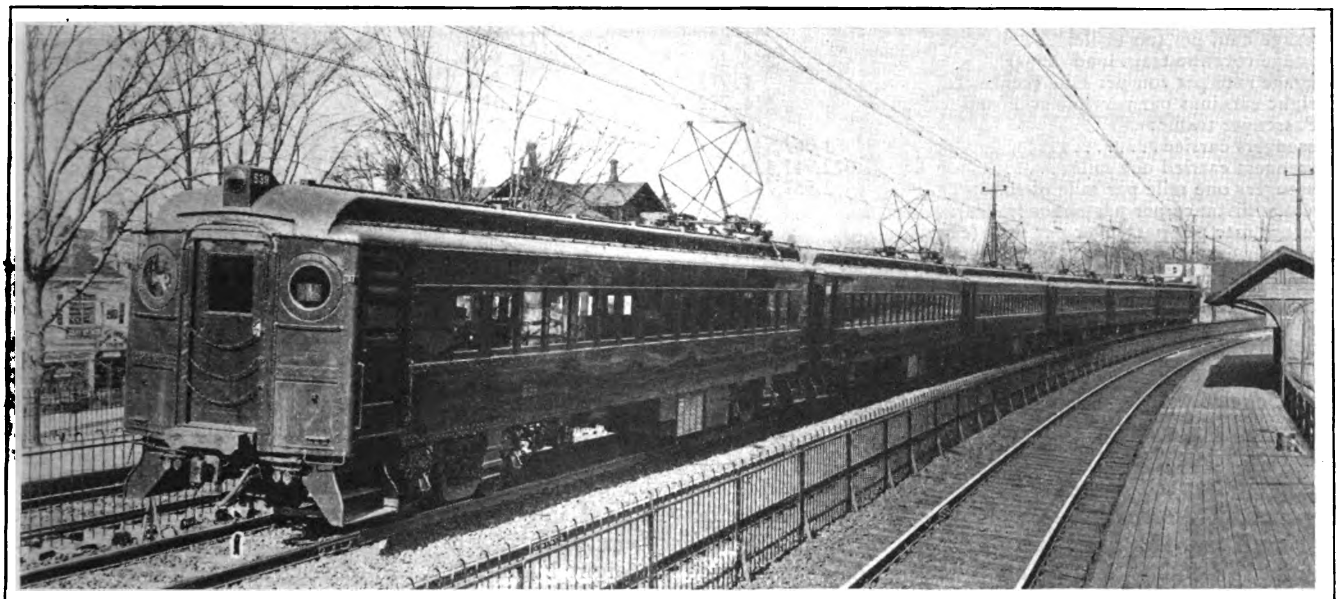
Top—Grand Central Terminal, New York Central Railroad, New York City. At left—The south façade showing the viaduct, located in the center of Park Avenue and crossing over Forty-second Street, by means of which street traffic is shunted around the station away from the narrow adjacent streets. At right—A general view of Grand Central Terminal from the north. In center—Bird's-eye view of the Pennsylvania Railroad Station, New York City, the New York terminal of the Long Island Railroad. This view was taken from the Seventh Avenue side before the erection of the Pennsylvania Hotel, which would now occupy the foreground of picture. Bottom, at left—Front of Chicago & Northwestern Railway Station, Chicago, Ill. At right—Broad Street Station, Pennsylvania Railroad, in Philadelphia.

Experience and practice of Long Island Railroad are covered in detail and data for other roads which are handling dense suburban traffic are given

Handling Suburban Traffic at Congested Centers

By C. Francis Harding

Head of School of Electrical Engineering, Purdue University



Suburban train, Philadelphia-Paoli electrification, Pennsylvania Railroad

THE rapid growth in population of the large cities of this country during the past few years has imposed difficult problems upon the railways which serve the communities around these centers. The methods developed for transporting large numbers of people within restricted periods of time are therefore appropriate subjects for consideration in this special issue devoted to "mass transportation."

In order to render the topic as tangible as possible the Long Island Railroad, which serves a considerable part of New York's suburban population, has been made the basis of the main part of this study. This road was one of the pioneers in electrification and its business is largely made up of suburban passenger traffic. Table I is reproduced to illustrate the characteristic features of the Long Island's traffic by comparison with three other roads which also have large suburban business. In addition data have been compiled as to the situation on the Pennsylvania's Philadelphia terminal, the New York Central's New York terminal, the Illinois Central's and Chicago & Northwestern's Chicago terminals and the New Haven's Boston and New York terminals.

CONDITIONS IN AND AROUND NEW YORK

Taking up first the New York region in general and the Long Island's territory in particular, it is safe to say that new homes, which are both comfortable and convenient, have been made available for 1,000,000 residents of New York as a result of the well-planned development of the electric railroads in that vicinity. Fifteen years ago the New York business man was obliged to travel the length of Manhattan Island in order to reach his home in reasonable time. The rapid-transit system in use and proposed at that time provided little opportunity for the resident of Brooklyn or Queens to get to his office promptly and in comfort. Yet in spite of this fact there were to be found within twenty minutes' ride of Wall Street some of the most attractive residential districts that any city could desire. The "airplane" view on page 669 indicates very clearly the undeveloped possibilities of this section.

Progressive railway officials, generously provided with imagination and foresight, have built up during the intervening period a most extensive network of electrified high-speed railroads. These have resulted in enormously increased passenger and freight traffic, and indirectly have developed very greatly the residential and industrial possibilities of the entire district immediately east of the business center of New York City.

The argument, often presented with less concrete evidence for its support, that passenger and freight traffic and finally increased population follow the development of adequate, rapid and comfortable railway service is forcefully emphasized in the case of the Long Island Railroad in the Borough of Queens in particular.

The number of passengers carried by the Long Island Railroad has increased during the past fifteen years from 18,199,000 to 64,067,000 per annum, a ratio of 353 per cent. Of this present passenger traffic, which rep-

TABLE I

Traffic Data for Four Roads for 1919
Reproduced to Illustrate Characteristics of Long Island Railroad's Traffic*

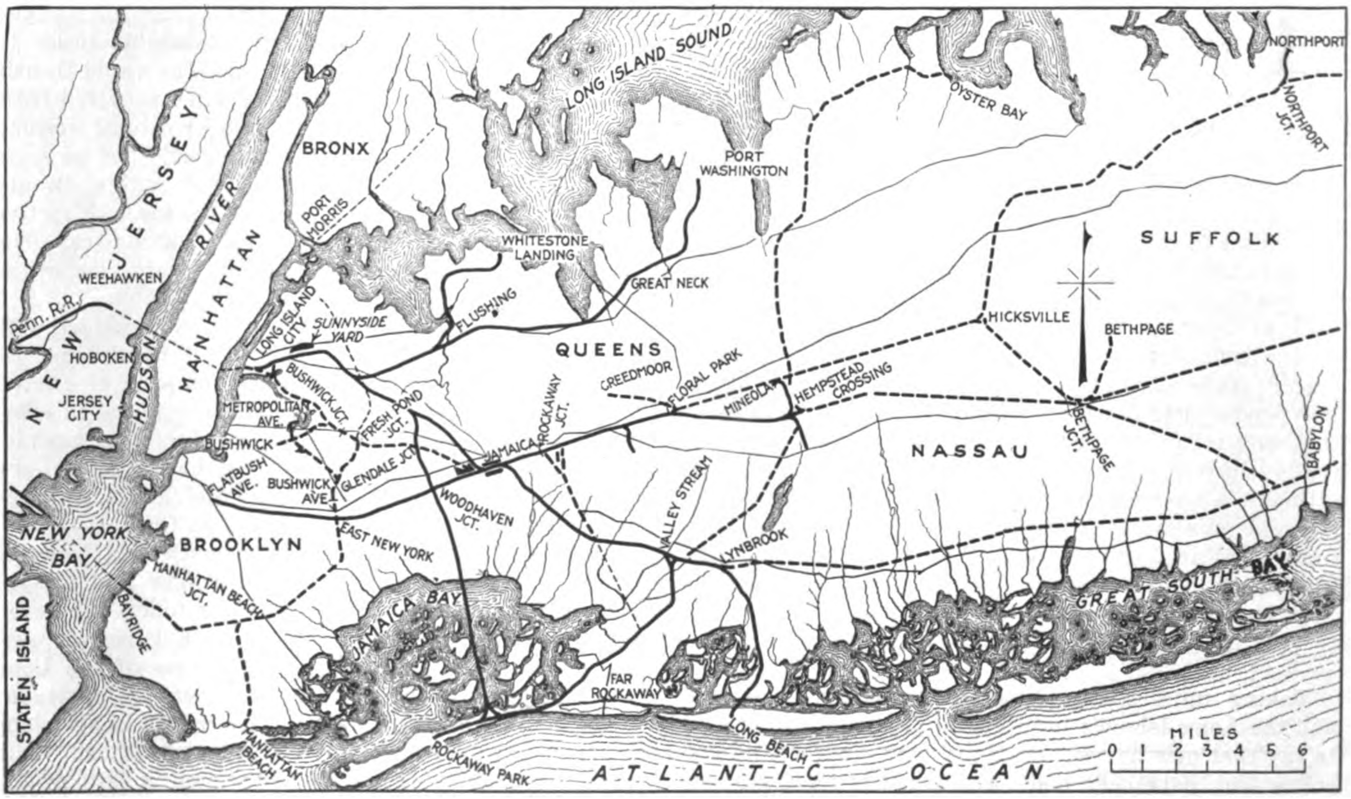
	Long Island R.R.	N.Y., N.H. & Hartford R.R.	N. Y. Central R.R.	Illinois Central R.R.
Mileage operated	398.38	1,965.76	6,040	4,793.22
Train mileage:				
Freight train-miles	410,035	5,896,941	25,870,044	15,169,784
Passenger train-miles	6,061,233	14,153,385	32,656,740	13,613,502
Mixed train-miles	6,886	79,604	277,746	218,764
Special train-miles	24,060	8,344	14,569	45,508
Freight traffic:				
Revenue freight moved (tons)	5,912,833	27,873,747	99,208,314	38,245,714
Revenue freight one mile (tons)	127,868,238	3,169,098,542	21,567,568,497	9,994,435,480
Revenue tons one mile per mile of road	320,971	1,586,451	3,568,798	2,085,119
Average haul per ton (miles)	21.63	111.44	217	261.32
Average revenue train load (tons)	295.26	504.39	824	649.47
Average rate per ton per mile (cents)	4.915	1.557	0.87	0.715
Freight earnings per revenue train-mile	$14.772	$8.01	$7.20	$4.645
Passenger traffic:				
Passengers carried	64,067,541	100,938,578	67,594,465	31,002,734
Passengers carried one mile	1,022,941,429	2,023,988,204	3,376,508,355	946,075,908
Passengers one mile per mile of road	2,567,753	1,063,678	615,014	197,378
Average distance per passenger (miles)	15.97	20.05	49.95	30.52
Average rate per passenger per mile (cents)	1.526	2.212	2.527	2.529
Passenger earnings per revenue train-mile	$2.575	$3.64	$3.23	$1.730

*Compiled by Poor's Publishing Company.

resents 70 per cent of the total business of this railroad, 367,057 passengers are riding on monthly commutation tickets. As a parallel to this, freight tonnage has increased since 1905 at a corresponding rate, as indicated in Fig. 1.

During the last decade, however, the population of the Borough of Queens, directly east of the business center of New York, has increased 64.5 per cent, while that of Manhattan itself has actually decreased, as indicated by the last census. The combined population of Brooklyn and Queens, after an increase of 30 per cent, is now approximately 2,500,000, which is in excess of that of Manhattan. Chicago, Detroit and Philadelphia only, of all the cities of the country, exceeded the Borough of Queens during the year 1919 in plans and cost estimates filed for new buildings and additions. Of the $46,000,000 proposed for building construction in this borough during the year, more than 60 per cent is to be expended for homes. The diagram reproduced in Fig. 1 indicates in a very striking manner the relation between growth of population and passenger and freight business in the district affected.

This railroad had the honor of being one of the first steam railroads in the United States, having been incorporated in April, 1834. The original railroad was constructed from the village of Greenport, L. I., to the


LONG ISLAND SOUND
NORTHPORT
NORTHPORT JCT.
OYSTER BAY
BRONX
PORT WASHINGTON
NEW JERSEY
HUDSON
RIVER
MANHATTAN
PORT MORRIS
WHITESTONE LANDING
SUFFOLK
WEEHAWKEN
GREAT NECK
Penn. R.R.
HOBOKEN
LONG ISLAND CITY
SUNNYSIDE YARD
FLUSHING
QUEENS
HICKSVILLE
BETHPAGE
JERSEY CITY
BUSHWICK JCT.
CREEDMOOR
FLORAL PARK
MINEOLA
HEMPSTEAD CROSSING
METROPOLITAN AVE.
FRESH POND JCT.
ROCKAWAY JCT.
BETHPAGE JCT.
BUSHWICK
JAMAICA
NASSAU
BABYLON
FLATBUSH AVE.
BUSHWICK AVE.
GLENDALE JCT.
VALLEY STREAM
WOODHAVEN JCT.
NEW YORK BAY
BROOKLYN
EAST NEW YORK
LYNBROOK
MANHATTAN BEACH JCT.
BAYRIDGE
JAMAICA BAY
GREAT SOUTH BAY
STATEN ISLAND
FAR ROCKAWAY
MANHATTAN BEACH
ROCKAWAY PARK
LONG BEACH
ATLANTIC OCEAN
MILES
0 1 2 3 4 5 6

Electrified and steam zones on the Long Island Railroad. Solid lines show electrified track; dotted heavy lines, steam-operated railway

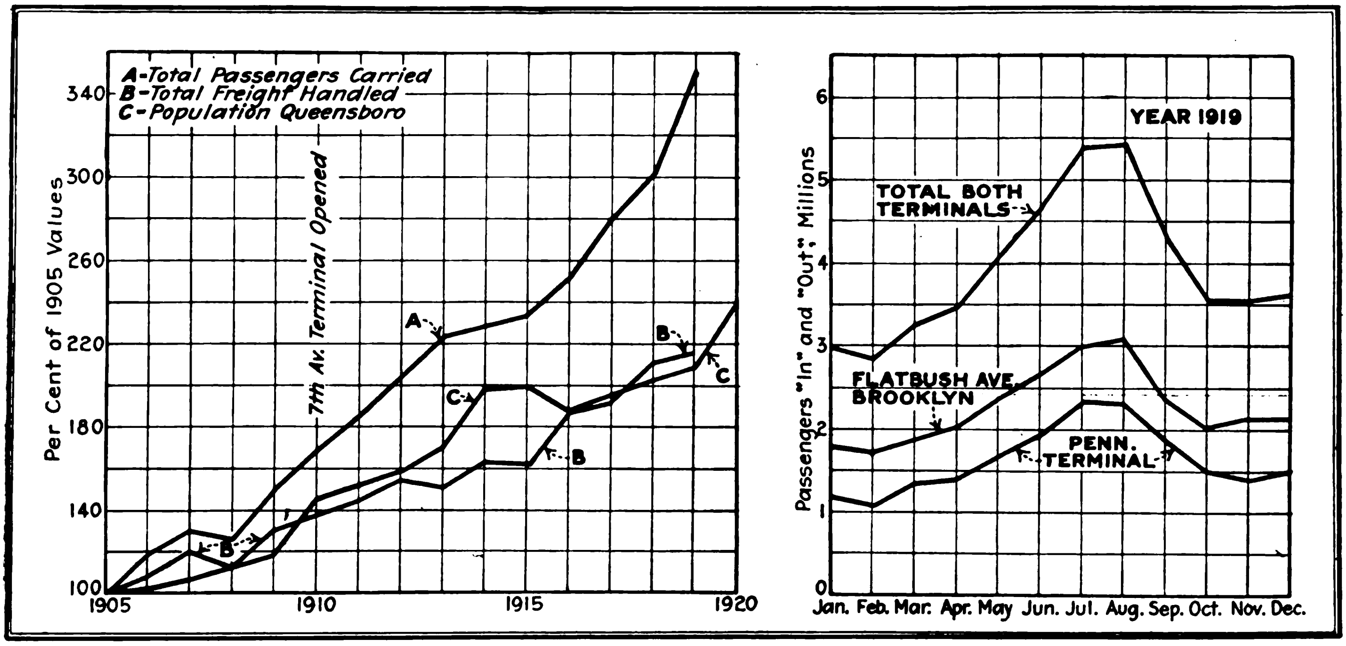


Fig 1—Increased population usually results from adequate passenger service. Fig. 2—Passengers "in" and "out" of terminals, Long Island Railroad, 1919

water's edge in the village of Brooklyn in order to connect with the steamboats at the former town. Thus a through line of transportation was established from New York to Boston. Long Island City and Jamaica, always important business centers upon Long Island, were connected in 1860, while Far Rockaway Beach was included in the system as early as 1873.

Control of the Long Island Railroad, greatly enlarged but still operated entirely by steam, was purchased by the Pennsylvania Railroad in 1901, and the road was electrically equipped at the time of the electrification of the Pennsylvania's New York terminal.

Aside from the vast residential and industrial areas in close proximity to a great city which are tapped by this system, enormous freight and passenger car storage yards, so necessary at the waterfront terminus of a transcontinental system, were provided thereby. The famous Sunnyside Yard at Long Island City, indicated upon the accompanying map, which comprises 190 acres, has a capacity of 2,000 cars with 73 miles of track. A loop, possibly of greater value for freight than passenger service, will be noted extending from Long Island City through Fresh Pond, East New York and Manhattan Beach Junction to the Bay Ridge

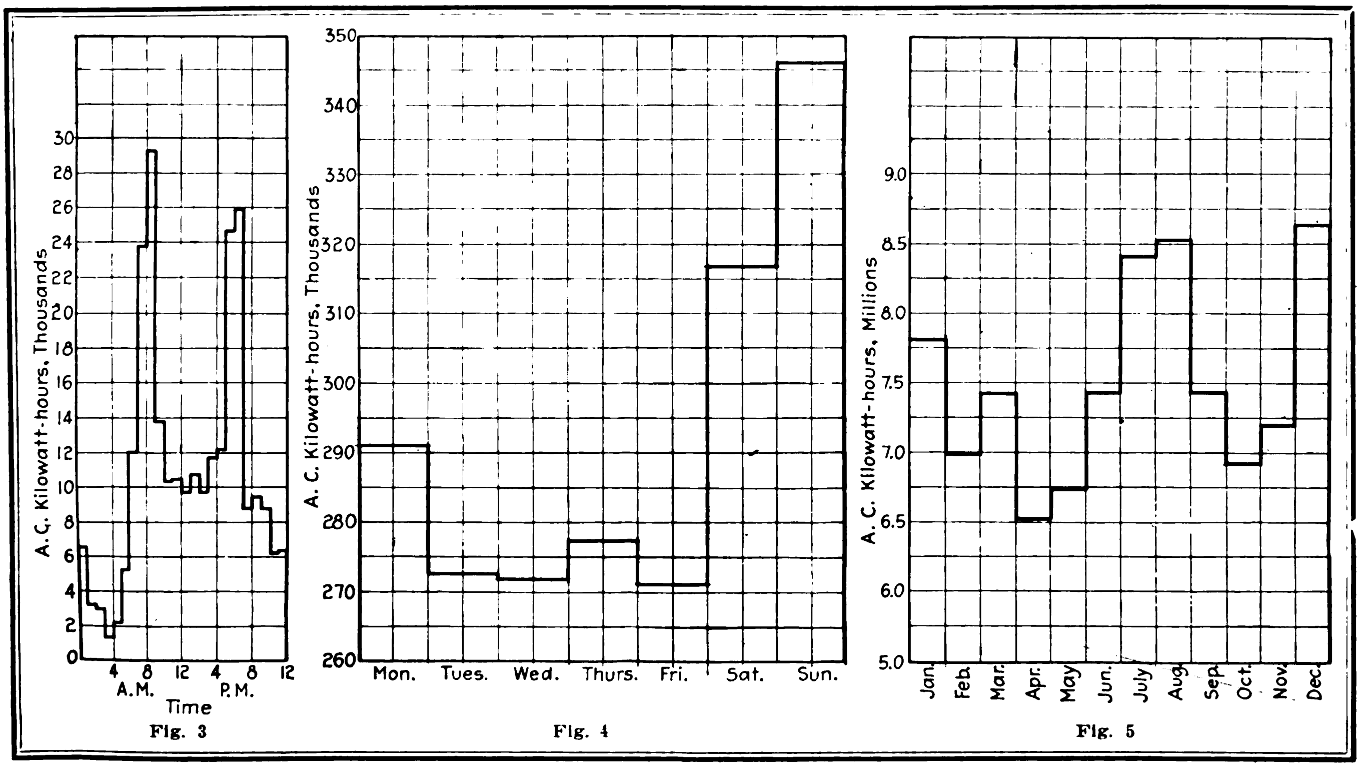
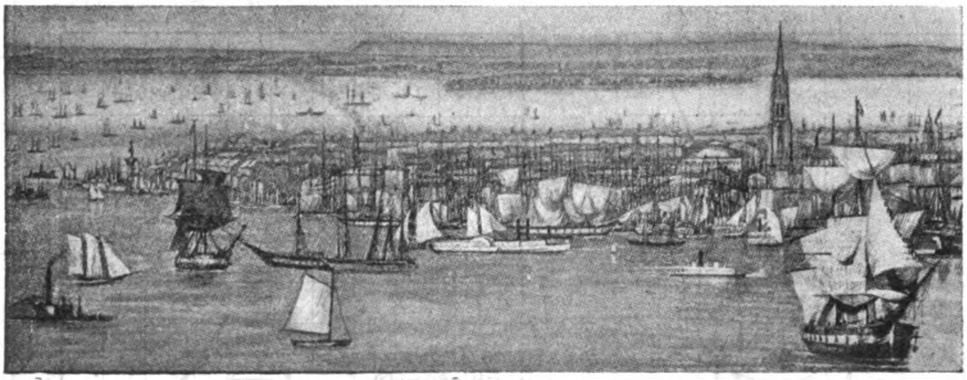


Fig. 3

Fig. 4

Fig. 5

Energy Demands on Long Island Railroad. Fig. 3—Typical hourly load, summer schedule, July 15, 1920. Fig. 4—Typical daily load, summer schedule, year 1920. Fig. 5—Monthly load, year 1919



The Battery in 1855

wharves, from which point the Pennsylvania Railroad ferry makes connection with the New Jersey docks. Furthermore, the tracks of the Long Island Railroad connect with all the important points of access to "Nature's great playground," as Long Island has often been called. Four hundred miles of shore line on ocean, sound and bays, not to mention the many fresh-water lakes on the island, attract thousands of summer resort tourists. On Sunday, July 4, this year, the road exceeded all previous records, when it transported 20,000 passengers to Rockaway Beach from New York City, 15,000 from Brooklyn and 25,000 from East New York and other points on the Atlantic division. Thus a total of 60,000 pleasure-seeking passengers were successfully handled to one beach only with a prearranged schedule upon a single day.

EARLY RESULTS OF ELECTRIFICATION

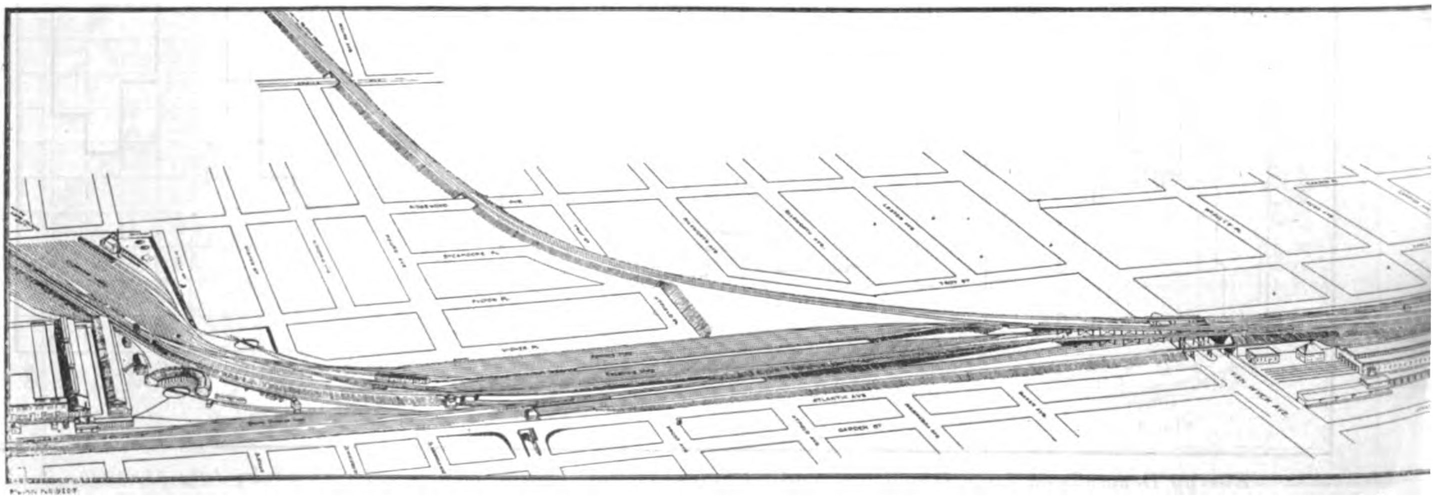
Soon after the acquisition by the Pennsylvania Railroad, the Long Island Railroad found it desirable to improve its connections between Queens and Brooklyn. This development between the Jamaica and Flatbush terminals involved a great deal of grade crossing elimination and tunnel construction, which led primarily to the first electrification, inaugurated July 26, 1905. The successful and economical results of such operation over 70 miles of track brought about the change to electricity, between 1905 and 1910, of practically all the lines within a radius of 25 miles of New York City. The cost of this operation was found to be sufficiently below that of steam practice to pay fixed charges and provide a surplus in addition. Figures quoted by George Gibbs, chief engineer of the Pennsylvania Terminal & Tunnel Company, in the ELECTRIC RAILWAY JOURNAL, March 28, 1910, page 534, indicated a reduction in cost as compared with steam operation from 27.95 cents to 17.8 cents per car-mile. This saving was 1.94 cents per car-mile greater than that obtained upon the West Jersey & Seashore Railroad, probably because of the difference in type of traffic handled by the two roads. The cars used at that time were small ones of the subway type operated from a third-rail supply at 600 volts, direct current, to make them interchangeable with those of the Manhattan subway. As early as 1901 plans were being laid for an electrified terminal in Manhattan for the Pennsylvania and Long Island. The following, quoted from the official plans, in the *Street Railway Journal*, Dec. 21, 1901, is significant:

> After years of exhaustive study the conclusion has been reached that a terminal line, operated by electricity, is in every way the most practical, economical, and the best, both for the interests of the railroad company and of the city . . . As the railroad will be wholly underground and operated electrically . . . it will not be objectionable in any way. There will not be any smoke, dirt or noise, and as all the surface property may be built upon after being utilized underneath for railroad purposes the neighborhood of the station will be improved instead of marred, as is often the case when railroad lines are constructed on the surface or elevated.

TABLE II

Passengers Carried In and Out of Terminals, Long Island Railroad

	Pennsylvania Station	Flatbush Avenue, Brooklyn	Total on Road
1910	1,417,903 (4 mos.)	13,455,991	30,978,615
1911	6,219,859	14,094,003	33,867,228
1912	7,732,184	15,772,402	37,319,812
1913	9,629,026	17,501,524	40,606,183
1914	11,031,845	18,064,729	41,634,223
1915	11,807,512	18,135,150	42,629,325
1916	13,224,258	19,666,344	45,802,722
1917	14,459,259	23,118,805	50,796,028
1918	15,595,142	23,824,123	55,004,086
1919	19,843,245	27,544,000	64,067,541



Track elevation and other improvements,

The Battery in 1920

Steel, multiple-unit trains were, as a result of this decision, operated through tunnels under the East River to the Pennsylvania Station on Sept. 8, 1910.

During the first ten months of such operation an increase of 92 per cent in the number of passengers carried on the Long Island Railroad was experienced, while the corresponding figure on the Pennsylvania Railroad was 31 per cent. The growth since that time is clearly indicated in Table II. The variation in traffic during the successive months of 1919 is plotted in Fig. 2. An inspection of these graphs will show, in a striking manner, the peak load encountered during the summer upon this railroad due to the heavy traffic to the summer resorts on Long Island.

Passenger receipts on the former road were found to be 160 per cent greater after electrification. In 1911, according to George Gibbs*, the operation of 8,600,000 car-miles over 152 miles of electrified track of the Long Island Railroad was accomplished at a cost of 24.2 cents per car-mile, including depreciation. A car-mileage of double that previously maintained was found to be possible, with decreased failures. The train-mileage between failures had been tripled during this period as a result of electrical operation. Where electric locomotives were used the cost of their operation per mile was, at that time, 5.91 cents, as compared with 8.83 cents for steam locomotives on the New Jersey division and 11.9 cents on the entire Pennsylvania system.

TRANSFER PROBLEMS SOLVED

The next problem to be confronted in planning the transportation of large masses of people into and out of this large city terminal was that of a central transfer point for distribution over Long Island. Sixteen trains per day, carrying a relatively small group of through passengers for Montauk and other eastern sections of the island where the road has not been electrified, are transferred from electric to steam locomotives at Long Island City soon after they leave the river tunnels. This is not, however, the logical center of distribution for the bulk of the traffic leaving the Pennsylvania Terminal for Long Island. Jamaica, which has been for a long time the hub of the island, was naturally selected for such a transfer station. Most of the passengers from New York City, therefore, change cars at this station.

The concentration of so much traffic upon the tracks centering in this locality, in which the grade crossings had not been abolished, brought up the problem of track elevation and the erection of a rather elaborate transfer station as early as 1903. This has been particularly well worked out in accordance with the perspective drawing reproduced herewith. The Jamaica station, shown in the cut on page 670, as operated since March, 1912, is remarkably well adapted to the severe service to which it is subjected. Three through tracks in each direction are provided, with concrete platforms at the level of the car floor. Two tracks with separate platforms take care of the local traffic. In addition, one run-around track is provided in each direction for the through non-stop passenger and freight trains. Certain tracks are very definitely assigned to regular routes and permanently marked with signs which prove a great convenience to the traveling public in locating the train desired. A number of guide signs in-

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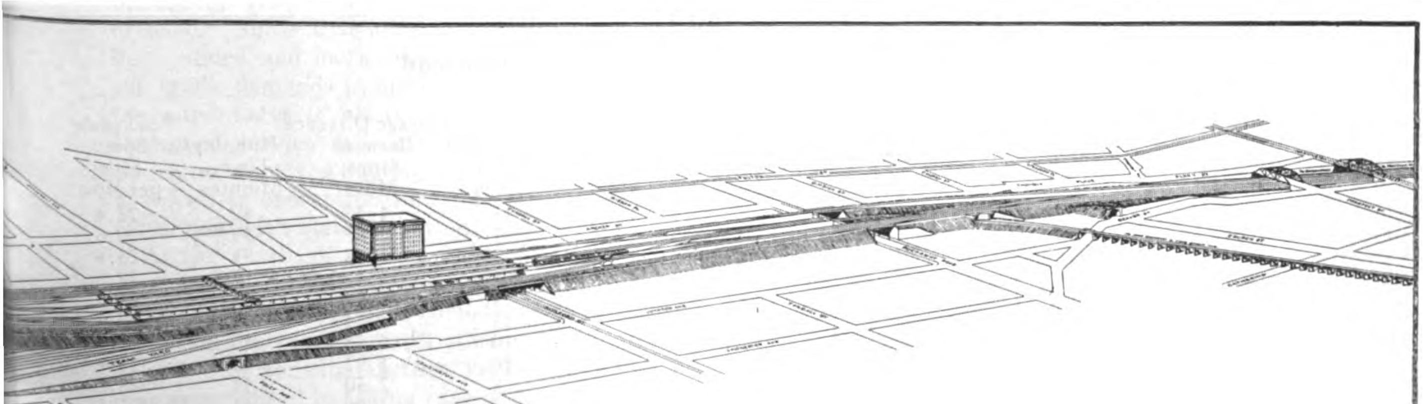
*ELECTRIC RAILWAY JOURNAL, March 23, 1912, page 463.



Long Island Railroad, Jamaica, N. Y.

dicate the destination of each particular train are displayed by station attendants previous to the departure of the train. As a result of the careful location of platforms between trains involving the transfer of many passengers, and the detailed direction signs provided, thousands of such transfers are readily made each day with no difficulty.

Forty-one west-bound trains, averaging seven cars each, pass through this station daily during the period between 8 and 9 a.m. Personal observation on the Fourth of July by a disinterested passenger, who had occasion to make several transfers at this point, proved conclusively that adequate provision had been made for the comfortable and prompt handling of very large crowds. Upon this particular week-end, including the holiday, all previous records of passenger transportation were exceeded, with a total number of 1,569,800 passengers handled.

TABLE III

Holiday Traffic on Long Island Railroad

	1915	1916	1917	1918	1919	1920
Passenger-train movements	5,015	5,361	4,897	4,857	5,179	5,470
Passenger-car movements	24,773	27,321	24,094	26,519	30,674	31,054
Baggage-car movements	1,369	1,508	1,382	1,342	1,481	1,353
Freight and work-train movements	374	411	356	368	382	392
Freight-car movements	7,939	8,986	8,124	8,386	7,821	8,651
Passengers carried	917,917	1,029,721	1,023,265	1,121,560	1,433,600	1,569,800
Carloads of express and baggage	780	1,077	977	874	894	916

Table III sets forth some interesting figures for five-day holiday week-end periods for this and previous years.

Although these crowds have been successfully handled thus far by using every available car and by carefully planning the extra schedules in advance, the margin of cars available for inspection and repair is too small for conservative operation. The Long Island Railroad operates 394.56 miles of road, of which 85.69 is electrified. The total track mileage is 964.48, of which approximately 220 miles of track is operated by electricity. A total of only 558 multiple-unit cars are available at present for this service, of which 424 are large motor cars, Type-M-P-54; ninety-one are trailers, and 134 are of the small M-P-41 type, used in the Brooklyn service, which are not interchangeable with the trailers. The regular morning-hour rush requires 406 large and 122 small cars, leaving margins of but 4½ and 9 per cent respectively for inspection and repair. It is estimated that the railroad is at least 150 cars short in its electrified zone. Of these, seventy are on order, with promise of possible delivery this fall. An adequate supply of cars cannot be provided until additional funds are available.

TRAIN SCHEDULES MAINTAINED WITH GOOD RECORDS

All trains are operated in accordance with a predetermined semi-annual printed time schedule. This is prepared to meet the traffic demands as nearly as possible as a result of a study made of the performance of similar periods during past years, combined with the growth of traffic during the years in question. Changes are made usually about the middle of May and October. Additional trains are necessary during the summer months to handle the excess traffic of that season. This excess is evident from Fig. 2. With the schedule once established, the variations in daily and hourly loads are provided for by the operation of more or fewer cars per train.

In order to take care of the extraordinarily heavy beach travel on Sundays during the summer months, the Sunday time-table is changed about the last week in June. The revised schedule continues in effect until the first or second Sunday following Labor Day, with the provision, of course, for many additional trains.

Tables IV to VI show the various runs and operating conditions upon the electrified section of the Long Island Railroad.

The number of employees assigned to a train is based primarily upon standard railroad practice, but owing to the short hauls and numerous stops upon this system additional collectors are necessarily added to the regular crews in accordance with the number of cars in the train. This varies on different divisions of the road and is somewhat affected by the class of travel handled. These extra trainmen work regularly on certain trains and have regular runs assigned to them.

TABLE IV

Typical Runs—Electric Service, Long Island Railroad

Terminals of Run		Express or Local	Length of Run, Miles	Number of Stops	Average Distance Between Stops, Miles	Running Time, Minutes	Schedule Speed, Miles per Hour
Pennsylvania Station	Port Washington	Local	19.9	15	1.33	49	22.4
Pennsylvania Station	Port Washington	Express	19.9	7	2.85	39	30.6
Pennsylvania Station	Whitestone Landing	Local	13.3	9	1.48	31	25.8
Pennsylvania Station	Jamaica	Express	11.3	1	11.3	17	39.9
Pennsylvania Station	Long Beach	Express	24.6	1	24.6	36	41.0
Pennsylvania Station	Long Beach	Local	24.6	15	1.64	52	28.4
Pennsylvania Station via Ozone Park	Valley Stream	Express	25.8	10	2.58	50	31.0
Pennsylvania Station	Rockaway Park	Local	19.2	10	1.92	42	27.4
Flatbush Avenue	Hempstead	Express	20.0	8	2.50	42	28.6
Flatbush Avenue	Rockaway Park	Local	15.9	15	1.06	41	23.3
Flatbush Avenue via Ozone Park	Valley Stream	Express	22.5	13	1.73	50	27.0
Flatbush Avenue	Jamaica	Express	9.3	3	3.10	17	32.8
Flatbush Avenue	Queens	Local	13.2	16	0.83	39	20.3

The nature of the hours of employment on the Long Island Railroad is governed entirely by the agreements with the various brotherhoods generally in effect upon standard railroads. It is often difficult to plan an effective employees' schedule in accordance with such agreements which will at the same time meet the demands of morning and evening peak loads of traffic. The trainmen are paid upon a combined hourly and mileage basis. This involves either a 140 or a 100-mile run in a standard eight-hour day as a basis for ten hours' normal pay. In many cases this work must be made up of two four-hour shifts, one in the morning and the other during the evening rush period.

ELECTRIFICATION OF TERMINALS MAKES ITSELF FELT IN IMPROVED SERVICE

It is difficult to draw any comparison between electric and steam operation, so far as the numbers of employees or employee-hours are concerned. When the electric service was first inaugurated upon the Long Island Railroad the schedule speed of trains was materially increased and the time required for setting trains and departing from the terminals was considerably decreased. Since that date many suburban stops have been added and more trains operated in proportion to the traffic demands in order to give better service. Thus the advantages of electric traction show themselves in improved service rather than in a reduction of train-hours or employee-hours. It would be quite impossible, however, to operate present schedules in and out of the terminals with steam traction.

BROOKLYN
ISLAND
EAST RIVER
MANHATTAN

Courtesy of Wm. D. Bloodgood & Co., Inc., Real Estate, Long Island City

"Airplane" view of Long Island, looking east from Manhattan

At the Flatbush Avenue terminal of the Long Island Railroad in Brooklyn twenty-six trains per hour are handled during the rush period upon six tracks. Contrast this procedure with steam traffic at the Long Island City terminal fifteen years ago, when difficulty was experienced in taking care of from fifteen to twenty trains per hour on sixteen tracks.

In the Pennsylvania Station, New York, the Long Island Railroad uses regularly six or seven tracks for departing trains and has the use of any and all tracks for incoming trains. Occasionally during the rush hours one or two tracks of the Pennsylvania Railroad are used in addition. Yet with this limited number of tracks, between 8.01 and 9 a.m. thirty-two west-bound trains were scheduled to arrive and ten east-bound trains to leave. Between 5.02 and 6.01 p.m. twenty-seven east-bound trains leave and nine west-bound trains arrive.

It is interesting to compare this with conditions at the London terminal of the Great Eastern Railroad, which probably handles the largest number of steam trains in a stub-end terminal. There forty trains per hour have been operated with six tracks. This system, however, has a provision for shunting the steam locomotives around the stub-end terminal tracks, thus greatly increasing the number of locomotive-hours available for active duty.

Disinterested inspection of the trains on the Fourth of July by a representative of the ELECTRIC RAILWAY JOURNAL indicated that very few passengers were standing in the cars in spite of the tremendous crowds that were traveling. Extra ticket booths, placed in the waiting rooms for the sale of tickets to the beaches, where traffic was particularly heavy, in addition to the twelve ticket windows, making twenty-one positions in all, had been established to relieve the congestion and keep the passengers in a favorable state of mind. Such little points as these have their marked psychological effect upon the riding public and yet involve little additional cost and trouble.

Cars on this road are inspected every ten days. The mileage basis of inspection has been discarded in favor of the time method. At present forty-nine cars per day are being handled by the two inspection shops. This process of repair and maintenance was described in detail in the ELECTRIC RAILWAY JOURNAL, June 5, 1920, page 1136. In addition, inspectors are employed between 1 and 9 a.m. at the various yards, where cars are stored for the night. This procedure takes care of minor repairs, such as brakeshoe changes, adjustments, etc. Groups of cars, numbering from thirty-five to eighty-five, are available for such inspection at five different yards located at various points upon the system.

POWER CONSUMPTION AND OPERATING COSTS

Considerable improvement has been made lately by the Long Island Railroad in energy consumption in regular operation. Table VII indicates the fact that whereas the electric motor car-mileage increased in 1919 over 1918 by a margin of 9 per cent and the steam car-mileage by 3.2 per cent, yet the make-up of trains has been so carefully planned that the trailer car-mileage has advanced 137 per cent. This improved operation, without detriment to schedules, is reflected in the energy consumption, which, it will be seen, has been reduced from 87.4 to 83.4 watt-hours per ton-mile at the third rail. A portion of the extra energy consumption in 1918 must, however, be attributed to the very severe weather conditions encountered during the winter of that year.

The cost of energy set forth in this table naturally shows an increase due to rise in fuel and labor costs, although the maintenance charges have been held remarkably close to the figures established in 1918. The cost increases are reasonable in view of the general increases which have occurred.

Transfer station and office building at Jamaica, L. I.

TRAIN DISPATCHING METHODS

Practically all trains in the electrified zone are operated without train orders unless unforeseen difficulties or delays arise. In such cases the train crews are instructed by telephone from the dispatcher's office at Jamaica. Telephone outlets are available to trainmen every 2,000 ft. throughout the electrified zone. Trains, in cases of trouble, are then detoured by the dispatcher, either upon an extra track or in another direction around one of the many available loops upon the system. Passengers waiting at stations from which trains are likely to be delayed indefinitely are notified of such delay in order that they may make other plans if desired. Such announcements are always appreciated by the patrons of the road, who would prefer to know the facts promptly rather than be kept in ignorance of the possibilities of reaching their destination.

The most densely operated sections of the road are equipped with automatic block signals, while the other portions of the road are operated under the "absolute manual block" rules.

At terminals records must be filled out by the conductor of the departing train, giving details of time, train make-up, etc., while upon arrival at its destination a more complete report is required, giving the causes of delays, if any, the number of passengers carried, etc. These are filed in the dispatcher's office.

Train orders, not affecting the rights of a superior train, may be given orally over the telephone and confirmed by both conductor and motorman of the train involved. Superior orders, subordinating the rights of trains otherwise having right-of-way, must bear the personal signatures of both conductor and motorman as an extra precaution against any possible misunderstanding.

Train dispatchers upon the Long Island Railroad recognize the impossibility of handling the traffic into such a terminal as that of New York City by means of steam locomotives. Upon being asked the question, "Is operation by means of steam locomotives possible?" the chief dispatcher answered, "Certainly not! What would you do with the locomotives when you got them in there? The switching of trains in and out of the station with steam locomotives under such short headway and with the limited track capacity is out of the question."

TABLE V

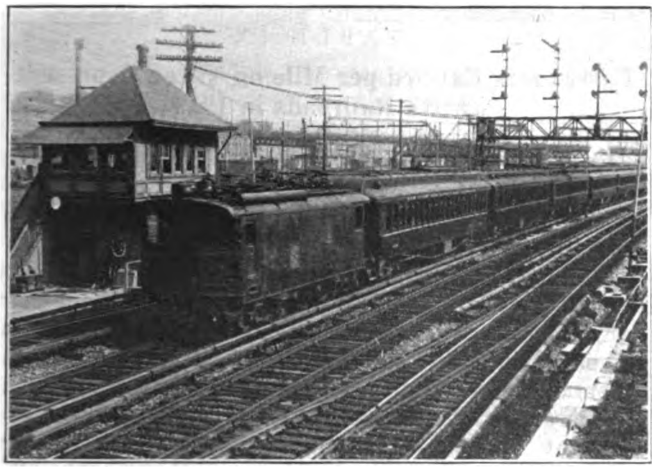
Train-Miles per Route-Mile—Steam and Electric Operation, Long Island Railroad

Year	Passenger Train-Miles Steam	Passenger Train-Miles Electric	Route-Miles Steam	Route-Miles Electric	Passenger Train-Miles per Route-Mile Steam	Passenger Train-Miles per Route-Mile Electric
1910	3,129,862	1,855,972	374.0	54.8	8,369	33,868
1911	2,936,184	2,553,219	363.1	64.7	8,086	39,462
1912	2,812,853	2,552,525	360.8	66.0	7,797	38,675
1913	2,272,809	2,845,878	354.0	74.1	6,420	38,406
1914	2,181,539	3,276,387	343.2	87.2	6,356	38,720
1915	2,102,766	3,202,617	341.2	90.3	6,104	35,466
1916	2,199,080	3,155,538	341.2	90.3	6,445	34,945
1917	2,291,552	3,435,192	341.2	90.3	6,716	38,042
1918	2,509,660	3,305,852	341.2	90.3	7,355	36,610
1919	2,544,043	3,576,097	341.2	90.3	7,456	39,602

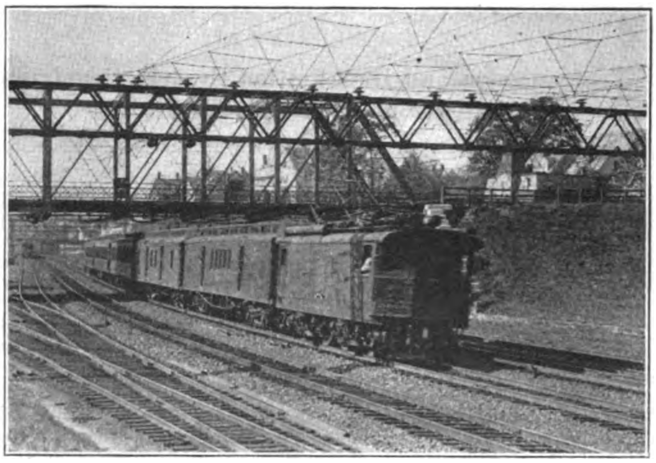
TABLE VI

Car-Miles per Route-Mile—Steam and Electric Operation, Long Island Railroad

Year	Car-Miles Steam	Car-Miles Electric	Route-Miles Steam	Route-Miles Electric	Car-Miles Per Route-Mile Steam	Car-Miles Per Route-Mile Electric
1907	14,441,861	3,830,911	378.5	38.0	38,175	100,200
1908	13,071,445	4,945,719	372.4	42.0	35,105	117,720
1909	13,535,123	5,754,436	371.4	44.8	36,460	128,350
1910	13,945,133	7,134,366	374.0	54.8	37,282	130,200
1911	13,534,626	9,497,738	363.1	64.7	37,260	146,730
1912	12,991,882	10,624,172	360.8	66.0	36,040	161,000
1913	12,302,872	12,039,426	354.0	74.1	34,770	162,750
1914	11,062,474	13,783,793	343.2	87.2	32,230	158,100
1915	10,957,699	13,832,618	341.2	90.3	32,110	153,200
1916	11,653,425	14,875,807	341.2	90.3	34,160	164,700
1917	13,036,476	15,507,970	341.2	90.3	38,200	171,800
1918	13,905,068	15,679,570	341.2	90.3	40,750	173,600
1919	14,353,592	18,059,377	341.2	90.3	42,050	200,000



New Haven train on New York Central track near New York City



New Haven train under 11,000-volt contact line on its own right-of-way

It should be remembered also, in considering the test of "mass transportation" upon the Long Island Railroad, that this road was called upon during the war to handle the soldiers of fourteen divisions located at Camps Mills and Upton, Long Island. Six thousand special trains involving 61,247 cars were required to transport more than 3,000,000 troops during the period from July, 1917, to October, 1919. This was in addition to more than 1,000,000 passengers and furloughed soldiers who traveled to and from the camps as individuals. During the heaviest month of this traffic 307,000 soldiers were transported to and from the camps and embarkation docks in 476 special trains. This was followed by the record-breaking landing in France in August, 1918.

By summarizing the density of passenger traffic of

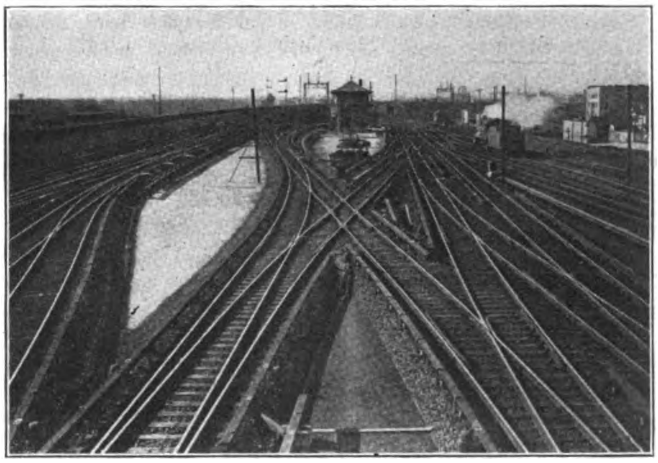
TABLE VII

Operating Data and Costs, Long Island Railroad

	1918	1919
Car-miles—motor*	14,920,207	16,266,607
Car-miles—trailer*	759,363	1,792,770
Car-miles—steam	13,905,068	14,353,592
Train-miles—electric*	3,333,390	3,496,958
Train-miles—steam	2,528,863	2,494,043
Car-miles permile of track—electric	6,958	8,010
Average cars per train—electric	4.71	5.17
Average cars per train—steam	5.50	5.76
Kilowatt-hours per car-mile at power house		5.17
Kilowatt-hours per train-mile at power house		25.72
Kilowatt-hours per car-mile delivered to third rail		4.15
Kilowatt-hours per train-mile delivered to third rail		21.46
Watt-hours per ton-mile at power house	108.8	103.3
Watt-hours per ton-mile delivered to third rail	87.4	83.2
Watt-hours per ton-mile at power house—summer months, no heater load	92.0	91.3
Cost of power per car-mile at power house	$0.0604	$0.0624
Cost of power per train-mile at power house	.2990	.3228
Cost of maintenance of transmission line per car-mile	.0047	.0053
Cost of maintenance of transmission line per train-mile	.0221	.0274
Cost of maintenance and operation of substations per car-mile	.0121	.0110
Cost of maintenance of substations per train-mile	.0570	.0458
Cost of maintenance of third-rail and track bonding per car-mile	.0071	.0070
Cost of maintenance of third-rail and track bonding per train-mile	.0330	.0362
Cost of power at car shoes per car-mile	.0843	.0857
Cost of power at car shoes per train-mile	.3971	.4431

* Includes traffic over P. R.R. tracks between Sunnyside Yard and Pennsylvania Station, N. Y., amounting to about 10 per cent.

Chicago elevated railway crossing Northwestern tracks



Looking east from Jamaica station, Long Island Railroad

TABLE VIII

Transmission and Distribution System Construction, Long Island Railroad

Electrified track, miles	225.65
Transmission line (longest distance), miles	26
Number of substations (permanent)	15
Number of substations (portable)	3
Substation rated capacity, kw	56,000
Power station rated capacity, kw	67,000
Length of pole lines, miles	75.24
Chestnut poles in line	2,353
Creosoted poles in line	565
Steel poles in line	393
Underground conduit system, miles	12.5
Underground conduit system, duct-miles	435.23
Underground cable system, miles	46.4
Signal circuit, miles	50.05
Number of lightning-arrester houses	9

TABLE IX

Passengers Carried per Mile on Three Representative Railroads in 1919

West Jersey & Seashore Railroad	1,091,807
New York, New Haven & Hartford Railroad	1,019,641
Long Island Railroad	2,570,205

three representative electrified steam roads of the East, as in Table IX, it is evident that conditions on the Long Island Railroad represent the application of electric traction to the densest traffic which is encountered on any of the electrified zones of trunk lines in the country.

The commutation traffic on the Long Island Railroad is particularly heavy as compared with through passenger or freight service. In 1905 the number of passengers who purchased and used regular monthly commutation tickets was 76,644 upon the entire system. Last year this figure had increased to 367,057, representing an increase of 380 per cent. Although this commutation traffic aggregated last year about 47 per cent of the total passengers carried 1 mile, the revenue from that 47 per cent was less than 24 per cent of the total revenue. This indicates the expensive nature of such traffic. To state it differently, the average return from this commutation traffic was three-quarters of 1 cent per mile. This reduces the return from the average passenger upon this road to 1.53 cents per mile, while the other roads of the United States averaged about 2.65 cents per mile and the bulk of the steam railroad traffic paid 3 cents per mile.

Although the numbers of commuters have greatly increased over last year, the gross earnings of the company for June, 1920, showed a falling off of $75,000, as compared with the same month of last year (due to the troop business handled in 1919), while the operating expenses showed an increase of over $200,000. The cost of doing business is so high that, with the present rate structure, the more passengers that are handled the greater is the financial loss. The problem therefore is necessarily one of asking the passenger, particularly the commuter, to pay the actual cost of good service rather than attempting to reduce the quality of service to approximate the income.

THE SUBURBAN SITUATION ON OTHER ROADS

The Long Island Railroad suburban business has been treated in detail in this article because the road's traffic is so largely a suburban proposition. Data have, however, been secured from several other railroads whose suburban business is considerable. These data vary in character on account of the different operating conditions and methods of record keeping, hence cannot be combined in a general table.

***New York Central Railroad.*—The number of commutation passengers carried by the New York Central in 1919 was 20,707,352, an increase of 3,030,533, or 17.6 per cent, over 1918, and 4,446,347, or 25 per cent, over 1917; the increase in 1918 over 1917 being, therefore, 1,415,814, or 12 per cent. These figures indicate actual rides by commuting passengers and are many times the number of tickets sold.**

About 75 per cent of the commutation service of this road is out of New York City, other commuting

TABLE X

Commutation and School Tickets Between New York City and Selected Stations on Hudson Division, New York Central Railroad, April, 1918, 1919, 1920

Station	Miles from New York	Mileage of Sixty Trips	Monthly Tickets Sold April, 1918†	Monthly Tickets Sold April, 1919†	Monthly Tickets Sold April, 1920†	Old Monthly Commutation Rates	New Monthly Commut'n Rates	Rates per Mile Under New Schedule	Increase in Fare per Trip Cents*
125th Street	4.2	252	...	...	...	$3.36	$4.03	1.59	1.1
University Heights	8.7	522	138	129	125	5.34	6.41	1.22	1.7
Spuyten Duyvil	10.4	624	32	47	60	6.16	7.39	1.82	2.05
Ludlow	13.7	822	309	366	662	7.15	8.58	1.04	2.88
Yonkers	14.5	870	448	638	1,353	7.43	8.92	1.02	2.48
Glenwood	15.6	936	298	336	589	7.65	9.18	0.98	0.55
Hastings-on-Hudson	18.8	1,128	240	297	412	8.31	9.97	0.88	2.77
Dobbs Ferry	20.0	1,200	190	219	286	8.47	10.16	0.84	2.82
Irvington	22.0	1,320	145	190	216	8.75	10.50	0.79	2.92
Tarrytown	24.5	1,470	653	700	979	9.08	10.90	0.74	3.03
Ossining	30.2	1,812	417	578	805	10.12	12.14	0.66	3.37
Croton-on-Hudson	33.9	2,084	114	125	186	10.56	12.67	0.62	3.51
Peekskill	40.6	2,436	237	317	447	12.16	14.59	0.59	4.05
Beacon	58.3	3,498	52	67	83	15.90	19.08	0.54	5.3
Newburgh	58.3	3,498	25	14	21	15.90	19.08	0.54	5.3
Poughkeepsie	72.8	4,367	54	73	123	18.59	22.31	0.51	6.19

* Increase based on sixty trips per month.

† Number of passengers carried may be greater than number of tickets sold as figures include family commutation tickets good for any member of purchaser's family.

cities on the system being Buffalo, Cleveland and Chicago.

Under the new schedule of rates, 20 per cent above those prevailing until recently, the average rate per mile which will be paid by commuters in the New York City district will be 0.8 cent per mile. The average commutation ticket will cost $11.57. The previous respective figures were 0.675 cent and $9.60. The commutation rate per mile varies according to distance, ranging from 0.5 cent for the maximum distance of 72 miles to Poughkeepsie to 1.59 cents for the 4-mile ride to 125th Street, New York City.

Table X shows details of the commuting business in April, 1918, 1919 and 1920 out of New York for a few typical stations on the Hudson Division, selected from among the total of thirty-eight.

Pennsylvania Railroad—Philadelphia Electrification.—This electrification consists of the Paoli and Chestnut Hill lines, and the purpose of undertaking the present electrification and of extending it later to other suburban lines is primarily to secure increased capacity in Broad Street Station and yard, which were badly congested under steam operation.

Careful analysis by a special operating committee of the movements under steam operation through the more important routes leading from the station to the main running tracks and yards lead to the conclusion that an increased capacity of from 20 to 25 per cent could be secured by this electrification. The improvements in operation under electric traction are such as to lead the operating people to believe that the estimates were substantially correct. The train service, of course, has changed materially under the new method of operation and a marked growth in traffic has been experienced.

The keeping of records during war years under government operation was curtailed and no data by years are available. The following figures for the year 1919 with comparative notes regarding previous steam conditions are, however, available:

1. The number of miles of main line electrified tracks is 106.1 and, including yards, the total mileage is 117.28.

2. The number of trains handled in both directions during the evening maximum traffic hour for both lines is fifteen and the corresponding number of cars is about eighty-four.

3. The average number of cars per train throughout the year is about four and the maximum number in rush hours in the heavy-travel direction is eight.

4. The number of trains per day operated at present is regularly 149. In certain seasons additional trains are run and, of course, the number of cars per train is varied from time to time. Comparisons with previous steam operation are not of any great value.

TABLE XI

Time-table of Running Time and Scheduled Speed, P. R.R., Philadelphia Electrification

	Broad Street to Paoli		Broad Street to Chestnut Hill	
	Steam	Electric	Steam	Electric
Running time, local trains, min.	57*	50	49	33
Schedule speed, m.p.h........	21	24	24½	21.8
Per cent increase over steam...	..	14	16⅔	6

* Steam trains could not maintain schedule by two to five minutes.

5. The running time and schedule speed as given in time-tables at which these trains operate is shown in Table XI.

6. The car-miles operated for the first and second years of full electric operation were: For the year ended April 1, 1919, 2,538,524 and for 1920, 3,020,000, an increase of 18.9 per cent.

7. The year 1919 shows an increase of 17 per cent in passenger receipts over 1918. Electric operation was inaugurated on the Paoli line in 1915 and on the Chestnut Hill line early in 1918.

New Haven Railroad.—The route mileage in the Boston suburban zone of the New York, New Haven & Hartford Railroad is fifty-four. In addition the New Haven has a considerable commuting traffic out of the Grand Central Terminal (the New Haven uses the New York Central Terminal for part of its New York suburban traffic). Out of Grand Central the following numbers of New Haven passengers were handled in the respective years mentioned: 1916, 14,412,974; 1917, 12,445,338; 1918, 12,201,891; 1919, 14,285,883.

Table XII shows the business at the Boston terminal for five years past and gives information as to the terminal itself.

Illinois Central Railroad.—A heavy suburban traffic is handled by the Illinois Central Railroad at its Chicago terminal. Table XIII contains full information as to this suburban traffic and the facilities available therefor. This terminal is now operated by steam, but early electrification is contemplated.

Chicago & North Western Railway.—Another railroad which does a large suburban business out of Chicago, employing steam motive power, is the "North Western." For the year ended Dec. 31, 1919, this road handled 13,540,417 passengers on its Wisconsin division, including 8,671,437 on the Milwaukee line and 3,622,014 on the Harvard line. On the Galena division 3,622,014 were carried, a total of 17,162,431 passengers. The passenger revenues were: Milwaukee line, $1,860,895; Harvard line, $713,610, and Galena division, $613,231; total, $3,187,736. Table XIV gives,

TABLE XII

New Haven Railroad's Terminal Traffic at Boston, 1915-1919

	1915	1916	1917	1918	1919
Number of passengers handled into and out of terminal...........	26,182,177	27,769,416	29,612,351	29,281,270	34,233,541
Average number of trains per day in and out of terminal—summer.	504	505	444	434	472
Average number of trains per day in and out of terminal—winter..	479	478	419	408	457

Maximum number of trains during the five-year period in and out during one day..	690
Number of terminal tracks..................	28
Approximate area of terminal, acres..................	31
Miles of road in suburban zone..................	55.45

data as to the number of trains required for this business. In this case the week-end travel is lighter than the regular daily traffic.

SUBURBAN TRAFFIC AND ELECTRIFICATION

The data of terminal traffic of steam roads which have been given in this article show the part which electrification is playing in helping solve the suburban transportation problem. Obviously the Long Island Railroad could not handle its terminal traffic by steam even if steam locomotives were permitted to enter New York City through the East River tunnels. In Philadelphia the terminal capacity was greatly increased by electrification and the Illinois Central will enjoy similar results when its present plans are carried out.

In Boston the New York, New Haven & Hartford Railroad, which is still operated by steam, has handled a steadily increasing suburban traffic during the past five years which now represents over 130 per cent of that in 1915. The increase of fare upon the Boston Elevated Railroad was no doubt the cause of a portion of this growth in traffic. During this period, however, the average number of trains handled in and out of the South Station has been reduced by 6.5 per cent as a result of limited equipment. This extra traffic, necessarily carried with reduced equipment, resulted in standing loads with little if any increased operating cost. It was a typical case of enforced impairment of quality of service rather than the provision for adequate service at increased rates. It is quite probable that the new rates will cause some of the patronage to revert to the electric lines and more or less automatically adjust the abnormal condition. Electrification, if immediately available, would have solved the problem.

Park Avenue approach to Grand Central Terminal, New York, from south

There is no question but that present conditions in all of the large city terminals are more favorable than ever before to electrification. Rapidly increasing density of traffic, limited track and equipment facilities, greatly increased costs of fuel and labor and the demands for prompt and efficient suburban service to sections of the community where living conditions are tolerable point to electric operation. It is not necessary to emphasize further the well-proven arguments for electrification, of lower operating costs, increased value of real estate located over terminals, power conservation, elimination of smoke, shorter headway possible due to rapid acceleration, etc. The advantages, both economic and esthetic, are obvious and therefore generally conceded. The problem then is to secure the necessary funds to take care of the first cost.

TABLE XIV

Trains In and Out of Chicago Terminal, North Western Railway, 1919

	Through			Suburban			Grand
	In	Out	Total	In	Out	Total	Total
Monday to Friday, inclusive	39	42	81	118	112	230	311
Saturday	39	42	81	115	112	227	308
Sunday	32	28	60	45	49	94	154

In conclusion, a few words regarding the power end of terminal electrification may be in order.

Although marked savings have been effected in the operating methods and efficiency of electrified railroads, rising costs have more than absorbed these. For example, when the New York Central Railroad was electrified energy was produced with 2.85 lb. of steam per kilowatt-hour. Economies practiced in the generation of this energy have now reduced this figure to 2.2 or 2.3 lb. per kilowatt-hour. At that time, however, coal was purchased at $1.99 per ton. Now this road is paying $7.20 per ton for fuel. In those days stoker operators could be called upon to keep the equipment in repair during periods of light load. Now, as they demand machinists' rates for this work, a separate staff of mechanics must be maintained for the purpose and the time of the stokers is used to less advantage.

TABLE XIII

Chicago Suburban Traffic of Illinois Central Railroad, 1915-1919

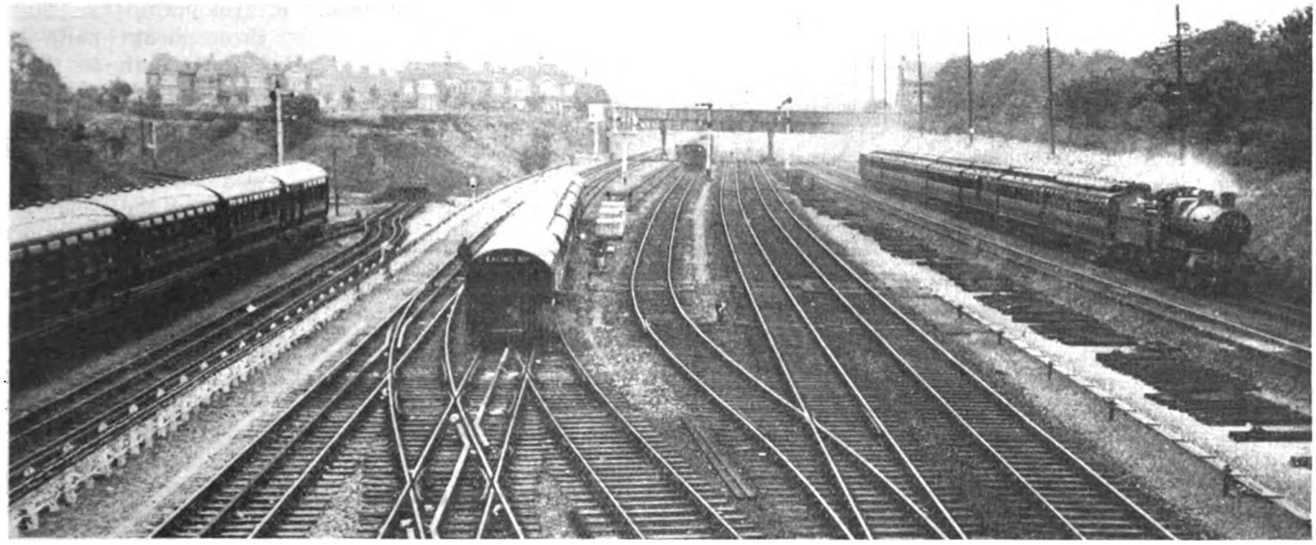
	Year Ended June 30		Year Ended Dec. 31		
	1915	1916	1917	1918	1919
Total passengers carried for year	12,681,298	13,699,341	13,815,447	12,818,552	15,257,398
Miles of track in suburban zone	82.32	82.32	82.32	82.32	82.82
Passenger train-miles	1,300,957	1,323,835	1,419,635	1,419,635	1,417,938
Average miles per passenger	8.00	8.04	8.18	8.26	8.23
Average cars per train	4.5	4.4	4.4	4.2	4.3
Number of terminal tracks	6	6	6	6	6
Area of suburban terminal yards—car capacity	279	279	279	279	279
Average time required to set train and remove locomotive, minutes	2	2	2	2	2
Total suburban employees engaged in suburban zone	490	506	509	519	481
Train employees in suburban zone	242	258	261	265	258
Number of trains per day in and out terminal:					
Average, weekday	288	294	308	312	306
Maximum, weekday	298	302	315	326	320
Sunday	132	132	134	138	134

Steam trunk lines have formed physical connections with the underground roads so as to permit through travel without change

Relieving London's Congestion

By a Correspondent

London, England



Main line of the Great Western at Ealing, Western London suburbs, showing train on District Station siding, a Central London underground train and a long distance express train

IN A RECENT review of the present state of traffic in London, Lord Ashfield, the chairman of the underground group of passenger transit agencies, stated that the difficulties with which his organization had to contend would be relieved in a large measure by the development of the policy of linking up the underground lines with the suburban lines of the trunk railroads. Lord Ashfield, American electric railway officials will recall, was formerly, as A. H. Stanley, the general manager of the Public Service Railway of New Jersey. Some account of recent developments in the undertakings that he now controls in the British metropolis should prove of interest to readers of this paper.

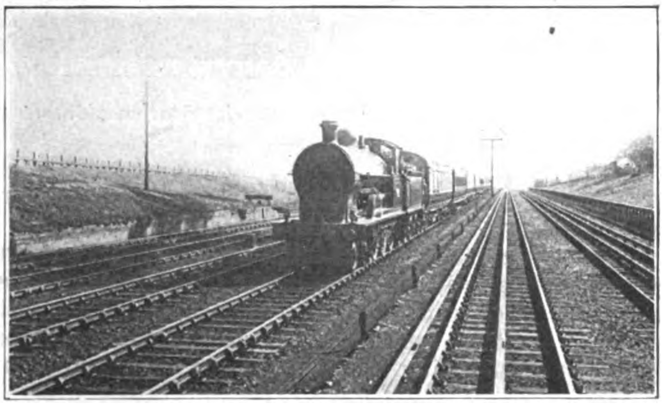
PRESENT STATE OF PASSENGER TRANSIT IN LONDON

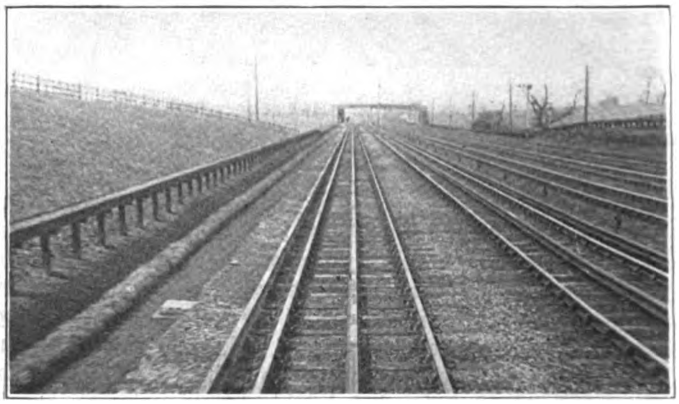
Railway extension in London and the normal development of existing facilities were, of course, held up by the war, and consequently a great deal requires to be accomplished to bring the urban railroads into line with the increased demands now being made upon them. One of the chief difficulties is the congestion of traffic that occurs at certain hours of the day, a difficulty induced primarily through the altered conditions of labor, the general adoption of the eight-hour day being responsible, as in American cities, for overwhelming volumes of traffic having to be dealt with during short periods of the morning and the evening. A contributory cause is the development of the central area of London as a commercial center, the demolition of extensive parcels of residential property, and the erection on their site of large blocks of business premises taking place rapidly and continuously. This latter factor in itself constantly adds to the number of passengers journeying to and from the central area, and the burden placed upon the urban railroads will become even heavier during the next two or three years when the many new housing schemes scheduled for various parts of the outer suburbs will have materialized.

Briefly, the London railroads have not only to make up the leeway lost during the five years of the war but have to cope at the same time with an inordinate increase of traffic arising through the changes brought about by the war. The problem is further complicated by the fact that the British railroads generally are sustaining heavy deficits in operation, with the result that the investing public is chary of providing the additional capital that is essential for new construction and other much-needed improvements.

The question of passenger traffic in London has twice been the subject of special inquiries by Parliamentary commissions, once in 1903 and again so recently as 1919. Both commissions reported very strongly in favor of a traffic board being set up as a supreme authority in all matters relating to passenger transit in Greater London. The duties of the traffic board would be to co-ordinate the operations of the various transport agencies and to regulate and direct all of them as a single entity. Up to the present, however, this recommendation—the adoption of which should help in the betterment of traveling facilities in the English capital —has been accorded no practical consideration by the government. Co-ordination, it is true, exists among certain groups of undertakings—such as those controlled by Lord Ashfield—that are under a single direction, but generally competition for traffic is rife. This means that each transit agency or group of agencies is influenced in its activities by a keen regard for its own immediate interests, instead of one and all working together on harmonious lines to deal with the problem in the best interests of the traveling public.

There are nine trunk railroads operating lines in London and its suburbs; two groups of underground railways, one of which—that directed by Lord Ashfield—controls the motor bus concerns and also two of the more important suburban street railways; the London County Council, which operates the street railways within the county area, and various small street railway undertakings which are operated by the municipal authorities in the outer suburbs.





At and near Harrow station, North Western Trunk Railway. Eight miles from tunnel zone, the Underground's tracks run by the side of tracks for long distance steam traffic

Notwithstanding certain increases that have been made in fares, all the foregoing traffic agencies are at present being operated at a loss. Wages, materials and the other items of operating expenses have risen to an enormous extent, and even with the further increases of fares that are contemplated it is questionable whether the London traffic agencies will be able to extricate themselves from their present difficulties. The street railways in particular are in bad plight. None of the privately owned concerns pays its way or has done so for some few years past, while the County Council undertaking is faced with a deficit on the current year of operation equivalent to a rate of sixpence on the pound.

Such, then, are the conditions prevailing in London today—conditions that aggravate the difficulties which confront the passenger transport enterprises.

The project of making physical connections between the underground lines and the suburban lines of the trunk railroads serving the British capital was inaugurated some forty years ago by the District Railway, the parent line of the group of transport agencies with which Lord Ashfield is associated. In its early days of steam operation the District extended its lines into the western suburbs and made physical connections at two separate points with the suburban lines of the London & South Western Railway, an important trunk railroad with extensive branches in the metropolis. Through these connections the District trains were enabled to run direct from the City (the term city in relation to London is applied only to the square mile or so—the heart of the modern metropolis—that constituted the London of the Middle Ages), to certain towns of the outer area. It also permitted trains of three steam railways to run through to the City over the District Railway tracks.

Whe the District system was electrified in 1905, however, the steam-hauled "foreign" trains were withdrawn in nearly every case, and at the present time these lines in the Central London area are scarcely capable of accommodating the traffic worked over them by the District company alone. One or two "foreign" services are still worked over the District track, being hauled on this section of their journey by electric locomotives.

As an illustration of the facilities accruing from physical connections between the underground and the trunk railroads it may be mentioned that the Midland Railway, with which the District lines connect at their eastern extremity, operates trains from Southend (situated on the Thames estuary) to Ealing, a distance of about 50 miles, the last 10 miles or so being over the District track in the London area. When the District was electrified, the various sections of the "foreign" lines over which the District trains ran were electrified also, so that the through-running facilities that had been brought about by the physical connections were preserved.

Here it may be as well to point out that the original underground railways of London—the Metropolitan and the District—are of the "cut and cover" type and consequently similar in general type to the subways of New York. The tunnel sections are sufficiently large to permit the passage of rolling stock of standard dimensions. On the other hand, the underground railways of later origin are in deep-level tunnels bored out by the Greathead shield system. These tunnels—or tubes, as they are popularly called—are of relatively small diameter, 11 ft. 8¼ in., increasing to 12 ft. 6 in. at the curves, and can therefore accommodate rolling stock of corresponding proportions only.

SOME RECENT PHYSICAL CONNECTIONS

The first physical connection between a deep-level underground line and a trunk railway was opened in 1917, in which year the trains of the Bakerloo section of the Underground began running over the North Western Company's track to Watford.

From the time taht it was opened for traffic in 1905 the Bakerloo has been extended on three occasions in a northwesterly direction, the third extension bringing the line up to the surface and effecting the physical junction with the trunk railway above mentioned. From the Bakerloo terminus at the Elephant and Castle in southeast London to the Watford Station of the North Western company is a distance of nearly 21 miles. The Bakerloo line itself is but 6 miles in length; this physical connection with the North Western Railway has therefore more than trebled the extent of route served by the Bakerloo trains. Between the Elephant and Castle terminus of the Bakerloo line in southeast London and Watford, which is in Hertfordshire, a fifteen minutes' service is maintained in each direction, the journey being accomplished in an hour, exceedingly good speed when it is borne in mind that the Bakerloo trains halt *en route* at twenty-two stations during the run, eleven belonging to the Bakerloo Railway and eleven to the North Western. Building operations follow the railway, and this and other long-distance extensions of the Underground into rural territory will play an important part in the expansion of London, opening up as they do new areas suitable for development on both residential and industrial lines.

CENTRAL
LONDON

At left, Central Underground train in newly developed residential suburb. Above, same train in tunnel station. At right, District Underground train on South Western Trunk Railway line

The linking up of the Bakerloo with the North Western Railway was the first physical connection of the kind that has taken place since Lord Ashfield assumed the direction of the London Underground Railways. It was one of several such schemes that had been projected prior to the war, but the majority of them are now held up indefinitely through the unsettled outlook in railroad operation and the greatly increased cost of carrying them out. One such scheme of connection, however, had progressed so far prior to the war that its completion after the cessation of hostilities was not retarded by the foregoing considerations. This was the extension of the services of the Central London section of the Underground to Ealing, to which, in view of the many features of interest that are presented, we propose to devote a special notice.

Although it was not actually the first deep-level electric line constructed in London (the City & South London Railway, opened in 1890, has this distinction), the Central London Railway may be regarded as the prototype of the latter-day underground railway.

Opened for tarffic in 1900, the Central London Railway, through the introduction of various features that were modeled upon American railroad practice, marked a new departure in urban transit in the British metropolis and determined in a large measure the form and policy to be adopted by deep-level railway undertakings opened subsequently. One interesting innovation was the uniform fare of twopence charged for any distance, an essentially American idea and one that proved exceedingly popular in London while it prevailed. This uniform fare was abandoned in 1907.

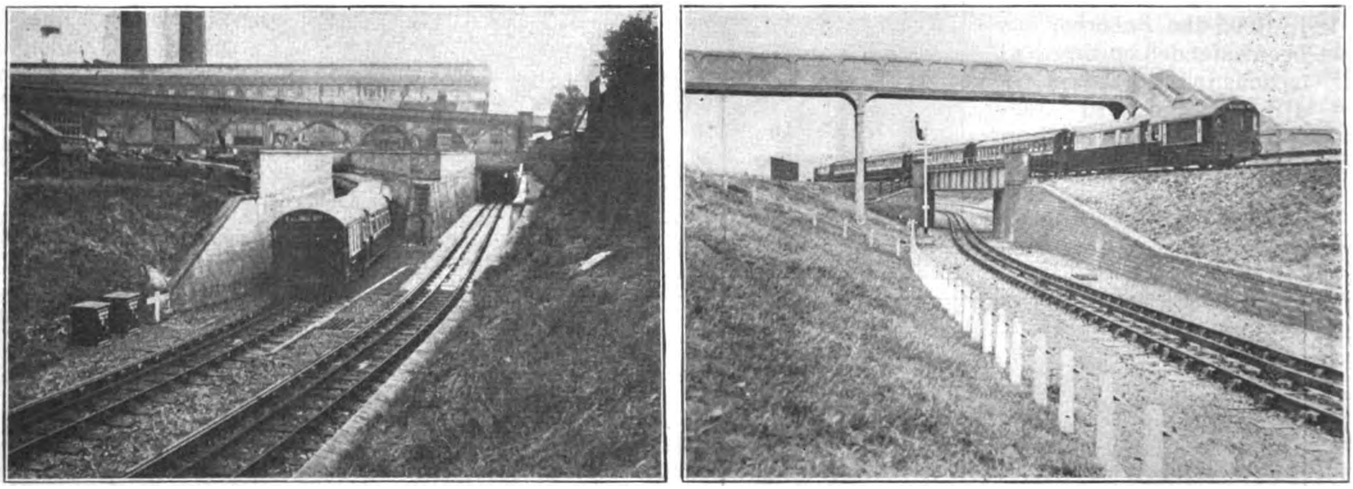
The Central London cars, which were the first in England of the American vestibule pattern, were hauled originally by locomotives, a method of traction that caused considerable vibration to the houses above the tunnels. This trouble was overcome by superseding locomotive traction by the multiple-unit system, an improvement which had also the further advantage of speeding up the trains. The drawbacks of locomotive haulage experienced on the Central London Railway led to the general adoption of the multiple-unit system of traction on the District Railway, as well as on all four of the new deep-level electric railways that were opened for traffic a year or two later, without these lines having first to "buy" their experience as the Central Railway had done.

Contiguous throughout its length to one of the two western trunk highways leading out of London, the Central London Railway affords a very good illustration of Euclid's definition of a straight line, as it takes the shortest route between its City terminal at Liverpool Street and its original western terminal at Shepherd's Bush, a distance of about 6 miles. At the latter point the line ended on the threshold of a patch of rural territory very sparsely populated but presenting good scope for development, assuming that it was traversed by a railway providing direct connection with the central area of London. The first development in the district in question was the laying out of the Shepherd's Bush Exhibition, which was opened in 1908 and will doubtless be recalled by many readers of this paper through its being the venue of the Olympic Games of that year. A short extension brought the Central London Railway right to the main entrance gates of the exhibition, where a new station, called Wood Lane, was erected. This extension carried the line, which was only a few feet below ground at Shepherd's Bush, up to the surface.

Four miles west of Wood Lane was an important station, Ealing, on the main line of the Great Western Railway, the chief trunk railroad serving the western counties of England, and with its London terminal, Paddington, situated outside the central area. The construction of a line linking up the Central London Railway with the Great Western was an obvious necessity in the interests of both undertakings. First projected in 1905, the work of construction was begun by the Great Western Company some few years later and had made such progress prior to the war that it was practicable to work special goods freights over the line during the period of hostilities. After the war work of electrification proceeded apace, and on Aug. 3, 1920, the Central London trains began working direct from the City to Ealing. The second physical connection of the Underground with a main-line railway had become an accomplished fact. Meanwhile, the development of the district served by the new line had been very rapid, from both an industrial and a housing point of view, with the result that besides the interchange facilities afforded to passengers using the Great Western and Central London lines the Underground trains have a new field of traffic opened up to them. Another good result is the relief of the congestion of traffic on the District line of the Underground to Ealing, this line, hitherto the only direct route between Ealing and the City, running to Ealing by a somewhat circuitous course south of the Central London line.

Unlike the other lines of the Underground, which are constructed on the four-rail principle, or with one rail for a return, the Central London Railway has the three-rail principle, with central positive conductor-rail and running-rail return, a system that has been adhered to on the extension. The construction work of the extension reflects in many respects the latest ideas in railroad engineering, one especially interesting feature being the signaling installation, which is of the Mackenzie-Holland three-position, all electric type, and is the longest stretch of this design that has thus far been installed on any British railroad. All the signals are worked in the upper quadrant and are controlled by alternating current track circuits, the following indications being given: Horizontal (red light)—danger; forty-five degrees (yellow light)—proceed with caution; vertical (green light)—proceed at normal speed. The signals are put to "danger" on the passing of a train and do not change position until the train has cleared the track circuit of the section ahead, when the signal arm works automatically to the 45-deg. position, assuming the vertical on the train clearing the second section. For foggy weather repeating-light signals are provided throughout the new line at a distance of 200 yd. from the signals. These are lighted when necessary by means of switches. On the underground system generally the two-position type of signaling in is force; the operation of the new installation on the Ealing extension is therefore being regarded with considerable interest.

Among other schemes of improvement that are now perforce in abeyance on the Underground in London are physical connection between the (1) Central London



At left, Central London Underground train emerging from tunnel at Wood Lane. At right, the physical connection between the Central London Underground and the Great Western Trunk Railroad

A deep-level Underground station, King's Cross on the Piccadilly line

line and the South Western Railway; (2) the Piccadilly line of the Underground and the District and South Western lines to Hounslow and Richmond, and (3) another between two Underground lines, the Hampstead and the City & South London.

The first-mentioned scheme entails the construction of only a short connecting line at Shepherd's Bush, where the tracks of the two railways concerned are within a quarter of a mile of each other. This extension would enable the Central London trains to work through direct to Richmond, Twickenham and other Thames Valley towns and would form a very considerable addition to the mileage of route served by that railway.

The present western terminal of the Piccadilly line is at Hammersmith, where this line shares a station with the District Railway. A physical connection between the two lines would mean the linking up of the southwestern suburbs of London with those in the north, where the other Piccadilly line terminal is situated.

The third scheme of physical connection—that between the Hampstead and City & South London lines of the Underground—would enable through trains to be worked direct between south London and north London and would greatly improve the existing means of communication between these districts. This project involves the enlargement of a considerable portion of the tunnels of the City & South London Railway. This line, as has already been stated, was opened so long ago as 1890, and the tunnels of the section then constructed have a diameter of only 10 ft. 2 in. which debars the use of the modern type of Underground rolling stock. One of the initial improvements needed to bring the City & South London Railway into line with the present requirements of traffic is the provision of the standard type of car in place of the primitive pattern at present in use. Hence the necessity to enlarge the tunnels, an undertaking of a very protracted nature, seeing that the work has to be done segment by segment and can be carried out only at night during the short intervals between the close and commencement of traffic.

While it is manifest that the policy of linking up the underground physically with the surface railways must affect a material improvement in the facilities for travel in London, it is also obvious that this improvement will in itself tend in the future to make general on the system a difficulty that is at present in evidence on one section only—the District. The whole of the underground railways of London are alike in having two sets of running rail only, a limitation that is bound to affect adversely the smooth working of more than the one service of trains for which each line was originally intended. The convergence of two or more services onto the sections of the Underground system in the central area of the metropolis will, if the passenger traffic of London maintains its existing rate of increase, lead in time to congestion on these sections during the busy hours. The frequency with which trains can be worked through to the terminals on the branch lines is circumscribed by the train-running capacity of the line from which they diverge.

The bottle-neck of the District Railway between the eastern and western bifurcations of its lines at Mansion House and South Kensington respectively is already taxed to its utmost capacity during the peak hours of traffic. As many as forty-three trains in each direction—eighty-six in all—are worked in the hour over this section. This is train-working extraordinary—perhaps a world's record. Nevertheless, the present requirements of traffic on this railway demand greater capacity. This might be supplied by a third track, although the cost of such an improvement now would be very great. Other possibilities are cars with greater capacities, better facilities for loading and unloading, and an increase in the number of cars to a train. Cars embodying the advantages mentioned are already on order for the District and other lines. These will have, besides additional seating accommodation, four doors on each side, arranged so that one will be readily accessible to passengers, no matter where they may be seated.

Rail-less Trolley Operation

RAIL-LESS trolley operation has been used for several years in Europe as an adjunct to street railways. The operating figures for the Bradford Corporation Tramways for the eleven months ended March 2, 1920, are given in an article by R. H. Wilkinson in the July issue of *Tramway and Railway World*. The rail-less trolley, the street railway and the rail-less battery bus are operated by this company and comparative figures are as shown in the table.

On the basis of results obtained in practice Mr. Wilkson compares a rail-less trolley system for a new project using sixty and fifty-one as the respective seating capacities. He finds that the rail-less trolley is more economical on a single-track line up to a five-minute service and on a double-track line up to a three-minute service. He points out that the rail-less trolley is not so comfortable to ride in as the street car, is on a par as regards accidents and is not so reliable, but thinks it can be made so. He states it causes less obstruction to traffic when a breakdown occurs and can draw closer to the curb in loading and unloading.

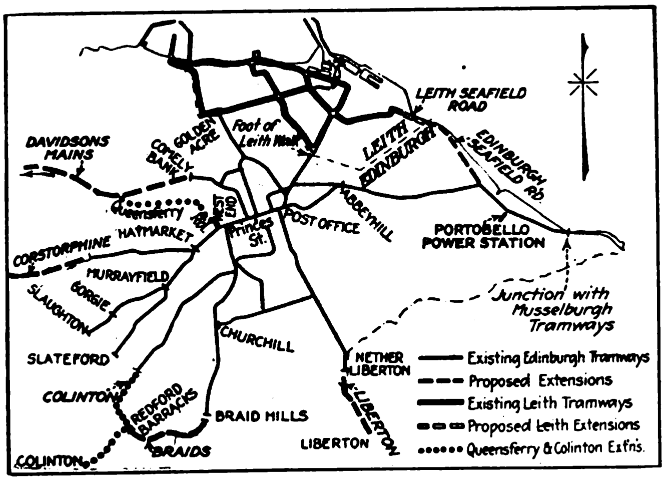
	Street Railway	Rail-less Trolley	Battery Bus
Traffic expenses per car-mile	17.97	16.24	25.82
General expenses per car mile	3.32	2.04	2.07
Repairs and maintenance	12.66	11.11	6.29
Power expenses	6.5	2.49	3.26
Overhead expenses	5.93	5.2	7.57
Total (cents)	46.38	37.08	45.01
Mileage	4,807,328	350,221	8,959
Receipts per car-mile	51.77	23.31	.....
Seats (cents)	60	29	29

The Place of the Bus Defined at Edinburgh

Through Runs to Adjacent Cities and Steady-Traffic Local Lines to Be Electrified—Motor Buses for Light Traffic

WHEN the municipality of Edinburgh took over the Edinburgh & District Tramways, June 30, 1919, it came into possession of a cable system which was not only badly run down but also undertracked. The intention of the city was to electrify and enlarge the system, as set forth in the ELECTRIC RAILWAY JOURNAL for May 3, 1919. However, several conditions arose that made immediate and extensive electrification impracticable. One factor was the terrific advance in the cost of track and a second was the impossibility of securing quick deliveries either of track or power equipment. Another complication was the desire of many people, for æsthetic reasons, to see Princes Street (the show thoroughfare) electrified on the top-cost conduit system, while the rest of the city was to have overhead trolley.

These several circumstances, plus the need for some immediate additional means of transportation, strongly favored the introduction of the motor omnibus. As the question was whether it would pay to convert to electric power or go to the motor omnibus entirely, the decision of the management as set forth to the Council on July 17, 1920, by R. Stuart Pilcher, tramways manager, and as supplemented by recent operating data, should be of interest to urban electric railways throughout the world.



PRESENT AND PROPOSED ROUTES AT EDINBURGH

Mr. Pilcher says that not even the first section, Pilrig-Nether Liberton (to Leith), could be operated electrically before the spring of 1922 because of lack of power. Following the Council's recommendations, he had started motor buses between Easter Road and Ardmillan Terrace and placed orders for more. The fact that the motor buses were being operated profitably and that they were being used to close down some of the northern cable routes (at least temporarily) had led many people to wonder if they were permanently to displace the electric car so far as Edinburgh was concerned. He would therefore venture to discuss the pros and cons.

The outstanding debt on the cable system May 15, 1920, was £462,761. The electrification was estimated to cost £695,700, spread over three or four years, but the fixed charges should not increase, as the cable debt would be decreasing as the electric debt increased. Since the estimated assets of the cable system convertible to electric traction were valued at £804,163, that sum would be virtually thrown away if motor buses were adopted instead. Furthermore, the cost of reconstructing the streets would have to be placed either upon the motor buses or upon the community taxes. The permanent way, as regarded renewals and repairs, really was in substantially the same position as the electric railways throughout the United Kingdom, hence the relative financial considerations as to car versus tram were not unique to Edinburgh.

One special condition was connection with the adjacent city of Leith, which, to please the public, would have to be either all bus or all car, since bodily transfer was intolerable. Leith already had a tramway system which was more economical than bus operation, so it appeared that the Leith-Edinburgh route, which includes the Pilrig-Liberton stretch, should be electrified. The Portobello section ought also to be electrified to allow through running with the Musselburgh Tramways.

Comparing the two methods for the cable routes of the city, Mr. Pilcher presents the following:

System	Capital Cost	Interest and Sinking Fund Charges per Annum	Interest and Sinking Fund Charges per Mile Run in Pence (2c.)
Converting cable to overhead system	£695,700	£56,014	2.334
Cost of providing same number of buses	456,640	64,131	2.672
Cost of providing enough buses to equal car seats	729,900	103,155	2.886

As car-seating capacity is fifty-two, against bus capacity of thirty-two, the buses must number 63 per cent more. The fifty-two-seat electric car could be operated at 18.12d. (36.24 cents) per mile, while the present thirty-two-seat buses cost 21.41d. (42.82 cents) per mile. The buses, however, would not have to give 63 per cent more mileage, because maximum capacity is required only during the rush hours. As the average speed of the bus would also be greater during the rush hours, Mr. Pilcher believes that the bus would be able to earn sufficient extra revenue to meet the extra cost of operation caused by its lower seating capacity. The total costs on this basis would be 20.33d. (40.66 cents) per car-mile, or 23.29d. (46.58 cents) per bus-mile.

After listing the merits and demerits of each type of vehicle and stressing the need of meeting rush-hour conditions, Mr. Pilcher concludes that: "It would appear for main lines of traffic, where the passenger traffic is assured and where it is dense, the electric car will be used, but where an infrequent service is sufficient, such as on a suburban route, or where the traffic is not fully developed, the motor bus will be used. I do not consider that the two systems are necessarily competitive, but rather supplementary."

On the four routes named in the report for July 1, 1919—May 15, 1920, the longest run is practically 3 miles and the fare 3d. (6 cents). The lowest fare, as on the tramways, is 1.5d. (3 cents) for a maximum length of 1.2 miles. There is no workmen's rate, but children between four and twelve years are carried at half rates with 1d. (2 cents) minimum. Several score buses are already in operation on these and other routes with earnings as high as 26d. (52 cents) a mile. The municipality also runs *char-à-bancs* (open touring cars), which are extremely popular with the visitors to this beautiful city.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Changes in the Convention Programs

SECRETARY BURRITT has announced a few changes in the programs of meetings to be held in connection with the Atlantic City convention, as printed in the issue of this paper for Sept. 25, pages 607 and 608. These are summarized below.

American Association

The committee reports which will be read after Mr. McAuliffe's address on Tuesday morning will be that of the Aera advisory committee and that on company membership. This session will close with the discussion of the Federal Electric Railways Commission's report, led by Philip H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, Pa.

On Wednesday the session will open with reports of the committees on fare systems and publicity and of the Committee of One Hundred.

Accountants' Association

On Monday afternoon the joint meeting with the T. & T. Association will be held in the Greek Temple from 3 to 4.

On Tuesday afternoon the paper on "Accounting for Material Received and Used, Including Inventories," by R. A. Weston, will precede that on "Cost-of-Service Accounting," by H. J. Davies.

Claims Association

On Monday afternoon the joint meeting with the T. & T. Association will be held in the Greek Temple from 4 to 5:30.

On Thursday afternoon, from 2:30 to 5, there will be a free-for-all discussion on these topics: (1) "The Increased Cost of Claims and Some of the Reasons Contributing Thereto." (2) "Prosecution of Claims for Damage to Company's property." (3) "How Best to Safeguard Releases from Attack." (4) "Value of Signed Statements." (5) "The Best Method of Keeping in Touch with Witnesses." (6) "Value of Secret Service." (7) "Handling Blind and Fraudulent Cases." This discussion will be followed by general business and the election of officers.

Engineering Association

On Tuesday afternoon the reports to be considered will be those of the committees on way matters and on buildings and structures. The Tuesday afternoon program as revised is as follows:

2:30 to 4:30 p.m. (Greek Temple). Joint meeting with T. & T. Association. Report of committee on safety car operation.

4:30 to 5:30 p.m. (Engineers' Hall). Papers on "Standardization and its Effect on Stores."

A. H. Armstrong's paper on "Railroad Electrification" has been transferred from Tuesday to Thursday afternoon, when it will be read after the discussion of technical reports.

The title of W. S. Murray's paper to be read on Wednesday afternoon has been changed to read: "Our Proposed National Power Policy."

On Thursday the reports of the committees on equipment and heavy electric traction will be discussed.

Transportation & Traffic Association

On Monday afternoon, from 3 to 4, the T. & T. Association will meet with the Accountants' Association in the Greek Temple for the discussion of the report of the committee on the collection and registration of fares, and from 4 to 5:30 in the same place with the Claims Association for discussion of the report of the committee on a code of traffic principles and to hear a paper by C. M. Talbert on "Automobile Hazards."

How the Delegates Will Be Entertained

THE convention entertainment will be under the direction of the following committee: Martin Schreiber, chairman; F. R. Coates, N. R. Garland, R. M. Campbell, R. C. Cram, George R. Lyman, Ross F. Hayes, C. H. Beck, L. E. Gould, Harold Hegeman, Thomas Cooper, J. A. Queenie, Charles C. Peirce, J. P. Barnes, J. C. Thirlwall and A. F. Walker.

The committee announces this as the program:

MONDAY, OCT. 11

Morning concert, Convention Pier, 11 o'clock, Strickland Orchestra.

Afternoon concert, Convention Pier, 3 o'clock, Strickland Orchestra, informal dancing.

Annual reception, ball room, Convention Pier, 9 p.m., in honor of the officers and ladies of the American, Accountants', Engineering, Claims and Traffic & Transportation Associations.

The reception will be followed by informal dancing.

TUESDAY, OCT. 12

Morning concert, 11 o'clock.

Ladies' bridge tournament, Convention Pier, 2:30 to 4 p.m. Play to start promptly at 2:30 p.m. Tournament open only to ladies wearing badges. Prizes will be awarded. Ladies are requested to arrange tables of four if possible. In cases where tables have not been arranged, the committee will gladly see that such arrangements are made prior to play. All visiting ladies are urged to enter the tournament. Mrs. W. F. Ham, hostess.

Afternoon concert, 4 o'clock.

Informal dancing, Convention Pier, 9 p.m.

WEDNESDAY, OCT. 13

Morning concert, 11 o'clock.

Ladies' obstacle tournament, Marlborough-Blenheim lawn, 2:30 to 4:30 p.m. Play starts promptly at 2:30 o'clock. Tournament open only to ladies wearing badges. Prizes will be awarded. All visiting ladies are urged to enter the tournament.

Afternoon concert, 4 o'clock. Violin solo, Abraham Ruvinsky, soloist, leader of Rail-Light Orchestra, Company Section No. 11 of the Toledo Railways & Light Company, Toledo, Ohio.

County Fair, ball room, Convention Pier, 9 p.m.

THURSDAY, OCT. 14

Morning concert, 11 o'clock.

Tea, Convention Pier, 4 p.m., Mrs. John H. Pardee, hostess, and concert, Strickland Orchestra.

Annual ball, Convention Pier, 9 p.m., music by Strickland Orchestra.

FRIDAY, OCT. 15

Morning concert, 11 o'clock.

Recent Happenings in Great Britain

Increased Fares for London Underground Sanctioned by Parliament —Larger London Buses—Labor Restless Again

From Our Special Correspondent

The London underground railway companies' bill to authorize them to charge higher fares passed through Parliament and received royal assent before the recess began in August. That was immediately followed by the companies issuing a statement to the effect that the revised scale of fares was being prepared but that it would not come into operation till the end of September. The newly authorized maximum fares are at the rate of 1½d. per mile or part of a mile, with a minimum of 2d. "Workmen's" tickets will be issued up to 7:30 a.m. and will be available for the return journey at any time during the day. The charge will not exceed the ordinary single fare for the double journey, with a minimum of 3d. (return). The companies do not propose to charge the maximum fares unless further emergency arises. They will continue their policy of giving preferential treatment to the longer-distance passengers, so the fare per mile in these cases will still be low though somewhat higher than before.

BY WAY, no doubt, of making it abundantly clear to the public that the increased fares are necessary, the companies have put up posters at their stations quoting the low dividends and in some cases the fact that there are no dividends at all on the ordinary stocks, and pointing out that to secure such meager results so many millions of passengers have been carried. Another form of this publicity work states that in the first six months of this year the associated companies carried 601,000,000 passengers; that each passenger on the average paid 2.02d., that on the average he cost 1.97d.; that the companies had left 0.05d., that this nearly broke the companies, and that only because of the Government subsidy and miscellaneous earnings were the companies able to maintain their solvency.

40 PER CENT INCREASE IN FARES

In the latter part of August, Lord Ashfield, chairman of the underground railways, in an interview stated that the companies did not intend to put into operation a greater average increase than 40 per cent over the pre-war fares, bringing the charge up to a little over a penny per mile. The fares on the steam railways of Britain, it may be mentioned, are now in many cases as high as 1¾d. per mile. Lord Ashfield also pointed out that there are still millions of passengers on the underground railways who pay only a penny each, while the terminal charges per passenger (printing, issue and collection of tickets, running of elevators, etc.) amount to about three farthings per passenger. If there is no further increase in working expenses the increase in fares of 40 per cent will allow of a dividend of 5 per cent on ordinary capital.

In connection with the fare question in London, there was a fluttering of certain dovecots during August over a proposal, which was defeated by a majority of only one vote in the London County Council, to abolish the 2d. all-the-way mid-day fare on the Council's tramways — started three or four months ago to encourage traffic during the slack hours of the day. The proposal was made by the highways committee of the County Council as one outcome of negotiations which have been going on between representatives of the Council and of the underground railways and the omnibus companies. The recommendation submitted to the Council was that subject to the omnibus companies agreeing that the fare for one section of about 0.6 of a mile should not exceed 1d. (this being the same as the new proposed Council's tramway fare) the charging of a 2d. maximum fare on the Council's tramways during certain hours of the day should be suspended. W. J. Squires, the chairman of the highways committee, in moving the proposal at a special meeting of the London County Council on Aug. 24, said it was the Council's desire to come to some understanding as to traffic on London tramways, omnibuses and underground railways. There should be a spirit of give and take, and he regarded the experimental 2d. fare as a direct cut against the omnibus company.

UNDUE COMPETITION UNDESIRABLE

G. H. Hume, who represented the Council before the Ministry of Transport and the omnibus companies, stated that the negotiations would not be taken up seriously till October, and undue competition was undesirable in the meantime. The omnibus undertaking proposed to do away with 1d. fares and to charge a minimum of 1½d.; they objected to the 2d., all-the-way mid-day fare, and it was proposed to meet them in this. Other councillors (including Labor men) contended that the 2d. fare had been successful and should be continued, and that the Council was not there to consider the interests of the shareholders of the companies.

The proposal was defeated by thirty-six votes to thirty-five. The decision is a fresh example of the difficulties arising from part of London passenger transportation being conducted by a municipality and part of it by companies. The jealousy of the former is always marked.

LARGER BUSES FOR LONDON

The size and the seating capacity of motor omnibuses in London are still increasing. The standard bus until recently seated thirty-four passengers. The next type, by means of a somewhat larger body and a modification in design, provides a seating accommodation for forty-six people. A number of this sort are now on the streets. In the end of August the Commissioner of Metropolitan Police agreed as an experiment to license a limited number of a new type, each of which will seat fifty-seven passengers. All the omnibuses mentioned are double-deckers, and the last type rivals a four-wheeled tramcar in capacity. It is said that the new vehicle keeps within the existing limit of weight, namely, 3½ tons unladen. At the time of writing no sample of it had begun operation.

It is expected that the London General Omnibus Company, which is in the underground "combine," will put up its fares at the same time the railways do. For this it does not need any Parliamentary powers. The company has resumed two all-night services of buses which were stopped owing to scarcity of men, vehicles and petrol during the war. These services are between the city and some northwestern suburbs. The buses run at intervals of about an hour between midnight and morning.

STRIKES CONTINUE

A truly remarkable record has been set up by the Great Eastern Railway by putting into effect a two-minute service of trains during the rush hours on certain of their suburban routes out of Liverpool Street Station in the city of London. This is said to be the most frequent service of steam trains in the world. The project for electrifying the company's suburban lines is still under consideration, but costs of everything are excessively high and it is not easy for the railways at present to raise additional capital.

Despite all the "settlements" that have been arrived at, sporadic strikes, often of the "lightning" variety, continue to take place on various tramway undertakings in England. They arise out of local grievances or disputes, and the Joint Industrial Council seems to be unable to prevent them. Tramway employees, like many other employees in this country, now go out on strike on the most trivial matters. Then in Scotland there was a twenty-four hour stoppage of some of the most important tramways, this being part of a one-day strike among various industries as a protest against a new act of Parliament allowing landlords to increase house rents—a thing prohibited during the last two or three years of the war. Glasgow tramwaymen threaten to strike because the Town Council will not recognize one of their trade unions. Another of these unions is already recognized. The Council evidently thinks that one union is enough.

It is announced that the government of New Zealand has accepted a tender of the English Electric Company for the electrification of the Arthur's Pass section of the main line railways. The route includes a tunnel 5½ miles long through the mountains. The gradients range up to one in thirty.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Budget Reduced $379,000

Cincinnati Street Railway Director Orders Cut in Supplementary Budget—Total $554,000

The Cincinnati (Ohio) Traction Company has filed an application for supplementary allowances for 1920 as follows:

Way and structures	$ 72,818
Equipment	170,384
Power	277,540
Conducting transportation	380,626
General and miscellaneous	21,720
Total	$923,090

The explanation of the company may be summarized under these general heads.

The failure of the O'Brien law in the Supreme Court dislocated the financial plans for track construction upon which the budget of 1920 was based, necessitating a larger expenditure for this purpose. The outlaw switchmen's strike interrupted the company's regular supply of coal from the mines and made it necessary to purchase coal in the open market at almost double contract prices.

The decision of the Wage Board of Arbitration added 18 per cent to the scale for members of the union and thereby required adjustments affecting every department of the company. The latter is the larger and more important item.

STREET RAILWAY DIRECTOR SATISFIED

William C. Culkins, Street Railway Director, after reading the report of the arbitrators said that he was impressed with the justice of their conclusions in the matter affecting wages. Mr. Culkins reiterated the recommendation of Chairman Tuttle of the wage board urging the railway to introduce every economy possible. Mr. Culkins said:

> A general survey of the system by this department shows that during the middle of the day, and in the late evening on many lines, cars are running almost empty. The change of a few minutes in headways during the middle of the day would produce an appreciable inconvenience but would materially reduce operating expenses on the whole system and benefit the car riding public, who will, I am sure, cooperate cheerfully in working out of any economy which does not reduce service below the standard established.
>
> One-man car operation, through rerouting, crosstown connections and other matters have been previously called to your attention, as the need of conservation is greater now than at any other time.
>
> The total supplementary allowances requested would increase the total operating expenses for the year 1920 from $5,449,346 to $6,373,434 and require a total, including taxes, rentals and other deductions, of $9,628,000. The total receipts for the first eight months of this year were $5,809,471.
>
> It seems reasonable, however, to expect an increase in traffic, but the number of revenue passengers for the last four months of 1920 will probably not exceed 42,500,000, or 2,500,000 more than in 1919. This would produce at an 8-cent fare approximately $3,440,000, or a total for the year of $9,249,000, which would be $379,000 less than the total allowance under the supplementary budget as requested.
>
> However, I am of the opinion that with economies suggested the company will be able to pay the new wage scale and still materially reduce expenses so that it will be possible to avoid increasing the present rate of fare.
>
> It is evident that the improvement of Eastern Avenue, Central Avenue and possiby Freeman and Hamilton Avenues will not be completed this year and the total estimated for this purpose will not be required before next year.
>
> The efficiencies suggested will reduce the consumption of power, and since the total excess over the budget for the first months of 1920 is $112,000 the amount requested, $277,000, seems excessive, especially in view of the improved railroad freight conditions which should assure a supply of high-grade coal.
>
> The greatest effects of the schedule readjustment and the greatest savings should be shown in "conducting transportation." Of the $21,720 requested for "general and miscellaneous," a satisfactory reduction in the injuries and damages accounts promises to offset increased costs of supplies coming under this heading.
>
> It is therefore ordered that the supplementary budget required by the company be not granted and that in lieu thereof the following supplementary allowances be and the same are hereby granted:

Way and structures	$ 30,000
Equipment	150,000
Power	200,000
Conducting transportation	150,000
General and miscellaneous	14,000
Total	$544,000
Reduction	379,000

City Representatives to Meet at Atlantic City

William C. Culkins, Street Railroad Director at Cincinnati, Ohio, and secretary of the American Association of City Representatives of Electric Railways, announced that on Oct. 13 at 2 p.m., during the convention of the American Electric Railway Association at Atlantic City, the Association of City Representatives of Electric Railways will convene at the Hotel Traymore. Mr. Culkins has requested each member to prepare a paper on local conditions to be read before the assembly.

Among those who have signified their intention of attending the meeting are: Thomas Murphine, former Superintendent of Utilities, Seattle, Wash.; M. M. O'Shaughnessy, City Engineer, San Francisco, Cal.; William C. Culkins, Director of Street Railroads, Cincinnati, Ohio; Fielder Sanders, City Street Railroad Commissioner, Cleveland, Ohio; Lynn B. Milam, Director of Public Utilities, Dallas, Tex.; William L. Sause, Street Railroad Commissioner, Youngstown, Ohio; C. R. Barnes, Street Railroad Commissioner, Rochester, N. Y.; R. F. Kelker, Jr., Chicago, Ill.; John W. Everman, Dallas, Tex.; D. W. Henderson, Seattle, Wash; Colonel E. M. Stayton, Kansas City, Mo.; and W. S. Twining, Philadelphia.

New Orleans Report Public

Special Masters Acting for Court Recommend Service-at-Cost Plan and an Eight-Cent Fare

The report of the three special masters arbitrating the differences between the trainmen and the New Orleans Railway & Light Company was filed with Judge Foster on Sept. 20. The document, which is signed by Charles J. Theard, George H. Terriberry and P. J. O'Leary, recommends:

> That the citizens of New Orleans pay a fare of 8 cents.
>
> That the company be allowed interest on its investment at the rate of 7 per cent. The valuation placed at $41,500,000.
>
> That the company immediately adopt the service-at-cost plan.
>
> That the men be paid 40 cents for the first six months in service, 52 cents the next six months and 55 cents thereafter. The men now are getting 38, 40 and 42 cents an hour.
>
> That the local union and its affiliation with the Amalgamated be recognized.
>
> That the company sign the contract of 1918 with certain reservations. These reservations in some instances are those requested by the company, one of which is the abolishment of the five-minute layover. The company also has the right to say how it shall run its cars.
>
> That school children pay not more than 5 cents with transfers.

EASY TO ADOPT NEW GRANT

The special masters agree with counsel for the New Orleans Railway & Light Company that the adoption of a service-at-cost plan in the city of New Orleans should not involve serious difficulties nor protracted negotiations. They express the opinion that it would appear to be improbable that difficulties will arise in selecting from these various plans such parts as are appropriate and adaptable to local conditions and incorporating them into a fair and workable cost of service plan.

Federal Judge Foster rendered a decision on Sept. 30 on the report of the special masters in which he granted the wages awarded to the motormen and conductors, holding that until such time as the service-at-cost plan was adopted an 8-cent fare was necessary to meet the wage increase and enable the receivers to give adequate service. He held further that since the city made no objection to the masters' recommendation of an 8-cent fare, he took it for granted that the city would not oppose the increase. He recognized the Amalgamated, but held that the men would have to abide by the masters' recommendation regarding working conditions. He disapproved and set aside the masters' valuation of $41,500,000 for the property in deference to the representatives of the stockholders, who objected to the valuation. The report now goes to the Commission Council, which will meet on Oct. 5 for final action.

Employment Control Upheld

District Court Says Employees Have Right to Organize, but Employers May Fix Employment Conditions

The Supreme Court of the District of Columbia has denied the application for an injunction sought by the Brotherhood of Railroad Trainmen to restrain the officers of the Washington & Old Dominion Railway from discharging any of the plaintiffs from the employ of the railway by reason of their affiliation with the brotherhood or for any cause not the result of the fault or misconduct of the plaintiff.

ROAD A COMMON CARRIER

The conclusion of the court as noted briefly in the ELECTRIC RAILWAY JOURNAL for Sept. 11 is that the defendant railway is such a carrier by railroad as comes within the purview of Title 3 of the transportation act of 1920. The court says that the company's right to dismiss its employees for becoming members of the labor union is supported by the judgment of the highest judicial tribunal in the country and that this judgment, in cases within the jurisdiction of the court, the court must recognize and enforce.

It was sought to have the injunction continued pending a decision of the so-called labor board created by the act of Congress, known as the transportation act of 1920. The bill also prayed that pending the decision of the labor board referred to the defendants be required to reinstate such of its employees as had been discharged because of their affiliation with the railway brotherhood.

The Washington & Old Dominion Railway insisted that it was an interurban or suburban electric railway not operating as a part of the general steam railroad system of transportation and was excepted from the provisions of section 300 and sections following in the transportation act. The railway admitted that some of the plaintiffs and other employees of the company had been dismissed from its employ and that those still in its employ at the time of the filing of the bill were threatened with dismissal because of their union affiliations. The railway contended that there was no equity presented by the bill and that the court did not have the authority to grant the relief that is sought.

EMPLOYERS HAVE RIGHTS, TOO

The court found that both the declared purpose of the company, the business contracted by the railway and the character of the territory through which the line ran, removed it from the category of either an interurban or suburban electric railway. On the issue of the matter of the policy of the road to prevent its employees from joining labor unions, the court said that Mr. Davis, the manager, very frankly stated the reason which influenced this policy.

The court also said that the right to labor was a social right which inhered in the individual and as a corollary to that the right not to work must equally be recognized. With the recognition of the right to belong to organizations of labor unions, so called, was another right which belonged to the employer. That right was to impose conditions upon those who sought employment from a given employer, be that employer an individual or a corporation. In this connection the court said:

> It may be asked what becomes of the right of employees to organize themselves into a union, or to become members of a union already in existence, if, as a consequence of doing so, the employer may exercise his right as recognized by the Supreme Court in the cases cited? The answer may not be easy to formulate, but this Court is not called upon to answer the question. Its duty is to give effect to the authoritative opinions and decisions of the Supreme tribunal. These, it would seem, give to the defendant railway company the right to dismiss its employees if they join a labor union.
>
> It may be urged that to so hold is to render vain the right which the plaintiffs claim is given them under the transportation act of 1920. But without stopping to inquire whether they are given rights under that act of the character claimed in the bill, it is enough to say that if that act undertakes to restrain the power of employers to discharge their employees for joining a labor union, the act would then appear to come within the denunciation of such legislation in the opinion of the Supreme Court to which attention has been called.
>
> It might be appropriate to point out that the provisions of the transportation act relied upon by the plaintiff contemplate, apparently, action by the labor board where application by an existing labor organization is made to it, or made by unorganized employees to the number of 100 or the labor board's own motion. It is alleged in the bill that there are not 100 unorganized employees of the defendant railway to sign the petition to the labor board, contemplated. But even so, the labor board may on its own motion, "if it is of the opinion that the dispute is likely substantially to interrupt commerce" . . . decide such disputes as it is by the act given jurisdiction to hear and determine.
>
> It is not for this court to discuss the policy which from the evidence submitted is the one adopted by the defendant railway employer with respect to its refusing employees becoming members of a local union. But it is well to keep in mind the evident policy of the National Legislature, which impliedly, at least, recognizes the right of employees to be members of a labor union.

Service Resumed Pending Inquiry

At a hearing before the Public Service Commission for the First District of New York on Sept. 16 Commissioner Barrett, acting for the commission, read a letter which he had just sent to Frueauff, Robinson & Sloane, attorneys for the receivers of the Manhattan & Queens Traction Corporation, pointing out the franchise obligations of the company and directing it to resume service at a 5-cent fare, pending the continuation by the commission of the investigation of the company's affairs made necessary by its application for increased fares. The attorneys for the receivers complied with the commission's request in a letter to Commissioner Barrett. In this letter they said that with many statements of the commissioner they were in accord, but that they have already shown that service cannot be rendered with the fare at 5 cents.

Bus Competition Protested

Pacific Electric Railway Opposes Direct Stage Competition—Increase in Fares Hurt Railway

The Pacific Electric Railway, Los Angeles, Cal., has instituted a fight before the California State Railroad Commission against direct auto stage competition on all parts of its system. A petition filed by the interurban system on Sept. 24 with the Railroad Commission protests and asks that wherever such competition is authorized or permitted to exist, the Pacific Electric be allowed to cancel all of its interurban commutation fares.

BLOW TO COMMUTERS

This drastic proposal as now made would be a serious blow to thousands of interurban commuters. It is made as the result of an application recently filed with the commission for the granting of an autobus franchise between the cities of Los Angeles and Alhambra.

An application of similar nature has since been filed with the commission in anticipation of autobus competition being sanctioned between Los Angeles and Pasadena. Similar action will be taken by the company to cancel the commutation fares between Los Angeles and Pasadena and to eliminate free transfer privileges now in effect in Pasadena from local lines to interurban lines on through business between Los Angeles and Pasadena.

The applicants for the competitive bus line between Los Angeles and Alhambra contend that unsatisfactory service on the interurban line and the unjust burden resulting from recent increased rates make the granting of a bus line franchise an absolute public necessity.

The bus line proposes to charge the same fare in effect on the electric line before the recent 20 per cent increase. There is nothing definite in the bus line proposal as to a commutation fare. All bus lines avoid this issue, always going after the one-way and round-trip business.

RAILWAY DENIES NECESSITY

In its protest to the commission the Pacific Electric Railway denies any public convenience or necessity for the proposed auto stage line. The electric line claims it is now furnishing sufficient and adequate service and would suffer material loss in patronage should the stage line be permitted to operate. In conclusion the company said:

> In the event your honorable body should see fit to grant the application of the bus line, the Pacific Electric Railway hereby makes application for authority to cancel all commutation tickets, and retain in effect only one-way and round-trip tickets.

It is cited that the electric line pays out 30 per cent of its revenue for taxes and maintenance of right of way, while the auto stage lines pay out only 2 per cent of their gross revenue in state taxes and the public maintains the right of way free.

Government Ownership Planned

Program of Mexican Government for Taking Over Electric Utilities Causes Surprise

Foreign investment interests in Mexico express much surprise at the authoritative announcement which has just come from the capital to the effect that the Mexican government plans to purchase the extensive holdings of the Mexican Light & Power Company and the Mexican Tramways, Ltd., including the hydro-electric plant at Necaxa. It is stated that an inventory of these properties has just been made and that the proposed purchase price has been practically agreed upon by the interests involved.

The making public of the government's plans to acquire these holdings was all the more of a surprise, coming, as it did, upon the heels of an authentic statement that the Mexican Tramways, Ltd., had under consideration plans for resuming construction work upon its two proposed interurban electric lines, one to run from the city of Mexico to Puebla, 130 miles, and the other from the city of Mexico to Toluca, a distance of 45 miles.

A $12,000,000 INVESTMENT

More than $12,000,000 gold was expended in the building of dams for the storage of water in the mountains, the installation of a hydro-electric plant of 200,000 hp. and the construction of transmission lines from Necaxa to the city of Mexico, Puebla and El Oro. How much money in addition to this was invested in the lighting system and electric railways of the capital and Puebla is not publicly known. The Mexican Light & Power Company and the Mexican Tramways, Ltd., are owned by a British syndicate.

It is the purpose of the Mexican Government to finance these pending transactions by issuing bonds, which will be retired from the profits of the companies. The details of how this financing is to be accomplished are lacking, however, in the preliminary announcement of pending negotiations.

Valuation Proceedings Begun

The valuation proceedings in connection with the appeal of the Philadelphia (Pa.) Rapid Transit Company for additional revenue started on Sept. 23. Commissioners Benn and Clement sat to hear the testimony regarding the company's holdings. A mass of evidence tending to show the length of mileage owned and operated by the company was introduced. In order to expedite matters with the city the commission postponed the hearing until Sept. 30 so as to give the city an opportunity to select its experts.

The company was ordered by the commission to throw open its books and give all data relating to the valuation as well as the actual property to the city's experts, so that the latter will have every opportunity to check up the figures that will be submitted to the commission in the valuation hearings.

The hearing opened with the reading of a paper by Coleman J. Joyce, counsel for the company, in which he explained that the company would be unable to submit anything but the inventory of the various equipment that makes up the system. The actual pricing of the items submitted, he said, would be made as the hearings progress. In explanation of the inability of the company to present the valuation as ordered by the commission. Mr. Joyce said that the failure of the company to get the higher fares it sought in June had made necessary certain economies that precluded the employment of the pricing experts required to expedite the valuation.

He also delivered a plea for the granting of a higher fare by the commission, pointing out that a higher fare had been allowed in Pittsburgh, and in Philadelphia, in the case of the Philadelphia Electric Company, higher rates were permitted while valuation proceedings were in progress. Mr. Joyce said that the work of compiling the valuation had started in November, 1918. At various times as high as 250 men had been employed on the valuation.

Employees Desire to Run Road

Trainmen in the employ of the Eastern Massachusetts Street Railway believe the Chelsea division, now run at a loss, can be made to yield a good profit, and desire an opportunity to operate it in their own way, expressing a willingness to make good any losses entailed by such management.

In an open letter to the public, signed by President James M. O'Brien, the Chelsea union declares it feels as though it could reduce the fare, give more frequent service and resume operation of lines which have been discontinued. The letter follows:

> To the public: The employees of the Bay State System, in the Chelsea division, who are members of the Amalgamated Association, desire to inform you that we did not raise the fare from 10 cents to 15 cents, and that we did not approve of it at the time it was done.
>
> The company alone is responsible for the advance and the only thing we can do is to collect whatever rate the company charges. We believe the company has made a mistake in trying to get additional revenue in this manner.
>
> Raising the rate of fares certainly drives away riders, and that of course results in fewer cars being run, and causes more of our men to be laid off. We are inclined to believe that someone in charge of running the Bay State system either does not understand how to run the property or has some idea in mind other than giving the public service.
>
> We believe that the Chelsea division is a good paying proposition and would welcome the opportunity of trying to run it in our own way. We feel as though we could reduce the fare, give more frequent service, and resume operation of lines that have been discontinued. We are willing to share in the losses, if there be any.
>
> According to its own statements, the present management must be convinced that it is a failure. Why do the officers stand in the way of letting others try it; why don't they stop before they put the entire property in the junk pile?

The proposal from the men is to be put up to the trustees of the Eastern Massachusetts Street Railway by the employees.

$175,000,000 Program Suggested

Greater New York's Transit Needs for Twenty-five Years Planned For by Commission's Engineers

General plans and studies for enlargement and extension of the city-owned rapid transit system in all of the boroughs of Great New York have been announced by Transit Construction Commissioner John H. Delaney and the engineering forces of the department. The plans have been prepared by Daniel L. Turner, chief engineer of the commission. The scheme as worked out has been issued in pamphlet form for consideration for the purpose of evoking suggestion and criticism from the operating companies, engineers and civic organizations generally.

As laid down in general terms the program for transit development is intended completely to take care of the city's needs as long as it is confined within its present boundaries. A definite program is suggested for the next twenty-five years, as such needs can now be forecast. Studies have been made in order that municipal growth may not be retarded in any direction and for the prevention of abnormal and congested conditions in certain sections of the city and strangulation of growth in other areas.

830 MILES OF LINE PROPOSED

In the proposed routes for the complete program provision is made for adding 830 single track miles to the present rapid transit facilities of the city, which now aggregate approximately 616 miles of single track elevated and subway lines. Projected lines and extensions to the existing lines, wherever they may originate in outlying boroughs, are laid out to enter and traverse the heart of the city, which from the transit viewpoint is 8 square miles in the section of Manhattan south of Central Park between Second and Tenth Avenues. The plan contemplates the addition of forty-two single track river crossings to the thirty-four single track river crossings provided in the existing dual transit system. All of the proposed crossings will be by means of tunnels. In the new project will be twenty-one additional two track tunnels connecting the boroughs of Manhattan, the Bronx, Queens, Brooklyn and Richmond.

No close estimate of the cost of construction of the enlarged transit system is possible at present, and it is not intended that the comprehensive scheme as laid out in its entirety will be undertaken at once, but that it should be proceeded with gradually and continuously. At pre-war prices it is estimated that the lines contemplated in the suggested program would cost approximately $175,000,000. At present prices, however, it is estimated that this cost would amount to $350,000,000 exclusive of equipment, interest during construction, engineering and superintendence.

Wages Vary with Net

Elgin & Belvidere Men Sign Contract with Wage Scale Under Which They Share in Earnings

Bion J. Arnold, sole owner and operator of the Elgin & Belvidere Electric Railway, Elgin, Ill., has entered into a new contract with his trainmen who are organized as Division 507 of the Amalgamated Association, which embodies a new principle in the matter of wage determination. A "basic rate" of pay of 31 cents, 32 cents and 33 cents, respectively, for first year, second year and senior men is provided, and to this is to be added an "increased pay" of an amount sufficient to make up the rate of pay contained in a table in the contract and varying upward with increasing net income.

PLAN SIMPLE IN OPERATION

For example, if the difference between gross receipts and operating expenses for the current month is between $3,500 and $3,000, the total rate of pay for that month is to be 43 cents, 44 cents and 45 cents an hour. If, during the next month, the net revenue should be between $4,000 and $3,500, the rate per hour would be 46 cents, 47 cents and 48 cents for that month.

The rate of pay is determined each month for the current month. At the end of the first fifteen days of any month, the net revenue is computed and multiplied by two to indicate the monthly net, and the men then paid for this first fifteen days, accordingly. The sliding scale thus determined varies for senior men from the basic rate of 33 cents an hour for a net earning of less than $2,250 per month to a maximum of 63 cents an hour for a net income of $6,000 or over.

The contract specifies that the operating expenses of the company shall be kept in accord with the Interstate Commerce Commission standard classification of accounts and shall include the actual cost of all labor and all other expenses incidental to the operation of the road, it being understood that 25 per cent of the gross receipts may be expended for maintenance and renewals, and 4 per cent expended or reserved for injuries.

CAPABLE OF WIDER APPLICATION

The rate of pay for the last half of the month is determined by taking the actual gross earnings for the month. Provision is made that checks drawn for the pay of the men shall be accepted by the men temporarily with the understanding that adjustments will be made within sixty days from the close of every month, and additional checks sent to cover the amount due the men, or deductions made from subsequent amounts to them if the amount paid was at a rate in excess of what was actually earned, according to the sliding scale.

While this plan has been worked out on a small property, Mr. Arnold considers it fundamental and capable of general application, provided that the companies are willing to accept a reasonable rate of return upon the actual cash invested in the property or upon a fair valuation. In the case of the Elgin & Belvidere Railway, which has never been profitable, the company will earn about 3.5 per cent on the actual cash (not stocks and bonds) invested in the property when the men are receiving 45 cents an hour and 5.5 per cent when the men are receiving 60 cents an hour. The whole plan is based on the theory that both the company and the employees prosper in good times and suffer in bad times, in proper proportion, the limit of the burden borne by the men and the extent to which they prosper being fixed by the wage scale tabulated in the contract. Mr. Arnold states:

> In our case we will probably never reach the 63-cent limit, although if we could I would be glad to see the men get the wage provided, but the probability is that the wages will run from 33 cents to 54 cents an hour, the 33 cents applying probably only during January and February of each year.

Another interesting clause of the contract is that the union employees of the Elgin & Belvidere Railway have agreed to maintain good relations with the union employees of the Aurora, Elgin & Chicago Railroad, which connects with it at Elgin, and co-operate with the non-union employees of the Rockford & Interurban Railway, connecting with it at Belvidere, in the establishment and maintenance of various through service to the end that the volume of business done by the respective companies may be increased.

Back pay has been paid the men from July 15, the date of expiration of the old contract. For the last half of July the men received 51 cents an hour and they will probably receive 51 cents for August, although the exact figures have not yet been determined. They will probably receive between 48 cents and 51 cents for September. The men have thus apparently received a raise of pay of from 8 cents to 11 cents an hour under the new contract.

Newspaper Reviews Railway Situation

In order to acquaint the residents of Cleveland with the present situation of its street railway system a series of articles about the Cleveland Railway is being published in the Cleveland *Plain Dealer*. Two installments have already appeared written by two members of the staff of that newspaper. The object of the articles is to present to the people of Cleveland the real situation with respect to its railway, discussing its present needs and future improvements. It is hoped that the digesting of these accounts will move people to help and not hinder the railway in giving its best service to the city. In the articles so far published it has been shown the system undoubtedly needs new equipment to maintain efficiency in transportation. The ways and means of acquiring this capital will be discussed in subsequent articles.

Council Repasses Measures

Toledo Body Clears Way for Railway Settlement at the November Election

The City Council at Toledo, Ohio, started the Milner service-at-cost ordinance and the twin bond ordinances providing for an issue of $7,000,000 of bonds to acquire and construct a municipally owned railway system on the way to the voters when it finally approved them at the meeting of the Council on Sept. 27, without a dissenting vote. It had been previously agreed that they would be passed without opposition.

PREPARING FOR CAMPAIGN

It is expected that Chairman W. L. Milner, of the service-at-cost commission, will lead in the campaign before the people for the adoption of the ordinance. No organized opposition to the Milner plan has been brought out except that voiced in the Scripps afternoon newspaper, the *News-Bee*. This paper is also supporting the municipal ownership plan as it did in the previous campaign. During the negotiations on the franchise the paper always supported the Milner commission as opposed to Henry L. Doherty and the company interests. Now it is turning against Milner in an effort to defeat the franchise after it has been approved by Council twice.

The campaign against the ordinance so far has been in general terms against the Tayler plan. The *News-Bee* has said that it is like "signing a blank check" to give the railway such a working plan. It is also extensively advertising the Wilcox statements regarding the Tayler plan.

It will be remembered, however, by many that while Mr. Doherty and the commissioners were trying to reach an agreement, Mr. Doherty objected to the Toledo plan largely because it differed from the Tayler plan as in force in Cleveland.

With the twin bond ordinances the taxpayers of Toledo will hand over to the Council $7,000,000 to spend *carte blanche*, except that it shall be for a transportation system. Radicals are opposing the measure because it does not provide for buses alone and others are opposing it because it does not provide for taking over the present system of transportation.

The service-at-cost plan at Toledo does not mean death to municipal ownership. It provides for municipal ownership in a series of small payments to be made one each year of the twenty-five years of the grant, or ownership or lease on short notice at any time in the twenty-five years.

It is expected the campaign for the Milner ordinance will open very shortly. Municipal ownership advocates have announced no plan as yet. W. L. Milner, chairman of the commission, will lead the business interests in favor of the service-at-cost and permanent settlement of the railway difficulties of Toledo.

Formal Appeal Made for Wage Rehearing

The Public Service Commission of Missouri has been petitioned by the attorney for the employees of the United Railways, St. Louis, Mo., to set aside its recent order denying the men a rehearing of their application for increased wages. The order of the commission sitting as a board of arbitration was for an advance of 5 cents an hour in the wages of the men. Most motormen and conductors are paid at present 60 cents an hour. The motormen and conductors recently voted to accept this award.

The attorney for the men issued a statement saying that one reason for the men's petition was that the order denying a rehearing was not issued by the same board of arbitration which granted the advance of 5 cents an hour, as after that action Commissioner Blair resigned from the commission and was replaced by Commissioner Kennish, who cast the deciding vote on which a rehearing was denied. The men ask that Mr. Blair be permitted to assume his old place as one of the arbitrators and that he vote on a rehearing.

Worcester and Springfield Wages Adjusted

Employees of the Worcester (Mass.) Consolidated Street Railway must accept the wage compromise of the company though they defeated the proposition by a vote of 504 to 420. The agreement which exists between the Springfield and Worcester unions is that each must abide by the total vote of both cities and the men of Springfield gave a sweeping "yes" to the proposal. The compromise carries with it an increase of 7 cents an hour for the second six months of this year, an additional 1 cent an hour for the first six months of next year and 3 cents an hour more after June 1 next.

Last spring the members of the Worcester division of the Amalgamated Association made demands on the company for an increase to 95 cents an hour. The question was to be referred to a board of three arbitrators, two of whom were Bentley W. Warren, Boston, for the company, and James H. Vahey for the employees. The third arbitrator was to be selected by these two men.

A time limit has been imposed for the selection of a third arbitrator and on the date of expiration the company announced that it had an offer to make to the men. The proposition from the company to the men which was voted on and accepted is as follows:

From June 1, 1920, to Dec. 31, 1920, 7 cents an hour, or 63 cents more a day.

From Jan. 1, 1921, to June 1, 1921, 8 cents an hour, 72 cents a day.

From June 1, 1921, to Dec. 31, 1921, 11 cents an hour, 99 cents a day.

Worcester rate on hourly basis same as present.

Springfield rate figured on daily basis.

Operators of one-man cars 13 cents an hour over rate paid on two-man cars.

All other conditions to remain the same.

Miscellaneous employees to receive the same rate per hour as uniform men.

News Notes

Big Plan Dies.—The plan of a proposed tunnel under East Fifty-fifth Street, Cleveland, known as the Barber project, has practically become extinct. On Sept. 24 a plot of land considered essential to carrying out the project passed into the hands of a realty corporation. At the time the plan was first advanced people of Cleveland were led to believe that the completion of this tunnel meant an ocean port for Cleveland. This now seems remote.

Bus Legislation Fails. — At the special session of the Legislature of New York, called to consider the housing situation, an effort failed to enact legislation fostered by Mayor Hylan of New York to permit the city to own and operate motor buses. The courts have already ruled against the operation of such vehicles in competition with the railways and have stayed the hand of the city in its effort to expend $1,000,000 for motor vehicles. The bus proposal was opposed by counsel for the New York Railways, the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company.

Wage Increase in Charlotte.—Z. V. Taylor, president of the Southern Public Utilities Company, Charlotte, N. C., has announced a new wage scale for the employees of his company. The men had submitted a contract which called for so great an increase that the company in view of its limited revenue was unable to meet the request. However, at a meeting where company officials and representatives of the men were present, a compromise was reached and the men of Charlotte, Winston-Salem and Greenville signed an agreement for the next twelve months which will give them an increase of 5 cents an hour. The new scale is as follows: For the first six months, 43 cents; second six months, 44 cents; second year, 45 cents; third year and after, 47½ cents. Operators of one-man cars will receive 5 cents an hour above the scale.

Interurban Franchise Case Heard.—The Wisconsin Supreme Court heard final arguments on Sept. 25 in the Milwaukee interurban franchise case. A decision is expected within a few weeks. The controversy resulted from the demand of the city of Milwaukee that the Milwaukee Electric Railway & Light Company obtain an interurban franchise for the operation of interurban cars over its city lines. This the company refused to do. The city thereupon obtained a restraining order. When the company prepared to obey this order by stopping all its interurban cars at the city limits and compelling passengers to get off and get on the cars again after the cars had crossed the city boundary line, the state intervened and the execution of the injunction was delayed pending a hearing by the State Supreme Court. The case was reported in ELECTRIC RAILWAY JOURNAL of May 22, 1920, page 1076.

East St. Louis Arbitrators Selected.—After conferences between Maurice V. Joyce and C. E. Pope, attorneys representing the East St. Louis & Suburban Railway, East St. Louis, Ill., and the men employed on the interurban lines of the company, Edward J. Coffey, East St. Louis agent for the Southern Railroad, was selected chairman of the board to arbitrate the wage demands of the men. David M. Walsh and C. E. Smith are the other members. The men are receiving from 48 to 53 cents an hour. Last April they presented a demand for an increase to 95 cents an hour. Whatever increase is granted them will be retroactive to May 1. Three weeks ago the Alton, Granite City & St. Louis Traction Company, controlled by the East St. Louis & Suburban Company, was placed in the hands of receivers and the line is now being operated under the supervision of the Federal court. Shortly afterward the receivers agreed to an increase of 6 cents an hour to men employed on the city divisions of the system and 7 cents to men employed on the interurban cars. The men have not voted on the proposition to accept the increase.

Program of Meeting

Public Utilities Association of West Virginia

The Public Utilities Association of West Virginia will meet at Charleston, W. Va., on Oct. 5, for the election of officers and the transaction of other business.

Joint Meeting in Providence

New England Street Railway Club Invites Rhode Island Company Section to Join in Meeting

The next meeting of the New England Street Railway Club will be held on Oct. 7 in Providence, R. I., at the Narragansett Hotel. The Rhode Island Company Section No. 12, A. E. R. A., will be guests, in what thus becomes a joint meeting. Elaborate plans are being made for this novel meeting, according to I. A. May, president of the club. At least 250 are expected to attend. There will be an afternoon session, a dinner and an evening session. The meeting will be addressed by Fred A. Cummings, publicity agent of the Eastern Massachusetts Street Railway, and the ensuing discussion is expected to be lively and instructive. At the evening session, two addresses are planned, one of which will be by William C. Bliss, chairman of the Public Utilities Commission of Rhode Island; the other speaker will be Joseph F. Berry, attorney for the Connecticut Company in Hartford.

Financial and Corporate

Norfolk Valuation Submitted

Taylor-Cooke Report $8,750,000—Company Seeks Valuation of $11,000,000 at 1920 Prices

The report of A. Merritt Taylor and his associate, Charles B. Cooke, Jr., on the Norfolk street railway problem has been made public. Mr. Taylor finds the value of the property to be $8,750,000 and suggests a return thereon at 8 per cent. He would retain the 6-cent fare within the city limits, establish additional fare zones on certain county lines and eliminate ultimately the 2-cent transfer charge.

It is the idea of Mr. Taylor to revise the franchise and relieve the company from street paving and from making a return to the city of moneys secured from the 2-cent transfers. He would continue the use of safety cars and eliminate jitney competition. A rehabilitation program of calling for the expenditure of $830,572 and a construction program calling for work to the total of $1,269,395 are suggested. Rerouting plans are described in detail. The report was made at the instance of the city. Its purpose is to develop and define the respective rights and obligations of the city and the Virginia Railway & Power Company and find solutions of the traction situation which will result in good transit facilities.

REPORT DISCUSSED BEFORE COMMISSION

The report was submitted and discussed at a hearing held recently before the Norfolk Public Utilities Commission. At the hearing Thomas S. Wheelwright, the president of the company, said that he agreed with all the recommendations in the report except as to the valuation of $8,750,000. Over this matter of valuation there was a discussion between Mr. Taylor and Mr. Blood of Stone & Webster, whose reproduction value of $11,000,000 was checked and accepted with slight modifications in the Taylor-Cooke report. The $11,000,000 valuation is based on present prices. Mr. Blood and representatives of the company contended that this was the proper basis of valuation. Mr. Taylor's figure was about midway between the reproduction cost at 1914 and 1920 prices.

President Wheelwright for the company said that he was greatly impressed with the recommendations in the report and with the thoroughness of the document, but that he was disappointed with Mr. Taylor's revaluation figures. These figures, he said, were lower than the company had hoped for, for "rate-making" purposes, and lower by nearly $3,000,000 than the estimate by Mr. Blood, which he considered fair. He expressed concern about the ability of the company to raise $1,600,000 suggested by Mr. Taylor to be spent within the next fifteen months.

All of the recommendations of the Norfolk Public Utilities Commission must be addressed to the City Council. The commission has within its power the right to accept the Taylor-Cooke findings and figures on those of Stone & Webster or to submit a report of its own to the Council.

The principles upon which Mr. Taylor's valuation was based were stated in writing by him prior to his undertaking the responsibility of acting for the city. He acted on the expressed understanding that he would appear in a judicial capacity and not as an advocate.

"Saturday Night" Reviews Federal Report

The Detroit *Saturday Night* of Sept. 4 contained a very interesting page summarizing the report of the Federal Electric Railway Commission. In the center of the page under the title "Sanity on Street Railway Problem" the editor explains what the problem was before the commission, who were the members and the witnesses. The rest of the page under such captions as "M O Is No Panacea for Street Railway Ills, U. S. Commission Finds," "How the Trolley Lines Can Be Put on a Sound and Efficient Footing," "Why Railways Can't Get Money" and "What Has Happened to Fares" tells the plight of the electric railways as outlined by the President's commission.

Interurban Surplus Increased

Boston & Worcester Railway Has Net Income for 1919 Three Times That of 1918

The income statement of the Boston & Worcester Railway for the year ended Dec. 31 shows that the total operating revenue increased from $882,666 in 1918 to 948,936 in 1919. This was an increase of $66,270, or 7.3 per cent. At the same time the operating expenses increased to $732,842 as compared with $689,174 in 1918, an increase of $43,668, or 6.3 per cent. The net revenue from railway operations increased 11.7 per cent, changing from 193,492 in 1918 to 216,094 in 1919. The expense due to taxes was considerably reduced.

In 1918, the taxes were $58,087, but decreased to $46,601 in 1919. This was a reduction of $11,486, or nearly 20 per cent over 1918. As a result of the increase in net revenue and a decrease in taxes, the gross income increased 25 per cent, or $34,088 over 1918. The net income transferred to profit and loss changed from $6,931 in 1918 to $29,488 in 1919. The operating ratio decreased 1 per cent. Total car-miles for 1919 amounted to 1,835,974, while the total car-hours were 138,040. The company owns more than 83 miles of track between Boston and Worcester. A reserve of $12,000 for depreciation was deducted from the yearly surplus.

INCOME STATEMENT BOSTON & WORCESTER RAILWAY

Year Ended Dec. 31:	1919	1918	Percentage Change Over 1918
Operating revenues:			
Revenue from transportation	$934,996	$869,566	+ 7.5
Other railway operations	13,940	13,100	+ 6.4
Total operating revenue	$948,936	$882,666	+ 7.3
Operating expenses:			
Conducting transportation	$438,902	$387,486	+13.3
Maintenance	198,379	206,785	— 4.1
General expenses	95,561	94,902	+ 0.7
Total operating expenses	$732,842	$689,174	+ 6.3
Net revenue railway operatins	$216,094	$193,492	+11.7
Taxes assignable to railway operations	46,601	58,087	—19.8
Gross income	$169,493	$135,405	+25.2
Interest on funded and floating debt	140,005	128,474	+ 9.0
Net income transferred to profit and loss	$29,488	$6,931	+325.0

STATISTICAL INFORMATION BOSTON & WORCESTER RAILWAY

Year Ended Dec. 31:	1919	1918	Percentage Change Over 1918
Total revenue car-miles	1,835,974	1,929.616	— 4.3
Total revenue car-hours	138,040	134,357	+ 2.7
Ratio C.M. to C.H. (speed m.p.h.)	13.3	14.3	— 7.0
Operating ratio (per cent)	77.2	78.2	— 1.3
Statistics per car-mile:			
Operating revenue (cents)	51.7	45.8	+12.9
Operating expenses (cents)	39.9	35.7	+11.8
Revenue from transportation (cents)	50.8	45.1	+12.6
Net income (cents)	1.6	0.36	+345.0
Statistics per car-hour:			
Operating revenue	$6.87	$6.57	+ 4.6
Operating expenses	$5.31	$5.13	+ 3.5
Revenue from transportation	6.77	6.47	+ 4.6
Net income (cents)	21.4	5.16	+315.3

Receivership Hearing Postponed

The hearing set to be held before the Federal Court in Kansas City, Mo., on Sept. 30, on the matter of the appointment of a permanent receiver for the Kansas City Railways was postponed to Oct. 14. Frank C. Niles was appointed temporary receiver on Sept. 9.

Reorganization Without Foreclosure Planned

The situation with respect to the Washington, Alexandria & Mount Vernon Railway and the affiliated Washington, Arlington & Falls Church Railway is explained in letters addressed to the holders of the $2,370,000 of outstanding first mortgage bonds of the former company, and the $1,000,000 first mortgage and $250,000 second mortgage bonds of the latter company. On account of the accumulation of floating debt which the company has been unable to finance without aid, the property requires about $250,000 to meet its overdue interest and maturities. A protective committee has agreed to advance the necessary funds subject to an audit now being made and when the stock of the company is deposited under an agreement giving the committee control of the management.

It is hoped to avoid foreclosure and to readjust the company's finances without the expense, delay and legalities which would be required by receivership. Following the bonds there is an issue of $2,000,000 of secured gold notes. These notes are held by banks, trust companies and other strong financial institutions. The protective committee of noteholders is headed by Howard S. Graham of Graham, Parsons & Company, as chairman. It is proposed that Mr. Graham shall succeed Norman Grey as president, the latter to become vice-president, and that the committee shall also name a secretary and treasurer and other officers.

The committee stipulates that 90 per cent of the outstanding stock shall be deposited before Sept. 24 with the Guarantee Trust & Safe Deposit Company, Philadelphia, under the terms of an option agreement under which the committee will have the right within two years from the date of the agreement to purchase the entire deposited stock at the rate of $10 per share for the preferred stock and $2.50 a share for the common stock. The agreement also provides that the depositary shall vote the deposited stock from time to time as the committee may direct.

Illinois Utilities Use Large Display Space

An advertisement of the Illinois Committee on Public Utility Information, used in half-page and quarter-page size, is now running in the Chicago newspapers and some of the larger papers in northern Illinois. It has been placed and is being paid for by some of the Chicago companies. The object is to stimulate public interest in the securities of the utilities of the State by calling attention to the tremendous number of persons who hold such securities. This effort is regarded as quite important, as the wider the circulation of this information the greater the good to the industry as a whole.

Financial News Notes

Certificate of Capital Increase Filed.—The Manila Electric Railroad & Light Company has filed a certificate with the Secretary of State at Trenton, N. J., increasing its capital from $3,000,000 to $5,000,000. The company operates an electric railway system and furnishes power and light in Manila and other parts of the Philippine Islands.

Milwaukee Issues Equipment Trusts.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has sold an issue of $1,090,000 ten-year 8 per cent sinking fund equipment trust gold certificates at par and interest through W. A. Read & Company. The notes are dated Oct. 1, 1920, and are issued under the Philadelphia plan against 139 new standard steel cars.

Receiver for Pennsylvania-Ohio Road.—The Cleveland & Erie Railway, Girard, Pa., operating between Conneaut, Ohio, and Erie, Pa., has been placed in the hands of a receiver, following proceedings in equity brought by George Bullock, receiver of the Buffalo & Lake Erie Traction Company. Failure to pay interest on bonds due on July 1 and $2,489,230 alleged to be due the local traction company for the use of its lines in the city of Erie are charged in the bill of equity.

Toledo Company Reimbursed.—From the Craig fund, authorized by federal court to provide for improvements to service of the Toledo Railways & Light Company, Toledo, Ohio, Judge Killits ordered $14,377 to be paid over to the company to reimburse it for repairs to tracks and equipment. This sum was additional to amount being expended in double tracking a part of Stickney Avenue and a part of it is being used to remodel cars and paint them. The fund is formed by payment of 6 per cent of the net earnings of the company weekly into the hands of an officer of Federal court. It was created to take care of a fraction of a cent raise in fare at a railway settlement several years ago.

Interurban Entrance Agreement Reached.—The City Council of Reno, Nev., has accepted the terms under which the Nevada Interurban Company has asked to be allowed to operate cars over the line of the Reno Traction Company from Reno Avenue to Second Street. Under this proposal the Nevada Interurban Company will pay $1,200 to the city, which will cover the cost of construction and repair work from California Avenue to Second Street. The Reno Traction Company will maintain the track from California Avenue to Reno Avenue, the city to do the paving on each side. Estimates furnished the City Council by City Engineer Chism would appear that it will cost the city near $20,000 for the reconstruction work.

Shuttle Service on Staten Island.—On the afternoon of Sept. 18 the receiver of the Richmond Light & Railroad Company commenced operating cars on the tracks of the Staten Island Midland Railway, which had been idle since last January. The operation was directed on Sept. 16 by the United States District Court, having jurisdiction in the matter of the receiverships, and is being carried on under contract arrangements between the receiver of the Midland company and the receiver of the Richmond company pursuant to instructions of the court. A shuttle car service is provided on different parts of the lines, each to be operated for a 5-cent fare. Through operation for a 5-cent fare to or from St. George, the focus of the main transportation routes of the Borough of Richmond, is discontinued by the court.

Oil Earnings Diverted to Utilities.—So far as the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., is concerned that property will be left to its own financial resources, according to F. C. Hamilton, testifying for the Doherty interests, which control the property, at the hearing before the Missouri Public Service Commission for an increase in fare from 7 cents to 10 cents. Mr. Hamilton is quoted as follows: "The public utilities could not get along unless they were helped from the oil earnings of the Doherty interests. The investment in the utilities is 35 to 40 per cent more than in oil, but the earnings of the public utilities are about one-sixteenth of the earnings of the oil business. The Dohertys have lost so much on their utilities that, in the future, unless they change their mind, they will decline to finance the utilities out of the oil earnings, and the utilities will have to stand on their own feet."

Cash Used to Take Up Certificates.—An order permitting Receiver Rolla Wells of the United Railways, St. Louis, Mo., to use $2,300,000 of the general funds of the company in order to retire the first issue of receiver's certificates has been issued by Judge Faris in the United States District Court at St. Louis. The issue of certificates was made Sept. 2, 1919, and bore 6 per cent interest. It was the original plan to sell a second issue of $4,200,000 of certificates and with the proceeds pay off the first issue and take care of some underlying bonds. Bids on the second issue, however, were all so low that none could be advantageously accepted. These certificates bear 7 per cent interest and run for three years. The stipulation in the issuance of the first certificates that if they were not paid at maturity they were to bear 8 per cent interest caused Receiver Wells to seek the court order. A representative of the company said that no effort would be made to market the second issue of certificates until the money market became more favorable.

Traffic and Transportation

States' Power at Issue

Utilities Commissions Take Action to Preserve Their Authority Over Intrastate Rates

The Public Service Commissions of a number of States have taken steps to prevent steam roads and electric interurbans from establishing for intrastate traffic the percentages of increase in freight and passenger rates recently allowed by the Interstate Commerce Commission. The National Association of Railway and Utilities Commissioners at a meeting in Chicago on Sept. 11 appointed a committee to follow all litigation in which carriers attempt to secure an interpretation of the Esch-Cummins act, "which will diminish the powers of the States to control intrastate rates and regulations of carriers."

WOULD SAFEGUARD RIGHTS

The commissions which have refused to allow the roads to install either in whole or in part the rates authorized by the Federal commission take the stand that if the efforts of the carriers are successful in the proceedings that have been instituted before the Interstate Commerce Commission they will have succeeded in stripping the state commissioners of all effective powers over state rates. Their position is outlined in a letter recently addressed by the association's committee to all state commissions. This communication reads in part as follows:

> The situation is serious. The state commissioners generally have allowed freight rate advances upon intrastate traffic corresponding to the advances allowed upon interstate traffic by the Federal commission. The Illinois commission has, however, allowed 33⅓ per cent, the Texas commission the same per cent and the Nebraska commission 25 per cent. Several commissions have restricted the advances on particular commodities. In states where passenger fares are limited by statutes they have refused to sanction the proposed passenger advance. . . .
>
> At the hearing in Chicago before the Federal commission in the Illinois Shreveport case no other evidence of discrimination was offered by the carriers than that the Illinois commission had allowed a less percentage of increase than the Federal commission. The carriers have chosen to rest upon the proposition that whatever action the Federal commission takes as to interstate rates must be also taken by every state as to intrastate rates, without consideration of the question of the reasonableness of the same as to state traffic, and even though it may be destructive to such traffic.
>
> Upon this proposition it was the unanimous opinion of the conference that we have no alternative but to fight. If the transportation act is correctly interpreted it does not strip the state commissions of all power over state rates, but carefully preserves the same. We owe it to the people of our respective states to defend our present powers against destruction by any such misconception of the transportation act as carriers are now attempting to give. We should do this first before the Federal commission, and then in court, if need be.

Sixteen state commissions have so far made authorizations in general accord with the Federal commission. The states where this action has been taken are California, Colorado, Florida, Georgia, Maryland, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia and Wyoming. The Idaho and Washington state commissions have authorized the freight and passenger advances, with the stipulation that no passenger fare as increased shall exceed 3.6 cents per mile.

Commissions which have allowed the full freight increase but have denied or postponed action on passenger rates under statutory limitations include Indiana, Iowa, Minnesota, Montana, New York, Ohio, South Carolina, West Virginia, and Wisconsin. The South Dakota commission allowed increases corresponding to those of the Federal commission, with the exception of advances in commodity rates. The commission of Illinois and Texas authorized freight advances of 33⅓ per cent, but denied the passenger increases under state laws.

Regulation of Jitneys Urged

According to an opinion of the State Department of Public Utilities, a continuation of jitney service in competition with the street railways of Massachusetts cannot long exist without disaster to one or both. The department's opinion is that, with the elimination of jitney competition, there "is every reason to believe" that the street railways alone would be able to render cheaper and better service than the railways and jitneys now furnish together.

The theory is advanced that the failure of Massachusetts to keep pace with the rest of the country in subjecting jitneys to reasonable and proper regulations is responsible for the jitney problem in that State assuming a more acute phase, perhaps, than in any other part of the country.

It is significant that practically all of the states and cities where the volume of jitney business has been largest in the past have found it necessary to adopt stringent regulations which have resulted in decreasing the number of jitneys to a point where their operation no longer constitutes a serious menace to existing transportation agencies or to the public. The 1918 statute represents an attempt, in part at least, to bring the Massachusetts policy into line with legislative precedents in other states.

The commission finds that a candid investigation of the conditions of jitney operation wherever it has been tried is bound to lead to the conclusion that while jitney service may supplement or destroy the street railway, it cannot take its place.

Railway Rests Its Case

Los Angeles Company Presents Reasons for Asking a Rate Increase at Commission Hearing

The application of the Los Angeles (Cal.) Railway for an increase in its rate of fare was presented to the California Railroad Commission at a hearing on Sept. 20. The City Attorney of Los Angeles was granted three weeks in which to examine statistics submitted by the corporation and to file a brief. The decision of the commission will be made without another hearing.

G. J. Kuhrts, general manager of the Los Angeles Railway, testified that $5,000,000 would be needed for investment in 1921. He declared that $1,393,000 would be needed for new cars, seventy of the standard type and sixty-two of the one-man safety type. The present valuation of the company was given as $41,083,864. The deficit on June 30, 1920, was stated to be $893,083.

A 27 per cent advance in power costs and wage increases amounting to $990,000 a year were given as the chief items of increase in operating costs experienced by the railway.

The possibility of jitney competition reappearing in Los Angeles after being stopped by a city ordinance was injected into the hearing by Jesse Stephens, Assistant City Attorney. Mr. Kuhrts said that he believed the public would resist any such move owing to the present traffic situation.

SPECIFIC RATE NOT ASKED

Mr. Kuhrts contended that an increase of from 20 to 30 per cent in fare would be necessary for the Los Angeles lines. No specific rate was mentioned. The Los Angeles Railway now charges a 5-cent fare. The Pacific Electric Railway was recently granted a 6-cent fare for local travel as a temporary measure.

Patrons of the company questioned Richard Sachse, chief engineer of the commission, on the practicability of one-man car operation and the advisability of extending this service. Mr. Sachse spake emphatically in favor of the safety car and advocated extension of the local service, as recommended in his report following the survey which led up to the recent rerouting of the Los Angeles Railway system.

Whether the Los Angeles Railway would receive 20 per cent more in revenue through a 20 per cent fare increase was discussed extensively. Bruce Campbell, assistant engineer of the commission, estimated that such a rate advance would produce a 17⅜ per cent increase in revenue and predicted a 5 per cent increase from additional traffic resulting from the expected growth in population.

One of the witnesses urged the adoption of a co-operative plan whereby non-rush-hour riders should be given rebate slips to be redeemed by local merchants. This scheme, he contended, would benefit trade as well as stimulate traffic.

50 per Cent More Riders

Co-operation Between Railway Management and Public Accomplishes Tangible Results in Fall River

Everybody is smiling in Fall River, Mass., these days. Everybody, that is, who comes in contact with the local electric railway system. The men who run the cars are happy because they have been given an increase in wages of 11 cents an hour. The people who ride the cars are pleased because theirs is the only community served by the Eastern Massachusetts Street Railway to escape the recent increase in fare. But the "joyfulest" person of all is A. J. Boardman, manager of the Fall River Division of the Bay State system. The reason why Mr. Boardman is especially gleeful and, incidentally, why there is so much smiling in Fall River just now is this: During the past twelve months traffic on the local electric railway lines has increased by 50 per cent.

IN JULY, 1919, there were 800,000 riders on the lines of the Fall River Division. In July, 1920, there were 1,200,000, an increase of 400,000 passengers. Last July the Fall River district netted a profit of $29,715. During the same period all the other divisions failed even to earn their cost of service. Because of this showing, the public trustees of the system announced that Fall River alone would be exempted from the recent advance in rates.

CO-OPERATION RESPONSIBLE

Co-operation between the railway management and the public has been mainly responsible for this growth in riding. Fall River, to a man, woman and child, "boosts" for the trolleys. The members of the Chamber of Commerce, the American Legion and the Ladies' Aid Society of the First Methodist Church are trolley "fans." James Tansey, president of the Fall River Textile Council and chairman of the home rule committee of the Fall River Division, has this to say of the situation:

> A street-car line must have passengers to make any profit. If the riders get a grudge and walk, or use other means of transportation, the street railway has simply got to run at a loss. The reason we are making a profit is because we have the confidence of the citizens, and by that means have got them to use the trolley in increasing numbers. The credit for accomplishing this belongs to all concerned. The Chamber of Commerce took the initiative in promoting co-operation; the home rule committee gave faithful service; the newspapers urged the people to "boost, not knock," and the Eastern Massachusetts trustees have kept faith in every particular.

It all began about a year ago. At that time the fare was 10 cents straight. Sidewalk and jitney competition was increasing by leaps and bounds. Car riding had been reduced to a "must" proposition—one "must" pay 10 cents only if one "must" ride. Then of a sudden there came a change. The Chamber of Commerce launched an educational campaign. It showed the people that they could not get along without trolley service. The public was quick to respond. "Take the trolley" became the city's slogan.

"HOME RULE" POLICY WINS

The railway management met the people half way. In September, 1919, the trustees made Fall River a separate operating district under the control of a home rule committee, nominated by the Mayor and appointed by the trustees. This committee has complete supervision of the territory, except for the setting of fare rates. At the same time the trustees established a workmen's ticket giving fifty rides for $3. Later the rate was further reduced by the introduction of a ticket giving sixteen rides for $1. The people have forgotten that the cash fare is still 10 cents. Every one uses tickets.

Charles J. Leary, managing editor of the Fall River *Daily Globe*, stated recently that whereas complaints against the railway used to pour into his office each day, he had not received a complaint now for months. Said Mr. Leary:

> We used to "knock" as hard as anybody. But now that the public and the company are working for each other there is no need for it. Though we helped out in the co-operative campaign, we don't intend to suppress complaints. The reason we don't print them is because we don't have them, strange as it may seem.

Among the most ardent workers for the railway is Charles M. Ketchum, secretary of the Chamber of Commerce. Mr. Ketchum summed up the situation as follows:

> The whole thing started with the movement for better streets. We needed road improvement, but also needed the financial help of the Bay State on the streets where it had lines. As it was only just managing to cover expenses and could spare no money the question boiled down to making the street cars pay. . . .
>
> Increased revenue has enabled the Bay State to provide new cars and better service. It has helped the city in its street improvements and is planning more, which have been temporarily held up by the recent wage award.
>
> The Bay State got its money; we got our road improvements, and now the people have got exemption from the most recent fare rise. It is a clear illustration that it is increase in number of passengers which makes a road pay, and it is because the people feel that the road is really run for them that they ride in ever-increasing numbers.

Ask Aid for Hartford Trolleys

Indorsing the report of its special transportation committee, the board of directors of the Chamber of Commerce of Hartford, Conn., on Sept. 28 appealed to the city authorities to suppress jitney competition with the local lines of the Connecticut Company. The committee's report, in addition to urging stringent regulation of the buses, suggested that the Chamber of Commerce petition the State Public Utilities Commission to grant the company an adequate rate of fare. The report follows:

> Based upon the investigation and findings of the Public Utilities Commission, the special legislative committee, the Federal Electric Railways Commission, as well as from local observation, and reports from other cities, also conference with representative of the jitney association and conference with representative of the Connecticut Company, your committee finds, and calls attention to, the following facts:
>
> 1. Under the present condition of operation the revenues of the Connecticut Company do not equal the expenses of operation.
> 2. Service has been maintained to date by the omission of payment of taxes and other lawful charges imposed by the state and city, and by omitting and postponing all but the most urgent maintenance work.
> 3. Such financial condition unless remedied must inevitably result in bankruptcy and cessation of service.
> 4. Under present conditions it is probable that with the increased expense of winter operation a general suspension of service on many suburban lines must occur, possibly extending as well to the poorest paying city lines.
> 5. Under present conditions the possibility of total abandonment of service must be faced in the near future.
> 6. Under present conditions trolley transportation cannot be self-supporting in competition with individual and unregulated bus competition of a material magnitude.
> 7. The continued operation of trolley transportation is of vital importance to the city, as the transportation of the public cannot at present be handled by any other means now available.
> 8. The city would be greatly benefited by systematic bus transportation in those territories not now served by trolley lines.
> 9. The present bus service is popular as shown by the patronage, and is more rapid than can be furnished by trolley service.
>
> In view of the above facts your committee recommends:
>
> 1. That the Chamber of Commerce urge the city authorities to make such suitable regulations as will eliminate the present bus competition in the sections of the city served by the trolley. Such regulations should not, however, discourage the operation of suitably regulated and responsible bus service lines in sections not now served by the trolley.
> 2. That the Chamber of Commerce urge that the Connecticut Company should obtain the necessary permission from the Public Utilities Commission for such rate of fare as will give sufficient revenue to rehabilitate its credit, and enable it to give an improved and proper service to which the community is entitled.

Advertise for Traffic

In an effort to assist the Cincinnati (Ohio) Traction Company in increasing business and getting people into the car riding habit, William C. Culkins, City Street Railway Director, on Sept. 14 suggested several ways of increasing traffic. Some of the suggestions offered by Mr. Culkins, which are already being put into practice by the railway, follow:

Induce passengers and their friends using the railroad depots to use street cars by adopting schedules closely adapted to the arrival of trains.

Operate a better type of car to the Central Union Depot.

Place a representative of the company at the station and use advertising matter and signs judiciously.

Advertise the baseball games attractively and legibly, and reclaim for the street cars many persons who now use taxicabs.

Remodel cars with longitudinal seats to cars with cross seats.

Mr. Culkins further suggests that advertising matter in hotels and newspapers explaining the possibilities of attractive scenery would be money well spent in the interest of the car rider. He commented on what appears to have been the policy of the company in recent years to discourage the use of chartered cars. He added that co-operation with the convention and publicity bureau of the Chamber of Commerce could be had

and special routes laid out in accordance with the particular interests of the convention to be served.

In Cincinnati some factories are "trucking" employees direct between their homes and the factory. Mr. Culkins holds that this traffic could be better served by the use of the street cars in instances where the patronage would warrant.

May Reopen Portland Case

The Oregon Public Service Commission is justified in reopening the case of the Portland Railway, Light & Power Company, Portland, with a view to relieving the company of heavy franchise charges, according to a ruling recently issued by the State Attorney General. A group of Portland citizens some time ago petitioned the commission for a hearing on the question of reducing these charges, which they contended made necessary the recent increase in fare by the company from 6 cents to 8 cents. The commission asked the Attorney General for an opinion on the case.

On March 27 last the commission found that the provisions of the franchise relating to taxes, car licenses, free transportation of city employees, paving assessments and bridge assessments were unreasonable and amounted to double taxation. The commission recommended that the city of Portland eliminate these alleged unjust burdens. On May 21 the proposal was referred to the voters at a referendum election and was defeated. The commission then authorized the company to raise its fare.

Connecticut Freight Rates Up

The Connecticut Public Utilities Commission on Sept. 29 authorized the Connecticut Company, New Haven, to increase its freight rates 40 per cent. The matter came before the commission on Aug. 23 in the form of a petition from the company. The commission held a hearing on the petition on Sept. 16. The order of the commission follows in part:

> The wage scale for the employees of the company engaged directly in the freight and express department shows the following increases over wages paid when the present rates were established in September, 1918: Motormen, 56.81 per cent; messengers, 46.66 per cent; freight handlers, 42.85 per cent, or an average wage increase of 48.77 per cent.
>
> The petitioner asks for an increase of 40 per cent over its present rates. In a recent decision by the Interstate Commerce Commission granting a 40 per cent increase in the freight rates of the New York, New Haven & Hartford R.R. and other steam railroads it stated relative to electric lines that the operating costs of these lines have on the whole increased approximately in the same ratio as those of steam railroads. In some instances there is competition between the electric lines and the steam railroads. We conclude that the freight rates of the electric lines may be increased by the same percentages as are approved herein by the trunk lines in the same territory.
>
> It is problematical as to whether a 25 per cent increase would produce more revenue than the proposed 40 per cent on the assumption that the latter increase on account of substantially higher rates would drive away business. Even with the retention of the present volume of business, a 40 per cent increase would not produce sufficient revenue to pay a 6 per cent return on the capital directly invested in and allocated to the freight and express business.

Riders Back P. R. T.

400,000 Philadelphians Express Their Approval of Mitten Fare Plans—Mayor Outlines City's Attitude

Patrons of the Philadelphia Rapid Transit Company to the number of 476,027 have given their written indorsement of the work accomplished by the Mitten management in the interest of efficient service. Announcement to this effect was made on Sept. 27 at a hearing before the transportation committee of the City Council, when the company made public the results of a canvass on the question of the abolition of transfers. As tangible evidence of the public's attitude, a delegation of P. R. T. employees produced fourteen wash hampers heaped with signed referendum cards.

> CO-OPERATIVE EFFORT
>
> TO THE CAR RIDER:
>
> Up to 1911 street-car strikes in Philadelphia greatly disturbed the car-rider, and caused enormous loss to the community.
>
> Co-operation, under present management, has put a stop to all this, and every car-rider should be deeply interested in helping to prevent a return to bad street railway conditions, as they used to be in Philadelphia, and still are in other cities.
>
> Instead of having strikes and interrupted car service during the war, co-operation, between the Men and Management of P. R. T., secured such settled conditions made it possible for Philadelphia to get more than its share of war contracts. The contracts provided plenty of employment at high wages, made money plentiful and benefited everybody—except P. R. T.
>
> Pittsburgh is now permitted to charge a 10-cent fare, and this would have been necessary here, except for the good work of this Management and its Men.
>
> P. R. T. was refused permission to make a general 3-cent charge for transfers last July, so that P. R. T. is growing daily deeper in debt.
>
> P. R. T. must have more money now —immediately—to pay its wages and other increased costs, and provide better service for the coming winter.
>
> A straight 5-cent fare, without transfers or exchanges, will save the Management at this time, but if permission is not granted now, an 8-cent flat fare at least will be later required to keep the cars running.
>
> The Men and Management believe that they have earned your confidence and consideration, and appeal to you, in a spirit of fair play, to express yourself as being now willing to pay the straight 5-cent fare, which is necessary to a continuation of the present Management.
>
> T. E. MITTEN, *President.*
>
> PLEASE DETACH HERE,
>
> SIGN AND HAND TO CONDUCTOR
>
> *P. R. T.'s Men and Management ask YOUR endorsement of the work they have done, by signing your name hereon, requesting that the Mayor, City Council and Public Service Commission consent to P. R. T. now collecting a straight 5-cent fare, without transfers or exchanges.* (This is a temporary measure, pending completion of valuation.)
>
> (Sign here) ....
>
> (Address) ....
>
> SEPT., 1920.

REFERENDUM CARD USED BY P. R. T.

Mayor J. Hampton Moore, principal witness at the hearing, declared that unless the company obtained an increase in revenue it would face bankruptcy. The Mayor refused to take a definite stand on the question of permitting the company to install a straight 5-cent fare. He placed responsibility for any alteration of the 1907 agreement between the city and the P. R. T. squarely on the shoulders of the Councilmen.

Mayor Moore declared that even if the company were wiped out by bankruptcy the fare problem would remain. In outlining his position he said:

> The statement given to the board of directors for the eight months ended Aug. 31 last shows the amount by which the gross revenues of the company are insufficient to provide for operating expenses, taxes, fixed charges and the 5 per cent return upon P. R. T. stock to be $1,151,628.77. It is freely stated—stated I think at your last meeting by one more qualified to speak of its affairs than myself—that the company must have more revenue before December, or face failure. . . .
>
> It is admitted that the company has no credit. It cannot borrow money. It cannot make extensions, so it is represented to the Mayor—and he has asked for many which the city desires—because it has not the funds with which to make extensions. It has retained the good will, however, of its thousands of employees by increasing or keeping wages up to meet the increasing cost of living, and it is unthinkable that faith should not be kept with those employees, particularly while the high cost of living continues.
>
> As to rentals paid to the underlying companies, or an increase in fares for services rendered to the public, either or both of these questions must await the determination of the Public Service Commission, based on a valuation of the property of the Philadelphia Rapid Transit and the underlying companies. . . .
>
> Therefore, whatever the Council may do with respect to the pending ordinance will be in the nature of a temporary recourse, to apply only and until the Public Service Commission, with the valuation of the property in hand, shall decide what is a just and compensatory rate of fare and what is a just and reasonable rental.

Business Men Ask Lower Fares

L. D. Pellissier, president of the Holyoke (Mass.) Street Railway, has received from the president of the local Chamber of Commerce a letter asking that the railway take immediate steps to improve service and possibly to reduce its fare. The letter states that the Holyoke business men feel that the carmen should not receive a further increase in wages which would lead to a still higher rate. The company is also asked to abolish the zone fare system under which it is now operating. Under the present plan the city of Holyoke is divided into two districts, in each of which a 6-cent fare is charged, the fare for a ride across the city being 12 cents. The company's employees, who are now receiving 55 cents an hour, are demanding a further increase in wages.

The railway has not been on a profitable basis since it stopped paying dividends three years ago. An attempt to recover the loss by adopting a zone system failed of its purpose and a modification with a 7-cent fare was next made. Under the 7-cent fare the company was able to accumulate a surplus of $33,000. The men then demanded higher wages and secured retroactive concessions that not only wiped out the $33,000 surplus, but resulted in a considerable deficit. The company then adjusted the present fare plan. The men now demand $7 for an eight-hour day, with one day off in fifteen with pay.

Ten Cents in New London

Lucius S. Storrs, president of the Connecticut Company, New Haven, Conn., announced on Sept. 29 that a 10-cent cash fare would be placed in effect on the New London city lines on Oct. 15. The New London Division, formerly a part of the Shore Line Electric Railway, is now being operated by the Connecticut Company.

The announcement that a 10-cent fare will be charged in New London is taken by many persons in Connecticut to indicate that the company plans to apply for a 10-cent fare throughout its system. The State Public Utilities Commission, at the time of granting the railway temporary increase in fare to 7 cents, announced that it would later hold a hearing for the purpose of fixing a permanent rate. This hearing before the commission was scheduled to take place on Oct. 1.

Transportation News Notes

Six-Cent Fare in Marion.—The City Council of Marion, Ohio, has passed an ordinance granting the Columbus, Delaware & Marion Electric Company, Columbus, a 6-cent cash fare with five tickets for 25 cents on its lines in Marion. The fare has been 5 cents.

Zone Fares 7 Cents.—The Chester & Derry Railroad, Chester, N. H., has raised its fare in each zone to 7 cents. The increase was authorized by the State Public Service Commission and became effective on Aug. 16. The company operates a line 8 miles long between Chester and Derry.

Fare Raised in Lima.—A 7-cent cash fare went into effect on Sept. 3 on the Lima, Ohio, lines of the Ohio Electric Railway. The fare was formerly 5 cents. Nine tickets are sold for 50 cents in place of six for 25 cents. Children are carried for 4 cents or two for one adult fare.

Seven Cents in Bangor.—The Maine Public Utilities Commission has issued an order authorizing the Bangor Railway & Electric Company, Bangor, to put into effect on one day's notice a new schedule of fares with a basic rate of 7 cents. The fare has been 6 cents. The company some time ago applied to the commission for authority to charge an 8-cent fare.

Ten-Cent Fare in Marshall.—The Marshall (Texas) Traction Company on Sept. 20 installed a 10-cent fare on its lines in Marshall. The company was recently granted authority to increase its fares from 5 cents to 7 cents. It now asserts that increased cost of operation makes the 7-cent fare entirely too low, and that it cannot operate longer on that basis.

Towns Ask Fare Cut.—At a conference of the city and town officials of Beverly, Salem, Peabody, Marblehead, Danvers, Wenham and Hamilton, Mass., on Sept. 25, it was voted to appoint a committee to confer with the trustees of the Eastern Massachusetts Street Railway with a view to the elimination of double fares within a single city or town. The restoration of the transfer privilege is also to be asked for by the municipalities.

Ten Cents Asked in Missoula.—The Missoula, (Mont.) Street Railway has filed with the Montana Public Service Commission a petition for authority to charge a 10-cent cash fare on its city lines. The company proposes to sell four tickets for 30 cents. The fare was raised from 5 cents to 6 cents two years ago. It is proposed to continue the issuance of free transfers. The railway also seeks to raise the rate on its suburban lines.

Fares Raised on Interurban.—Passenger fares on the line of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., have been raised 20 per cent. The company has raised its commutation rates 10 per cent. Freight rates have been advanced 40 per cent, as recommended by the Interstate Commerce Commission. The company's passenger fares are now on the basis of 3 cents a mile, mileage books on one of 2½ cents a mile and commutation books on one of 1½ cents a mile.

Lower Fares for Brockton.—At the request of Mayor William L. Gleason of Brockton, Mass., the public trustees of the Eastern Massachusetts Street Railway have promised to reduce the present fare rates in that city by introducing a limited $4 commutation ticket good for three zone rides, to be used within two weeks. The purpose will be to aid those who live outside Brockton, particularly working people, to get into the city and home again at reduced rates.

Needs More in Sacramento.—The Pacific Gas & Electric Company, Sacramento, Cal., has notified the Sacramento City Commission of its intention to apply to the State Railroad Commission for authority to raise its fare. The company asks that the city take no action looking to the revoking of jitney restrictions pending action on its application. The company's local lines earned only 2.5 per cent, or $56,742, for the year ended June 30, 1920. The company recently curtailed its service owing to a shortage of power.

Ten-Cent Fare Asked on Suburban Lines.—The Connecticut Public Utilities Commission on Sept. 21 held a hearing on an application of the Waterbury & Milldale Tramway, Waterbury, for permission to raise its fare to 10 cents. John H. Cassidy, general manager of the company, stated that even at a 10-cent fare the company would not make ends meet. Daily expenses are $355, while the receipts approximate $283. The company has paid no dividends in some time. It owes $15,000 interest on its bonds.

City Fights Higher Fares.—The city of Winnepeg, Man., has begun an action in the provincial court looking to a reversal of the order of the Manitoba Public Utilities Commission granting the Winnipeg Electric Railway permission to charge a 7-cent fare. Under the order of the commission the company raised its rate from 6 cents to 7 cents on Sept. 1. In attacking the commission's action, the city alleges that the former has no power to interfere with a contract between a utility and a municipality.

Asks More in Alton.—W. H. Sawyer and F. E. Allen, receivers for the Alton, Granite & St. Louis Traction Company, Alton, Ill., have applied to the Illinois Public Utilities Commission for an increase in the company's fare to 10 cents. The petition asked that the new rate be made effective on Sept. 30. The present fare in Alton is 8 cents with two for 15 cents and seven for 50 cents. The receiver recently replied to a demand for a wage increase from the carmen that they would be willing to pay 6 cents an hour more if a higher fare was granted.

Motor Stages Opposed.—Protest has been filed with the Utah Public Utilities Commission by the Bamberger Electric Railroad, Salt Lake City, against the granting of a permit for a motor passenger and freight line between Farmington and Salt Lake City. The company states in its protest that it has been giving the public a daily service for the last ten years, that one of its taxable holdings is a franchise, assessed to be worth $75,000, which will be injured if the stage line is permitted to run, and that the auto stage will use the state highway, a cement road, which the taxes paid by the Bamberger line have helped to make and to keep in a state of repair.

Eight Cents Cash in Durham.—Cash fares on the city lines of the Durham (N. C.) Traction Company were raised from 7 cents to 8 cents on Sept. 5. The price of tickets in strips of four was advanced on the same date from 25 cents to 30 cents. The increases were made by authority of the State Corporation Commission. The company had applied to the commission for a 10-cent fare, asserting that during the past year it operated its railway department at a loss of more than $61,000. Granting of the company's petition was opposed by the city, which contended that the company was operating its other departments at a profit.

Auditors Justify Fare Increase.—After an examination of the books of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, the firm of Billings, Prouty & Tompkins, auditors, has announced that the company was justified in raising its fare from 6 cents to 8 cents. The railway installed the new rate about a month ago, contending that it could no longer continue to operate at a 6-cent fare. The auditors find that an 8-cent fare will produce revenue in excess of the company's operating costs, including depreciation, without making allowance, however, for the reduction by the imposition of Federal income taxes.

Seven-Cent Fare Approved.—The City Council of Texarkana, Texas, has passed an ordinance granting the local electric railway an increase in fare from 5 cents to 7 cents for adults and from 3 cents to 4 cents for children under twelve years of age. This action was taken after a petition had been presented by the Southwestern Gas & Electric Company, which operates the local traction system, and after the City Council of Texarkana, Ark., had granted the increase. Neither ordinance embodied the full requests of the traction company, and the company has not indicated whether it will accept the franchises.

Ten Cents in Paducah.—Alfred Nichols, manager of the Paducah (Ky.) Railway, recently notified the Board of City Commissioners that the company would raise its fare to 10 cents on Oct. 1. Mr. Nichols announced that in case the city opposed the rate increase the company would take the case to the Federal courts for judication. The company has been operating under a service-at-cost franchise and at a 6-cent fare. In notifying the commissioners of the intention to raise fares Mr. Nichols stated that since Jan. 1, the railway had sustained a loss of $70,000. The City Commission has passed an ordinance forbidding the company to raise its rates until the need for an increase has been investigated.

Commission's Power Questioned.—The Delta Light & Traction Company, Greenville, Miss., has brought suit in the Circuit Court against the Mississippi Railroad Commission to determine whether the commission has the power to forbid the company to abandon operation of its railway lines. Several months ago the company applied to the commission for permission to abandon its lines, comprising approximately 7 miles of track. The commission refused this request, but authorized the company to charge a fare of 10 cents. The company contends that it can abandon service at will without incurring any penalty other than forfeiture of the railway portion of its franchise and that its electric lighting franchise remains intact.

Skip-Stop for Golden Gate.—Shortage of hydro-electric power throughout northern and central California has caused the skip-stop system to be revived on the electric railways of San Francisco. H. S. Butler, State Power Administrator, recently issued an order calling for the curtailment of power consumption by public utilities as well as by private corporations. Under the terms of this order both the United Railroads and the Municipal Railway of San Francisco installed the skip stop on Sept. 20. It is estimated that the saving in power under the new arrangement will approximate 8 per cent. Several other traction companies in the northern part of the state have adopted similar measures. The Pacific Gas & Electric Company, Sacramento, recently reduced its service approximately 20 per cent.

Fare Increase Alternative to Shutdown.—Fares on the local electric railway in Attleboro, Mass., have been raised from 5 cents to 6 cents by authority of the State Department of Public Utilities. The Interstate Consolidated Street Railway, operating the Attleboro lines, recently applied for permission to raise its fare, stating that unless the rate was increased it would have to abandon operation. Service is now being furnished at a loss estimated at $3,000 a month. A year ago the company's line was divided into zones and the fare was raised to 7 cents. Two months ago the zones were shortened and the fare was reduced to 5 cents. Traffic has fallen off during the summer, owing to the fact that the company abandoned the use of open cars, thus losing the patronage of many riders.

City to Operate Lines.—The Board of Estimate and Apportionment of New York City has revoked the franchises of the Richmond Light & Railroad, operating electric railway lines in Richmond Borough, because of the failure of the company to operate its lines continuously. The railway is now operating cars on all of its lines at an 8-cent fare and will continue to do so under a court injunction, prohibiting interference with it. The city is expected to ask the court to withdraw the injunction so that it can prepare for the operation of municipal lines. Grover A. Whalen, commissioner of Plant and Structures, is completing arrangements for taking over on behalf of the city the lines of the Staten Island Midland Railway, also serving Richmond Borough. The company, which is in the hands of a receiver, suspended service last January on the plea that it could not pay expenses on a 5-cent fare. It recently resumed operation over a part of its lines.

Ten Cents on Penn Line.—The Public Service Commission of Pennsylvania has granted the application of the Waverly, Sayre & Athens Traction Company, Waverly, N. Y., for an increase in the cash fare on its lines in Pennsylvania to 10 cents. The company is required to sell thirty tickets for $2.40. The company is also given the right to abandon such parts of its line as are unremunerative. The Frankford, Tacony & Holmesburg Street Railway, Philadelphia, has filed with the commission a rate schedule under which it proposes to divide its lines into two zones, charging a 6-cent fare in each zone. The Southern Pennsylvania Traction Company, Chester, announced that beginning Sept. 19, the rates within the city limits and in each fare zone on all suburban lines would be increased from 7 cents to 8 cents. The Steubenville, East Liverpool & Beaver Valley Traction Company, East Liverpool, Ohio, has filed notice with the Pennsylvania Commission of an increase of fare from 5 to 10 cents between stations.

New Publications

Proceedings of Public Ownership Conference

Published by the Public Ownership League of America, Chicago, Ill.

This is the full report of the conference held in Chicago Nov. 15-17, 1919, the second conference of the kind. Among other subjects the report contains one on "The Street Car Problem and Its Solution," with contributions by Delos F. Wilcox, M. M. O'Shaughnessy, Hon. A. M. Todd, Thomas Murphine and Frank Ayers.

Calculating Diagrams for Design of Reinforced-Concrete Sections

By James Williamson, Constable & Company, Ltd., London, England.

Mr. Williamson's book is a collection of diagrams with examples to show their application, for use in the design of slabs, beams and columns under tension, compression and bending stresses. His purpose in publishing the book was to provide a convenient and quick means for calculation, eliminating danger of arithmetical error and complication of elaborate mathematical formulas.

Safe Storage of Coal

By H. H. Stock. Technical Paper No. 235, United States Bureau of Mines, Washington, D. C.

In view of the importance of its subject to electric railways this little pamphlet, which can be obtained free by addressing the bureau, should be in the hands of all railway men who are in any way responsible for continuity of coal supply. It is in the form of a catechism, is practical and contains a good bibliography of coal storage.

Personnel Administration

By Ordway Tead and Henry C. Metcalf. 53 pages, cloth, 5 x 9 in., McGraw-Hill Book Company, New York, N. Y.

This book is written to that newly developed field of personnel administrators and is useful both as a text in colleges and for other types of classes studying this question, as well as to men engaged in personnel administration or other phases of management of men, as reference to suggest new ideas.

Included in the book are admirable discussions of reasons for and functions of a personnel department, employment methods and provisions for both safety and training of workers and employees of all sorts. There are also suggested lines of study upon which improvement can be made, rewards to men and the larger problem of administrative relations and joint relations between the administration and the employees.

It is a book which should appeal to all those interested in the problem of handling men whether in large or small groups.

Personal Mention

M. J. Loftus, general superintendent of the Texas Electric Railway, Dallas, Tex., has been given the duties of superintendent of maintenance of way.

W. Clapper, general manager of the Inter-Urban Railway, Des Moines, Iowa, has resigned. Mr. Clapper became general manager last May. He was formerly traffic manager of the company.

F. C. Chambers has succeeded W. Clapper as general manager of the Inter-Urban Railway, Des Moines, Iowa. Mr. Chambers will continue to act as general manager of the Des Moines City Railway.

Hon. William B. McKinley, president of the Illinois Traction system, Peoria, Ill., and Congressman from the Nineteenth Illinois District, has won the Republican nomination for United States Senator in the recent state primary election.

H. L. Treeman has tendered his resignation as superintendent of the electrical department of the Eastern Pennsylvania Railways, Pottsville, Pa. Mr. Treeman was graduated from the Oklahoma Agricultural and Mechanical College in 1909 with the degree of Bachelor of Science, having specialized in mechanical and electrical engineering. For several years thereafter he was employed by the Edison Electric Illuminating Company, Brooklyn, N. Y. as power engineer. In 1915 he left the service of that company to accept the position of electrical engineer of the Eastern Pennsylvania Railways.

Prof. Charles F. Scott, chairman of the Department of Engineering of Yale University, returned on the *Finland*, on Sept. 25, from a three months' stay in Italy. Professor Scott has been representing the Western Electric Company on the problem of communication cable location, his associate being L. P. Ferris, formerly assistant engineer on the California inductive interference studies. The object of their trip was to determine the practicability of running a cable as projected between Milan, Genoa and Turin wihtout interference from railroad and transmission lines, and to determine what precautions should be taken by the telegraph administration and railroad administration or the former alone to prevent inductive interference. Part of the railway is already being operated by electricity and the rest soon will be. As a result of the summer's work a considerable amount of interesting information was collected with reference to inductive interference and three-phase lines under the peculiar conditions that surround this installation. A modified route was suggested for the cable free from disturbance with certain precautions.

W. I. Brown Promoted

Made Assistant to President Denman of the Tri-City Railway & Light Company

Walter I. Brown, for several years past secretary to B. J. Denman, president of the Tri-City Railway & Light Company, Davenport, Iowa, has been promoted to be assistant to President Denman. Mr. Brown assumed his new duties on Sept. 1. As right-hand man to Mr. Denman, Mr. Brown will occupy a post of great responsibility with one of the largest electric railway systems in the Middle West. The Tri-City Railway & Light Company, in addition to controlling the Tri-City Railway of Iowa and the Tri-City Railway of Illinois, owns the city lines in Muscatine, Rock Island, Moline, East Moline and other cities and towns in Illinois and Iowa. It also operates a number of interurban lines. The work of integrating the activities of this great network of lines will fall to no small extent upon the shoulders of Mr. Brown.

W. I. BROWN

Mr. Brown was born in Nevada, Mo., on Aug. 31, 1893. Seven years later he removed with his family to Davenport, Iowa. There he attended the public schools, graduating from the Davenport High School in 1911. In the following year he entered the employ of the Tri-City Railway & Light Company as a stenographer for J. M. Porter, then president of the company. After serving in this position for two years he was made secretary to Mr. Denman, then vice-president.

After serving as secretary to Mr. Denman for three years, Mr. Brown entered the United States Army in November, 1917. He was honorably discharged from military service in April, 1919, with the commission of Second Lieutenant and the rating of Assistant Camp Finance Officer, Camp Wadsworth, S. C. Immediately following his discharge he resumed his duties as secretary to President Denman, continuing in that capacity until his recent promotion.

G. M. Spidell, purchasing agent of the New York, Westchester & Boston Railway, has resigned.

Reid McManus has been elected secretary of the Hydro-Electric Power Commission of New Brunswick.

D. C. Bridges has been appointed superintendent of buildings of the Texas Electric Railway, Dallas, Tex.

J. F. Simerlee has been appointed superintendent of roadway of the Texas Electric Railway, Dallas, Tex.

C. W. Robinson has been elected chairman of the Hydro-Electric Power Commission of New Brunswick.

J. E. Gallaher has resigned as master mechanic of the Eastern Texas Electric Company, Beaumont, Texas.

C. O. Foss, a member of the Hydro-Electric Power Commission of New Brunswick, has been made chief engineer of the commission.

C. J. Crampton has been appointed superintendent of the safety and efficiency department of the Dallas (Tex.) Railway.

Charles Johns has succeeded J. F. Daugherty as manager of the St. Thomas Ontario Municipal Street Railway.

H. G. Crampton has been elected secretary and treasurer of the Capital Traction Company, Washington, D. C., succeeding the late R. D. Simms.

G. W. Carver has succeeded G. M. Spidell as purchasing agent of the New York, Westchester & Boston Railway, New York, N. Y.

J. W. Anderson has been appointed terminal freight agent of the Pacific Electric Railway, Los Angeles, Cal., to succeed T. H. Mann, resigned. Mr. Anderson was formerly local freight agent for the railway at Long Beach, Cal.

Robert W. Hewins, treasurer and general manager of the Norton, Taunton & Attleboro Street Railway, Norton, Mass., has resigned. Mr. Hewins has been connected with the railway for the past twenty-five years. The company's line was taken over for municipal operation by the towns of Norton, Taunton and Attleboro several months ago.

Chester B. Lawson has been appointed superintendent of the electrical department of the Eastern Pennsylvania Railways, Pottsville, Pa. He succeeds H. L. Treeman, resigned. Mr. Lawson was graduated from the Pottsville High School in 1905. After completing a course in electrical engineering at Lehigh University he was employed for a time in Boston, Mass. He has been connected with the Eastern Pennsylvania Railways for the past six years.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Price Trend of Iron and Steel Market Uncertain

Consumers Delay Buying in Hope of Lower Prices—Producers Discount Possibility of Reduction

In view of the direct bearing of the iron and steel market upon the buying of electric traction companies in many lines, such as car trucks and wheels, brake shoes, rails, and other track supplies, tools, etc., current discussion regarding the possible price trend of iron and steel is interesting. At present there seems to be two widely divergent views of the situation. Consumers are very generally holding off ordering with the expectation of lower prices developing. Producers, on the other hand, say there can be no immediate reductions, but that even higher prices on iron and steel may develop. This view is apparently based on the grounds that the general steel market is still largely under-supplied, that labor is high and transportation costs are much greater.

At present the market is rather quiet. Transportation has improved to such an extent that unfilled tonnages have been reduced by two-thirds, it is stated. Railroads as yet have not ordered heavily and many cancellations have been received from automobile, oil and other industries. Export demand is said to be extremely light just now. Furthermore the price of coke is showing signs of softening. These factors would seem to justify hopes of lower prices, and, in fact, slightly weaker quotations on the part of independent producers are noted in one or two lines. The average price of eight principal iron and steel products as quoted by *Iron Age* shows no change during the last four weeks, however.

DEMAND LIGHT AT PRESENT

On the other hand, this is normally the slack season in the iron and steel industry. In spite of this, cancellations from automobile manufacturers and others seem to have been readily absorbed. To compensate for this loss demand for structural steel is apparently reawakening. Orders booked during August were 72,200 tons, or 40 per cent of the total month's capacity, it is stated. A very large market is also expected to develop the steam railroads. Thus far orders in that quarter have for the most part been confined to small items such as spikes, bolts and tie plates. In 1921, however, a large portion of their program of expenditures, amounting close to $1,000,000,000, it is estimated, is expected to be placed. At present the United States Steel Corporation is said to be booked ahead with orders for about nine months, while independent producers have sufficient business on hand to carry them through the winter. These conditions, producers hold, substantiate their position that prices will not drop materially.

In analyzing the probable trend of prices it must be noted that there are two price levels. The price scale of the United States Steel Corporation averages $21 per ton below the independent level. In many quarters the view is held that the independents' prices must come down to approximately the level of the United States Steel Corporation before buying will be resumed on a large scale. If one considers the latter's quotations as the market level, however, these same opinions hold that no general reduction can be made. Opinions differ whether the United States Steel Corporation will be able to absorb the increase in freight costs, which is estimated to total approximately $50,000,000 annually on the raw and intermediate material used by the corporation. A more definite trend to the market is expected to be evident in the next month or so. At the present time the situation is one of "watchful waiting."

Active Demand for Window Glass

Stocks Are Low, but Manufacturing Conditions and Deliveries Are Improving—Prices Show Great Steadiness

Manufacturers of window glass report a very active demand for their product at present. One large producer has been so far behind on filling orders this year that no new business was sought for a period of four months. Orders are being received from electric railways in good volume and a still heavier buying movement seems to be expected from that source as traction companies continue to change over from summer to winter equipment. Demand for glass for building construction has not been as heavy as in other seasons, it is stated, but this market is expected to develop large orders in the not far distant future.

Raw material difficulties seem to have been the chief obstacle retarding output. Sand, chemicals, coal, gas and lumber for boxing have been both scarce and high in price, it is reported. The production of one representative producer is only 60 per cent of normal at present. Conditions in general are improving, however. Manufacturers are now fairly well caught up on orders and deliveries can be made in better time. Delivery quotations cover a wide range of from about two to eight weeks. Labor conditions are also beginning to ease up. Stocks while fair on some types of window glass, on the whole are low. This is especially true of the double-strength glass usually placed in car windows. According to one producer the production of this type of glass is proportionately slower than ever before. The receipt of orders which should have arrived months ago is said to have somewhat relieved the present situation. Some quantities of window glass are arriving from abroad, notably Antwerp, but these receipts are but a drop in the bucket. The field is apparently too well covered by domestic producers to encourage foreign competition.

Producers see no reason for any immediate change in prices. The consensus of opinion seems to be that no fluctuation will take place within the next few months. One reason may be the fact that manufacturers have contracted ahead for raw material supplies.

Carbon Brush Deliveries Fairly Prompt

From Two to Three Weeks Is Generally Quoted—Heavy Demand and Good Supply of Raw Material

There is no shortage of carbon brushes, according to representative manufacturers. Deliveries are being made in good shape and are improving somewhat under the influence of better conditions of production. In general, orders are filled in about two weeks, ranging up to three weeks in many cases. So far as could be learned but one producer is unable to make such prompt shipments and from four to eight weeks is quoted in this case. Deliveries of railway type brushes are made in slightly better time in some cases and about within the same limits in others.

Heavy orders are generally reported by producers. Railway brushes are even in stronger demand than usual. In some quarters this demand is said to have slackened recently, but a larger buying movement seems to be looked for soon. Traction companies are said to have pretty well anticipated their needs for brushes and their reserve supplies are consequently fairly heavy.

Factory stocks of unfinished carbon are in good condition, so that raw material is not seriously affecting the supply of carbon brushes. Improved transportation is also aiding the situation. As a result, production, except in one or two instances, is proceeding at a normal pace. One of the large manufacturers reports an increase in output last year of 33 per cent. The present season is expected to show an even larger output due to plant additions. Labor conditions in the industry are much better and no trouble from this source is now being experienced. An entire absence of cancellations is also noted.

Prices have been holding steady. Most manufacturers say they anticipate no increase soon, though the exception is provided by one large company which looks for higher prices to materialize.

Production of Turnstiles Is Improving

Raw Material Has Been Showing Deliveries—Demand Is Normal, with Prices Holding Steady

Manufacturers of turnstiles report a demand for their product during the past year that compares favorably with other seasons. Orders from electric railways have not been extraordinarily large because the construction of new terminals, etc., has been somewhat curtailed. On the other hand, the buying of turnstiles by such interests as athletic and amusement parks has been unusually large, it is reported. Producers are extremely optimistic over the outlook for next year's business.

Construction work in many lines which requires the use of turnstiles is expected to go forward in increased volume. One of the large manufacturers is also looking for a big field to open up in the use of these machines on street cars to register automatically the number of passengers. A turnstile for this purpose has been developed and successfully experimented with on several lines, it is stated.

At the present time factories are endeavoring to accumulate surplus stocks in anticipation of the expected spring buying. Production during the winter closely follows the estimated future requirements of all interests, however. For this reason manufacturers state that traction companies should now start to figure their needs for 1921 in this line, with a view to ordering supplies three months in advance for shipment next spring. In this producers can accurately gage the number of turnstiles that will be needed next year. By governing production accordingly delays in making shipments may be avoided, it is said.

The labor situation at factories is reported satisfactory. Raw material has been retarding production in the past, however. This condition is now considerably relieved as a result of better transportation and quicker shipments from steel mills. Orders in some cases have been running behind and stocks of the finished goods have been correspondingly low. With the dull season at hand, however, this is expected to be remedied.

A few cancellations have been made as a result of long deliveries, but the number, it is stated, is not alarming. Prices have remained steady for some months and the outlook seems to be for the present level to hold firm until the first of next year at least. After that date the tendency of prices may be upward, manufacturers think.

Rolling Stock

Birmingham (Ala.) Railway, Light & Power Company is reconstructing many of its old cars and installing new motors.

Interstate Public Service Company, Indianapolis, Ind., has purchased fifteen new freight cars that are scheduled for delivery in December, it is reported. The eight all-steel 62-ft. passenger cars ordered some time ago are expected to be placed in operation in November, it is stated.

Track and Roadway

Danbury & Bethel Street Railway, Danbury, Conn.—The Danbury & Bethel Street Railway has begun the construction of a line on West Street. This connecting line joining the present tracks on West Street opposite Orchard Street will run alongside the park at the junction of West and Division Streets and will not go into the center of the street until after it leaves Division Street.

Central Texas Electric Railway, Waco, Tex.—O. A. Ryfle, president and general manager of the Central Texas Electric Railway, with headquarters at Waco, has been advised that 100 tons of steel rails for the Waco-Temple Interurban are now en route to Waco. Other material is on the ground and the laying of the track of the first 6 miles of this line, extending from Waco to Robinson, will begin in a few days.

Richmond - Fairfield Railway, Richmond, Va. — The Richmond - Fairfield Railway, a recent incorporation, is making real progress according to its presi-

NEW YORK METAL MARKET PRICES

	August 3, 1920	October 1, 1920
Copper ingots, cents per lb	19.00	18.50 to 18.75
Copper wire base, cents per lb	22.50 to 23.00	21.50 to 22.00
Lead, cents per lb	8.50	7.75
Nickel, cents per lb	43.00	43.00
Zinc, cents per lb	8.02½	7.70 to 7.80
Tin, cents per lb	48.25	42.75
Aluminum, 98 to 99 per cent, cents per lb	33.00	35.10

OLD METAL PRICES—NEW YORK

	Aug. 3, 1920	Oct. 1, 1920
Heavy copper, cents per lb	15.50 to 16.00	15.25 to 15.50
Light copper, cents per lb	13.50 to 13.75	13.00 to 13.25
Heavy brass, cents per lb	9.25 to 9.50	8.50 to 9.00
Zinc, cents per lb	5.50 to 5.75	4.50 to 5.00
Yellow brass, cents per lb	7.25 to 7.75	6.50 to 7.00
Lead, heavy, cents per lb	7.25 to 7.50	6.50 to 6.75
Steel car axles, Chicago, per net ton	33.50 to 34.50	33.00 to 34.00
Old carwheels, Chicago, per gross ton	36.00 to 36.50	37.00 to 38.00
Steel rails (scrap) Chicago, per gross ton	28.00 to 28.50	27.50 to 28.00
Steel rails (relaying), Chicago, gross ton	35.00 to 36.00	37.50 to 38.50
Machine shop turnings, Chicago, net ton	9.50 to 10.00	9.00 to 9.50

ELECTRIC RAILWAY MATERIAL PRICES

	August 3, 1920	October 1, 1920
Rubber-covered wire base, New York, cents per lb	28.00	28.00
Weatherproof wire, (100 lb. lots), cents per lb	29.00	29.00
Standard Bessemer Steel Rails, per gross ton	45.00 to 63.00	45.00 to 63.00
Standard open hearth rails, per gross ton	47.00 to 65.00	47.00 to 65.00
T-rail, high (Shanghai), cents per lb	3.00	.....
Rails, girder (grooved), cents per lb	3.00	.....
Wire nails, Pittsburgh, cents per lb	3.25 to 4.50	4.25
Railroad spikes, drive, Pittsburgh base cents per lb	4.00 to 5.75	4.50 to 6.00
Railroad spikes, screw, Pittsburgh base, cents per lb	....	....
Tie plates (flat type), cents per lb	4.00	4.00
Tie plates, (brace type), cents per lb	4.00	4.00
Tie rods, Pittsburgh base, cents per lb	7.00	7.00
Fish plates, cents per lb	3.75 to 4.75	4.00 to 5.00
Angle bars, cents per lb	3.75 to 4.75	4.00 to 5.00
Rail bolts and nuts, Pittsburgh base, cents per lb	6.00 to 7.50	6.00 to 7.00
Steel bars, Pittsburgh, cents per lb	2.35 to 4.00	2.35 to 4.00
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20 to 7.85	4.20 to 7.35
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.25 to 8.55	5.25 to 8.30
Galvanized barbed wire, Pittsburgh, cents per lb	4.45	4.45
Galvanized wire, ordinary, Pittsburgh, cents per lb	4.20	3.70 to 4.70
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, AA quality) New York, discount	79%	79%
Waste, wool (according to grade), cents per lb	17 to 23	17 to 23
Waste, cotton (100 lb. bale), cents per lb.	15 to 17½	15 to 17½
Asphalt, hot (150 tons minimum), per ton delivered	38.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	42.50	42.50
Asphalt, filler, per ton	45.00	40.00
Cement, New York, per bbl	5.10	5.10
Linseed oil (raw, 5 bbl lots), New York, per gal	1.58	1.22
Linseed oil (boiled, 5 bbl. lots), New York, per gal	1.605	1.24
White lead (100 lb. keg), New York, cents per lb	15½	15½
Turpentine (bbl. lots), New York, cents per gal	1.65	1.46

*These prices are f.o.b. works, with boxing charges extra.

dent. The relaying of track and the installing of new overhead wires have already been started.

Toronto (Ont.) Civic Railway.—Commissioner R. C. Harris has recommended the construction of a permanent double-track line on Bloor Street from Runneymede Road to Jane Street. It will cost approximately $104,245.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway has recently announced in detail its program of reconstruction work delayed by the late war. The greater portion of this improvement work in Southern California became necessary principally through franchise and legal obligation. The improvement plans referred to are now under way.

Hydro-Electric Power Commission, Ont.—The double-tracking of London Street, West, has been started, and the proposed improvements to the local street railway system, now operated by the Hydro-Electric Commission of Ontario will be rushed to completion. In the June 26 issue of the ELECTRIC RAILWAY JOURNAL, reference to this improvement on London Street was made.

Chicago North Shore & Milwaukee Railroad, Highwood, Ill.—The Chicago, North Shore & Milwaukee Railroad operating in Waukegon will extend its line from North Avenue to Greenwood Avenue, then east to the Chicago & Northwestern Railroad's tracks. A survey of these streets has just been made and the work of estimating the cost is well under way. The extension will be approximately 2 miles and is practically assured.

Connecticut Valley Street Railway, Greenfield, Mass.—The Connecticut Valley Street Railway has petitioned the Selectmen of Greenfield to relocate the tracks in Deerfield Street and to add a spur track from the main line.

Brockton & Plymouth Street Railway, Plymouth, Mass.—The Brockton & Plymouth Street Railway has laid new track from the carhouse to Jaboz Corner and from Hotel Pilgrim to Hornblower's estate.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The State Highway Commission has approved of the application of the Trenton & Mercer County Traction Corporation for the removal of a spur on its Slackwood branch along the Brunswick pike.

New York, Westchester & Boston Railway, N. Y.—The New York, Westchester & Boston Railway expects to build 1.5 miles of standard double-track railroad, an extension of the present line from a point ¼ mile east of New Rochelle to Chatsworth Avenue, Larchmont.

Brockton & Plymouth Street Railway, Plymouth, Mass.—The Brockton & Plymouth Street Railway has installed two miles of copper trolley wire and plans for additional wire have been made. Nearly 200 new 35-ft. poles have been set replacing old equipment. The wooden poles upon the West side of Main Street will soon be removed and permission has been secured of all the property owners to string the trolley wire to the buildings.

St. Paul City Railway, Minneapolis, Minn.—The St. Paul City Railway will extend its lines in the suburb 3 miles just as soon as earnings will permit.

St. Joseph Railway, Light Heat & Power Company, St. Joseph, Mo.—Residents of St. Joseph have petitioned the City Council for an extension of the Prospect Avenue line to Third Street and Hamburg Avenue. The St. Joseph Railway, Light, Heat & Power Company is not in favor of this movement on the ground that it would not be a profitable undertaking.

West Virginia Traction & Electric Company, Wheeling, W. Va.—The West Virginia Traction & Electric Company will start at once the laying of the new tracks that will enable the re-routing of its cars up Eoff to Twelfth, to Chapline and South to Sixteenth on the outbound trip. The new routing will dispense with the Market Street tracks and traffic to Elm Grove down that thoroughfare. It will relieve traffic congestion along upper Chapline Street, Eleventh and Market between Eleventh and Sixteenth.

Power Houses, Shops and Buildings

Three Rivers (Que.) Traction Company.—The Three Rivers Traction Company has purchased a site on St. Maurice Street and contemplate erecting a station and waiting room.

New York, Westchester & Boston Railway, N. Y.—The New York, Westchester & Boston Railway expects to build one 16-ft. I beam and concrete slab bridge and two frame temporary stations with standard high platforms. One will be located about midway at Potter Avenue and one at Chatsworth Avenue at the Larchmont end.

Havana Electric Railway, Light & Power Company, Havana, Cuba.—The Havana Electric Railway, Light & Power Company is planning an extension and reconstruction of its shops for the maintenance of rolling stock.

Havana Electric Railway, Light & Power Company, Havana, Cuba.—The Havana Electric Railway, Light & Power Company has recently contracted for 50,000 k.w. generating apparatus to install in the present power plant. There will be additions to the piping system, and a distilling equipment for boiler feed water, new feed pumps and economizers is being considered. The company will also build a reinforced concrete wharf on the harbor frontage of the gas works property at Rincon de Melones, which will be provided with movable coaling crane to receive coal from ships and barges and to load cars—about 100 tons per hour capacity. Another improvement will be the construction of a steel building, 50 ft. x 150 ft. for company automobile trucks.

Trade Notes

The General Electric Company, Schenectady, N. Y., is having plans prepared for a five-story factory addition, 70 ft. x 400 ft., to its Pittsfield Works.

The Marion Insulated Wire & Rubber Company, Marion, Ind., has awarded contract for a three-story-and-basement, 35-ft. x 60-ft. extension.

The Consolidated Wire and Machinery Corporation, 519-527 West Van Buren Street, Chicago, is issuing a loose-leaf price list of new and second-hand motors, Kuhlman transformers and miscellaneous materials.

The Monroe-Louisiana Carbon Company, Monroe, recently organized, contemplates the construction of a large carbon plant at Hancock, near Monroe, to cost, including equipment, about $1,000,000. Barney Oakland of Monroe is superintendent.

Roller-Smith Company, 233 Broadway, New York City, announces the appointment of the Mountain States Machinery Company, 1710 Glenarm Street, Denver, Col., as its agent for the states of Colorado, Wyoming and New Mexico. The Mountain States Machinery Company will, in addition, handle the products of Crocker-Wheeler Company, Maloney Electric Company, Cutler-Hammer Manufacturing Company, Terry Steam Turbine Company and others.

New Advertising Literature

Panel Supports.—The General Electric Company, Schenectady, N. Y., has issued bulletin No. 47,703-A, to supersede No. 47,003. It describes standardized fittings and such accessories.

Combustion Control.—The Engineer Company, 17 Battery Place, New York, has just printed a booklet on "Modern Practice in Combustion Control," of interest to all steam-station engineers.

Insulator Testing.—T. F. Johnson, Jr., Atlanta, Ga., is distributing five booklets describing his insulator-testing methods and methods of working on live lines.

Melting Pots.—The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has issued a two-page leaflet, entitled "Metal Melting Pots," describing the C-H melting pots, both portable and bench types.

Switchboard Panels.—General Electric Company, Schenectady, N. Y., has issued bulletin 47001-A, superseding No. 47001, on standard unit switchboard panels for both direct current and alternating current in large and small capacity plants.

Water Softeners, Filters, Etc.—The Permutit Company, 440 Fourth Avenue, New York City, has issued bulletin No. 101, entitled "Permutit Water Rectification Systems," in which it describes and illustrates its products, including water softeners, filters, manganese removal equipment, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL. Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Promptness at Meetings Urged on Convention Delegates

ONE of the greatest aids toward securing a maximum of results from the sessions at Atlantic City will be the promptness with which the delegates reach the meeting halls. The time which it is practicable for any one association to devote to business sessions is limited, being not more than three hours a day for three or at the most four days. If the cost of these meetings in the way of traveling expenses, etc., of the delegates should be divided by the number of minutes devoted to sessions the cost of each session-minute for each association would probably be found to be a very large sum, running probably into the hundreds of dollars. Of course, such a computation would not be entirely fair as to the cost of the time, because the benefits from meetings of this kind are not confined to the work done actually during the session. Nevertheless, while it would be hard to evaluate that time in actual dollars, it is admittedly great. Railroad men who know the necessity of maintaining schedules on their properties should be equally ready to do the same with their association meetings, and we hope that delegates will make a special point this year of being prompt at the meetings so they can be begun at the appointed times.

Quibbling About Pennies While Lavishing Dollars

"PENNY wise and pound foolish" is about the true characterization of the action of the people of some localities (or their so-called champions in public office). While they strenuously oppose an increase of 1 cent in the rate of fare on the street car, they lavish money on luxuries, insist on the best cuts of meat, wear silk stockings and silk shirts to work and think nothing of paying twice or three times as much for these items as they did before the war—if indeed they bought them at all before the war.

To look at this situation more concretely, consider for instance the building laborer of Chicago. In 1914, when the fare on the elevated lines was 5 cents, he could buy eight rides for an hour's wages. With the fare existing today, or 10 cents, this same building laborer can buy eleven rides for an hour's wages and have more than the price of a newspaper left over. His transportation today is relatively cheaper than it was six years ago. What has been said of the building laborer is pretty nearly true of workers in general.

Or looking at the problem in another way, it was pointed out to the citizens of Springfield, Ill., the other day that if their general household costs had increased no more than their electric light rates their grocery bill would still be the same as in 1910; if their coal bill had increased no more than their gas rate they would be paying only $2.75 a ton instead of $4.16; if their municipal taxes had increased no more than their car fare their city tax bills would be only 40 per cent instead of 128 per cent higher than ten years ago.

To think about these things seriously, and to take into consideration the fact that the times are in general prosperous and that every one, seemingly, has plenty of money, particularly the "poor, down-trodden laboring man," whose interests are always the subject of wordy protection on the part of politicians, practically forces upon one the conclusion that the opposition to increased fares is a thing of small concern to the average man and is almost wholly a misguided or pernicious activity of politicians in behalf of the non-interested public. It seems to us that the politicians would attract much greater public support and applause if they would utilize the energy and talk so liberally spent in fighting a penny or two increase in a 5- or 6-cent fare in a sincere effort to reduce the price of $18 shoes, $75 suits, 20-cent milk, $14 coal, exorbitant house rents, etc., any one of which items offers opportunity to produce a saving large enough to pay the family car fare for a year.

Special Fares Logical for Special Services

IN OUR larger cities, where two and even three forms of transportation are becoming available, namely, the surface car, the rapid transit train and the motor bus, the question arises as to whether these different forms of transportation with different speeds should charge the same rate of fare, at least when under one management. There seems to be no logical reason for such uniformity if we are to take an example from steam railroading. People who value their time are willing to pay more to ride on a fast train, although the accommodations offered are otherwise exactly the same.

An instance similar to city conditions is that of travel between the city and adjacent suburbs. We have in mind one case where the average commutation rate of fare is 20 cents and the running time thirty minutes, as compared with a combined trolley and rapid transit run which costs 10 cents and takes fifty minutes. Yet the majority of regular riders pick the double-fare service, apparently for two reasons; one, the greater speed, and the other, the assurance of a seat. A still more pertinent example of the natural tendency of the public to select the faster, costlier service was noted in the article on the Cleveland Interurban Railway in the July 31 issue of this paper. Many Cleveland workmen were stated to be paying 10 cents for a fourteen-minute ride in preference to paying 5 cents for a twenty-five-minute ride.

Why should the same fare obtain for a ride of given distance which is negotiable in sixty, forty-five or thirty minutes, as the vehicle selected varies from a street car averaging eight to ten stops per mile to a rapid transit line stopping but once or twice per mile? In most cases the distances given for the unit fare on our rapid transit lines are so long that even the passengers comment upon the ingenuity of the railway in meeting expenses, yet in the same city the same public feels that the surface railway fares ought to be decreased, if anything, to deserve their patronage for short-haul traffic.

Still another instance of special service for which patrons cheerfully pay is seen in the case of special accommodations furnished. Again referring to steam railroad practice, we see the Pullman parlor car and sleeping car as accepted and even welcomed because they supply special accommodations, for which special charge is paid without complaint, even though there is no gain in speed. And, further, in the case of the Fifth Avenue Coach Company and some other special forms of *de luxe* transportation, patrons gladly pay extra fares for the accommodations—such as open-air riding and the assurance of a seat, even though the speed is much slower. Compare, for example, a Fifth Avenue bus from 135th Street to Fourteenth Street with a subway express.

What we would point out is that special services deserve and will be accorded special fares. The determination of that fare is affected by both speed and accommodation, to say the least, and the answer may not always be simple. However, only force of habit or a public policy opposed to it can keep American operators from developing this desirable and proper differentiation in charge.

Transportation—Knowledge Versus Ignorance

WE SOMETIMES think a little knowledge is dangerous and we are inclined to believe that lack of full knowledge in conception of the other fellow's work is the chief cause of the present street railway-motor bus controversy. This ignorance, if the term may be applied without malice, appears in three places—the motor bus companies, the street railway companies and the political arena. Each of the three agencies makes statements, quotes figures and argues from its respective standpoint and with its respective interests in view. We question the knowledge of each party regarding the transportation business and vehicle as developed by the other when considering the street railway and the motor bus companies and have little doubt of the ignorance of most politicians concerning either system.

Transportation knowledge is the essential key to the controversy and not expert knowledge of the mechanism of the street car, the motor bus or the body politic. Only through an intensive study of transportation can the place, type and function of the various agencies be determined, and there is little to stand on for either the motor bus company, the street railway company or the politician who attacks the problem from a selfish or narrow standpoint. We are frank to admit that the world moves and that transportation methods, vehicles, etc., are subject to change; we do not venture to predict the ultimate future type of surface transportation, but we are firm in our conviction that whatever the type, it will be used because it is the economic social and æsthetic solution to the transportation problem. The solution may involve the use of street cars, motor buses and other transportation types as yet unknown, but we maintain that the proper people to solve the problem are those who know transportation and attack the problem from that standpoint. The street railway companies are the big dealers in transportation, with fifty years' experience in transportation back of them. By all logic they should solve the transportation problems of the present and the future, whatever may be the agencies used in the traffic. Open-minded, intelligent effort along developmental lines should be the present policy of street railway companies, and right now there should be a well-directed effort to find the place of the motor bus in transportation and to use it in its logical place in connection with the existing systems.

Short-sighted conservatism and extravagant propaganda are alike out of place in dealing with public utility developments. Progress based on knowledge is the logical method for development to avoid disaster, and the street railways have the strategic position to obtain the facts and direct the development.

The Industry's Thinking as Reflected in the Convention Programs

WE LOOK to the program of the American Electric Railway Association and its affiliated organizations to point out the high spots in the business by their selection of topics for the annual and other meetings. The interest which attaches to these topics is a measure of the virility and activeness of the industry, a sort of barometer, so to speak. Judged from this standpoint, the programs made up for the Atlantic City convention this year are excellent.

Taking up first the program of the parent association, we note a great diversity of subjects, although there is a certain unity about it. It covers mainly the motor bus, freight and express traffic, labor, fuel and rate of return. Looked at another way, the subjects group themselves roughly as relating to conducting present activities more effectively and the attempt to find new transportation fields.

Of particular interest at this time is the motor vehicle, truck or bus, and its relation to rail transportation. The vital question is that suggested in the title of the address to be presented by G. M. Graham, vice-president Pierce-Arrow Motor Car Company, namely, "The Motor Vehicle—Competitor or Ally?" The answer will be outlined by other speakers as well as him. Of course, the answer will be "Ally," but then we shall want to know how it is to become such. It has been much more successful as a competitor. This topic has and deserves a fine place on the program.

The association is fortunate in having captured Governor Allen to talk on labor matters. A more harmonious and consistent relation between men and management must be fostered. The Governor is bound to "say something" along this line.

Referring now to the programs of the affiliated associations, it is plain that these organizations are broadening out, although, of course, doing so along the lines of their specialties. To illustrate: The claims men will talk mainly about accident prevention and welfare work rather than the settling of claims; the engineers will discuss railroad electrification and the "super-power" plan, in addition to their committee reports; the accountants will take up the problems of general finance and the accounting profession as well as accounting details, and the transportation experts will consider merchandising as well as producing what they have to sell—rides.

Another fine thing about the convention program is the plan for fostering co-operation among the several departments of the electric railway organization. Viewed narrowly, inter-departmental interests ofttimes seem to conflict. Thus, the mechanical department wants the cars sturdy, to keep them out of the shop, whereas the power department wants them light, to conserve energy, and the transportation people, who operate the cars, sometimes have ideas of their own. But over and above their own petty interests these fellows are concerned with giving good service at a reasonable profit, and the more keenly they realize the fact the better. Such joint sessions as are provided at Atlantic City will foster real co-operation.

Coal Tests Aid the Purchasing Agent

IN THE present struggle to secure coal enough to keep the rolling stock and shop equipment moving, fuel testing and inspection look like needless refinements to many purchasing agents. Recent inquiries regarding the relation between coal tests and practical operating results brought the information that in certain companies very little interest is displayed in this matter at present. Not a few purchasing agents seem to think that if they succeed in landing carloads of coal beside the power house their duty is done, and even the executive circle is inclined to throw up its hands and trust to improved conditions in the future rather than attempt to have fuel analyzed and prices readjusted accordingly.

Under such conditions as now prevail it may not be feasible to purchase coal upon a B.t.u. basis or to settle bills therefor upon a standard of heating value only. Analyses and calorific tests, however, point the way toward fair settlements, and even if the purchasing agent cannot obtain fuel of the specified quality in many cases it is highly desirable that he should know what quality he *is* getting. In case more clearly normal conditions prevail later in the market the knowledge of variations sustained in these trying days will be very helpful and should be on record. If abnormal conditions prevail for years, blind buying without check-up tests will lose money to an unknown degree for the operating man. It is not unknown for a carload of poor quality coal to pass through four or five selling hands between the mine and the ultimate consumer, and at present costs, and with priorities accorded public utilities, the rejection of poor quality coal should be prompt and decisive, if based upon the specific information which the fuel expert can supply.

Finally, a study of the relation of plant efficiency to fuel market conditions emphasizes the importance of analyses as a means of ascertaining station efficiency. With the variations in quality now experienced in many localities, the pounds of coal burned per kilowatt-hour delivered at the station bus is not as good a measure of efficiency as the B.t.u. per kilowatt-hour. Without definite knowledge of the quality of fuel burned, obtained at short intervals, station performance becomes more a matter of guesswork than is well. Close "tabs" on fuel quality are needed all along the line. A movement toward more centralized fuel buying appears to be taking shape in the East, and the purchasing agent who tries to "go it alone" will do well to consider how his purchasing practice can be improved through expert aid and co-ordinated ordering.

What Will the Engineers Discuss at Atlantic City?

A MERE glance at the program arranged for the Engineering Association convention this year indicates the large amount of work that it is planned to accomplish. The other associations have blocked out a lot of work too, but by the very nature of their work a vast amount of detail falls to the engineers. Due to the suspension of activity of the various committees during the war period, a large amount of work was left over. This has been fairly well "cleaned up" by the present committees.

The subject of standardization, which is always an important one, sticks out all over the program. This is now of greater value than ever, because the manufacturer members are represented on each committee. One thing that is sure to come up for discussion in this connection is the effect that standardization has upon the cost of operation and maintenance of equipment. All engineers should come to Atlantic City prepared to discuss this topic, as there seems to be a diversity of opinion in regard to the effect of standardization in reducing cost. The far-reaching effect of standardization will be further emphasized in the papers and discussion on stores and purchases.

At the end of last winter, when certain localities were hard hit by blizzards and other evidences of winter, the study of the effect of severe winter conditions on equipment was assigned to the committee on equipment for investigation and report. Much valuable information has been collected, and this special report should again open up the subject at a time when the railways are ready to make improvements to meet the problems of the coming winter. In this connection the developments which have been made during the past year in perfecting insulation and making it impervious to moisture should form a subject of vital interest to the industry. Again, the lack of equipment for removing ice from between and along railway tracks was most forcibly brought to the attention of Eastern roads by the several severe ice and sleet storms during the latter part of last winter. A discussion of the remedies employed and equipment found useful in keeping cars in operation in spite of ice and snow would be helpful.

If operating engineers have any criticisms to offer in connection with the service obtained from equipment, these engineering sessions will afford an excellent place in which to bring points to the attention of the manufacturers. Many benefits can be derived from frank criticism and discussion, and the engineers of all manufacturing concerns are eager to assist in any way possible that will help to prevent and remedy troubles which are pointed out to them.

But equipment is not the only subject of engineering interest, although at the moment it is a salient one. The effects of the advances in the welding art upon track construction, the progress made in heavy traction and the problems of the power engineer are all entitled to full and conscientious consideration. The whole convention is going to be a worth-while affair, and the engineers are going to hold up their end.

The issue of Oct. 16 will contain full reports of the Atlantic City meetings of the American, Accountants', Engineering and Transportation & Traffic Associations

Kansas City Operation Analyzed

City Member of the Board of Control Makes His Sixth Annual Report on the Kansas City Railways—Discussion of the Traffic, Financial and Engineering Features of the Year's Operation

ROBERT P. WOODS, city member Board of Control, Kansas City Railways, has made his sixth annual report to the Mayor and the city's directors in the Kansas City Railways. Mr. Woods resigned Aug. 1, to accept a position as vice-president and general manager of the Kansas City, Clay County & St. Joseph Railroad, and was succeeded by Col. E. M. Stayton as city member Board of Control. On July 7, 1920, six years of operation under the new franchise had been completed, and during this time the personnel of the five city directors had been unchanged and Mr. Woods had served continuously as city member of the Board of Control. The present report, which is abstracted below, depicts conditions as of May 31, 1920.

During the first three years after the passage of the new franchise the company paid out $400,000 in dividends and had a surplus of more than $1,000,000 left in its property, but during the two years and eleven months following, although the gross income increased over that of the former period, the operating expenses increased so greatly that, considered as a whole, the company has created a deficit of more than $4,000,000. The operating ratio was about 70 per cent for the first three years after the passage of the franchise, but during the past two years and eleven months the ratio of operating expenses to gross earnings has been 95.9 per cent. There have been two increases in wages within the past fiscal year and, compared to conditions in 1916, the following table gives the percentage of wage increases:

Trainmen, first six months	127.28
Trainmen, second six months	116.27
Trainmen, second year	103.85
Trainmen, third year	83.33
Firemen	156.41
Oilers	156.41
Painters	55.56
Machinists	40.63
Track laborers	123.53
Linemen	89.66

Fare increases have been granted throughout the period of the franchise operation and at the present time there is a cash fare of 8 cents, a paper ticket rate of 7 cents when purchased in lots of five and a metal token which sells for 7½ cents.

The report shows a very interesting graphic tabulation of the proportion of cash fares to tickets during March, April and May, 1920, taking Wednesday, a normal day, as typical of average conditions. The tabulation shows that for each month 65 per cent of the receipts were in the form of metal tokens, 25 per cent were in the form of the paper tickets and only about 10 per cent were cash fares.

For the month of June, 1920, the average number of cars operated daily was 661.6, as compared to a daily average of only 579.2 for June, 1919. This increase was due to new equipment purchased and placed in operation where it was most needed and to a redistribution of the old equipment, which has in addition been put in better condition, thereby decreasing the number of cars in the shops for repair. John A. Beeler, traffic expert of New York City, has co-operated with the Board of Control in bringing about needed changes and betterment in service. There has been continuous and serious difficulty throughout the year with fuel, as to quantity and quality, and some trouble in the power house operation. Two new substations were placed in operation and automatic control equipment was placed in two other substations.

The gross income from the property for the last two years and eleven months was $25,595,566.97. The operating expenses were $24,500,070.11, leaving an operating income of only $1,095,496.86. Neither the 6 per cent on the capital value in Missouri nor that in Kansas was earned and the fixed charges for this period amounted to more than $5,000,000, thus making a deficit to fixed charges alone for the period of $4,228,936.40*

TRANSPORTATION AND CONSTRUCTION

The company did a considerable amount of reconstruction work during the period and the following estimate gives the cost for the complete reconstruction in 1920 of about 2 miles of single track on paved streets in congested districts, including the cost of dismantling, maintaining and constructing temporary diverting tracks:

Total cost $142,313.40, divided between material, $82,202.77, and labor, $59,815.63.

These figures show the extremely high cost of approximately $70,000 per mile for the reconstruction of track under heavy city traffic conditions with existing labor and material prices. The company spent more than $81,000 in making additions, betterments and renewals during the year, and of this sum $49,000 was spent for material and $32,000 for labor. The present total mileage of single track is 315.73, of which 249.149 is in Missouri and 66.581 in Kansas.

In discussing transportation the report brings out the fact that the situation in general looks much brighter than it has for three years. In the opinion of Mr. Woods the service is better now than it has ever been, especially when, in addition to many improvements made in regard to the tracks and additions to equipment, the following conditions are considered:

1. That more cars are in service now than there have been in the past, and this notwithstanding the fact that there are from 35,000 to 45,000 fewer passengers being hauled each day than there were three years ago.
2. That the service is better adjusted to the present needs.
3. That the speed of the cars has been increased, especially in the downtown districts.
4. That the intercity viaduct has been opened for street car traffic.

For the eleven months ended May 31, 1920, the company carried 111,263,827 revenue passengers with a car-mileage of 22,442,466 and a total passenger revenue of $7,842,696, as compared with the year ended June 30, 1919, which had 21,174,642 passenger car-miles, 109,-

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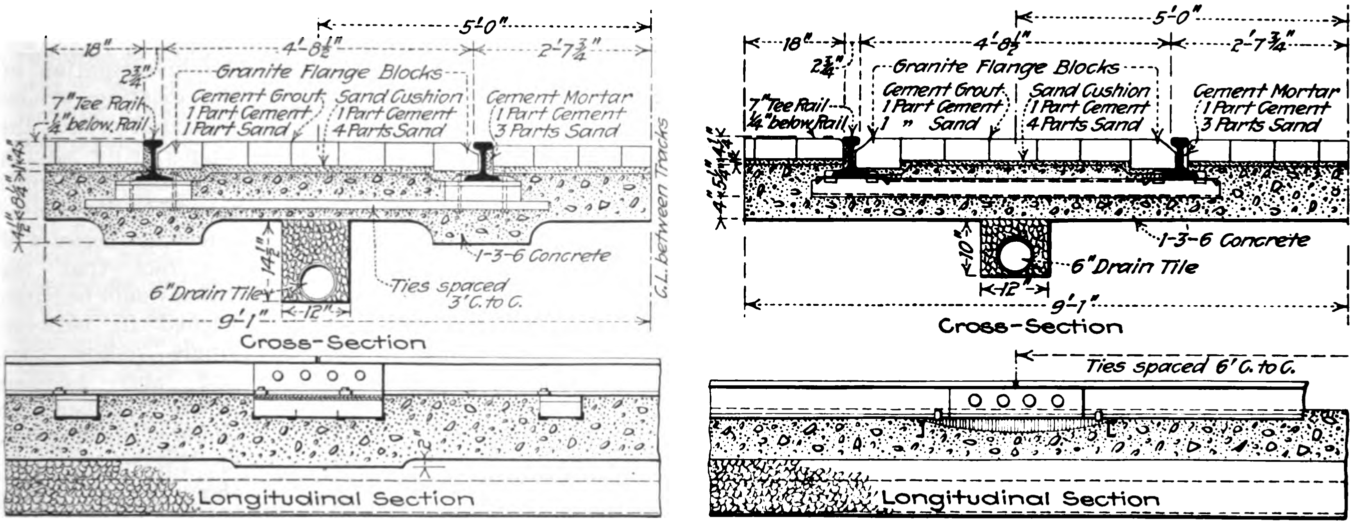
*The company was placed in the hands of a receiver on Sept. 9, 1920.—EDITORS.

273,320 revenue passengers and a total passenger revenue of $6,351,168. The great increase in operating expenses has been felt by the company, so that during the past eleven months it has been operating at a deficit.

Increased Use of Safety Cars

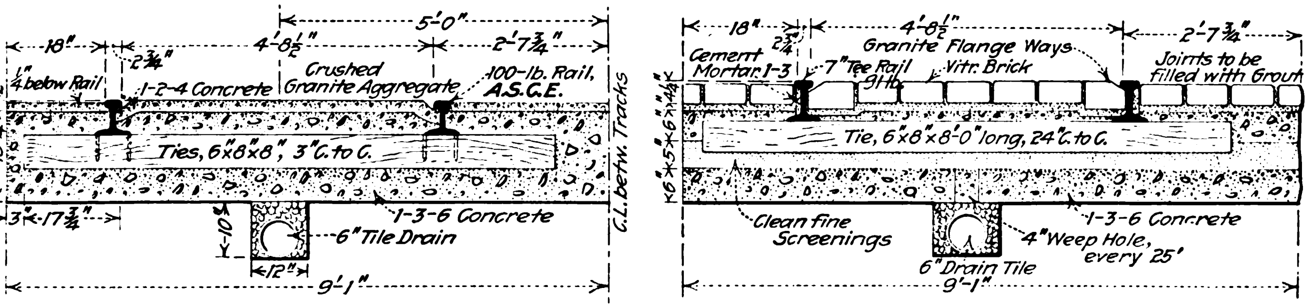
During the past year the company has purchased and received sixty-five safety cars, making a total of ninety-five now on the system. While the appearance of the last sixty-five is very similar to the first thirty, there really is considerable difference in some of the details, such as the seating arrangement, entrance way, rear door mechanism, trucks and other things of less importance.

With the exception of two lines all of these cars have been placed in service on lines that do not enter the business districts. The cars on the two lines that do enter the congested business district were placed in service without the approval of the Board of Control. It has always contended that these cars are too small for the handling of large crowds. This is principally on account of the time consumed by passengers boarding and alighting from the cars, there being only one door, so that passengers desiring to board have to wait until passengers desiring to alight are out; when this has to be done through a crowd in a narrow roadway it certainly slows up traffic.


5'-0"
18"
4'-8½"
2'-7¾"
2¾"
Granite Flange Blocks
7" Tee Rail ¼" below Rail
Cement Grout 1 Part Cement 1 Part Sand
Sand Cushion 1 Part Cement 4 Parts Sand
Cement Mortar 1 Part Cement 3 Parts Sand
1-3-6 Concrete
6" Drain Tile
Ties spaced 3' C. to C.
12"
14½"
10"
9'-1"
C.L. between Tracks
Cross-Section
Ties spaced 6' C. to C.
Longitudinal Section

TRACK ON CONCRETE USING DAYTON MECHANICAL TIE, 7" TEE RAIL 91 LB., AND BRICK PAVING

TRACK ON CONCRETE USING INTERNATIONAL STEEL TWIN TIE, 7" TEE RAIL 91 LB., AND BRICK PAVING


5'-0"
18"
4'-8½"
2'-7¾"
2¾"
¼" below Rail
1-2-4 Concrete
Crushed Granite Aggregate
100-lb. Rail, A.S.C.E.
Ties, 6"x8"x8', 3' C. to C.
1-3-6 Concrete
6" Tile Drain
12"
10"
3"
17¾"
9'-1"
C.L. betw. Tracks
Cement Mortar 1-3
7" Tee Rail 91 lb.
Granite Flange Ways
Vitr. Brick
Joints to be filled with Grout
Tie, 6"x8"x8'-0" long, 24" C. to C.
Clean fine Screenings
1-3-6 Concrete
4" Weep Hole, every 25'
6" Drain Tile

JACKSON AVE. 9TH TO 12TH STS. CROSS-SECTION OF TRACK USING 100-LB. RAIL A.S.C.E.

8TH ST. McGEE TO TROOST & 10TH ST. McGEE TO TROOST PROPOSED TRACK CONSTRUCTION

SPECIAL TYPES OF TRACK CONSTRUCTION USED BY KANSAS CITY RAILWAYS IN RECONSTRUCTION WORK

Traffic congestion has increased during the past year. The principal causes for this have been the narrow streets, the increased number of jitneys, the increase in the loading and unloading of vans, the increased number of privately owned automobiles and the freedom with which they are allowed to park, and finally the routing of too many street cars on certain congested streets.

However, an ordinance has been passed which eliminates jitneys from congested districts and also an ordinance has been passed regulating the parking of vehicles, so that after certain cars have been rerouted it is expected that this congestion will be relieved greatly.

Equipment and Shop Changes

As a direct result of the strikes starting in December, 1919, there was a precipitous rise in the number of car pull-ins from approximately 670 in November, 1919, to about 2,500 in June, 1920. The utmost energy was expended during the year to overcome the handicap to service due to the large number of cars in bad condition. A vigorous and comprehensive overhaul program was undertaken under the direction of the railway company's equipment engineer. A steady decline in the number of pull-ins was the direct result, the number decreasing from approximately 2,300 in July, 1919, to about 800 for June, 1920.

In this rehabilitation program the effect was concentrated upon mechanical and electrical details, such as the overhaul of trucks, controllers and motors. Calculation showed that it was physically impossible to keep up with the desired painting program without handicap to service on the street, and it was therefore decided to do only such painting as would not delay the placing of overhauled cars promptly in service.

In systematizing the overhaul program all passenger cars were classified in three groups, as follows:

Group 1—Wrecked and burned cars waiting decision as to disposal.

Group 2—Old cars unfit for passenger service, including cars still in service and cars out of service.

Group 3—All other passenger cars.

Group 3 was subdivided into three divisions, bad condition, fair condition and good condition.

As a result of the program a rather interesting cost record is available. Twenty-nine cars, group 1, were subjected to a complete overhauling and painting, from trolley to rail, and remodeling, at a cost of $1,000 per car. Twenty cars, group 2, were subjected to the overhauling and painting and remodeling at a total cost of $406.50 per car. Forty-six cars, group 3-A, were subjected to light overhaul and painting of body and complete overhaul of trucks, motors and control at a cost of $220 per car. Two hundred and sixty-one cars, group 3-B, were subjected to light overhaul of body and complete overhaul of trucks, motors and control without painting at a cost of $170 per car. Two hundred and twenty-two cars, group 3-C, were subjected to complete overhaul of trucks and motors only at a cost per car of $100. The time taken for the overhaul of the various classes was thirty days for the group 1 overhaul, fifteen days for the group 2, ten days for the group 3-A, five days for group 3-B and one day for group 3-C.

CHANGES IN SAFETY CARS

The experience with the first twenty-five safety cars purchased and placed in operation during the spring of 1919 showed that certain mechanical and structural changes as well as a general rearrangement were highly desirable, so that considerable time was spent by the engineers in an analysis of these cars and the preparation and recommendation of changes therein. Decision was early reached that more safety cars were desirable, and as the car makers were indifferent, if not antagonistic, to making any changes, it was necessary that the proposed changes be such as could be obtained from the car companies without too great distortion of existing standards and shop methods.

The principal changes made in the safety car are outlined as follows:

Structural strength of underframe materially increased.

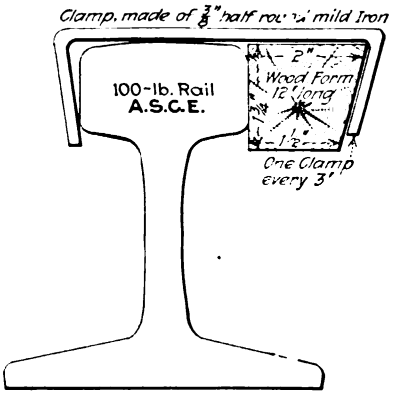
Seating and platform arrangement extensively revised to facilitate loading and passenger movement.

Twenty-four-in. cast wheels replaced by twenty-six-in. steel wheels, and specially designed rubber cushions installed in the truck suspension bolts to reduce noise.

A high-grade, full-rattan-covered, spring-upholstered seat replaced the slat seats. Maximum step height was reduced 2 in. Interior ceiling or head lining was added to improve appearance and warmth in winter. Thirteen heaters were installed instead of eight. Aluminum grab rail and stanchions were used instead of painted iron. Special design of projecting fender was installed instead of lifeguards, which have given unsatisfactory service. Heavier and better riding trucks were added. Low-voltage push buttons without exposed metal parts replaced high-voltage push buttons with exposed metal parts.

The above changes involved an increase in weight of approximately 1,200 lb. per car and an increase in cost above the cost of the standard safety car of approximately $200 per car. The revised weight was 15,000 lb.

During July, 1919, some experimental work was done under the direction of the board's engineer subsequent to his suggestion that it was apparently feasible to provide fan ventilation on Westinghouse 306 motors used on cars of the 800 and 900 series, thereby increasing the motor capacity sufficiently to haul double-truck trailers, seating about forty-seven passengers each. An experimental fan was built and the test results confirmed the estimate that between 20 and 25 per cent additional continuous capacity could be obtained, which would be sufficient to handle the largest trailer. At the same time an investigation was made of existing schedules to determine the possibility of using numerous motor car and trail trains. This resulted unfavorably, it being found that periods of minimum headway, that is under two minutes, were exceedingly short, so that the trail trains could not be used for any long period of time without making long headways, approximately four minutes, because of the large capacity of trains. An investigation of the existing grades indicated that the apparent saving with trailers would have to be discounted somewhat because of the fact that the trains would be sandwiched in between single motor cars and also because slower acceleration would somewhat delay the motor cars, thus increasing the running time. The company replaced the register fare boxes with Woods lock fare boxes during September of 1919. The price of the new box with brackets was $45 per box.



WOODEN FORMS USED TO FORM FLANGEWAYS IN CONCRETE

POWER CONDITIONS DURING THE YEAR

The power situation has been critical throughout the year. The shifting personnel at the plant made it difficult to carry on the construction program, as well as very adversely affecting the power plant economy and upkeep. Combined with these factors was the serious difficulty of obtaining a good fuel supply, and it was only by the most vigorous methods that a sufficient quantity was obtained. The coal delivered was consistently about the poorest ever burned in the station.

The new Northeast power station was started during the year, and other principal construction jobs were the continuance of underfeed stoker installations, a new fan house and duct, a trial installation of extension of chain grates, with new type of arch, as well as starting construction of revised ash-handling facilities.

About the first of the year a Westinghouse development, in the nature of side wall tuyeres or air boxes, was installed in boiler No. 5, for the purpose of reducing the adhesion of clinkers to the side walls of the furnace. This trial installation was a wonderful success and an order was immediately placed for side wall tuyeres for the remaining eleven underfeed stokers. In spite of the extremely poor coal, some of it averaging less than 7,800 B.t.u. per pound, the underfeed stoker installation promises to fulfill the specifications as regards efficiency and capacity. The irregularity of the fuel and its poor quality has shown the decided advantage of the underfeed stoker in regard to maintaining fires. At times from four to six fires have gone out on the chain grates at the Missouri River Power Station, requiring their entire rekindling. This trouble was not entirely confined to the Missouri River Power Station, as it is understood that the new Northeast Power Station found difficulty in maintaining a capacity between 18,000 and 20,000 kw. with boilers intended for approximately 40,000-kw. output.

Use Boilers as Evaporators

While considerable improvement has been made in the boiler feed water temperatures, the average is probably under 170 deg. F. Steps are being taken to install a bleeder connection between the third and fourth stages on the 15,000-kw. turbine and the auxiliary exhaust which passes close by the turbine. It is estimated that these connections will cost approximately $250. Check valves will be installed so that when the turbines are shut down or operated under light loads no steam will flow from the auxiliary exhaust to the turbine. When the turbines are operated at load, steam will be bled from the turbines into the auxiliary exhaust, enabling the water to come from the underfeed heaters at approximately 210 deg. instead of 170 deg. Besides the heat gained by this arrangement, it is hoped to deposit approximately two-thirds of the scale-forming compound in the heaters instead of in the boiler tubes. This will be accomplished by raising the feed water temperature in the heaters. Most of the carbonate scale will be deposited if the temperature is kept at about 180 deg., and it is estimated that at least two-thirds of the scale-forming compounds are carbonates.

The presence of scale and the large amount of boiler cleaning necessary have resulted in the loss of a considerable number of boiler tubes. In combination with the above bleeding scheme, the board's engineer recommended, and the suggestion is being placed in effect, that six boilers be used for purely evaporator service. Under this scheme all raw water will be sent to a certain group of boilers which will always be operated at relatively low ratings on account of the bad water conditions in them; all other boilers in the plant will then be fed from pure, condensed water.

No scale whatever would therefore exist in a great majority of the boilers in the plant, resulting in a higher efficiency of heat transfer, and making it unnecessary to waste heat for blowing down or causing delay for replacing any tubes. It is proposed to feed all raw makeup water to one of the small heaters on the north side of the boiler room.

Power Statistics and Cost

The company generated 210,427,964 kw.-hr. in 1920, as compared to 202,264,946 kw.-hr. in 1919. The switchboard cost in 1920 was 1.2336 cents per kilowatt-hour; in 1919 this cost was 1.3264 cents per kilowatt-hour. The average price of coal per net ton in 1920 was $3.64, as compared with $3.74 in 1919. The average price of oil in 1920 was $1.68 per barrel, as compared with $2.56 in 1919. The fuel cost per kilowatt-hour in 1920 was 8.86 mills, while the labor cost was 1.38 mills. The company used 387,143 tons of coal during the year and 175,955 bbl. of oil. The company averaged 3.926 kilowatt-hour per car-mile in 1920, as compared with 4.250 kw.-hr. per car-mile in 1919.

Beeler's Report

Mr. Woods publishes the report of John A. Beeler, traffic expert, who was retained by the Board of Control to study Kansas City conditions and to make recommendations for relief.* The report speaks of Mr. Beeler's work in a complimentary manner and states that conditions have been greatly relieved through the adoption of his recommendations.

Since the Wood report was issued, the Kansas City Railways has been placed in the hands of a receiver, as has been noted in these columns. An account of the receivership and the causes leading up thereto is given in the Financial and Corporate Section of the ELECTRIC RAILWAY JOURNAL this week.

The South African Railway Administration is going ahead with the electrification of the Cape Town-Simonstown line and the Durban-Pietermaritzburg line, involving an expenditure under present price conditions of nearly four and one-half million pounds sterling. This is part of the general electrification plan mentioned in the issue of this paper for Jan. 10, 1920, page 102.

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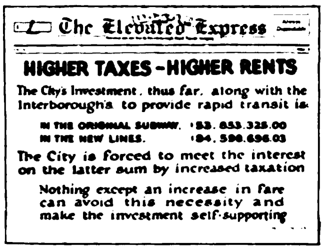
*Five sections of this report have been reviewed in ELECTRIC RAILWAY JOURNAL, issues of Feb. 14, April 3 and Aug. 14.

Reproductions of recent issues of the "Subway Sun" and "Elevated Express," which tell their own story



The Elevated Express

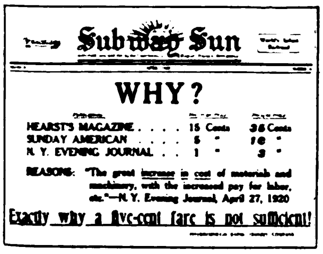
HIGHER TAXES - HIGHER RENTS

The City's Investment, thus far, along with the Interborough's to provide rapid transit is:

IN THE ORIGINAL SUBWAY.	$53,853,325.00
IN THE NEW LINES.	$94,598,696.03

The City is forced to meet the interest on the latter sum by increased taxation

Nothing except an increase in fare can avoid this necessity and make the investment self-supporting



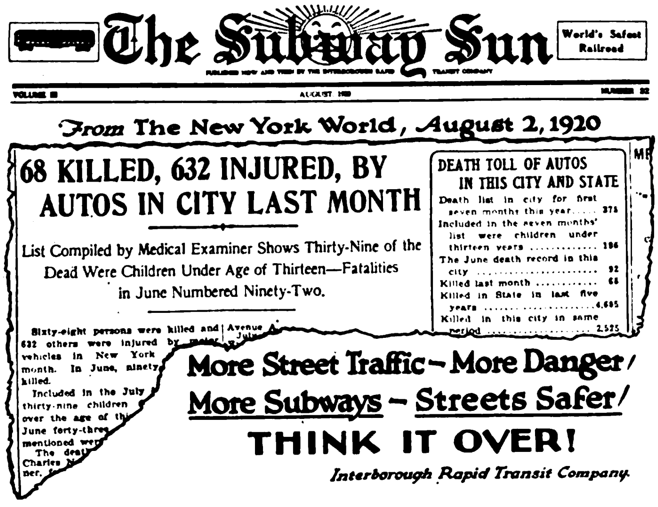
Subway Sun

WHY?

HEARST'S MAGAZINE	15 Cents	25 Cents
SUNDAY AMERICAN	5 "	10 "
N. Y. EVENING JOURNAL . . .	1 "	2 "

REASONS: "The great increase in cost of materials and machinery, with the increased pay for labor, etc."—N. Y. Evening Journal, April 27, 1920

Exactly why a five-cent fare is not sufficient!



The Subway Sun

World's Safest Railroad

From The New York World, August 2, 1920

68 KILLED, 632 INJURED, BY AUTOS IN CITY LAST MONTH

List Compiled by Medical Examiner Shows Thirty-Nine of the Dead Were Children Under Age of Thirteen—Fatalities in June Numbered Ninety-Two.

Sixty-eight persons were killed and 632 others were injured by motor vehicles in New York month. In June, ninety killed.

Included in the July thirty-nine children over the age of th June forty-three mentioned we

The deat Charles N ner,

DEATH TOLL OF AUTOS IN THIS CITY AND STATE

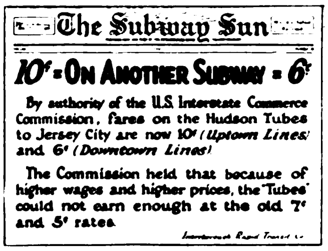
Death list in city for first seven months this year	375
Included in the seven months' list were children under thirteen years	186
The June death record in this city	92
Killed last month	68
Killed in State in last five years	4,685
Killed in this city in same period	2,525

More Street Traffic – More Danger!

More Subways – Streets Safer!

THINK IT OVER!

Interborough Rapid Transit Company.

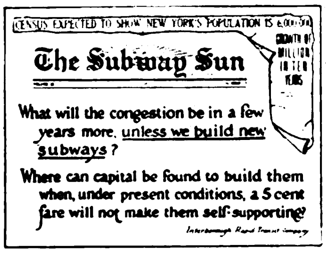


The Subway Sun

10¢ = ON ANOTHER SUBWAY = 6¢

By authority of the U.S. Interstate Commerce Commission, fares on the Hudson Tubes to Jersey City are now 10¢ (Uptown Lines) and 6¢ (Downtown Lines)

The Commission held that because of higher wages and higher prices, the "Tubes" could not earn enough at the old 7¢ and 5¢ rates.



CENSUS EXPECTED TO SHOW NEW YORK'S POPULATION IS 6,000,000

The Subway Sun

What will the congestion be in a few years more, unless we build new subways?

Where can capital be found to build them when, under present conditions, a 5 cent fare will not make them self-supporting?

Utility Situation Reviewed

Committee of Investment Bankers' Association Reports Utility Situation Encouraging—Status of Public Utilities Considered

AT THE annual meeting of the Investment Bankers' Association, held this week in Boston, O. B. Willcox, vice-president Bonbright & Company and chairman of the committee on public service securities of the Investment Bankers' Association of America, presented an extended and able review of the public utility financial situation in this country. According to Mr. Willcox:

> The public utility situation is distinctly encouraging. The functions of public service are better understood, their financial problems are recognized and are being solved. The critical observer cannot escape the just conclusion that the public in limiting the rate of return on utility investments has become responsible for a fair return. The events of the year have confirmed the conclusion of those operators and regulators who have pointed out that the most efficient utility is the prosperous utility. The demand for the great expansion of all public utility service comes not from the owners and operators but from the public. It is not too much to say that public regulation of utilities in the United States has reached a point where its principal function is recognized to be the provision of adequate public service through just rates sufficient to attract the capital needed for their expansion.

According to Mr. Willcox, utilities have taken their places in the public mind as no longer either merely conveniences or luxuries or merely private enterprises interesting only to their owners, but as great and essential tools of industry, no less important in their fields than the railroads, the banks and the post office. They are not mysterious or impressive aggregations of predatory wealth, but they are human accomplishments composed of materials and money and men, subject to the immutable economic laws that govern all human industrial endeavor.

The public has also come to realize that these systems must expand or they are no longer efficient public servants, and that new money can be drawn only from the investment funds of the country, accumulated out of the savings of the industrious and thrifty, and that, in their requirements for capital, these utilities compete with all the attractive and profitable opportunities offered to capital anywhere in the world.

Continuing, Mr. Willcox pointed out that under regulation, which now prevails throughout the country, the amount of capital invested in the utilities is limited to a fair and reasonable return, so that the money of speculators will not flow into this channel. Only those seeking investments with a limited return will provide the capital required, but they in turn must be assured of the certainty of their principal as well as of the promised income. The public, therefore, in regulating its utilities has at the same time assumed responsibility for both protecting the capital invested in public service and assuring its reward in the form of interest and dividends.

The recent water power bill is considered by Mr. Willcox to be an example of practicable legislation, and many hundreds of thousands of electrical horsepower will be speedily developed under its terms, if the newly created water power commission administers the act so that powers developed on the public lands and navigable streams "will not be so handicapped by vexatious restrictions and administrative expenses that they cannot successfully compete for their capital requirements and for the sale of their output with power generated by fuels or on streams not under Federal jurisdiction." Some fifty applications for permits have already been filed with the commission, contemplating the development of several hundred thousand electrical horsepower.

The speaker also referred to the study now being conducted by the United States Geological Survey of the power resources of the Atlantic seaboard between Boston and Washington.

Mr. Willcox quotes extensively from the report of the Federal Electric Railways Commission, a report with which, he says, it is important that bankers throughout the country should be familiar. Continuing, he says:

> As in all industrial enterprises, the fundamental requirement for efficient street railways is credit, and the handling of credits in the large volume required is the peculiar function of investment bankers; they can do great public service in lending their advice and aid in the rehabilitation of street railways by counseling those readjustments that will most speedily re-establish street railway credit, and they will thereby serve their own interests in promoting the prosperity of their several committees and in creating large volumes of sound securities which they can handle at fair profit.
>
> Even before the filing of the commission's report there was an obvious endeavor on the part of the regulating officials throughout the country, with very few exceptions (of which New York City is the most conspicuous), to make the rates of fare flexible so as to meet the requirements of each separate situation. The increases in rates granted have gone a long way toward establishing a basis for the rehabilitation of the credit of the street railway systems of the country.

A section of the report is devoted to the practice during the last few years of many companies to secure a local distribution of their securities by selling them to their customers and patrons. It is estimated that upward of $100,000,000 of utility securities have so been sold since the outbreak of the war. Such a plan should be encouraged for many reasons.

Discussing another phase of financing utilities, the report points out that the corporate and financial structure of many utility enterprises has proved to be disappointing (1) in not providing adequately for continuing financing to make money provision for constant growth and expansion, and (2) in relying too largely on fixed obligations and not providing sufficient equity represented by shares of stock. The rapid growth of utilities could not perhaps have been foreseen, it was said, but now that continued growth and expansion are recognized as inevitable incidents and functions of efficient and successful utilities the bankers advising and directing the development and growth must guard against the consequences of inflexible financing, which has both hampered the proper expansion of utility service and sometimes brought disappointment and loss to bankers and investors. The banker called on to market utility bonds has perhaps been too much governed by the old precedent of limited issues of sinking fund mortgage bonds. While these constituted a proper part of the financial structure of fixed, static and non-expanding enterprises, they have proved altogether inadequate to modern utility financing and will be more disappointing in the great utility expansion which is clearly in sight. Bankers must adopt the form of mortgage which while affording adequate security will permit and promote, not obstruct or hamper, the growth which is inseparable from successful and sound utility enterprises. The report then calls attention to the need of adequate stock issues and says that the principles of the non-par value stock are now better understood than formerly and their use in public utility capitalization is to be encouraged, as it would simplify some of the problems and encourage investment in utility enterprise, which is so necessary.

Motor Buses as Railway Auxiliaries

The Aggregate Number of Electric Railway Companies Which Are Now Operating Bus Lines Is Not Large—Some Statistics and General Conclusions Are Given

MOTOR BUS WITH TRAILER IN AUXILIARY AND SUPPLEMENTARY SERVICE OF THE OKMULGEE (OKLA.) TRACTION COMPANY

AN EFFORT was made recently by this paper to tabulate the electric railway companies which are operating bus lines. The result is shown in the accompanying list. Cases of buses owned by the same interests as the trolley lines but operated as entirely independent enterprises, of which there are a few, are not included. Notes are appended in regard to some of these properties.

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

This company operates a bus line about 1½ miles in length which connects two radiating street railway lines and intersects a third railway line about midway in its route. The company has never felt that the business warranted the necessary capital expenditure for a railway line and installed the bus line as a compromise measure. The service furnished is comparable with street railway service in headway, average speed, rates of fare and transfer privileges. The present buses are Nash 2-ton truck chassis, carrying a special body built by the company with a total weight unloaded of 6,700 lb. They will seat twenty-four passengers and permit sixteen additional passengers to stand, and are one-man operated.

The results of operation have been very satisfactory and, on the basis of July business, the line will handle 500,000 revenue and 300,000 transfer passengers during the year. In spite of the high transfer ratio the earnings average 35 cents per bus-mile.

The company's experience up to this time indicates the desirability of motor buses to furnish service in outlying districts, on crosstown routes or on extensions to existing car lines where traffic is more or less uniform during the entire day on account of their low initial investment. In view of its limited carrying capacity, however, this advantage of a bus largely disappears on lines having heavy peak load conditions.

The buses in Milwaukee were installed in April, 1920, and make approximately 85,000 bus-miles per year with two buses in constant service.

CONNECTICUT VALLEY STREET RAILWAY

This company installed a motor bus route in November, 1919, as a supplement to its street railway system. Two buses are needed to maintain the schedule and the third is held as a reserve. The bodies are mounted on lengthened Cadillac chassis and have a seating capacity of nineteen with an unloaded weight of 5,500 lb. The buses operate about 240 miles per day. The fares are collected by the Rooke register. A minimum fare of 10 cents is charged, with 5 cents for each additional zone. Further particulars of this line will be found in the ELECTRIC RAILWAY JOURNAL for April 24, 1920. In a recent letter the company says: "So far our judgment, as it is formed by our limited experience, is that there are some sections of territory which need transportation and that the use of the motor bus provides transportation at a minimum capital outgo. The public apparently likes to ride in the buses, and we believe the buses are the proper things to use for our situation. They have disadvantages in that they are expensive of maintenance, and we had weather conditions last winter that made it impossible to operate them when street cars operated very well in the same territory. They cannot handle peak loads and the use of many buses would badly congest highways as against other users. If normal costs were in vogue today we think we would try the motor bus experiment a little further in one or two other sections."

BALTIMORE TRANSIT COMPANY

The system of this company, which is associated with the United Railways & Electric Company of Baltimore, was described at length in an article on page 13 of the issue of this paper for Jan. 3, 1920, so a brief statement only will be given. Twenty single-deck buses are used, each with a seating capacity of sixteen and a weight of 7,000 lb. The present buses were installed in August, 1917, but the original service was instituted in 1915.

No transfers are issued to the trolley lines, and for 1919 the buses carried 1,958,915 passengers with a bus-mileage of 367,131. The installation in Baltimore has proved the value of the motor bus there to give a supplemental and also auxiliary service. The chief disadvantages found have been high operating costs and small carrying capacity.

MUNICIPAL RAILWAY OF SAN FRANCISCO

This railway system installed rented buses in 1917 and owned buses in January, 1918, as feeders to its street car lines. Five buses are operated, each seating nineteen passengers and with a capacity of thirty. The bus weighs 7,800 lb., including the 1½-ton chassis. During the year ended June 30, 1920, the bus-mileage was 236,797 and the buses carried 784,295 passengers. A financial statement for the last fiscal year is given in detail in Table I.

Transfers are free at all connecting points. A statement accompanying this report says: "In a new district where the travel will not justify the initial cost of railway construction and the people have no other means of transportation, buses may be used to advantage, although they are expensive to operate and are small units." The lines operate at a loss of about 13 cents per bus-mile, with receipts of 13 cents per bus-mile and expenses 26 cents per bus-mile. The fare is 5 cents, with 2½-cent school tickets and local transfers for the same price as the school tickets.

TABLE I—MUNICIPAL RAILWAY OF SAN FRANCISCO—STATEMENT OF BUS LINE OPERATIONS FOR FISCAL YEAR ENDED JUNE 30, 1920

Receipts:			
Route No. 1, Tenth Avenue and Fulton to Twenty-fifth Avenue and Irving Street	$14,982.60		
Route No. 2, Great Highway, Cabrillo to Sloat Boulevard	7,693.70		
Total receipts		$22,676.30	
Operating expenses:			
Account Number 39 A, repairs to motor buses	$15,479.29		
Account Number 78 C, conductors, chauffeurs, buses	15,995.50		
Account Number 78 D, garage expenses, buses	12,205.96		
Account Number 39 A, tire expense	13,023.96		
Total operating expense		$56,704.71	
Operating loss			$34,028.41
Reserves:			
Depreciation (18 per cent of receipts)	$4,081.72		
Compensation insurance	663.46		
Total reserves			$4,745.18
Gross excess of expenses over receipts:			$38,773.59
69 Q.M. tickets at 5 cents	$3.45		
6,708 school tickets at 2½ cents	167.70		
322,520 local transfers, at 2½ cents	8,063.00		8,234.15
Total revenue credits:			
Net loss			$30,539.44
Average net loss per day			83.44
Bus-Mileage—236,797			
Receipts per bus-mile (revenue credits not included)			0.095
Receipts per bus-mile (revenue credits included)			.13
Total expenses per bus-mile			.259
Net loss per bus-mile			.129

FRESNO TRACTION COMPANY

This company has been operating a motor bus route since July, 1916. It uses two buses, which make a bus-mileage per year of about 27,000 and carry 50,000 passengers. The bus is a single-deck affair with a seating capacity of fifteen and a weight of 5,000 lb., including the Moreland chassis and built-up top.

The routes serve as feeders to the railway. The company does not see any advantages in the use of the motor bus and says that "the cost of operation per car-mile in regular street car work is about 9 to 1 in favor of the cars." It hopes to discontinue the buses as soon as possible.

TWIN CITY RAPID TRANSIT COMPANY

In 1918 the Twin City Rapid Transit Company purchased thirty-eight jitney buses then in competition with its cars and started to give a bus service at a 5-cent fare with free transfers to the trolley cars. The experiment, however, was not very successful, as never more than half of the buses were able to operate at one time, the others undergoing repairs. During the last year of operation it was rarely possible for the company to keep even thirteen buses in regular service. The buses consisted of a seven-passenger chassis with bus body, and with a seating capacity of fourteen passengers each. These buses were discontinued on April 30, 1920, and a trolley line is being built over the former bus route. The company writes: "We have proved to our own satisfaction that we cannot operate motor buses on a 5-cent fare and break even, and it would seem that a 10-cent fare at least would be required for profitable operation."

WINNIPEG ELECTRIC RAILWAY

The Winnipeg Electric Railway owns twelve one-man buses. The latest type was described on page 505 of the issue of this paper for Sept. 11, 1920. Five of these have been in operation since May 10, 1918. Of these three were used on schedules and two in reserve. These buses weigh 3,700 lb. without load and seat sixteen passengers. A bus mileage of 111,920 was made during

TABLE II—STATISTICS FROM TEN ELECTRIC RAILWAYS USING MOTOR BUSES IN AUXILIARY SERVICE

Name of Company	Location	Use of Motor Bus	Number of Buses Operated	Date Installed
Milwaukee Electric Railway & Light Company	Milwaukee, Wis	Supplementary	2	April 17, 1920
Connecticut Valley Street Railway	Greenfield, Mass	Supplementary	3	Nov., 1919
Baltimore Transit Company	Baltimore, Md	Supplementary	20	Aug. 1, 1917
Municipal Railway of San Francisco	San Francisco, Cal	Feeders	7	Sept. 1, 1917
Fresno Traction Company	Fresno, Cal	Supplementary	2	July, 1916
Pacific Electric Company	San Bernardino, Cal	Supplementary	4	1917
Peninsular Railway	San Jose, Cal	Feeders	2	1919
Dubuque Electric Company	Dubuque, Iowa	Supplementary	3	1919
Winnipeg Electric Railway	Winnipeg, Canada	Supplementary	12	May 10, 1918
Okmulgee Traction Company	Okmulgee, Okla	Supplementary	6	1920

the twelve months ended June 30, 1919. The maximum mileage made by a bus during a single month was 3,800. Transfer regulations are carried out the same as for electric cars. In a recent letter the company says: "One of the chief advantages of the motor bus is that service can be extended into new territory which demands transportation with a minimum of immediate capital expenditure. The chief disadvantages of motor buses as compared with street cars are more frequent breakdowns and interruptions to service and the necessity for side trips off the line for gasoline, etc. The future policy of our company in regard to the use of the motor bus will be the same that has governed our past procedure in this respect. We do not think that the motor bus will ever take the place of a street car, except possibly on small shuttle lines and where breaking into new territory. We regard the bus merely as a temporary expedient until traffic conditions warrant the extension of our track and investment in rolling stock."

Since the early part of this year the company has had two Sterling buses in operation in addition to those previously mentioned. These are used on the Stock Yards route to replace a stub-line car.

PENINSULAR RAILWAY COMPANY

The company states that "at the present time we are operating but one motor bus regularly, it being in service on Hobson Street, San José, in lieu of a remote car line which we obtained permission to abandon if we would substitute the bus service. The bus is operated at a great loss in view of the fact that the revenue taken in on the bus, which is in operation about eighteen hours a day, amounts to about $2.50. So, therefore, we are unable to give satisfactory figures pertaining to bus operation under conditions of this kind. We also operate a bus line to Oak Hill Cemetery on Sundays and holidays only. This was also done to secure abandonment of a remote narrow-gage line, and conditions surrounding this operation are similar to those on Hobson Street."

VIEWS OF ONE OPERATOR

One operator of extended experience who has made a study of the bus situation has reached the following conclusions:

Efficient, adequate and cheap means of urban transportation are indispensable to the welfare of cities.

Electric railways have and are supplying this. They are a part of the social, economic and industrial life of cities. They are permanent institutions which, in their proper sphere, nothing as yet devised can supplant.

Communities where electric railways operate have a vital interest in their prosperity, because upon this depend the quality and quantity of service rendered.

In the field of urban transportation, and particularly where mass transport is involved, the motor bus as at present constituted is not an adequate substitute for the electric railway, for the following reasons:

1. If all factors involved are taken into consideration, such as the length of ride, equitable taxation, allowance for depreciation, etc., it is found that the bus is not as economical as the electric car operated over steel rails.

2. The physical limitations of highways make the motor bus undesirable as a means of mass transport because of:

(a) Increased street congestion..
(b) Increased accident hazard.

3. Climatic conditions in some parts of the country do not permit all-the-year-round efficient operation of the motor bus.

Though the electric railway cannot in its proper sphere be supplanted by the motor bus as at present constituted, the service it renders can under certain conditions and in a measure be supplemented by automotive vehicle operation, particularly as follows:

1. The motor bus can act as a feeder line in suburban or urban sparsely settled territory.
2. The motor bus can act as a link.
3. The motor bus can under certain conditions furnish a *de luxe* service.

Where the need of motor bus service is found and determined to be economically sound, an opportunity should be given the existing transportation agency—the electric railway—to furnish such service. Monopoly in the public utility field is essential to efficient and economical operation from the community point of view as well as from the utility point of view.

With the advent and development of the automobile, the electric railways no longer have a monopoly in the field of urban transportation.

The rapid development of the automobile has had a tremendous and disastrous effect upon the earnings of electric railways and consequently upon the quality and quantity of service furnished by them to the public.

Efforts to supplant the electric railways with the automobile have injured the electric railways, but more so the communities served.

The unfair competition of the automobile did not solve the urban transportation problem; on the contrary, it made the solution more difficult by rendering inoperative an agency which the automobile cannot replace.

The automobile has benefited by the construction of good roads and highways, frequently paid for by the street car rider in the form of a paving tax.

The operation of the automobile should be regulated and its operating requirements made no less onerous than those imposed on the street car.

Wholesale Prices in August

A PRONOUNCED drop in the general level of wholesale prices in the United States from July to August is shown by information collected in representative markets by the Bureau of Labor Statistics of the United States Department of Labor. Measured by changes in the bureau's weighted index number, in which each commodity has an influence proportionate to its importance in the country's markets, the decrease was more than 4½ per cent.

Food articles showed the greatest price recessions, the decrease for the group as a whole being more than 12 per cent. Farm products, containing many basic food materials, declined nearly 6 per cent. Cloths and clothing followed closely, with a decrease of approximately 5¾ per cent from the July level. Smaller decreases were recorded for the groups of building materials, chemicals and drugs, and miscellaneous commodities, the latter including, among others, such important articles as bran, cottonseed meal and oil, jute, rubber and soya-bean oil. Fuel and lighting materials, on the other hand, continued upward, with an increase of more than 6¼ per cent. Metals and house-furnishing goods also showed a net advance from the preceding month.

Are You Ready for the Coming Winter?

The Causes for Your Trouble Are Explained and the Author Outlines Some Practical Methods Which May Be Used in Advance to Minimize the Possibility of These Troubles

By J. S. Dean
Railway Motor Engineering Department Westinghouse Electric & Manufacturing Company.

TO COPE WITH SNOW LIKE THIS TAKES PREPARATION AND FORETHOUGHT

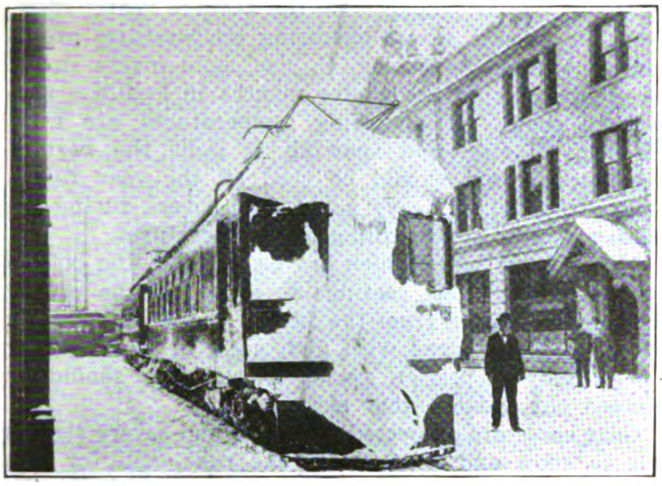
THE problem of operating street cars during the winter season, particularly in localities subject to heavy snowstorms, is one that vitally interests all street railway men from the president down through the organization and including the men in the shops and carhouses. To the officials this problem is evidenced in a financial loss, due to reduced earnings and increased operating expenses, and in a possible antagonistic public sentiment very detrimental to the interests of the company. To the average employee of the company the winter weather means longer hours of labor, followed by physical discomforts, and in spite of increased earnings and larger pay envelopes the employee becomes inefficient and discouraged, resulting sometimes in a general breaking down of the morale.

Interest in this subject varies between a maximum and a minimum, depending upon the geographical location of the operating company. Operators in the extreme South need give this subject but a passing thought, while those facing such conditions as shown in some of the accompanying illustrations are vitally interested. It is generally conceded that a line passing through Washington, Cincinnati and St. Louis, approximately the 37th degree of latitude, represents an intermediate point between the two extreme conditions referred to.

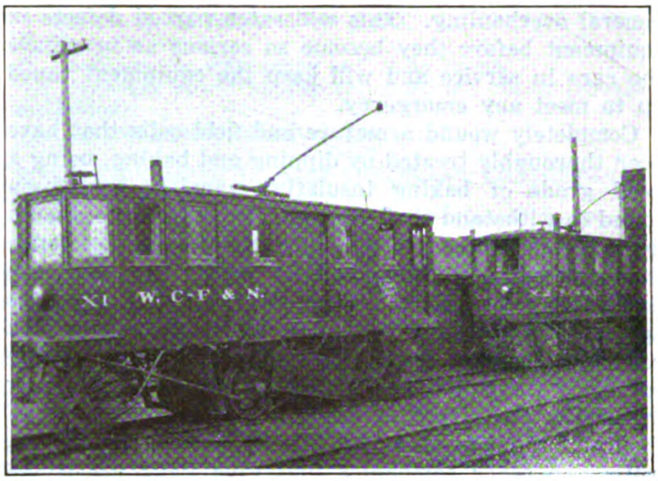
THE REASONS FOR MOTOR FAILURE ARE MANY

Careful analysis on a number of street railway properties of the operating conditions and equipment failures during the winter season, combined with an expression of opinion from a number of men closely allied with the railway industry, shows the following primary causes as being largely responsible for equipment failures at such seasons:

1. Heavy snowstorms blocking the track, submitting equipment to an undue overload.
2. Inadequate and inefficient snowfighting equipment being unable to keep tracks clear, thus compelling the use of passenger cars to do a large share of this work.
3. Snow and ice packed between the rails by automobiles and heavy trucks. Under these conditions cars are lifted off the rails by motors riding on the ice, resulting in spinning of the wheels and roasting of the windings. Motors overloaded and sometimes burned out as a result of gear cases rubbing open on the ice and allowing the snow and ice to pack in the case, jamming the gears.
4. When a thaw comes the snow melts rapidly, and with sewers choked and consequent poor surface drainage abundant water and slush collect on the tracks and through this the cars must operate, resulting in wet motors caused by wheel splash and pocketing of water in depressed sections of the track.
5. Cars used to pull in cripples, thus overloading the motors.
6. Equipments in a general rundown condition, in most cases due to forced neglect of maintenance, and equipments physically unfit to meet emergencies caused by overloads.
7. Overworking all available equipments as a result of the many crippled cars in the carhouse and the increased travel due to poor weather conditions.
8. An increased number of mechanical failures due to the extreme low temperature, frozen condition of roadbed, and to the action of the frost on roadbed and track.
9. Sweating of motors that are parked in zero weather all night after being worked to the maximum temperature the previous day.
10. General demoralization of schedules due to crippled cars and stranded automobile trucks tying up traffic.



A RAILWAY SUBJECT TO SUCH OPERATING CONDITIONS AS THIS IS VITALLY INTERESTED IN PREPARATION FOR NEXT WINTER



THE SNOW SWEEPER IS BEST ADAPTED TO LIGHT SNOW AND FOR GENERAL WORK IN REMOVING SNOW FROM CITY STREETS

11. Rough and careless handling of the equipment by the trainmen, who are forced to make up lost time due to unavoidable delay.

12. Extreme cold weather, with resulting uncomfortable condition of the pits and carhouses, reducing the efficiency and the morale of the workmen and causing makeshift repairs and poor maintenance.

13. Poor shipping facilities, resulting in a scarcity of repair parts which are necessary to maintain the equipment properly.

THE WEATHER MAN TREATS 'EM ALL ALIKE

The experience of the past few years, and especially the past winter, in certain localities has demonstrated the fact that adequate preparation must be made in order effectively to cope with the heavy snowfall and severe winter weather conditions. An efficient snow-fighting organization with effective equipment must be maintained to combat these unusual operating conditions.

Evidence collected from fifteen representative operating companies by an official of a large railway company in New England was segregated and tabulated and showed that armature failures due to severe winter conditions during the early part of the present year were on the average about equally divided between those of the two large motor manufacturers.

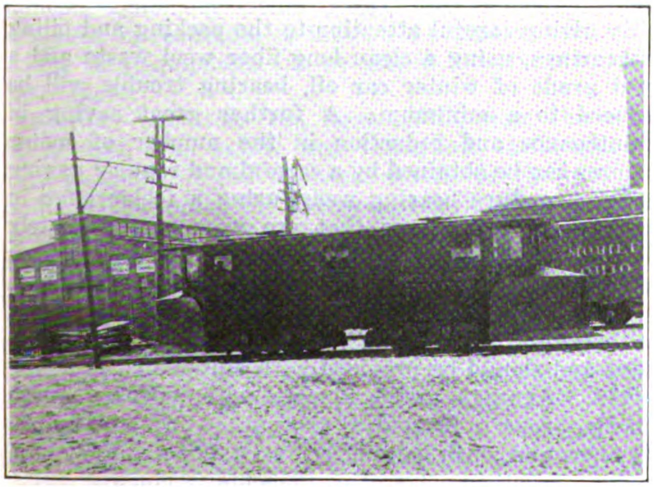
These data further showed that approximately the same percentage of failures occurred with both the interpole and non-interpole motors and with the non-ventilated as well as with the ventilated type of motors. This indicates that an epidemic of motor trouble during unusual weather conditions is no respecter of the manufacturer or of the type of motor construction. It was found that certain properties operating under practically the same conditions had less trouble in general than others, and this was accounted for only by the more thorough preparedness of the former to meet these emergencies.

THESE PRECAUTIONS WILL HELP REDUCE FAILURES

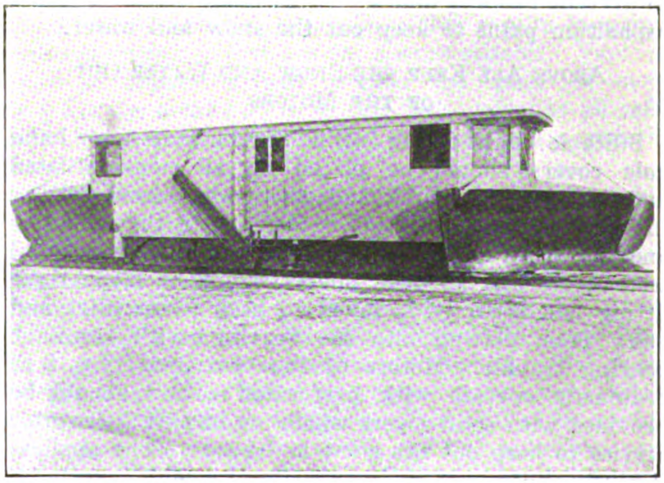
Some of the lessons learned from the investigation mentioned above and from data obtained through other sources of information bearing on this subject and gathered from a number of other railway companies operating in various parts of the country suggest the following points that are worthy of consideration if an effort is to be made to minimize possible trouble due to severe winter operating conditions:

In order to be prepared to handle all manner of equipment trouble it is of vital importance to have an efficient and well-organized body of trained shop men under the supervision of a competent master mechanic.

Regular and frequent inspections should be made at stated intervals of time or on a mileage basis and at least once a year all equipment should be given a



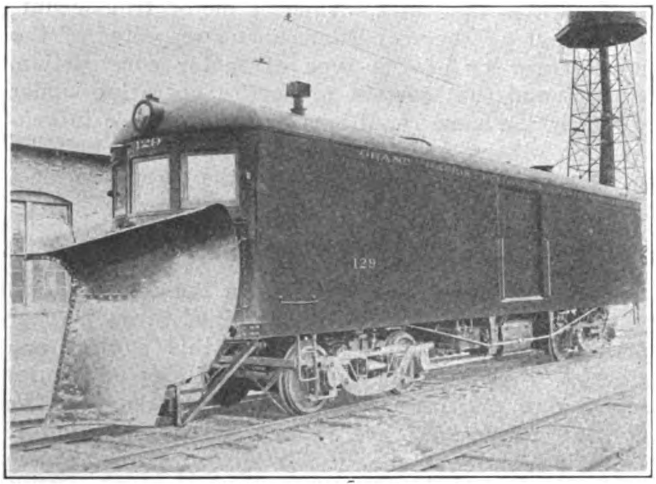
THIS TYPE OF PLOW IS SUITABLE FOR CLEARING SNOW FROM SINGLE TRACKS



THE SHEAR PLOW IS USED ON DOUBLE-TRACK RIGHT OF WAY general overhauling. This will catch partial defects in equipment before they become so serious as to cripple the cars in service and will keep the equipment tuned up to meet any emergency.

Completely wound armature and field coils that have been thoroughly treated by dipping and baking, using a good grade of baking insulating varnish, have been found to withstand the water and moisture encountered during the winter season with less resultant trouble than untreated windings. This treatment has been highly recommended as a means of fortifying windings against grounds and short circuits. In this connection reports submitted in the above investigation by two operating companies which did not dip and bake their armatures show that 58 per cent and 43 per cent of the total number of armatures in service had failed, while two other companies that give their armatures this treatment reported armature failures of only 20 per cent and 14.5 per cent respectively.

All motor leads should be cleated to prevent rubbing and chafing and to insure against grounded or broken leads. Breaks in leads may occur and cars be operated "three-legged" for some time without detection, thus overloading the motors and roasting the insulation. A heavy coating of asphaltum paint protects these leads against snow and water by making them moisture-proof. All unprotected car wiring should be well cleated to prevent rubbing and should be painted with a heavy asphaltum paint to keep out the snow and water.



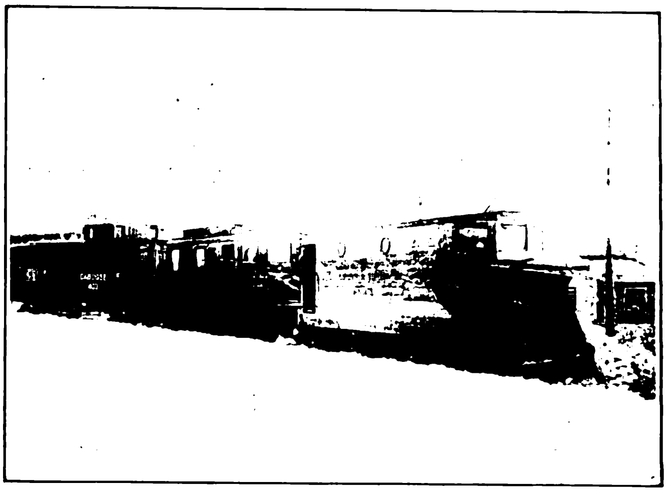
A PILOT PLOW MAY BE READILY ATTACHED TO ANY INTERURBAN CAR

ABOVE ALL KEEP THE SNOW AND WATER OUT OF THE MOTORS

Suitable tight-fitting solid commutator and hand hole covers should be placed on all non-ventilated motors to prevent snow and wheel wash from getting inside the frame, resulting in damage to the windings and the brush-holders. Armature and axle bearing oil well covers and all dust shields should be made tight fitting and securely fastened to keep water, dirt and snow from getting into the bearing, with resultant bearing trouble. Motors of the ventilated type that ordinarily operate with perforated covers should be provided with solid covers wholly or in part for winter service to keep out the snow and water. The application of solid covers to these motors should, to a large extent, be controlled by local conditions, such as maximum operating temperature of motors and the severity of the winter as judged from the average yearly snowfall. In general, where operating temperatures are as low as 55 deg. to 60 deg. C. rise, solid covers should be applied during the winter months in localities subject to snow. If operating temperatures are high, 75 deg. C. rise, and snowfall is light the regular ventilated covers should be used all the year round. Where snowfall is heavy apply solid covers during the winter months, disregarding the temperatures.

Motor drain holes which are provided in the bottom of the motor frame castings to allow for the proper drainage of water from the inside of the motor quite often become clogged with dirt, snow or ice. During the regular inspection period these holes should be cleaned out and openings cleared.

Gear cases are subjected to bumps and severe strains due to snow and ice between the rails, and for this reason they should be made to clamp securely to the supporting lugs by keeping the clamping bolts drawn up tight and securely locked. The two halves should be carefully fitted together and all covers should be made tight and kept closed to keep out the snow and water.



THE PUSH PLOW IS USED EXTENSIVELY ON INTERURBAN LINES

It is very important that all bolts on motors be kept tight and securely locked to prevent parts from working loose, thus allowing water to enter the motor frame and bearings. These bolts, which should be made of a special heat-treated steel, should be carefully gone over and tightened at each regular inspection.

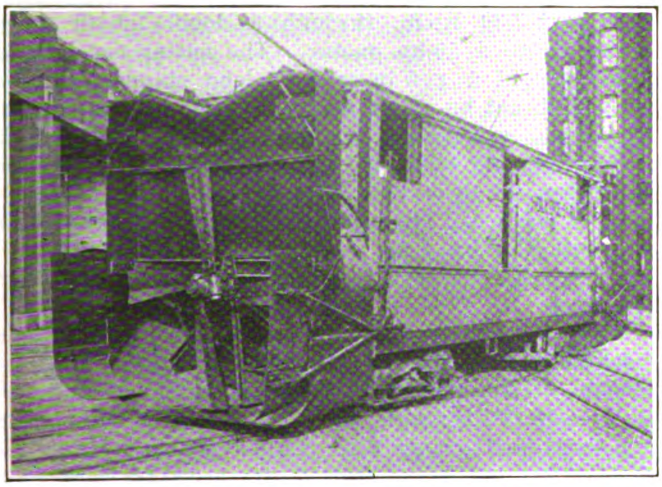
By giving careful attention to the packing and oiling of bearings, using a clean long fiber wool waste and a good grade of winter car oil, bearing trouble will be reduced to a minimum. A further great saving in maintenance and reduction in the number of motor failures can be obtained by a careful and regular gaging of the armature bearing wear, using a feeler gage in the air gap. Bearings that are worn approximately $\frac{1}{16}$ in. should be replaced to prevent the armatures from getting down on the poles and damaging the windings.

The windings and leads of all detail apparatus should be thoroughly painted with a good grade of asphaltum paint and should be provided with suitable tight-fitting covers. Arrange to fit all cars with suitable splash guards, properly located to prevent, so far as possible, the snow and slush lodging on resistance grids, motors, wiring and other parts of equipments.

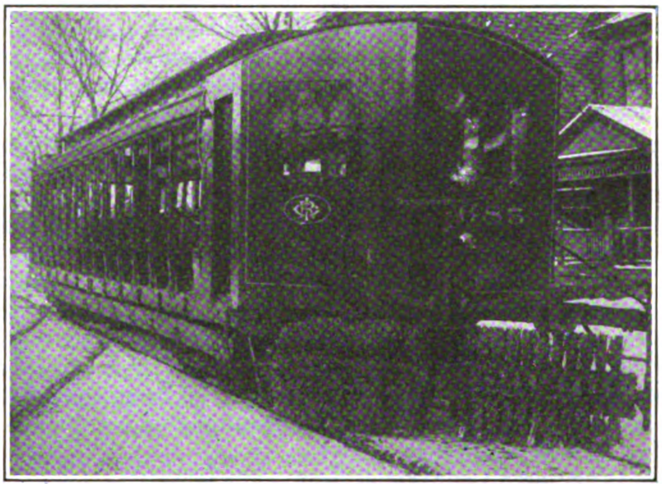
It has been found by experience that to meet emergencies it is good practice to keep in stock an available supply of spare parts of all apparatus and detail parts. This is especially important at the present time owing to the long delivery dates forced upon the manufacturers on account of the present condition of the labor and material market. It is also well to remember that during the winter season the shipping facilities are not very reliable, and although the material may be available for shipment any promise of delivery cannot be depended upon under existing conditions.

A factor that is too often overlooked is the condition of the inspection pits and carhouses during the winter season. In many cases pits are poorly lighted, wet, dirty and littered with tools and broken repair parts. Many carhouses are not provided with storm doors and are poorly heated, resulting in cold, damp, uncomfortable conditions under which the men are compelled to do their work. These conditions, which exist on a great many railway properties, have a tendency to reduce the efficiency of the workmen, who slight their work and congregate in some corner around a small stove to thaw out and be comfortable.

The organization of a city fire department is considered to be the last word in preparedness for combating fires. It has been suggested that the snow-fighting forces of a street railway company be organized along similar lines. Experienced and reliable crews should be assigned to the different types of snow-fighting equipment operating from the various carhouses and held in readiness so that on a comparatively short notice this equipment can be placed in service to clear the tracks.



A ROTARY PLOW IS NECESSARY FOR HIGH DRIFTS AND OPENS A WIDE ROADWAY



SUMMER CARS CAN BE CONVERTED IN WINTER TO SWEEPERS AT LITTLE COST

Railway operators can learn much from the army strategists, who before any important battle make a careful study of the minutest details of the strength and distribution of the enemy forces in order to determine his vulnerable points. With this information available, together with definite information of their own strength, an attack is planned and executed with clock-like precision. In preparing to fight snow an operating company should make a careful study of the situation and map out a definite program which should take into consideration the following:

1. Available snowfighting equipment.
2. Condition of equipment.
3. Additional spare equipment and parts available.
4. Study of weather conditions.
5. Assignment of crews.
6. Nature and severity of snowfall.
7. Routes to be followed by plows.
8. Time of attack.
9. Provision for emergency and relay crews.
10. Sufficient power supply (consider the use of portable substations).
11. Rearrangement of schedules.

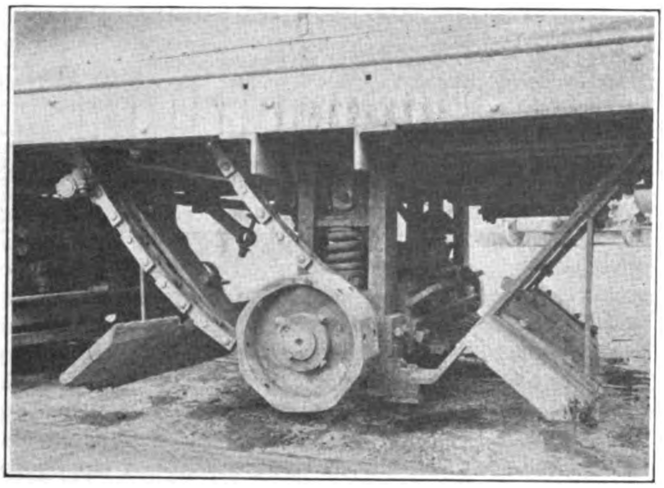
PROPER EQUIPMENT IS MOST IMPORTANT CONSIDERATION

Each individual operating company should figure out its requirements for snow-fighting apparatus based upon past experience. Railway companies with inadequate equipment are compelled to use passenger cars to keep the right-of-way open. Cars that are used in bucking snow may do this work without showing any immediate apparent injury to the motors, but it should be definitely understood that the excessive overheating of the motors by this overloading weakens the insulation of the winding and shortens the life of the equipment. This is especially true in the case of cars equipped with the light-weight ventilated type of motor which has a lower short time overload rating.

The problem of keeping electric railway tracks clear of snow and ice during the winter season has been the means of developing a variety of ingenious devices, some of which have become standard pieces of apparatus and are used quite extensively by all railways. One great fault in connection with this class of apparatus and which is common with too many operators is the use of old and obsolete electrical equipment which is nearly ready for the scrap pile. This results in snow-fighting machines that are not always reliable. Various types of apparatus used to clear the tracks of snow and ice, the details of which are well known to all railway operators, will be touched upon only in a general way.

Snow sweepers consist of either four-wheel or eight-wheel self-propelled cars with a motor-driven broom rotating at an angle on the forward end of the car. This brushes the snow from the tracks and is best adapted for use in light snows and for general work.

Snowplows consist primarily of cars with either four or eight wheels, self-propelled, or pushed, and having on the front end a metal or wooden shaped nose which forces the snow from the track. This kind of apparatus is best suited for deep snows and for suburban and interurban lines. There are various types of snowplows. The nose plow, with the tip or point of the plow coinciding with the center of the track is self-propelled and



AN ICE CUTTER IS A VALUABLE ADDITION TO THE SNOW-FIGHTING EQUIPMENT

forces the snow to both sides of the right-of-way. This type is best suited to clear the snow from single tracks. The shear plow, with the tip or point of the plow offset from the center of the rails, is self-propelled and forces the snow to one side of the right-of-way. This type of plow is most commonly used to clear the snow from double tracks.

The push plow consists of a specially built car having the plow integral with the body of the car. This must be pushed by an external source of power. The pilot plow consists of a sheet metal plow adapted to the front end of any standard type of self-propelled passenger, freight or express car. The rotary plow consists of a self-propelled or an externally driven car with a motor-driven fan mounted at the front end. By means of the centrifugal action of this fan the snow is thrown a considerable distance from the roadbed. This type of plow is best suited for use in high drifts and deep snow.

Other detail apparatus used in fighting ice and snow includes snow scrapers fastened to the cars directly in front of the wheels to clear away the snow and brooms or brushes placed directly in front of wheels to brush away the snow. Then there are also trolley sleet cutters attached to the trolley to clear the sleet from the trolley wire, and third rail sleet cutters attached to the car in front of the third rail shoe to clean the third rail. A chemical solution of calcium chloride may also be squirted on the rail to cut the sleet. Salt is often applied at spring switches to keep these operative, but in cases of a heavy snowfall shovels and brooms must be resorted to in order to keep these switches clear.

The placing of wooden fences along the right-of-way at points subjected to drifts will often prevent the snow from piling up over the roadbed at such points.

ICE CUTTERS ARE ESPECIALLY EFFECTIVE

Since the advent of the low floor car, operating on 24-in. wheels, considerable trouble has been experienced due to snow and ice packed between the rails, thus causing considerable damage to the equipment under the car on account of its small clearance to the roadbed. A very effective device for cutting this ice is illustrated. This consists primarily of a revolving cutter driven at 300 r.p.m. through a double chain drive connected to a 50-hp. motor. The cutter consists of a number of 1 x 5-in. x 5-ft. long standard angles with teeth cut by an oxyacetylene torch. These angles can be removed readily by taking out eight bolts. This cutter is spring supported and can be raised or lowered through a range of 4 in. to adjust itself to the thickness of the ice. The machine is run over the tracks and cuts the ice from between the rails and is followed by a sweeper that clears the chopped ice from the tracks.

Any further detail information regarding this machine can be obtained from J. W. Hulme, superintendent of motive power of the International Railway, Buffalo, N. Y., through whose courtesy this description and these photographs were made available for publication. This apparatus proved so successful last year that two more duplicate machines are being built.

THERE WAS PLENTY OF ACTION FOR ROTARY PLOWS IN NEW ENGLAND LAST WINTER

A similar device has been built by another operating company, but so far its success has not been assured, as the machine has not been given a thorough tryout in service. In general it is similar to the machine as described above except that the cutters used consist of a number of old gears with alternate teeth cut away.

One large operating company whose present equipment consists of forty-two plows and twelve sweepers is planning to add to this equipment for the coming winter. Arrangements have been made to utilize thirty-six double-truck freight cars and orders have been placed for the necessary material to change these over into seventeen sweepers and nineteen snowplows. The work of reconstructing these cars is being done at the shops of the railway company, and the equipment is expected to be ready for service during the coming winter.

An interurban company in the Middle West has taken a number of maintenance-of-way flat cars which will be heavily loaded and the front end fitted with a special pilot plow. These will be utilized as push plows during the winter season with very satisfactory results. This change can readily be made at a comparatively small expenditure of time and money.

An accompanying illustration shows a summer car that has been converted to a snow sweeper for winter service. This scheme also is being used by J. W. Hulme of the International Railway, Buffalo. In an article on this subject by Mr. Hulme in the Jan. 18, 1918, issue of the ELECTRIC RAILWAY JOURNAL he states that the initial cost of installing this sweeper equipment was $900, and conversion at the end of the season can be made for approximately $30.

OTHER CONSIDERATIONS BESIDES REMOVING SNOW FROM TRACKS

In the congested downtown districts of some cities it is necessary to remove the snow entirely from the streets. This work is usually done by shoveling the snow into wagons or cars and hauling it away. In some cities sewers have been utilized to carry away the snow. One novel and efficient scheme used in Boston during the past winter was to use an electrically operated crane, fitted with a grab bucket, to clean the streets of snow. This was described in the ELECTRIC RAILWAY JOURNAL for Feb. 21 and May 1, 1920.

Every railway company operating in the snow belt has experienced during the winter season a considerable demoralization of schedules due to the unusual operating conditions encountered at that time. It has been recommended that in order to meet these unusual conditions schedules be studied and a special snow schedule planned which will give motors sufficient lay-over at terminals during snowstorms to cool off before making the return trip.

A very important consideration which is too often overlooked in connection with the operation of a street railway, especially during the severe winter season, is the necessity of retaining the good will of the traveling public. During these months there are numerous existing conditions beyond the control of the railway company, such as extreme severe weather, poor surface drainage, with resultant flooding of streets and tracks; congested street traffic, stranded automobiles and trucks, abnormal labor conditions and shortage of coal.

These factors tend to disorganize the transportation department and cripple the regular operation of the cars, thus arousing the indignation of the public, which to a large extent is ill-advised or ignorant of the facts. By the expenditure of a little printer's ink in the form of posters, publications or advertisements in the daily newspapers the truth regarding these conditions can be brought forcibly to the attention of the people, and in most cases this will result in securing their co-operation rather than their condemnation.

Securing Observance of Safety Laws*

Effect of Proper Enforcement of Laws and Ordinances Relating to Self-Propelled Vehicles in Reducing Crossing Accidents

BY J. A. VAN OSDOL
General Attorney Union Traction Company of Indiana, Anderson, Ind.

OF THE factors to be dealt with in the problem of crossing accident prevention, the automobile is the conspicuous figure in the foreground. Probably no phase of accident prevention presents greater difficulties than this one because of the diversity of interests encountered and of the fact that practically every law or regulation impresses the individual upon whom it is intended to operate as an encroachment upon his personal liberty. This is especially true when the class to be restrained is composed so largely of persons of immature judgment, or of little or no responsibility. While the grade crossing is not the scene of all of the accidents of this class, it is the place where most of these tragedies are staged, and while they cannot be entirely eliminated so long as we have the crossing at grade, their number can be greatly reduced.

Grade crossings we shall have for years to come, and we must deal with the dangers which these crossings present and endeavor to reduce them to the minimum. Law enforcement is regarded as an efficient means to this end, but law enforcement is more than the mere matter of laws, courts and police officers; those factors are essential parts of our social structure, but they will fail to produce the desired results if left to work out the problem alone. We must bring to their support every agency that is calculated to put behind law enforcement the proper public sentiment.

An investigation made by the Indiana Public Service Commission in 1919 is instructive. The traffic at thirteen public highway crossings over steam roads in as many different parts of Indiana was checked by its inspectors, with a view to observing whether engineers were careless in giving signals, and the manner in which drivers of vehicles approached and passed over these crossings. Here is the result: During the checking 172 trains passed over these crossings, of which 163 gave the proper highway crossing signal. During the same period 1,924 vehicles crossed over these intersections, of which 625 drivers did not look or listen. Of the thirteen crossings checked, five were protected by bells or wigwag signals, which were found in perfect condition. Over those crossings, forty-six vehicles passed over the tracks when the warning signal was operating. The inspectors reported that the drivers of horse-drawn vehicles in most cases looked and listened, but that the automobile drivers as a rule did not look or listen until directly upon the tracks.

From the foregoing it is seen that while approximately 5 per cent of the engineers failed to obey the law at these crossings, 32 per cent of the drivers of vehicles failed to obey. We take it that the result of these tests may be said fairly to indicate the relative failure of duty as between the engineer and the driver of other vehicles. The recklessness of these drivers imperils not merely their own lives, but likewise the lives of the other occupants of the automobile, the train crew and passengers on the train.

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*Abstract of paper read at Ninth Annual Safety Congress, Milwaukee, Wis., Sept. 30, 1920.

If more individual offenders were held responsible in civil damages for the results of their own negligence, the cause of law enforcement would be greatly promoted and the reckless would have more respect for the law. The tendency of juries to set aside the rule of law which forbids one to profit by his own neglect, and the reluctance of some of our courts to interfere with verdicts which are contrary both to the law and the evidence, serves to put a premium on negligence and to bring the law into contempt.

Whether the law to be enforced is some federal or state statute, some municipal ordinance, or the rule prescribed by some commission or by some employer, or merely that particular rule of conduct which has the sanction of experience, public sentiment must back it up if it is to be properly observed or enforced. But these accidents cannot be wholly prevented by any sort of laws or rules which operate only to regulate the conduct of the individual; the personal equation is in this problem and must be taken into account. We cannot absolutely regulate human inclination or human judgment by any set rules, but we can influence them by a course of wise and persistent education. To that end systematic accident prevention should become a part of our national life.

The program adopted to carry on this work of general education must be sufficiently comprehensive to reach all classes and sufficiently practical to arrest the attention of the men of affairs. It must be applied constantly; we must not expect its accomplishment with a single effort. A simple statement shows the problem to be solved: Of the 91,000 lives lost in civil life outside of industry during the nineteen months our country was engaged in the World War, 15,800 of these deaths were caused by automobiles or auto trucks, while during the same period only 47,949 of our soldiers were killed by the enemy.

In 1910 there were 400,000 automobiles and 2,300 deaths; in 1917, 4,941,276 automobiles and 9,000 deaths; in 1919, 7,523,664 automobiles and 10,000 deaths. In 1920, it is estimated we will have 9,500,000 automobiles in use. If the ratio of fatalities for previous years holds good, there will have been 12,600 deaths chargeable to that instrumentality during this year.

The foregoing covers deaths due to automobiles under all circumstances. When, however, we view the automobile and its fatalities as related to railroad grade crossings, the figures published by the Interstate Commerce Commission comparing 1917 and 1918 furnish some comfort. Notwithstanding the fact that while the number of automobiles during that period increased 26 per cent, the total number of automobile accidents at railroad grade crossings increased only 9.5 per cent, the number of persons killed in those accidents but 4.2 per cent and the number injured but 3.6 per cent. These figures indicate that safety work is bearing fruit.

Here are the facts as ascertained recently through inquiry made by the Indiana Public Service Commission of commissions in all of the states, asking for data on crossing accidents, and for experience during the last two years. Of thirty-one states answering, twelve either had no data on the subject or had not yet assembled any. Of the nineteen states which had such data at hand, fourteen reported a decrease and five an increase in crossing accidents. While in some the decrease was but slight, the tendency in that direction in view of the increase in automobiles is interesting and invites investigation.

Texas made an interesting return to the inquiry. Reports from that State show that railroad accidents at highway crossings from Jan. 1 to Dec. 31, 1919, compared with the corresponding period in 1918 decreased 20 per cent, and that deaths resulting from such accidents decreased 53 per cent. For the same period Michigan showed a decrease of 29 per cent in number of crossing accidents, and a decrease of 18 per cent in deaths from that cause. Ohio for the same period reports a decrease of 17 per cent in deaths from such accidents.

Thus far the effort to reduce accidents has been exerted in the urban centers, but before we can bring all the people to the proper appreciation of this work, and before we can expect a healthy public sentiment so general as to insure law enforcement, the rural side of the problem must receive attention. That is a field practically untouched up to this time, and while results there must not be looked for so quickly as in some industries where instruction, inspection and supervision in safety work are matters of daily routine, rural life stands ready to respond with community effort whenever it can be made to see the need of it.

Of all the channels selected through which it is now planned to reach the general public and induce it to take up this cause as a community effort, nothing offers more promise than that of the public schools. No more effective means exists for getting safety incorporated into the community life than to first get it incorporated into every school curriculum.

British Figures Regarding Tramway Transportation Made Public

ACCORDING to data just made public by the Ministry of Transport, the length of the tramway route open for public traffic in the United Kingdom has increased from 269 miles in 1878 to 2,728 miles in 1918-19. Of these 2,728 miles, 1,713 miles were owned and operated by local authorities and 146 miles were owned by local authorities but were operated by companies.

Compared with the last completed year prior to the war (1913-14) the total number of passengers carried has risen from 3,426,473,192 to 4,557,640,078 in 1918-19, an increase of 1,131,166,886, or 33 per cent. In the same period the number of car-miles run has decreased from 354,379,672 to 320,378,376, with the result that the average number of passengers per car-mile is now 14.2, as compared with 9.7 in the year 1913-14. This is an increase of 46 per cent.

The number of journeys per head of the estimated civil population works out at 108, as compared with 74 in the year 1913-14, while the number of passengers carried per mile of route open was 1,668,122, an increase of 400,387, or 31.6 per cent on the pre-war figure.

The number of local authorities who have obtained authority to install trackless trolley undertakings is twenty-six, but of these only seven actually operated lines. Five companies have also obtained powers, of which only one was operated during 1918.

Mechanical Department Stores Accounting*

An Airtight System of Stores Accounting Based on Efficient Administration of Standard Practice with Addition of Special Provision to Guard Against Leaks and Losses—Cost Accounting Is Also Handled by Storekeeper

By THOMAS KENNEDY
Storekeeper Tri-City Railway & Light Company, Davenport, Iowa

STORES accounting is a subject that has been treated on but lightly, when we consider the numerous papers and books written on almost every other phase of accounting, organization and efficiency. It would seem that this topic was unimportant, merely a subject covering a minor routine and to be passed over lightly, and that same could be adjusted or corrected without the outlay of much time or thought.

All those interested in this subject should take the time to investigate the stores accounting systems of some of the large industrial corporations, the steel companies, railroads, etc., and they would soon learn that these companies insist that the routine of receiving and distributing of material and supplies be strictly adhered to and the accounting for them is as necessary to the economical operation of the business concerned as it is to see that the cash account is properly balanced.

There is not one among you who, if the storeroom bins and shelves were filled with dimes, quarters, dollars, etc., would allow the heart-breaking freedom of access and loose methods in the storeroom that you do at the present time. Yet that is what it amounts to. The bolts, batteries, bells, bearings, buckles, bushings that are stacked in your storeroom bins are in reality so many real dimes, quarters, half dollars, dollars, etc. Bins of them! Some full—some half full! The storekeeper and stores accountant must war continually against *carelessness, ignorance* and, without a doubt, against *downright thievery and dishonesty.*

It requires a man of rare intelligence and good judgment successfully to operate a stores system. He must be able to master a mass of detail and be a fighter for the system in the interests of the company. Do not be surprised or discouraged if you find that it takes time to develop the man you want. It has been my experience in the storerooms of the Tri-City Railway that a man is not of much value under two years of service.

There are no accepted standards to follow in installing a stores accounting system, as the details in some cases are always subject to local conditions of storeroom equipment, as well as the nature of the reports required by the accounting department.

I will endeavor to explain to you our method of handling stores material from the time it is requisitioned until final disposition is made of the stored material.

When any material is required for the operating, mechanical or construction departments, a requisition is made out on the purchasing department, either by the storekeeper or the foreman of the above departments. The storekeeper is furnished with a copy of all orders for material purchased by the purchasing agent, regardless of whether the material was requisitioned by the storekeeper or by one of the superintendents or foremen. A yellow copy indicates to the storekeeper that it covers material requisitioned by himself, and a green copy indicates that it was requisitioned by some other party. One copy of the order is also sent to the party making out the requisition. The requisition form has a "Do not fill in or use this space" column for the notations of the purchasing agent to his clerks as to where to get quotations.

The purchase orders, issued from these requisitions, are made out in sets of three, a quadruplicate being used in rare cases, such as when material is requisitioned by others than the storekeeper, the usual use being made of the three. The copies of the purchase orders received by the storekeeper are listed alphabetically in the order record book and a chain index used which enables him to get at any order on any company very readily. They are then filed in a binder, numerically, to await the receipt of the material.

MATERIAL RECEIVED CAREFULLY ACCOUNTED FOR

When material is received by the storekeeper, he makes up a record of same on a loose leaf blank which gives a complete record of the order number on which it was purchased, from whom, the size or catalog number of the article, the article itself, the railroad or express company delivering same, with the railroad freight bill number, if by freight, amount of same and drayage, quantity, gross cost of same after deducting discount, net cost after adding freight, account to which this material is to be charged, folio number of the stock book to which these articles are afterward posted, as well as the voucher number which covers payment for the same. These sheets are made daily and are numbered consecutively from one up. All material received is listed on these sheets the day it comes in and the page number of this book is marked on his copy of the order. The order is then transferred from the open file to the closed file, if all the material is received. If only a part of the order is received the order remains in the open file until final completion. A similar form is used when material is delivered to branch storerooms, the original being sent to the main store room.

On receipt of material it is checked with the copy of the order. This copy also tells which account is to be charged with this material and this information is filled in under the heading "Charged direct to."

Very definite instructions are issued to cover receipt of material, checking, identifying shipments, handling short or damaged shipments, and unpacking.

The next step is the approval of the invoice for same. All invoices, after having been approved for price by the purchasing department, are forwarded to the storekeeper for check and receipt. If the material is to be in one of the stores accounts he so indicates on the invoice, or if it is to be charged to some operating or maintenance account, he so indicates on the invoice. In either case he is guided by the charge appearing on the receiving sheet under the heading "Charged direct to," which he entered there on receiving the material. The invoices are then forwarded to the accounting department.

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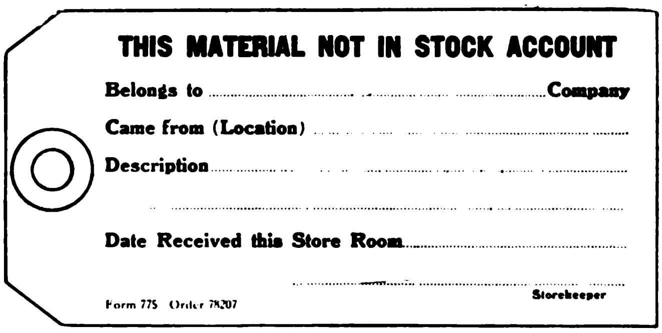
*Abstract of paper presented before Iowa Electric Railway Association, Omaha, Neb., Sept. 16, 1920.

The material in the meantime, having been properly checked for quantity and quality, is stored in its proper bin or racks provided for same, and on which appears a blue label, shown in an accompanying illustration. For wire and other material not placed in bins, tags, as shown, are used.

All material received during the month is posted from the receiving book to the stock ledger sheets. These sheets have spaces on the heading for location of storeroom, bin number, folio, catalog number, name of article and unit of measure. The body is divided into three parts, the left hand side being a record of all receipts of this article and the right hand side for the record of all disbursements, a small space at the extreme right being used for the balance on hand, which is brought down every month for comparison with the general books. There are two checking columns, one on the "receipt" side and one on the "disbursement" side. All entries on either side are rechecked, for they must be correct.



THIS MATERIAL NOT IN STOCK ACCOUNT

Belongs to ....**Company**

Came from (Location) ....

Description ....

....

Date Received this Store Room ....

....
Storekeeper

Form 775 Order 78207

RED "NOT STORES" TAG TO MARK MATERIAL NOT CHARGED TO STORES ACCOUNT

The method used to check what has been vouchered is for the accounting department to send to the storekeeper a transcript of his stores accounts for that month.

It is the policy of our company that all construction work must be duly authorized before same is started. To facilitate matters of this kind we have filled out and properly signed what is known as a proposed expenditure blank. After this has been approved by the general manager and executive board it is proper for work to be done and charges put through against construction accounts bearing this "P. E." number, in addition to its regular number under P. C. C. classification. Charges to operation and maintenance accounts come under the same classification.

When issuing material from the storeroom, a storeroom requisition must be signed for all material issued regardless of who it is that is taking the material from the storeroom. Storekeepers must not sign storeroom requisitions for any one. Requisitions used by branch storerooms in requisitioning material from main storeroom are identical in form but of larger size. These requisitions are forwarded to the storeroom office, where they are posted daily on monthly summary sheets provided for this purpose and headed with spaces for the following information: Month; account number; credit, which applies to the particular stores account which is to receive credit for the material issued; location of storeroom and clerk who enters same in stock record and approval of purchasing agent, who in our company is in direct charge of all storerooms. The folio number of stock sheet is also shown, as is the name of article issued.

The balance of the sheet is divided off for the number of days in the month. In our case, as the storeroom month runs from the 21st to the 20th, these sheets begin with the 21st, as this is on the first day of the storeroom month. To these sheets are posted daily all material issued. As the storeroom requisitions are numbered consecutively as passed, this number is carried also on the entry.

At the close of the month, these charges are totaled and priced, then entered in the stores ledger on the disbursement side of the stock ledger sheet. The totals of the monthly summary sheets constitute the charges to the accounts indicated for the month and the storekeeper's report is made from these sheets.

SOME OF THE AIRTIGHT PROVISIONS

The foregoing is a complete record of our method of distributing and accounting for materials. If that covered an efficient storekeeper's duties, you could in all probability train a man in six or eight months' time. But please let us pause here and consider that mass of detail, mentioned early in this paper, and which will cover: Credit memorandums, gasoline receipts, inventory tickets, inventory sheets, "not stores" tags, material returned reports, oil reports, brake shoe reports, monthly junk statements, wheel reports, shop orders.

> Foremen are required to turn in daily scrap material accumulated in their departments, when it is practical to do so, but it must be turned over to storekeeper at least once a month. Scrap material should not be allowed to accumulate, except, in the storeroom until such time as it is sold by the proper party. In delivering scrap material to the storekeeper please advise the storekeeper the account or authorization number which is to receive credit.

For this purpose and also for crediting back material taken out of service and which can be reclaimed and put back in service, we use the credit form shown herewith, to credit the operating or construction accounts and charge "stores." These are made up in book form with original and duplicate. The original is perforated and is sent to the storekeeper by the foreman making out the credit, the duplicate remaining in the book for his record.

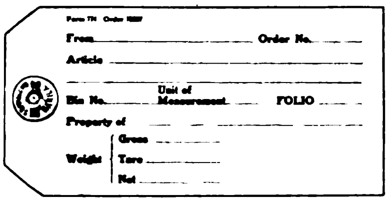
All the gasoline used in the operation of our automobiles and trucks is purchased from the filling stations. Our form for keeping a record of the same is shown in an illustration. These are made up in small bound books of fifty sets each. They are then issued to the operators of the automobiles and trucks by the storekeeper, and a record of the book numbers kept by him. From the pink duplicate copies of these receipts sent to him the storekeeper O. K.'s all invoices for gasoline.

Inventory tickets are made out in advance of an inventory period and the names of articles, bin number and folio number are taken from the stock ledger sheets. They are then distributed to the proper bins and count of same is taken on these tickets. At the close of inventory period, they are gathered up and after making the allowances noted for material received or given out since counted the net figure is transferred to inventory columns of the inventory sheets, which carry the usual information. The sheets can be used for two successive inventory periods.

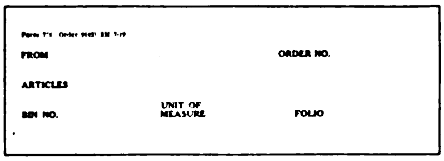
A "not stores" tag, reproduced herewith, is attached to all material which is in the storeroom but for some reason is not charged to any stores account. It may have been charged to some special account on receipt, or it may be discarded material that can be used for some other purpose.

Another form is used when returning materials to dealers or manufacturers for credit, replacement, repairs or otherwise. If the material is to be repaired at the expense of our company, a purchase requisition is also sent to cover same. These reports are made up in books of 50 sets each. The original is green in color and the duplicate is pink and both are perforated. The triplicate is yellow in color and remains in the book. These forms are filled out by the storekeeper and sent to the purchasing agent to start a claim.

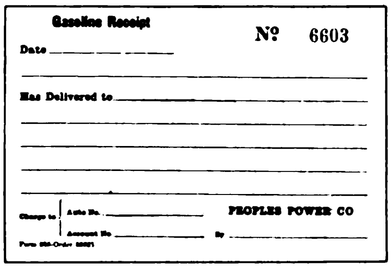
You will note the lower part of the original is perforated, and number of this report is also printed there. This is for the use of the purchasing agent's clerk, who fills in the number of the claim and returns it to the storekeeper, who enters the claim number on his yellow triplicate copy in the book. When material is returned or credit received he notifies the purchasing department to close this claim.



From ____ Order No. ____
Article ____
Bin No. ____ Unit of Measurement ____ FOLIO ____
Property of ____
Weight: Gross ____ Tare ____ Net ____



FROM ORDER NO.
ARTICLES
BIN NO. UNIT OF MEASURE FOLIO



Gasoline Receipt **Nº 6603**

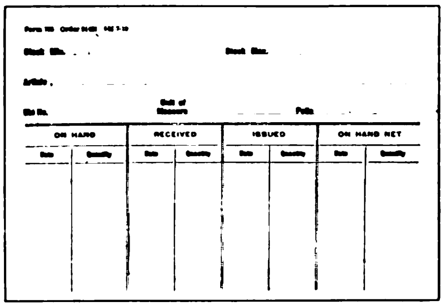
Date ____

Has Delivered to ____

Charge to: Auto No. ____ Account No. ____

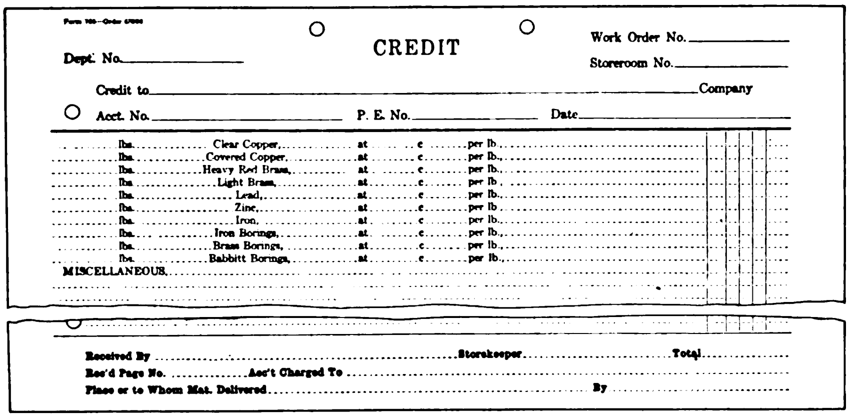
PEOPLES POWER CO

By ____



Stock No. ____ Stock Size ____
Article ____
Bin No. ____ Unit of Measure ____ Folio ____

ON HAND		RECEIVED		ISSUED		ON HAND NET	
Date	Quantity	Date	Quantity	Date	Quantity	Date	Quantity



CREDIT

Dept. No. ____

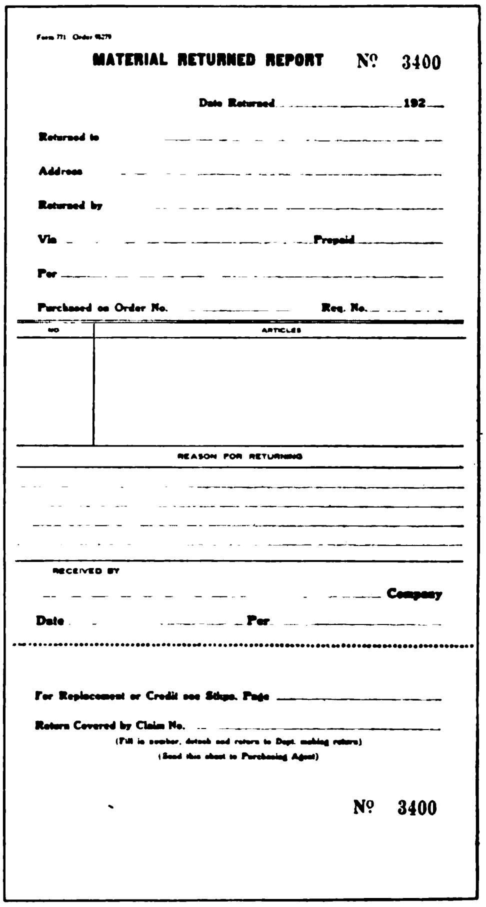
Work Order No. ____
Storeroom No. ____

Credit to ____ Company

Acct. No. ____ P. E. No. ____ Date ____

.... lbs. .... Clear Copper, ... at .... c .... per lb.
.... lbs. .... Covered Copper, ... at .... c .... per lb.,
.... lbs. .... Heavy Red Brass, ... at .... c .... per lb.,
.... lbs. .... Light Brass, ... at .... c .... per lb,
.... lbs. .... Lead, ... at .... c .... per lb.,
.... lbs. .... Zinc, ... at .... c .... per lb
.... lbs. .... Iron, ... at .... c .... per lb.,
.... lbs. .... Iron Borings, ... at .... c .... per lb.,
.... lbs. .... Brass Borings, ... at .... c .... per lb.,
.... lbs. .... Babbitt Borings, ... at .... c .... per lb.,
MISCELLANEOUS ....

Received By .... Storekeeper .... Total ....
Rec'd Page No. .... Acc't Charged To ....
Place or to Whom Mat. Delivered .... By ....



MATERIAL RETURNED REPORT **Nº 3400**

Date Returned ____ 192__

Returned to ____
Address ____
Returned by ____
Via ____ Prepaid ____
Per ____
Purchased on Order No. ____ Req. No. ____

NO	ARTICLES

REASON FOR RETURNING

RECEIVED BY

____ Company

Date ____ Per ____

For Replacement or Credit see Stkpr. Page ____
Return Covered by Claim No. ____
(Fill in number, detach and return to Dept. making return)
(Send this sheet to Purchasing Agent)

Nº 3400

SOME OF THE INTERESTING FORMS USED BY TRI-CITY RAILWAY & LIGHT COMPANY IN STORES ACCOUNTING

Upper left, blue tag for material not in bins. Upper center, blue card for bin label. Center left, gasoline receipt blank. Center, inventory ticket, partly made out before inventory period. Lower left, credit form for periodical return of material taken out of service. Right, material returned report made out by storekeeper.

More and more, good storekeeping really develops into cost accounting, and when you talk of cost—let us stop and consider that word and what it means. In modern industrial organizations there is no item of greater importance than cost. To know your cost is to thoroughly know your business. Cost accounts should be regarded as detailed statements of the condensed statements shown in the general accounts. They should give in detail the causes which produce certain totals, and will enable the manager to reason intelligently regarding these totals. A good cost system is impossible without a good storeroom and good storeroom accounting methods.

We were called on in the storeroom of the Tri-City Railway for the material cost of numerous classes of work done in the shops. It might have been the cost of repairing wrecked car number 452 or of painting auto number 19. To consolidate all the charges at one point, to get the information wanted when it was wanted, we instituted our present shop orders. To begin with, I wish to say that up to this time we had no method of knowing the total cost of any of the jobs and what information had to be got was taken care of by the storekeeper in special reports. While this deals with only the direct materials and direct labor, nothing being done with such items as rent, heat, light, depreciation, insurance, taxes, etc., it answers the purpose for which it was intended, namely: To give the total amounts of the above-mentioned direct labor and material for any particular piece of work. The balance of the miscellaneous charges can be distributed under a percentage plan. Since all the methods of distributing expense establish a relation between expense and some feature of material and labor, a close appreciation of the expense necessary for a given piece of work can usually be made when this basic factor is known.

The three principal uses of a cost system are: First, to show the actual cost of operations. Second, to form the basis of managerial reports. Third, to predict future operations.

No one method of cost finding can be laid down that will answer the requirements of every situation. Our case was studied independently and a system arrived at that would be applicable to the problems we had at the Tri-City Railway. And it has opened our eyes to a good many things. For instance, we found we could not paint automobiles as cheaply as we could have them painted outside. We found men charging time promiscuously, to any maintenance account or wrecked car that was in the shop at that time. We found we could buy steel bushings cheaper than they could be made. We found that it was more expensive to wind and rewind field coils ourselves than it was to have the work done on the outside.

It is necessary to give detailed instructions for the handling of shop orders in order that the benefits of the cost accounting be realized. They are issued in triplicate, by the storekeeper, one copy going to the man in charge of the work, one going to the timekeeper and the third remaining in the book. The order indicates by whom it is issued and at whose request, to whom it is issued and the work to be done. An important item in our organization is to have noted, for intercompany accounting, the company to whom the work shall be charged. There is a shop order card for each shop order, and on this card all charges, for both labor and material, to this shop order are entered, as work progresses, so that at any time the total expenditure on this order is known. When the work is completed, the original order is returned to the storekeeper and the account of that order may be closed.

You will, no doubt, agree with me that you cannot attach too much importance to the value of a competent storekeeper and a good stores accounting system. They are, in my opinion, the life of the organization—to a certainty, they are the clearing house between the accounting, mechanical, operating and construction departments. Some of our members may think the system as outlined above may seem to be overburdened or to contain too much of the renowned "red tape." It seems to the writer that it is a common opinion that the storeroom is of little importance and that it is only necessary to have in charge of a storeroom a good strong man to open boxes and wrestle car wheels, with the usual characteristics of honesty. This, in my opinion, is a very serious mistake, as we have found from experience that brains are more necessary in a storeroom than brawn.

If you are going to have a storeroom and a stores accounting system and maintain them as such, it is necessary to have one in charge who thoroughly understands the accounting system of the company, and who is capable of properly classifying his charges from stores. An inefficient system can cause great inconvenience to the public as well as a great financial loss to the company in not having running repairs on hand so as to keep the cars in service at all times. It is much better to have the stock on hand than to have the cars tied up in the carhouse. And since the coming into existence of state commissions, it is imperative that you be prepared to furnish details of all operation and construction charges which your property shows.

Another feature is your ability at any time to determine the value of your stores, and this is especially true where the accounts of a company are examined by public accountants, who not only have to be shown that you have the material on hand as represented by your stock ledgers, but also that the charges made against construction and operation have been properly classified. It is a rare instance indeed when a good stores system will not pay good dividends and adequate returns.

STOREROOM-RECORD ECONOMIES DISCUSSED

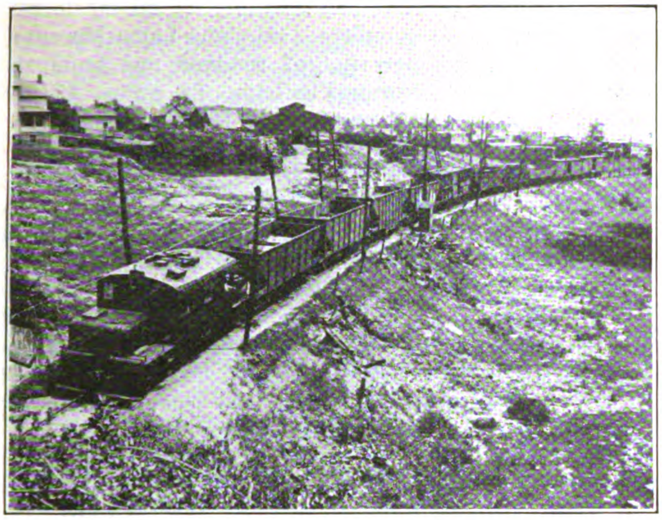
There was a rather long discussion of Mr. Kennedy's paper on storekeeping, the main thought at issue being whether or not an "airtight" storekeeping system was justifiable, comparing the savings to be realized with the cost. Mr. Kennedy summed up the results obtained in Davenport by adhering to the practice of a closed storeroom and a careful accounting of all materials and supplies by saying that prior to the adoption of the present system the stores accounts would come out $3,000 or $4,000 a month over or short, whereas the discrepancy now seldom runs over $200 or $300. He commented that there was absolutely no such thing as an exact balance in storekeeping accounts, for the cost of keeping such a close account of the very small things such as screws, nuts, etc., would be prohibitive.

R. H. Findley, Omaha, asked about the cost of the storeroom department in Davenport, in connection with the railway shops, and was informed by Mr. Kennedy that he employed only three clerks and two men to do the heavy work and issue and receive materials. He contended that this was all work which had to be done, and that if it was not done in the storeroom it would have to be done in the general office, so that the maintenance of a careful storeroom accounting system did not increase the company expense particularly.

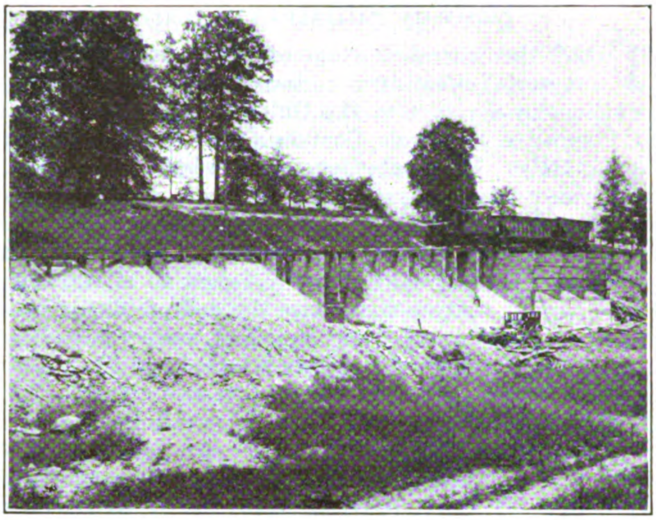
W. G. Lamb, Waterloo, Iowa, explained how a control over the storeroom issues was maintained on his property. After material is issued from the storeroom, all requisitions are forwarded to the general foreman of the shops, who glances over them in odd times and initials them before returning them to the stockroom. If he notes any undue requisition of material, he immediately checks up on it. Then in the problem of keeping down the stock of reclaimed equipment, Mr. Lamb said that whenever he noted an overstock of such used parts as nuts, bolts, trolley bases, trolley poles, etc., he puts a stop order on the issue of any of these things being issued from the new stock until the reclaimed ones are used up. This forces the repairing of the old parts and keeps the stock and investment in new parts down.

Mr. Kennedy was asked about his ability to keep up his maximum and minimum records on supplies. He replied that there had been so much trouble in securing materials in the last few years that the maximum and minimum records had been practically discarded. Presumably these records will go back into use again when the condition of the market becomes more nearly normal. The author was also asked about the manner in which the company disposed of junk. He explained that it was sold to the highest bidder each month. Mr. Keith, Des Moines, said that his company sold junk to one man in order to make identification of brass and copper more readily possible. Des Moines junk dealers are required to report to the city within twenty-four hours any copper and brass junk purchased. If the railway company sells to various junk dealers it is very difficult to check up on these city reports, a copy of which is immediately forwarded to the local railway company.

Mr. Kennedy said that this had formerly been the practice in Davenport, but it had been found that the junk dealer thus favored had not given the company as good prices as it should have received.



ONE OF THE YOUNGSTOWN & SUBURBAN ELECTRIC LOCOMOTIVES SHOVING A TRAIN OF EMPTIES ONTO THE PENNSYLVANIA RAILROAD TRANSFER



A 540-FT. TIPPLE OF 3,000 NET TONS CAPACITY UNDER CONSTRUCTION ON YOUNGSTOWN & SUBURBAN ELECTRIC LINE

Co-operating with Local Industries for Freight Business

Youngstown & Suburban Railway, Built as Passenger Line, Plays Important Part in Providing Freight Service to Industries Along Line

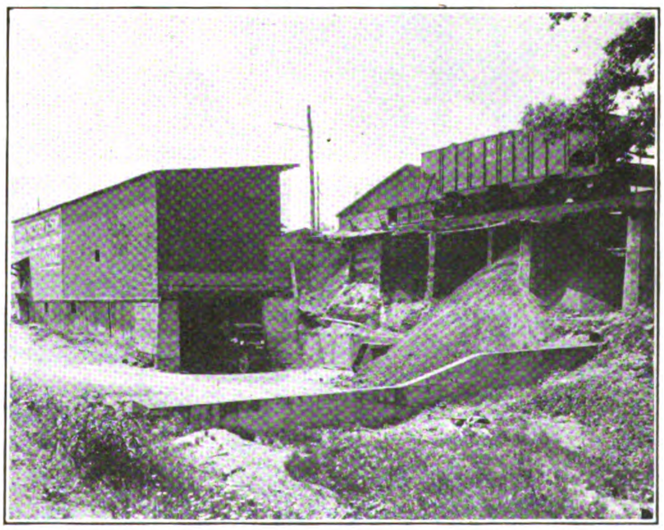
THE accompanying three views give some idea of the manner in which the Youngstown & Suburban Railway, Youngstown, Ohio, is tying up with the local industries along its line to serve their requirements for handling freight. Until a few years ago practically the entire attention of the officials of the road was devoted to passenger traffic, but the development of freight service on this 40-mile line in the last few years has increased to such proportions that today it requires almost the undivided attention of the management.

The line serves a thickly populated territory with numerous industrial plants, oil wells and coal mines along its line. One of the principal sources of revenue to the company has been in the handling of coal and building materials. This has been greatly facilitated and the continued patronage of customers assured through the building, by the customers, of unloading tipples served only by the electric line. Interchange facilities with the steam roads have made this exclusive service possible.

One of the three photographs reproduced herewith shows the tipple constructed on the electric line by a large Youngstown coal dealer. This tipple has a capacity of approximately 800 tons of coal. Slag, sand, cement, etc., are unloaded in the shed shown at the left. Brick, tile and the like are unloaded on the opposite side of the tipple. This company also has several large warehouses which are located on the opposite side of this tipple, one of which can be seen in the picture referred to.

The other tipple pictured herewith is under construction at the present time and is said to be one of the largest of its kind ever built on an electric railroad. This is being built on the electric line by a contracting firm which is spending about $40,000 in the construction of this tipple and in adjacent warehouses, etc. The total trackage of the tipple shown herewith, when completed, will be more than 1,000 ft. and the tipple itself will be 540 ft. long and have a capacity of 3,000 net tons. The grade from the bridge to the near end of the tipple is 3 per cent, with no grade on the part yet to be completed. A solid concrete wall is to be built along one side of the concrete piers supporting the track. Parallel to this wall there will be a macadam driveway, from which wagons and trucks can be loaded from the chutes with which the bins will be equipped. With these facilities a carload of material can be unloaded in five minutes or less and a 5-ton truck can be loaded in two or three minutes. At one side of this tipple there will be constructed sheds and stables with a capacity of thirty-five trucks and wagons and about fifteen head of horses. On the opposite side of the tipple several warehouses are to be built. This same contracting company is to construct adjacent to the tipple a track 1,100 ft. long with a clearance of 900 ft. for use exclusively in unloading brick, tile, sewer pipe, etc.

The Youngstown & Suburban Railway claims to operate entirely on a steam road basis and to be equipped to handle any amount of carload freight. The accompanying photographs illustrate how local industries may be induced to co-operate with electric lines, to the mutual advantage of both parties, in the problem of securing prompt transportation of materials and supplies.



RECEIVING TIPPLE OF YOUNGSTOWN COAL AND BUILDING MATERIALS DEALER SERVED BY ELECTRIC LINE

Railway Situation in Italy

THAT the critical shortage of coal in Italy is having a material effect upon railway development in Italy is shown in a report to the United States Department of Commerce by Trade Commissioner H. C. MacLean, Rome, Italy. He points out that efficient operation of any transportation system is dependent upon the adequacy and condition of its mechanical equipment, a sufficient supply of fuel and a disciplined personnel. Italy is at a disadvantage with respect to all three of these factors. At no time since the end of the war has the supply of coal in Italy exceeded more than about one-half the quantity normally consumed and the Italian railroads have been obliged to eke out their scanty allotment by employing unsatisfactory substitutes.

When the principal railway systems of Italy were taken over by the government on July 1, 1905, and became the Italian State Railways, their length was about 6,961 miles, while the length of the roads which continued under private management was about 1,924 miles, a total of 8,885 miles. At present the State Railways have a mileage in excess of 9,920 and the private roads 3,845, a total of 13,765.

The keen interest of the Italian government in providing for the rehabilitation of the railways and their expansion is clearly demonstrated by the action taken immediately after the signing of the armistice. Provision was made for the transition period between war and peace by the authorizing of an expenditure of 1,800,000,000 lire (lira at par of exchange = $0.193 American money) for railway work and renewal of railway material. Much work is subsidized by the government and subsidies are allowed to private companies of from 5,000 to 15,000 lire per kilometer; 2,000 lire extra where electric operation is specified. Subsidies are also given for the electrification of existing lines.

Mr. MacLean gives the following data regarding lines under construction which will be operated by electric motive power: Domodossola-Confine, 21 miles, 66 per cent of entire line completed; Modena-Lama-Mocogno, 37 miles, about 30 per cent of roadbed and buildings completed; Spoleto-Norcia-Piediripa, 34 miles, 45 per cent of 19 miles and 2 per cent of 15 miles completed; Rome-Ostia, 18 miles, commenced; Pracchia-San Marcello, 10 miles, commenced. In all, private companies have under construction about 366 miles of new railroad, about 245 miles of which will be steam traction and the remaining 121 miles electric traction.

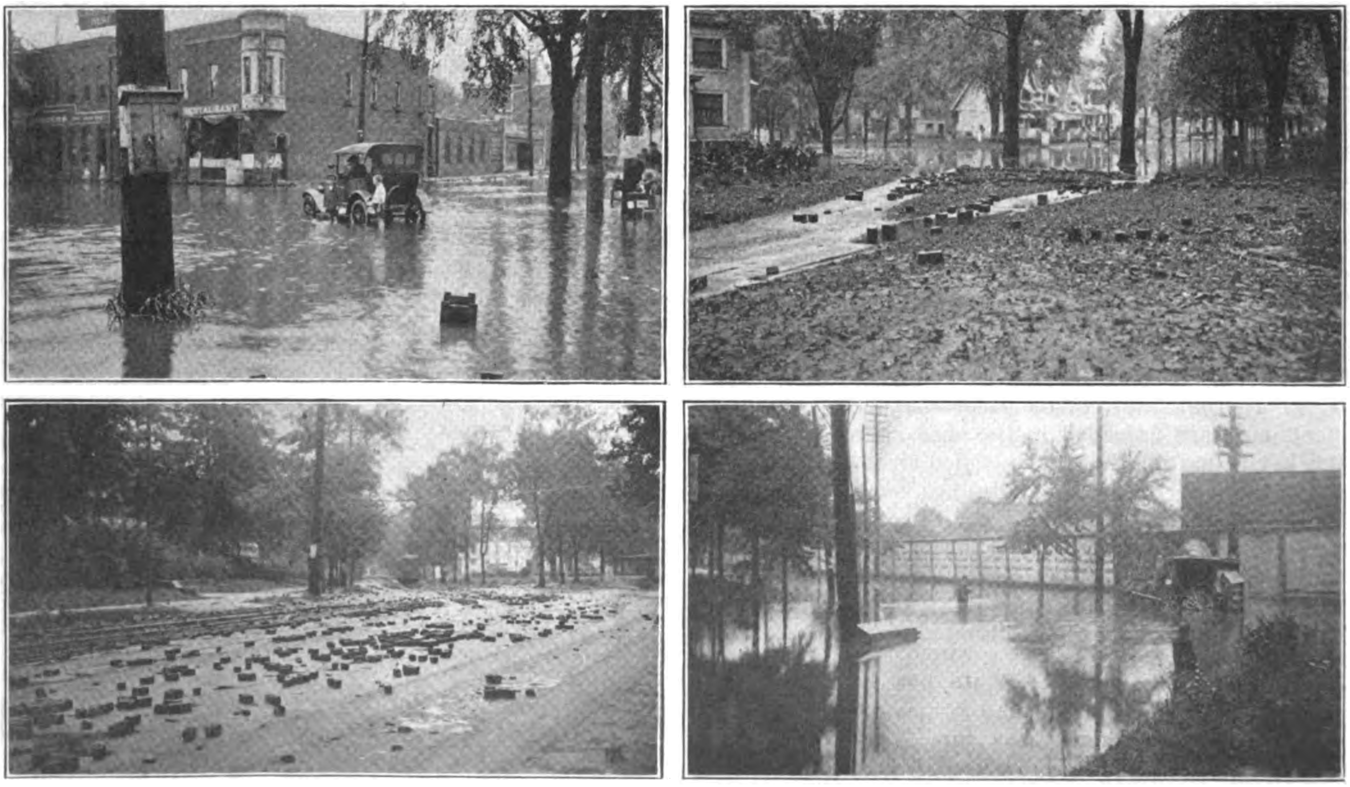
Other work which will probably be started in the near future covers a mileage of 281, of which 135 miles will be steam and 146 miles electric. The electric lines are Genova-Casella, 14 miles; Rome-Civitacastellana, 63 miles; Civitavecchia-Orte, 53 miles; Intra-Premeno, 9 miles; S. Giovanni Bianco-Piazza Brembana, 6 miles.

Cloudburst Expensive for Rail-Light

THE Toledo Railways & Light Company suffered heavily as a result of a cloudburst which occurred in Toledo and vicinity on Aug. 16. The severity of the storm can be inferred from the fact that 4.28 in. of water fell in one hour. The accompanying illustrations are from photographs taken at important points on the electric railway system and indicate the temporary operating difficulties which were encountered. At one low point the water was over 6 ft. deep, and the water fell so rapidly and with such force that at several points the creosoted wood paving blocks were floated out of place.

A total of 150 cars were crippled through the water-soaking of the field coils and armatures, and the shops have been hard put to it to get them dried out and otherwise rehabilitated.

In some ways the railway company was more fortunate than the city in that the rails and ties held the paving securely in the strip paved by the railway.



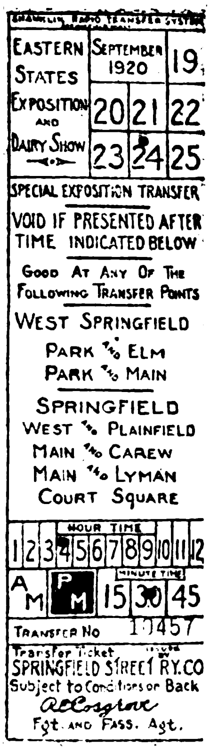
DIFFICULT OPERATING CONDITIONS FOR THE TOLEDO RAILWAYS & LIGHT COMPANY

A "Foot Punched" Transfer

New Machine Issues Transfer Without Demanding Use of Both Hands of Platform Men—Applicable to One-Man Cars

THE Shanklin rapid transfer machine, manufactured by the Shanklin Equipment Company of Springfield, Mass., represents a new and unique development in street railway apparatus. This machine issues a transfer punched and ready for the passenger to use, without the aid of any clockwork mechanism and with the use of only the foot of the conductor, after the "combination" is set.

The machine consists of a box mounted on a pedestal which has a foot lever at its base. The box is readily removed from the pedestal, weighs about 20 lb., is about 18 in. long, 12 in. deep and 6 in. wide. It is made of sheet metal and contains a strip of 500 transfers, a punch plate and an operating mechanism for feeding the transfers, properly punched, to the passengers.


SHANKLIN RAPID TRANSFER SYSTEM

EASTERN STATES EXPOSITION AND DAIRY SHOW

SEPTEMBER 1920

19		
20	21	22
23	24	25

SPECIAL EXPOSITION TRANSFER

VOID IF PRESENTED AFTER TIME INDICATED BELOW

GOOD AT ANY OF THE FOLLOWING TRANSFER POINTS

WEST SPRINGFIELD
PARK AND ELM
PARK AND MAIN

SPRINGFIELD
WEST AND PLAINFIELD
MAIN AND CAREW
MAIN AND LYMAN
COURT SQUARE

HOUR TIME
1 2 3 4 5 6 7 8 9 10 11 12

AM PM MINUTE TIME 15 30 45

TRANSFER No 1[illegible]457

Transfer Ticket issued by
SPRINGFIELD STREET RY. CO
Subject to Conditions on Back
A C Cosgrove
Frt. AND PASS. Agt.

SPECIAL EXPOSITION TRANSFER ISSUED BY MACHINE AT PREPAYMENT LOADING POINT, SPRINGFIELD FAIR GROUNDS

The pedestal is of cast iron with a diameter of about 3 in. and a height of 3 ft. The foot lever at the base operates a rod, which in turn operates the punch plate and also a ratchet-and-pall device, which feeds the transfer to the outlet. A push downward is all that is required after the initial adjustments are made. The rear portion of the box opens for the insertion of the lapped strip of 500 transfers in a receptacle, after which the first transfer is placed in the die plate and the door closed.

On the left-hand side of the box is a movable sector of a circle which has segments marked AM, PM, 15, 30 and 45. This is used to set for AM or PM and any fifteen-minute interval of an hour. On the right-hand side is a similar sector of a circle which has numbers from 1 to 12 on the segments. This is used to adjust for the hour desired. These two sectors thus allow the time to be set to within fifteen minutes of the time desired at the next transfer point.

On the top of the box a set of push buttons is located and also a window which shows the counter dial for recording the number of transfers issued. The push buttons are labelled with the different routes, emergency, inbound and outbound. By means of the push buttons the conductor can punch the transfer for any route desired.

As an example, assume the next transfer point on an inbound car at 4 p.m. is at 4:15 p.m. on the run schedule. The sectors on the sides would be adjusted to 4:15 p.m. and the inbound push button would be pushed down. If the route to which transfers are desired is "Pine Street," then its push button is also operated. The conductor then simply pushes the foot lever as each passenger asks for a transfer and the properly punched transfer issues at the mouth of the box for the passenger to grasp.

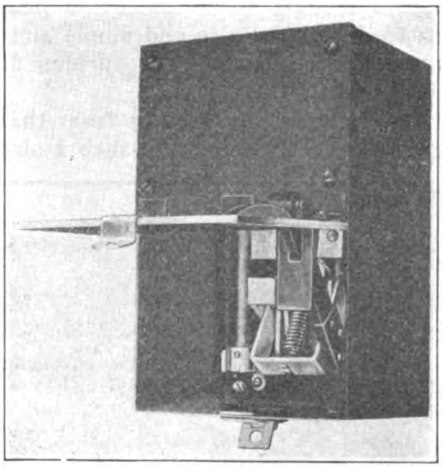
The internal mechanism is simply a pressed steel die plate and a punch plate containing hardened steel punch slugs. The punch plate is on springs and the operation of the foot lever pushes it up against the die plate and causes the punch slugs to penetrate the transfer at the open holes in the die plate.

The die plates are removable, so that any plate corresponding to a given group of routes can be installed in the box. It is claimed that the box is particularly suited to one-man safety car operation, as it allows transfers to be issued quickly and safely while the conductor collects fares or watches the track ahead.

Four of these machines were recently used at the time of the Eastern States Exposition at Springfield for the purpose of issuing transfers at a prepayment loading station at the fair grounds exit. The records for the week show that Monday the four machines issued 4,363, Tuesday 5,011, Wednesday 10,862, Thursday 10,763, and Friday more than 10,000. On Thursday one machine issued 2,136 and the four machines more than 8,000 in about three hours. According to plans these machines were to be tried out in Springfield on safety cars commencing early in October in order to get a service try-out on cars.

Safety Switch for Electric Heaters

A NEW type of heater switch is being placed on the market by the Consolidated Car Heating Company, which is designed to prevent trainmen from accidentally touching any live part while throwing the switch or while changing fuses. It is inclosed in a steel box, having the lower half of the cover hinged to swing upward. The handle works through a slot in this hinged cover in such a manner that it is impossible to open the cover without first throwing the handle to the "off" position. When in this position the fuse and all accessible parts are dead and all live parts are protected by insulating barriers. With the cover open it is also impossible to throw the handle to the "on" position. The switch mechanism works on a toggle principle, which gives a quick brake and quick make, regardless of a slow operation of the handle. Whenever the switch is in the "on" position the slot for the handle is closed by a slide. These various features insure protection for trainmen.


SAFETY HEATER SWITCH WITH COVER RAISED

This switch has been assigned type No. 311, and is rated at 50 amp. and 600 volts. A similar switch, No. 312, is made for 1,200-volt service.

In a recent issue the *Electric Railway and Tramway Journal* directs attention to the fact that owing to the linking up of bus services it is now possible to travel by this means a distance of 100 miles from London.

Automatic Compressor Oiling

Oiling System for "Bungalow" Air Compressors Has Been Improved to Provide Direct, Positive and Automatic Lubrication

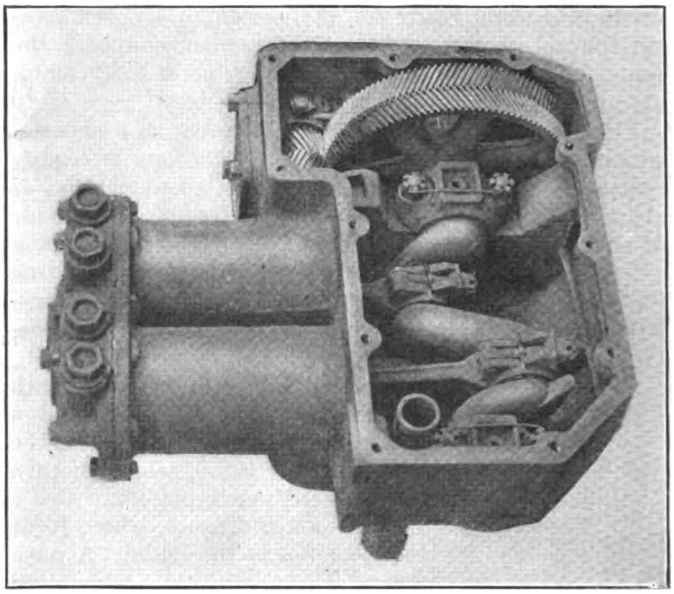
ALTHOUGH the splash system of lubrication employed in the Westinghouse "Bungalow" air compressor has proved eminently satisfactory, improvements have resulted in the standardizing of a direct, positive lubricating system entirely automatic. The only attention required is to replenish the oil supply in the crank case at intervals which can safely equal the longest permissible interval between general inspections of other car equipment. There is but one place in which to pour the oil. This consists of a fitting which also serves as a gage to indicate the oil level. In well-arranged installations it is readily accessible from the side of the car.

The cheeks of the crankshaft are extended to form oil throwers, which splash oil onto the front and back walls of the crank case and onto the cover, as the crankshaft rotates. The oil thrown against the front wall drips down onto the pistons and thoroughly lubricates them. The oil thrown up onto the under side of the cover drains from distributor ribs, provided for this purpose, into both crankshaft bearings and the connecting rod bearing, providing these parts with flood lubrication.

Some of the oil dropping on the connecting rod flows down a groove in the top side of the rod to the wrist pin bearing. The oil splashed against the back wall of the crank case flows down into a trough by which it is conducted over into the gear case. Some of this oil is carried up by the gear and thrown off into a trough, so designed and placed above the gear as to drop a definite and ample amount of oil into the armature bearings. The surplus flows back into the gear case.

The oil passage leading from the crank case to the gear case is restricted to such a size that it will, combined with the pump action of the gear, maintain a certain definite oil level in the gear case. Thus the gear is amply lubricated and sufficient oil carried up to the armature bearings, and at the same time the gear runs in a small quantity of oil, thereby preventing the generation of heat.

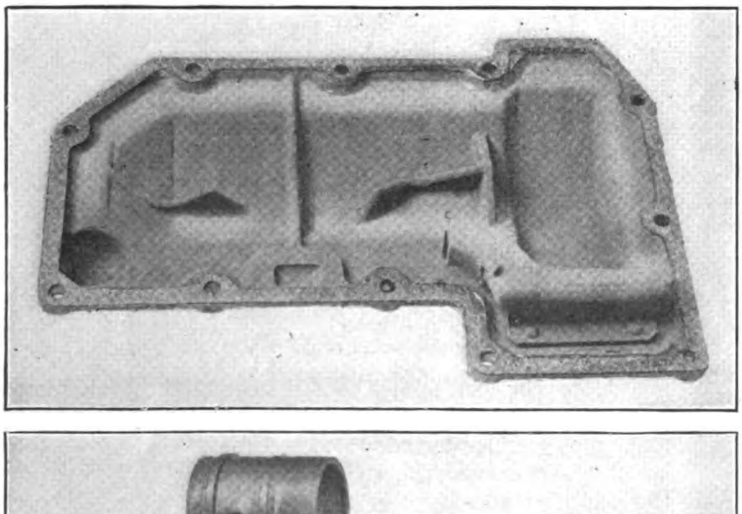
Oil throwers on the armature shaft and a catcher on its housing, with a return passage to the gear case, insure that any excess oil passing by the large armature bearing will go to the gear case instead of over into the motor. This return passage is connected into the bottom of the gear case, which provides a seal and prevents even oil vapor reaching the motor.

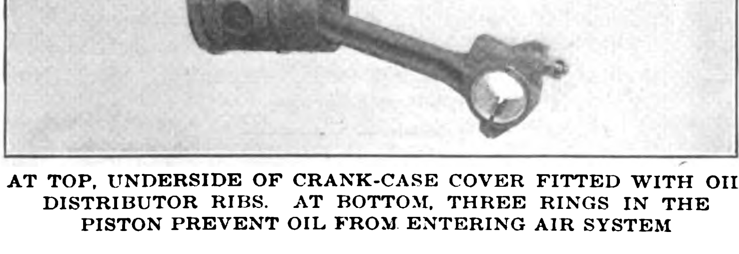


TOP VIEW OF COMPRESSOR, SHOWING DIRECT OIL DISTRIBUTING FEATURES

The concave end of the armature is protected by a metal shield, and any oil which may have seeped past the bearing will be deflected into a passage and conducted away instead of being permitted to reach the motor windings. The various oil conductors and passages are so arranged that the integrity of the lubricating system will not be affected by the tilting of the car on a curve, either to restrict the flow of oil to the parts where it is desired or to permit flooding of oil to parts it should not reach.

The design of the pistons and cylinders is such as to limit the passage of oil from the crank case side to the pressure side of the pistons to an amount such as will insure the proper lubrication. The pistons are neatly fitted to the cylinders, and beveled grooves are provided on the non-pressure edge of the rear packing ring groove and that immediately ahead of the wrist pin. The excess oil is therefore wiped back by the rings, finally reaching the rear groove, from which it drains into the crank case through a hole provided for this purpose. An absolutely tight joint is maintained at the various covers by the use of cork gaskets. To prevent mechanical injury the gaskets are shellacked to the part receiving the least handling when the compressor is dismantled. The ribs and projections add strength to the castings as well as provide a means for directing the oil to a point when needed for lubrication.





AT TOP, UNDERSIDE OF CRANK-CASE COVER FITTED WITH OIL DISTRIBUTOR RIBS. AT BOTTOM, THREE RINGS IN THE PISTON PREVENT OIL FROM ENTERING AIR SYSTEM

The Atlantic City Convention Programs

Convention Motto: Be on Time

All Associations

Monday, Oct. 11

Registration and distribution of badges at booth, right of entrance, Youngs Million Dollar Pier. American Association; all day; all other associations 9.30 a.m. to 12.30 p.m.

American Association

Tuesday, Oct. 12

9:30 a.m. to 12:30 p.m.

All meetings held in Greek Temple

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees.

Reports of committees:

On compensation for carrying United States mail.

On electrolysis.

On national relations.

Address on "Problems of Fuel Supply," by Eugene McAuliffe, president Union Colliery Company, St. Louis, Mo.

Reports of committees:

Aera advisory.

On company membership.

Discussion of report of the Federal Electric Railways Commission, led by Philip H. Gadsden, vice-president United Gas Improvement Company, Philadelphia, Pa.

Wednesday, Oct. 13

9:30 a.m. to 12:30 p.m.

Reports of committees:

On fare systems.

On publicity.

Committee of One Hundred.

Paper on "Possibilities of Transporting Other than Passengers on Interurban Lines—Britton I. Budd, President, Metropolitan West Side Elevated Railway, Chicago, Ill.

Address on "Training of Electric Railway Personnel," by Martin Schreiber, manager Southern Division, Public Service Railway, Camden, N. J.

Address on "Settlement of Labor Disputes in the Interest of the Public and its Influence on Fares," by Hon. Henry J. Allen, Governor of Kansas.

Thursday, Oct. 14

9:30 a.m. to 12:30 p.m.

Report of committee on valuation.

Paper on "Utility Regulation and Rate of Return"—Cecil F. Elmes, manager Sanderson & Porter, Chicago, Ill.

Paper on "The Place of the Motor Bus"—Frank C. Pick, Commercial Manager, London Electric Railway Co., London, England.

Paper on "The Place of the Motor Bus as a Supplement to Electric Railways"—R. Gilman Smith, Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Address on "The Motor Vehicle-Competitor or Ally?"—George M. Graham, Vice-President, Pierce-Arrow Motor Car Co., Buffalo, New York.

Reports of convention committees:

Unfinished, and general business, and election and installation of officers.

Engineering Association

Monday, Oct. 11

2:30 to 5:00 p.m.

Meeting Held in Engineers' Hall

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of committee on resolutions.

Reports of committees:

On way matters.

On buildings and structures.

Tuesday, Oct. 12

2:30 to 4:30 p.m.

Meeting held in Greek Temple

Joint meeting with Transportation & Traffic Association.

Report of the committee on safety car operation.

4:30 to 5:30 p.m.

Meeting held in Engineers' Hall

Paper on "Standardization and Its Effect on stores." (a) "From a Storekeeper's Standpoint," P. F. McCall, storekeeper, South Side Elevated Railway, Chicago, Ill.

Wednesday, Oct. 13

2:30 to 5:00 p.m.

Meeting held in Engineers' Hall

Reports of committees:

On power distribution.

On power generation.

On national electrical safety code.

Address on "Our Proposed National Power Policy," by W. S. Murray, chairman superpower survey, United States Geological Survey.

Thursday, Oct. 14

2:30 to 5:00 p.m.

Meeting held in Engineers' Hall

Reports of committees:

On equipment.

On heavy electric traction.

On standards.

Address on "Electrification of Railroads," by A. H. Armstrong, chairman, electrification committee General Electric Company, Schenectady, N. Y.

General business, and election and installation of officers.

Transportation & Traffic Association

Monday, Oct. 11

Booth, Young's Million Dollar Pier

2:30 p.m. to 3 p.m.

Meeting held in Greek Temple

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees.

3 to 4 p.m.

Joint meeting with Accountants' Association. Report of committee on collection and registration of fares.

4 to 5:30 p.m.

Joint meeting with Claims Association.

Report of committee on code of traffic principles.

Paper on "Automobile Hazards," by C. M. Talbert, commissioner of streets and sewers, St. Louis, Mo.

Tuesday, Oct. 12

2:30 to 5 p.m.

Meeting held in Greek Temple

Joint meeting with Engineering Association.

Report of committee on safety car operation.

Wednesday, Oct. 13

2:30 to 5 p.m.

Meeting held in Greek Temple

Report of committee on economics of schedules.

Thursday, Oct. 14

2. 30 to 5 p.m.

Meeting held in Greek Temple

Reports of committees:

On express and freight traffic facilities and costs.

On merchandising transportation.

General Discussion.

General business, reports of convention committees, and election and installation of officers.

Accountants' Association

Monday, Oct. 11

2:30 to 3 p.m.

Meeting held in Accountants' Hall

Annual address of the president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees.

3 to 4 p.m.

Meeting held in Greek Temple

Joint meeting with Transportation & Traffic Association.

Report of committee on collection and registration of fares.

Tuesday, Oct. 12

2:30 to 5 p.m.

Meeting held in Accountants' Hall

Reports of committees:

On accounting-claims.

On accounting-engineering.

On standard classification of accounts.

Paper on "Accounting for Material Received and Used, Including Inventories," by R. A. Weston, certified public accountant, New Haven, Conn., formerly general storekeeper, New York, New Haven & Hartford Railroad.

Paper on "Cost of Service Accounting" by H. J. Davies, secretary-treasurer Cleveland Railway, Cleveland, Ohio.

Wednesday, Oct. 13

2:30 to 5 p.m.

Meeting held in Accountants' Hall

Paper on "Financial Problems Confronting Public Utilities During the Period of Reconstruction," by Harry E. Mendes, member of Touche-Niven & Company, certified public accountants, Cleveland, Ohio.

Paper on "The Accounting Profession," by George L. Vannais, certified public accountant, Hartford, Conn.

Reports of Convention Committees:

Election and installation of officers.

Claims Association

Monday, Oct. 11

2:30 to 4 p.m.

Meeting held in Claims Hall

Annual address of the acting president.

Annual report of the executive committee.

Annual report of the secretary-treasurer.

Appointment of convention committees.

Reports of committees on membership, subjects, safety, ways and means, interchange of claims statistics and constitution and by-laws.

4 to 5:30 p.m.

Meeting held in Greek Temple

Joint meeting with Transportation and Traffic Association.

Report of committee on code of traffic principles.

Paper on "Automobile Hazards," by C. M. Talbert, commissioner of streets and sewers, St. Louis, Mo.

Tuesday, Oct. 12

2:30 to 5 p.m.

Meeting held in Claims Hall

Paper on "Automobile Hazards," by Ralph Stickle, assistant superintendent accident department Cleveland Railway, Cleveland, Ohio.

Written Discussion by L. H. Roche, General Inspector Associated Bureaus, Pittsburgh Railway, Pittsburgh, Pa.; W G. Fitzpatrick, general claims attorney Detroit United Railway, Detroit, Mich., and J. H. Hanlon, claim agent United Railroads of San Francisco, Cal.

Wednesday, Oct. 13

2:30 to 5 p.m.

Meeting held in Claims Hall

Paper on "Accidents—Cause and Prevention," by F. E. Shumate, general attorney Atlanta Northern Railway, Atlanta, Ga.

Written Discussion on "Cause and Prevention of Accidents," by R. N. Hemming, Superintendent Transportation Indiana Service Corporation, Fort Wayne, Ind.

Written Discussion on "Co-operation of Trainmen," by J. E. Duffy, General Superintendent, New York State Railways, Syracuse, N. Y.

Thursday, Oct. 14

2:30 to 5 p.m.

Free-for-all discussion of the following topics suggested by members to the subjects committee at the mid-winter meeting, (members limited to five-minute discussion): "The increased cost of claims and some of the reasons contributing thereto"; "Prosecution of claims for damage to company's property"; "How best to safeguard releases from attack"; "Value of signed statements"; "The best method of keeping in touch with witnesses"; "Value of secret service"; "Handling blind and fraudulent cases."

General business, reports of convention committee, and election and installation of officers.

Letter to the Editors

The Movie and Other Publicity Means

GEORGIA RAILWAY & POWER COMPANY

ATLANTA, GA., Sept. 30, 1920.

To the Editors:

While I have read with real interest your editorial suggestion in the JOURNAL for Sept. 25, I am convinced that the question is not "Shall we use the movie," but how soon can we use it. The reason for not using it here has been that the only kind of movie proper to use is one thoroughly comprehensive and complete in every detail, which would be more expensive than one company would probably want to undertake.

My idea about the movie for the electric railway industry is that we should have two kinds. One for the system operated by hydro-electric power, and the other for the system using coal to generate electricity. It would be impossible to estimate the extent of the public interest, for instance, in a picture which begins with the showing of a bank of clouds and attractive mountain scenery, followed with a rainfall, streams trickling down the mountain side forming a larger body of water harnessed by a massive dam. Then a power house and transmission lines, followed by all phases of street car operations, with possibly a showing of the old horse car to illustrate the progress that has been made.

The other film could begin with a scene in the coal mine, followed by a representation of transportation with the increased prices of coal and cost of transportation brought out. This picture should be carried clear through to a showing of street car operations, including repair shop as well as the carhouse activities at 4 a.m., when the movie patrons are asleep. Sight should not be lost of the opportunity to show some of the public weaknesses, such as the blocking of car entrances, failure to move forward, talking to the motorman, one man in an auto delaying a car containing sixty-five people, etc. The possibilities of the movie are limitless.

There are of course situations where the influence of the movie would be limited. Members of the State Legislature are to a very large extent named by people living in the rural districts, most of whom would not be reached by the movie. Then there are questions that arise from time to time that are too specific to be answered effectively by motion pictures, and the practice of waiting until an appropriate time to put on a newspaper campaign, covering a limited period, brings us to a realization of the necessity for some means for supplementing the newspaper, preferably the educational movie. The next step seems to be a multigraphed letter, having the appearance of being typewritten, going, say, every Monday morning, in the form of a personal communication, to individuals in the county or state involved—these individuals being carefully selected because of their importance and the value of their judgment in their respective communities. In this way, if the whole story is told in brief letters covering a long period, a knowledge will be planted in the minds of an important number of people in their communities, so that no opposing sentiment could possibly grow.

J. F. TRAZZARE,
Manager Employment and Public Relations.

Association News

ATLANTIC CITY CONVENTION, OCT. 11 TO 15

Association Reports for September

THE following special reports and compilations were prepared by the Bureau of Information and Service during last month:

NEW BULLETIN NO. 125 ON WAGES, containing over one hundred recent changes in wage rates.

SAFETY CAR COMPILATION; a summary of replies to a questionnaire.

NEW BULLETIN ON FARES, giving the latest information on increased rates of fare classified according to the cash fare paid in various cities throughout the country.

NUMBER OF JITNEYS IN VARIOUS CITIES; a summary of replies to a questionnaire, showing the number of jitneys operating in each city and the rules and regulations covering their operation.

TABLES SHOWING EFFECT OF INCREASED FARES ON OPERATING REVENUES FOR A NUMBER OF TYPICAL CITIES; a revision of the information shown in a former compilation entitled "A Series of Charts," bringing the information up to Sept. 1, 1920.

LIST OF CITIES WHERE MOTOR BUS COMPANIES ARE OPERATING, either as auxiliary or as a competitor to electric railways, with data on number of buses, miles of route, fare, etc.

TABLE OF OFFICIAL VALUATIONS per mile of track and per car based on Public Service Commission division.

Joint Meeting in Providence Great Success

New England Street Railway Club and Rhode Island Company Section No. 12, A. E. R. A., Enjoy Two Sessions and Dinner

WITH almost two hundred in attendance, about half of whom came from Connecticut and Massachusetts, the New England Street Railway Club and the Rhode Island Section No. 12, American Electric Railway Association, held a most successful meeting at the Narragansett Hotel in Providence on Thursday, Oct. 7. There was an afternoon session and a dinner and evening session.

I. A. May, president of the New England Street Railway Club, and W. C. Slade, president of Rhode Island Section No. 12, and also vice-president, for Rhode Island, of the New England Street Railway Club, alternated in the chair during the sessions.

The afternoon session at 4 o'clock was devoted to the subject of publicity or public relations, the one address being delivered by Fred A. Cummings, Public Relations Representative of the Eastern Massachusetts Street Railway Company, and the informal discussion which followed this address lasted until dinner was called at 6:15. After the dinner, at which music was furnished by the Rhode Island Section Orchestra, an excellent address was delivered by W. C. Bliss, chairman of the Public Utilities Commission of Rhode Island, followed by the other announced address of the evening by Joseph F. Berry, attorney for the Connecticut Company in Hartford. Mr. May, presiding, called upon the following for extemporaneous remarks: T. F. Green, Z. W. Bliss, and F. H. Swan, the three receivers of the Rhode Island Company; W. R. Dunham, president of the Connecticut Company Section No. 7, and C. C. Pierce of the General Electric Company. These talks were both entertaining and instructive.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Commission Taking Evidence

Canadian Body Begins Inquiry Into Hydro-Electric Radial Railway Matters

The Ontario Hydro-Radial Railway Commission, under the chairmanship of Justice Sutherland, began its sittings at Toronto on Sept. 28 for the purpose of considering evidence in connection with the whole project. The personnel of this commission was given in the ELECTRIC RAILWAY JOURNAL on July 24, at the time the Ontario Government announced its appointment. Since that date T. A. Russell has resigned as a member, and Brigadier General C. H. Mitchell, of the Toronto University staff, was appointed in his place.

ENGINEER GABY FIRST WITNESS

The following are engaged as counsel: I. F. Hellmuth, K.C., representing the Ontario Government; Colonel C. S MacInnes, K.C., for the Hydro-electric Power Commission; Robert MacKay, K.C., for the Ontario municipalities supporting the radial railway undertaking, and R. S. Robertson on behalf of the municipalities which are opposed to proceeding with the project and some other municipalities which are not included in the present scheme.

Chief Engineer F. A. Gaby of the Hydro Commission was the first witness called. He reviewed the progress of the hydro-radials since their inception in the year 1912, when the municipalities comprising the Ontario Municipal Electrical Association discussed electric transportation on the same basis as electric power distribution.

TORONTO & EASTERN FIRST

The first road dealt with was the Toronto & Eastern Railway. The estimates placed before the Government had amounted to $7,206,687 for construction. An increase to $8,368,794 had been made by the Government, which included rolling stock and substations and to provide for increases in labor and materials since the date of the commission's estimate of 1919 was presented, as above for construction only. Of the increase between the two sets of figures above mentioned, Mr. Gaby stated that $400,000 to $500,000 had been occasioned by allowance for 6 miles of track within the city limits. The terminal of the road was planned to be at Bay Street.

Toronto to St. Catharines was next taken up. It was expected to purchase the existing line from Toronto to Port Credit, constructing 12 miles from the latter point to Oakville, and purchase the Hamilton Radial line from Oakville to Hamilton. From Hamilton to St Catharines, the line would run east parallel to the Grand Trunk steam road to Fruitlands, then across the Grand Trunk to Winona, and from there over the Jordan River into the city of St. Catharines. At St. Catharines it was proposed to purchase from the Dominion Government the Niagara, St. Catharines & Toronto lines to Niagara Falls and Port Colborne.

The cost of the Toronto terminals would be divided between the Toronto & Eastern and the Toronto & St. Catharines divisions in proportion of about two-thirds and one-third respectively.

Delaware Tube Plan Revived

Plans for a tube beneath the Delaware River will be discussed at a conference in the office of the Mayor of Philadelphia to be attended by Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, and representatives of the Pennsylvania and Reading Railroads. Announcement to that effect was made at the Mayor's office on Sept. 12.

No talk of a tunnel under the Delaware to Camden has been heard in recent years prior to the above announcement except in the communications to the press from Samuel Rea, president of the Pennsylvania Railroad. Mr. Rea in announcing that the Pennsylvania, which operates the ferries, would not oppose the bridge project, always coupled with that the phrase "or tunnel project."

Another plan under contemplation involves double-decked ferryboats. That plan, it is said, could readily be adopted and would greatly reduce the traffic congestion if approaches for passenger traffic from footways running from the top of the hill at Market Street straight to the elevated railway structure were built in order that foot passengers be not mixed up with vehicular traffic running on the surface.

Electrification Nearing Completion

The Northeast Oklahoma Railroad will soon be in a position to use electricity on its line between Douthat and Miami, Okla. The last of the poles was installed on Sept. 30 and some of the trolley wire has been strung. A substation is being erected at Picher. The company has several cars in the carhouse in Miami which were bought from other cities for use until new ones can be delivered. The cars have been repaired and repainted. Most of the work in preparation for electrification has been completed.

Campaign Under Way

Toledo Prepared for Exciting Times Over Railway Settlement Proposal Soon Before Voters

The first day of registration at Toledo, Ohio, under the new conditions of twice as many precincts and women voting brought forth a showing which indicates that the women will take a large part in the election at which the railway franchise and municipal ownership propositions will come up Nov. 2.

WOMEN DEMAND MILNER RUN

The women have also demanded that W. L. Milner, the author of the service-at-cost measure and head of a commission appointed by Judge Killits of the Federal court, be a candidate for Mayor next fall. This indicates that they want the franchise settlement to be put into effect and desire Mr. Milner to be the man to start it on its way.

The *News-Bee*, which waged a campaign in favor of the twin municipal bonding ordinances when they were defeated by a majority of more than 4,000 votes, has taken up the battle against the Milner plan. That paper claims it is a perpetual franchise and a "blank check" system of financing.

Both of these claims are offset by improvements made upon the Tayler plan and backed by the same paper when there was a fight in conferences between Mr. Milner and Henry L. Doherty & Company interests.

The city begins to acquire an equity in the property of the new Community Traction Company as soon as the sinking fund begins to retire outstanding bonds. And this process will continue, so that the city will have nearly one-third interest at the end of the first ten years. It will gain representation on the board of directors along with the equity in the property. The last fifteen years of the twenty-five-year grant will be devoted to a process of amortization through which complete ownership of the system will be obtained with less than 0.8 cent extra fare during the period, according to Mr. Milner.

COUNCIL CONTROLS SERVICE

Council has the full authority to control service. Additional financing cannot be made without the authority granted by the elected representatives of the citizens of the city. The bond measures, ostensibly for municipal ownership of some kind of a transportation system, are designed to give to Council $7,000,000 to spend.

Very little of a definite nature is available on the municipal ownership plan. No campaign is being made in its behalf yet.

Fresno Strike Over

Boycott and Intimidation Fail as Weapons Against Local Railway in Labor-Ridden Town

The strike of the employees of the Fresno (Cal.) Traction Company has not been declared off, but traffic has again become normal and nearly all of the strikers have found work elsewhere. The earnings of the company for the first three weeks in September show a substantial increase over the earnings for the same period last year.

FIRST TROUBLE IN TWENTY YEARS

In many respects the strike at Fresno was unusual. The company up to the time of the present disturbance had not had a strike in the twenty years of its existence. Its employees until very recently did not belong to any union, though constant pressure was brought upon them by unions to join the Amalgamated Association. Finally in response to the demands of these outside unions a capable organizer was imported from Tacoma. In April and May every effort was made to get the traction company employees to join the union, they being promised the full support of all the unions in Fresno in securing recognition if they would do so. The traction company paid no attention to the movement and something more than a majority of the men were finally induced to join. The men then presented a demand for recognition of the union, stating that they would not discuss any question of hours or labor until the union had been recognized. The request for recognition was refused and a strike resulted, about one-third of the men choosing to stay with the company.

Other men were brought to Fresno immediately and service was resumed. The men who remained loyal to the company were not subjected to the hazard of attempting to operate cars during the first strike period.

The morning paper came out strongly against the traction company, declaring it should recognize the union, and coloring all of its news in favor of the strikers. The evening paper adopted more of a "middle-of the-road" attitude.

VIOLENCE RESORTED TO

The men who operated the cars were from time to time assaulted, but on the whole were able to take care of themselves. Jitney lines were formed all over the city by the unions and the strikers and a systematic course of persuasion and intimidation established to keep people from riding on the cars. Members of various unions declared boycotts on the railway and at permanent corners pickets were placed to persuade people to patronize the jitneys instead of the cars. Members of unions who rode on the cars were fined and in one case pressure was brought to bear which cost the user of the car her job. The boycott was highly effectual, but independent investigation showed that outside of unions there was not much sympathy with the strike.

A committee of sixty businessmen investigated the situation and with the exception of two declared the attitude of the railway to be entirely proper and undertook to bring about a strike settlement. The strikers finally voted to return without recognition of the union, yielding their seniority to the old employees who had stayed on the job, but the next day again quit work.

Thereupon the City Council passed an ordinance which in effect eliminated all of the jitneys where they competed with the street car lines. In the meantime the people had again begun riding on the cars and traffic gradually increased. At the time of the passage of the ordinance traffic was 50 per cent normal. It increased gradually and became normal with the withdrawal of the boycott.

The city of Fresno is the center of a very prosperous farming and fruit growing territory. It is essentially a merchandising city. The increase in wealth in the tributary territory during the last few years has been very large. High prices have been received for raisins, peaches and other fruits, and the income from oil well development has been very large. A large amount of Fresno capital is invested in oil wells, but there are no wells near the city. The city increased in population in the last ten year more than 80 per cent.

Labor in the city is employed largely in the packing and canning of fruits and the incidental manufacturing work that goes with a city of 50,000 people. For many years, notwithstanding it is a city of trade, it has been one of the principal centers of union labor in the West. The principal newspaper is a strong advocate of union labor. The city generally is so prosperous as to yield to union labor demands in various lines of activity without any fight. Even the newspaper reporters and school teachers are organized.

All Cincinnati Roads Under Service at Cost

Service at cost will be the basis of all electric railway fares in the city of Cincinnati, according to an opinion by Judge Stanley W. Matthews of the Hamilton County Court of Common Pleas, who recently dissolved temporary restraining orders preventing the Ohio Traction Company from charging more than 5 cents between the villages of Wyoming and Lockland and the Zoo.

The service-at-cost ordinance, the Judge held, is not only a contract between the city of Cincinnati and the Cincinnati Traction Company, but is also a law governing traction lines within corporation limits. He said the home rule charter of the city gives its ordinances the effect of state laws.

The villages of Wyoming and Lockland brought suit because, it was stated, they had contracts with the Ohio Traction Company whereby they were guaranteed a 5-cent fare between their corporation limits and the Zoo, which lies about a mile within the city limits.

Detroit Injunction Argued

Fight Still in Progress Over Rights of City Under Recent Municipal Ownership Authorization

Arguments of both parties in the injunction suit brought by the residents of Clairmount Avenue to restrain the city of Detroit, Mich., from constructing a municipal railway on Clairmount Avenue have been finished. Corporation Counsel Wilcox has ten days in which to submit his brief in answer to that of Attorney Weadock, who represents the 110 protesting residents. The case is being heard before Judge William B. Brown, Grand Rapids.

FORMER RAILWAY ATTORNEY IS COUNSEL

It is maintained by Mr. Weadock, former attorney for the Detroit United Railway, that the ordinance for the submission of the Municipal Railway proposal to the voters is invalid in that it deprives abutting property owners of their right of ingress and egress to their property, and because it attempts to authorize as a part of the Clairmount line, street railway tracks in streets of Hamtramck before having obtained the consent of that village. Hamtramck is entirely surrounded by the city of Detroit and the proposed route for the Clairmount line traverses the village.

Another point of the ordinance attacked by Mr. Weadock is the fact that the ordinance provides for a line in Linwood Avenue where the street is now occupied by a Detroit United track. The purchasing by the sinking fund commission of bonds for financing the street railway is branded as illegal on the ground that it is a contravention of municipal safeguards and against public safety. It is also argued that the ordinance is inoperative because there are no valid funds for carrying on the work, and that contracts to do the work are invalid because the law was not followed strictly by the Commissioner of Purchases and Supplies in advertising for bids.

CITY CONFIDENT OF ITS RIGHTS

In answering, Corporation Counsel Wilcox defended every step so far taken by Mayor Couzens, the City Council and the Street Railway Commissioners in the carrying out of the proposed municipal railway project, and upheld the contracts let for work upon the lines now under contract. That the city can take over the Linwood Avenue line at any time and oust the Detroit United Railway was argued by the corporation counsel since the company is operating there only on a day-to-day agreement.

Mr. Wilcox argued that, if necessary, the lines in Hamtramck can be altered in route to go around the village. He said that the people voted on a proposition, not an ordinance, and that it was not a piece of legislation.

In reply to the claims made by the Clairmount residents, it was denied by

Mr. Wilcox that the construction of a double-track railway on their street would shut them off from their property, except for the momentary passing of a car. He stated that engineers for the commission had made surveys and recommend Clairmount as a route, but that their recommendation might not be accepted by the commission.

All contracts, according to the corporation counsel, have been properly advertised, and the Sinking Fund Commission in buying the Public Utility Street Railway bonds was merely following the established custom.

In answer to Attorney Weadock's claim that the $15,000,000 was insufficient and that the bond issue was therefore unlawful, Mr. Wilcox asserted that the adoption of the monolithic type of construction of tracks would enable the city to save enough money to acquire not only the 156 miles of track included in the class A and B lines but also the 62 miles of class C lines, and come within the $15,000,000 bond issue voted on April 5. He denied that it was necessary to build the class C lines out of the $15,000,000, and said that the sample ballot issued by the city called attention to a financial plan for the A and B lines. The charter was held to provide for the issue of street railway bonds to add to the system, and these bonds, according to Mr. Wilcox, were not a lien against the city but against the railway itself.

Interpretation of Utility Measure Asked

Assuming that the opinion recently given by J. O. Bailey, Assistant Attorney General, was sound as far as it pertained to the utility act giving to the Oregon Public Service Commission authority to remove any and all unreasonable franchise provisions now imposed on the traction division of the Portland Railway, Light & Power Company, the commission has asked Attorney General Brown to give legal construction and to express the propriety of the commission taking summary action upon a matter as important and as highly involved as the one presented.

The commission also seeks to ascertain from the Attorney General its actual jurisdiction in the matter and a statement as to what procedure should be followed in making a determination of the issues legally effective. Three questions were submitted for legal interpretation, as follows:

1. What part or parts, if any, of the application for removal of franchise provisions now imposed upon the company may properly be considered and to what items, if any, does our jurisdiction extend?
2. What is the extent of our jurisdiction, and the proper and necessary procedure to make a determination legally effective?
3. What consideration must the city of Portland receive if the effect of action taken by us reflects itself seriously upon the finances of the city?

$862,000 for Betterments

Program of Improvement Work Under Way on Pacific Electric Lines in Southern California

Since July the Pacific Electric Lines, Los Angeles, Cal., have undertaken a vast program of improvement work on its system, which had been delayed during the past three years due to the late war affecting the labor and material situation. The greater portion of this improvement work became necessary principally through franchise and legal obligation; the following is the schedule of the improvement jobs now under way:

Pasadena City Lines (East Colorado Street) — 2,154 lin.ft. double-track reconstructed with 7-in. 127-lb. grooved girder rail. Rock ballast and asphalt concrete pavement. Treated ties.

Long Beach City Lines (East Seventh Street)—11,250 lin.ft. of double-track reconstructed with 7-in. 91-lb. Tee rail (50 per cent) ; balance (50 per cent) with $4\frac{13}{16}$-in. 75-lb. C. S. revised rail. Rock ballast and oil macadam pavement. Treated ties.

Long Beach City Lines (Magnolia Avenue)—2,375 lin.ft. single-track reconstructed with $4\frac{13}{16}$-in. 75-lb. C. S. revised rail. Rock ballast and oil macadam pavement.

Santa Ana City (North Main Street)—Converting 6,110 lin.ft. of track to single-track line; 6,110 lin.ft. single-track reconstructed with $4\frac{13}{16}$-in. 75-lb. C. S. revised rail. Rock ballast. Oil macadam pavement.

Santa Ana City (East Fourth Street)—2,300 lin.ft. double-track reconstructed with $4\frac{13}{16}$-in. 75-lb. C. S. revised rail. Rock ballast. Oil macadam pavement.

San Bernardino City Lines (Third Street) —Reconstruct 2,050 lin.ft. single-track with 7-in. 127-lb. grooved girder rail. Rock ballast. Treated ties. Asphalt pavement.

San Bernardino City — New substation building and equipment to improve power conditions.

Redondo Beach—Pacific Electric is wrecking its Wharf No. 2 which extends 600 ft. out into the Pacific Ocean, including trackage thereon. This wharf formerly served as freight steamer unloading dock, but company's business is now handled at its Wharf No. 3 at Redondo Beach.

Long Beach—Relocating and construct as new lines 2,310 lin.ft. of single-track and 8,600 lin.ft. of double-track as a portion of the company's Long Beach-Wilmington line and local city Seaside Park line, due to the county of Los Angeles Board of Flood Control and the United States War Department constructing and defining a permanent channel 720 ft. in width for the Los Angeles River and at the point for its emptying into the Pacific Ocean. The Pacific Electric in the relocation of its line relinquished its right-of-way for a consideration as awarded in interlocutory judgment of the court, outlining Pacific Electric rights and setting forth a fixed sum for settlement for right-of-way taken for the channel. Likewise, the county furnishes right-of-way easement for the company's relocated lines to be constructed on the east and west dykes of the new river channel being dredged by the county. The company is also provided rights for a double-track portion of one of the relocated lines over and across one of the bridges to be constructed by the county to span the new channel.

Glendale—Relocation of portion of the company's Glendale-Burbank Line at Arden Junction account of the County of Los Angeles Board of Flood Control constructing a new channel fof Verdugo Wash.

King Street Station (Santa Ana Line)—Account of flood control work on Santa Ana River channel Pacific Electric is replacing its 1,104-ft. single-track pile trestle bridge spanning the river with 270 ft. of steel span structure; filling in and abandoning the maintenance of 744 ft. of the structure, while remaining portion of pile trestle will be replaced with common standard single-track pile trestle.

El Moro Station — Account of County of Orange Flood Control Board constructing and defining a new channel for the Santa Ana River at the point where it empties into the Pacific Ocean the Pacific Electric, operating its Newport Beach Line adjacent to the ocean, is constructing 525 lin.ft. of single-track steel span bridge to span the point where relocated river channel will be constructed by the county.

Rio Hondo Station (Whittier Lines)—The Pacific Electric is replacing 716 lin.ft. of double-track pile trestle with 122 ft. of double-track steel spans and replacing 594 ft. of present double-track pile trestle in kind. Two 60-ft. steel girder spans will be placed on one track and two 62-ft. steel girder spans on the other track. During years 1915 four 50-ft. spans were placed in this bridge, giving 100 ft. of the structure clear-spanned with steel girders, but County Flood Control work in defining a permanent channel for the Rio Hondo necessitates adding the extra spans at this time.

The approximate cost of the improvements mentioned, exclusive of the flood control program, is $525,000.

The approximate cost of the flood control work, which is only a portion of the work of this nature that the company is facing, is $337,000.

Segregating the improvement work by cities the approximate cost in each city is: Pasadena City Lines, $77,000; Long Beach City Lines, $196,000; Santa Ana City Lines, $142,000; San Bernardino City, $107,000.

Vote Urged to Establish Municipal Line

John J. Hamilton, Commissioner of Public Parks and Buildings, has recommended to the City Commission of Pasadena, Cal., that the proposition of constructing an electric railway between Pasadena and Los Angeles be submitted to the voters at the November election. Assembling all items of cost as reported and adding $75,000 for interest during construction, $100,000 for terminal buildings in Pasadena and Los Angeles and $12,000 estimated as the total cost of option, surveys, engineering and appraisal cost thus far incurred, the probable cost of the entire project ready for operation as set down by Mr. Hamilton will be as follows:

Cost of railway and equipment, exclusive of right of way......	$3,465,867
Right of way, including damages.	827,335
Terminal buildings	100,000
Duplicate electrical equipment, etc.	45,000
Interest during construction.....	75,000
Option, survey, appraisal, etc.....	12,000
Total	$4,525,202

In concluding a report which he made to the City Commission Mr. Hamilton said:

> I recommend that the city press this vital and important enterprise to the earliest possible completion. The present condition of the market for securities would prevent the sale of bonds at the present legal rate of less than 5 per cent, but this is a temporary condition, and the city commission should not permit the project to wait a day beyond the time when the money market rights itself.

At the November election the residents of Pasadena (Cal.) may have an opportunity to vote on the proposed $4,500,000 bond issue for the construction of the municipal railway, for Mr. Hamilton presented a resolution to this effect at the meeting of the City Commission on Sept. 1. Commissioner Reeves said that whereas he was in favor of the people voting on the project, he objected to the wording of the resolution "that public interest and necessity demand" the construction of the railroad. The matter has been delayed so that City Attorney Howard will have time to decide whether the question should be included on a ballot with other questions to be voted on.

Employees Appeal to Board

Electric Railway Not Represented at Hearing to Consider Its Discharging Union Employees

The Washington & Old Dominion Railway was unrepresented before the United States Railway Labor Board on Oct. 5 in Chicago in the case in which employees are endeavoring to secure the reinstatement of men discharged "for the good of the service." This case was reviewed in the ELECTRIC RAILWAY JOURNAL for Oct. 2, p. 684.

DISTRICT COURT DENIED INJUNCTION

The Supreme Court of the District of Columbia had denied the application of the Brotherhood of Railroad Trainmen for an injunction to restrain the officers of the Washington & Old Dominion Railway from discharging any of the plaintiffs because of union affiliation. This court expressed the opinion that this railway came within the classes of railroads included under the transportation act of 1920, and that therefore this labor dispute came within the jurisdiction of the United States Railway Labor Board created by that act.

W. N. Doak, vice-president of the brotherhood, appeared at the Chicago hearing to place the case before the labor board. There was some question as to the jurisdiction of the board and as to failure of the plaintiff properly to bring the case before the board. After a great volume of matter had been put into the record, Chairman R. M. Barton sought by questioning to bring out exactly what it was that Mr. Doak would have the board pass upon. It was finally determined that two questions were involved: First, whether the board had jurisdiction to pass on the disputes as to wages and grievances. Second, whether or not the officials of the Washington & Old Dominion Railway had the right to discharge those men because they belonged to the union. If not, it was the plea that the board should order their reinstatement. There was no indication as to the answer that would be made to either of these questions.

MR. HENRY IN ATTENDANCE

Charles L. Henry, chairman of the committee on national relations of the American Electric Railway Association, informed the board that he had been in close touch with the committeemen of the Senate and House of Representatives while they were formulating the act, and that it had been the understanding that the electric lines, except those operated as an integral part of the steam trunk lines, were to be excluded from the provisions of the act.

The board also questioned Mr. Henry at some length as to what constituted an "interurban" line as spoken of in the act. Mr. Henry advised the board that the Interstate Commerce Commission had sent out an elaborate questionnaire to all the electric lines in an effort to determine more exactly whether any of them should come under the act. The result of this questionnaire has not yet been made public.

Charlton Ogburn Arbitrator

Will Act as Umpire in Settlement of Dispute Between Buffalo Company and Its Employees

Charlton Ogburn, New York, executive secretary of the Federal Electric Railway Commission, has been named by Governor Alfred E. Smith as the third member of the board of arbitration to settle the differences between the International Railway, Buffalo, N. Y., and its union employees, members of the Amalgamated. James H. Vahey, Boston, general counsel of the Amalgamated, represents the employees on the board, and Coleman J. Joyce, Philadelphia, counsel for the Mitten interests, represents the International. The first meeting of the board was held in New York City on Oct. 6.

Mr. Ogburn will be chairman or umpire of the board. At the conference in New York details of organization were agreed upon and the method of taking testimony was decided. All testimony and hearings will be held in Buffalo.

The position of the International Railway in the arbitration proceedings is outlined in a letter written by Herbert G. Tulley, president of the railway, to the company's representative on the board, Mr. Joyce. Mr. Tulley says the company has not receded in its stand that any increase in wages awarded the employees must be contingent upon the granting by the Public Service Commission of a higher rate of fare on the Buffalo city lines.

In his letter of instruction Mr. Tulley tells Mr. Joyce that "any further increase in wages shall be made effective only from the date when such increase in rate of fare is made effective as is necessary to make the payment of such increased wage possible."

Although the company's employees ask that the wage award be made retroactive to May 1, on which date their agreement with the company expired, they have announced their intention of allowing the board of arbitration to decide when the wage award shall be made effective. The company points out that Buffalo cannot fairly be expected to pay increased fare to meet the cost of increased wages at Niagara Falls or Lockport, or on the interurban lines.

In this connection Mr. Tulley says that "consequently, if a general increase in wages be ordered by the arbitration board, there must be a separate action to secure increased revenue to meet the separate requirements of each of the four different locations." The present rate of fare in Buffalo is 7 cents with transfers or four tickets for 25 cents. The men now are receiving a maximum wage of 60 cents an hour. They ask 88 cents an hour maximum.

Strike Settled Temporarily

Men at Kalamazoo on Strike Fifteen Days When People Fail to Approve Fare Increase

Some time ago the City Commission of Kalamazoo, Mich., granted the Michigan Railway a temporary local rate of fare of 10 cents cash and four tokens for 30 cents. At this time the company had an understanding with its trainmen that their wages were to be increased from 40 and 42 cents an hour to 60 and 62 cents, with 10 cents additional for overtime, so long as the company was able to collect the increased fare, granted by the City Commission as a temporary measure, but that the old rate of wages was to go into effect again if the company was forced to go back to the old rate of fare.

The matter of an increased rate of fare was placed before the voters of Kalamazoo on Aug. 31. While 300 more people voted in favor of the measure than against the proposal, it failed to receive the three-fifths vote required to make it effective. Consequently, the commission rescinded its temporary fare order and refused to do anything about fares until it should receive a petition signed by 5,000 qualified voters. The company therefore announced to the men that the wages would be returned to the former scale. The trainmen then struck.

After a suspension of service lasting fifteen days a petition was presented signed by 6,000 voters. The commission then put into effect the rate of fare originally granted the company for the purpose of paying the increased wages, and the men went back to work at the 60-cent and 62-cent scale. The fare question is to be voted on again at the election on Nov. 2.

As a result of the August election the car riders lost their car service, the trainmen lost their pay for fifteen days and the railway lost its revenue for a like period.

Trainmen on "Vacation"

Trainmen of the Northwestern Ohio Traction Company refused to take out their cars because they objected to new schedules placed in effect on Oct. 2. Officially the men went on a "vacation" till the schedules are adjusted.

The company is insured against loss on account of strikes, riot or insurrections.

Company officials declared the cars would not operate till a new force of platform men was secured. If the vacation continues 125 more men may be thrown out of work. F. K. Woodring, general manager, said the company would not take back the men who quit because they did not like the schedules. He said there had been no wage difficulties and no differences about working conditions.

The general offices of the company are at Oak Harbor. Power, light and line workers were not affected, but they may be if the vacation is prolonged.

District Court Intervenes in the New Orleans Tangle

The Mayor and the Commission Council of New Orleans, La., have been estopped from acting upon the award of the Special Masters in Chancery in the street railway controversy. The 8-cent strip car fare is still a remote possibility.

Judge King, of the Civil District Court, has issued an order granting the petition of the Assistant Attorney General of Louisiana, for a writ of injunction, without bond, prohibiting the city of New Orleans from increasing the street railway fares. The case has been alloted to Judge Cage, of Division A, who, on his own motion, has fixed the case for hearing on Oct. 15.

It is alleged in the petition of the Assistant Attorney General that the original franchises sold to the existing street railways were disposed of by the city, acting as agent of the State, under authority conferred on the city by the State for that special purpose. The franchises were all 5-cent franchises, and the Mayor and Commission Council are without authority to increase the fare, it is averred. It is further alleged that the present necessities of the New Orleans Railway & Light Company arise from improvidence.

The members of the local union of the Amalgamated Association of Street & Electric Railway Employees were to take a secret ballot on Wednesday evening, Oct. 6, on the acceptance of the Court's strike award. The principal point on which the men objected to the award, is the elimination by the Masters of their right to arbitrate. Judge Foster, however, has given them the right to appeal to the court.

It is believed that the men will accept the recommendation of the executive board that the union shall approve the court's findings.

The Facts About Nashville

The statement in the ELECTRIC RAILWAY JOURNAL for Sept. 25 regarding the strike on the railway lines of the Nashville Railway & Light Company, Nashville, Tenn., received by telegraph, was inaccurate. The facts are that on Aug. 21, 600 men, members of the Amalgamated, employees of the company, went on strike. Of the 450 platform men employed, 350 were among the strikers.

The company immediately put into operation 60 per cent of its normal service and has built up to normal from that point. The service was never tied up. No strike breakers were employed. The old men have not returned to work and will not return to work.

The union demanded a closed shop and the equivalent of 25 per cent increase in wages. The men struck without notice after a conference with B. C. Edgar, vice-president, and J. P. W. Brown, general superintendent. There was a strong public sentiment with the company from the beginning. The strikers spread rails, but a dynamite plot was thwarted. In connection with the dynamite plot and other disorders thirty-three strikers and many of their sympathizers were arrested. One hundred and twelve loyal employees remained at work. Only fifty-seven strikers known to be loyal men were re-employed during the first few days. No more strikers have been re-employed. The securing of new men made possible the quick return to normal service.

Plea for Power Conservation

Frequent and prolonged stopping of electric cars during rush hours, and costly interruptions of factory operations and all other electric service, will be unavoidable in spite of anything the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., can do, it is announced, unless each light and power customer immediately reduces his use of electricity 20 per cent betwen the hours of 7 a.m. and 7 p.m. The announcement was made through the medium of third-page newspaper advertisements placed in the Milwaukee papers on Sept. 26, 1920. It follows a similar appeal made about a week earlier which resulted in a reduction of about 4 per cent in the total use of electricity during the hours specified.

The company points out that it is up against the same conditions that handicap electric central stations in many other large cities at this time. The war stopped the expansion of the power producing facilities. Since the end of the war the company has been making every effort to get its new power plant ready for service. The first generating unit of 20,000 kw. is expected to be in operation within three months.

The company further points out that the best coal it can get today costs more than three times what good coal used to cost and it produces 15 per cent less energy. The co-operation of all customers in conserving electric current is again asked.

News Notes

Advance for Platform Men.—The platform men of the Chattanooga Railway & Light Company, Chattanooga, Tenn., have been granted an increase of 4 cents an hour effective Sept. 16. The present rate is from 41 to 45 cents and the men had requested an increase of 46 to 55 cents.

Wants Expert Retained.—The City Council of Akron, Ohio, has been petitioned by the Car Riders' League of that city to retain Delos F. Wilcox as expert to make an analysis and pass judgement on the proposed new franchise between the city and the Northern Ohio Traction & Light Company.

Railway Official Indicted.—The indictment of James W. Samuel, former assistant secretary and treasurer of the United Railways, St. Louis, Mo., on a charge of embezzlement of $27,619 of the company's funds, has been announced by the Circuit Attorney's office. Mr. Samuel immediately arranged for bond, which was placed at $5,000. The date for the trial has not yet been set.

Akron Grant Completed.—Work on the proposed franchise for the Akron, Ohio, lines of the Northern Ohio Traction & Light Company has been completed and the measure was to be submitted to the City Council at its meeting on Oct. 5. City Manager Laub has announced that he will demand that the measure be amended to prevent an increase in the fare above 10 cents.

East St. Louis Arbitration Begun.—Testimony offered by W. H. Sawyer, president of the East St. Louis & Suburban Railway, East St. Louis, Ill., in the hearing before the arbitration board on the wage difference between the company and the men, showed that conditions are such that the wage given to the East St. Louis and Belleville employees several weeks ago, of 70 cents an hour, is unjust both to the company and the public. Mr. Sawyer will present further evidence to support this contention at the next hearing of the board. Earlier in the same session Frank P. O'Shea, international vice-president of the Amalgamated, presented the demands of the men. The present wages are 53 cents an hour. The men want 90 cents an hour.

Advance for Pine Bluff Men.—Increases of 7 cents an hour in rates of pay of motormen of the Pine Bluff (Ark.) Company, retroactive to Sept. 21, were announced recently by J. L. Longino, manager of the company. With the increase of 3 cents an hour made on Aug. 1, this raise puts the rate of pay at 10 cents an hour more than prevailed on Aug. 1. This increase in pay of the motormen, together with increases to other employees, will absorb all of the additional revenue derived from the 7-cent fare. Under the new schedule of rates motormen in the employ of the Pine Bluff Company may earn from $125 to $159 a month, in addition to bonuses offered for careful operation of the cars.

One-Man Cars Cause Strike.—Union carmen of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, went on strike on Sept. 24 as a protest against the use of one-man cars by the company. The railway, which raised its fares recently from 6 cents to 8 cents, had announced that it would reduce the fare to 7 cents provided it was allowed to install "safeties." The City Council gave its consent to this proposition, but the carmen objected on the ground that adoption of this plan would lead to the reduction of wages and to the discharge of many men. The strikers returned to work on Sept. 27 with the understanding that wages should not be reduced.

Financial and Corporate

Cleveland Offers Stock

Railway Operating Under Model Service-at-Cost Points Out Strong Investment Features of Issue

Last April Henry J. Davies, treasurer of the Cleveland (Ohio) Railway, notified stockholders that it was necessary to sell the remaining 10,000 shares of stock in the treasury in order to make needed improvements. Additional stock is now being offered to present holders for full cash or on the basis of $10 down per share and $10 per month per share until the subscription has been paid in full.

In the letter which it is sending to its own stockholders, the Cleveland Railway first tells the history of the effort to obtain 7 per cent on its capital and of the refusal of the voters to sanction it Aug. 10. Then it itemizes various reasons why the stock should still be considered, even by investors, a sound and attractive "buy" at par. The letter is concluded in part as follows:

> The 6 per cent rate cannot be reduced, however, at any time in the future without our consent. Our ability to earn this rate is more certain than it has been in past years, for several reasons:
>
> 1. The life of the franchise has been extended. It ran originally to May 1, 1934; it runs now to May 1, 1944.
>
> 2. The maximum rate of fare that could be charged under the original franchise was 4 cents cash fare, seven tickets for 25 cents, 1 cent for transfer—an average of about 4 cents. The maximum now is 6 cents cash fare, nine tickets for 50 cents, 1 cent for transfer—an average of about 6.2 cents.
>
> 3. The maintenance allowance provided for in the franchise has been increased. It was 5 cents per car mile; it is now 10 cents.
>
> 4. Several amendments besides those mentioned have been made in the franchise since its original passage and acceptance. Every one of them has been of advantage to the stockholders of the company.
>
> This railway is the only one in the world that was able to pay 6 per cent upon its capital stock, without skipping a single quarterly payment through the period of the war. It is better able to earn that rate now than it has ever been before. It is as certain of earning it as the savings banks can be certain of earning and paying 4 per cent. Investment in the stock will earn a larger return than has ever been paid for savings banks deposits.

INVESTMENT FEATURES OF STOCK OUTLINED

> The rate of return on our stock has been higher than the rate of return on the stocks of the steam railroad companies since the war started. Higher dividends have been paid upon some industrial stocks, but the dividends on those stocks fluctuate, and, while they may be in excess of 6 per cent at times they may fall below that rate at other times. Our dividend rate has been constant, and will continue to be 6 per cent until the city buys the property, if it ever becomes able to do so; and if it buys it must pay a price equal to $110 per share of stock.
>
> Ohio stockholders are reminded that the stock is not taxable by the State, nor by any county or municipality in the State.
>
> The dividend on the stock is exempt from the United States normal income tax.
>
> The stock is good collateral at any bank in Cleveland.
>
> Cleveland is still growing fast and the number of car riders is increasing faster. There were 3,665,000 more in June, 1920, than in June, 1919, an increase of more than 15 per cent.
>
> To take care of this increasing business we must add to our track and equipment. For these purposes money is needed. It is impossible to borrow enough at the banks. If we should issue bonds the equity of the stockholders would be thereby reduced. Preferred stock is still more objectionable. It was the intention and understanding of the framers of the franchise that money for additions to the property of the company should be raised by the sale of stock.
>
> We solicit your subscription for more stock. You may have as many shares as you wish to buy at par and accrued dividend and you may pay for the shares at your convenience at any time within a year. For convenience in calculating the dividend we prefer that you buy on a dividend day. The dividend days are Oct. 1, Jan. 1, April 1 and July 1. If you prefer, however, you may pay at the rate of $10 per share per month on the first day of each calendar month. Receipts will be issued for payments for fractions of a share, certificates for whole shares when fully paid for.

Mr. Feustel Will Check P. R. T. Appraisal

Robert M. Feustel, president of the Indiana Service Corporation, Fort Wayne, Ind., has been appointed as the representative of the city of Philadelphia in checking the inventory and appraisal of the Philadelphia Rapid Transit System. While the railway is exerting every effort to avert a financial crisis, the valuation proceedings before the State Public Service Commission are continuing.

Commissioners Benn and Clement took steps on Sept. 30 to speed up the proceedings when they ordered the minute examination of the witnesses discontinued and instructed Coleman J. Joyce, counsel for the Philadelphia Rapid Transit Company, to present all of the items that are on the inventory of the company's assets as soon as possible. Commissioner Benn urged haste on Mr. Joyce and suggested that lawyers in the city and company cooperate to the fullest extent.

The Superior Court has postponed to Oct. 18 hearing on arguments on the question as to whether the Public Service Commission has the power to probe the matter of rentals paid to the Union Traction Company and other Philadelphia Rapid Transit Company subsidiaries.

Common Stock Dividend Reduced

The directors of the American Light & Traction Company, New York, N. Y., on Oct. 6 cut the common cash dividend of the company to 1 per cent for the quarter. The stock dividend declared on the common was 1¾ per cent., which was unchanged from the July 6 declaration. The cash declaration on the common as of that date was 1¾ per cent. The regular quarterly dividend of 1½ per cent was declared on the preferred. All of the disbursements are payable Nov. 1 to stockholders of record Oct. 15.

Before the July 6 declarations the company had paid 2½ per cent in cash and 2½ per cent in stock on the common shares.

Fare Increase Fails

Seattle Municipal Railway Still Going Behind Despite Recent Fare Advance

Mayor Hugh M. Caldwell of Seattle, Wash., in a statement about the jitney situation in Seattle, predicts a further increase of fare on the Seattle Municipal Railway unless some other means is found to increase the revenue. In discussing the jitney situation, Councilman Drake declared that elimination of the jitneys would increase the receipts of the railway $80,000 to $100,000 a month. Mayor Caldwell took exception to this. He declared that during the two or three days jitney service was stopped by the city authorities in their attempt to enforce the jitney regulation ordinance the average daily increase in receipts on the railway was only $300.

CITY TREASURER GROWING CAUTIOUS

The Mayor's assertion that the finances of the railway are in bad shape despite the recent increase in fares was confirmed by other city officials. Attention was called to the fact that the department has asked for $513,435 to defray operating expenses during the month of October. This sum is only $17,401.32 less than the receipts during the first month under the increased fare. It included no allowance for interest, redemption or depreciation, covering only expenditures for salaries, wages, materials and supplies.

Reports from the city treasurer's office, councilmen said, showed that the average daily overdraft on the city railway has not been reduced by the increase in fare. The treasurer's records showed an overdraft of $392,736 on this fund for one day. On July 23, the day before the increased fare went into effect, the overdraft was $324,000. Since that time the overdraft fluctuated from $264,000 to $514,000.

NEWSPAPER ISSUES WARNING

The Seattle *Times* in the course of a column editorial said recently:

> The jitneys must go or the bankruptcy of the municipally-owned street car system is certain.
>
> And, if the latter "goes broke," the municipality will be extraordinarily fortunate if it does not follow the same road.
>
> These were the outstanding facts developed at yesterday's conference on the street car situation between Mayor Caldwell and the City Council.
>
> It is not the purpose of the *Times* to adopt a critical attitude toward the municipal authorities.
>
> They are desperately striving to put Seattle's "white elephant" on a paying basis.
>
> In this effort, they need all the encouragement and constructive assistance public-spirited men can offer.
>
> But this newspaper earnestly counsels both the Mayor and the City Council to face this outstanding fact:
>
> They are not SOLVING the problem at all.
>
> They merely are straddling two stools and inevitably are due to fall!
>
> The city cannot support two transportation systems.
>
> The street cars must be removed from the streets in order that the jitneys may prosper; or
>
> The jitneys must be barred in order that the car lines may live.
>
> There is no middle ground.
>
> THE JITNEYS MUST GO!

Rochester Has Deficit

Only Four Days of Operation at Service-at-Cost Are Included in August Figures

The income statement of the New York Railways, Rochester Lines, for August was submitted to Mayor Edgerton and the Common Council on Sept. 28 by Charles R. Barnes, city commissioner of railways. A deficit of $71,525 was created in August, notwithstanding that the month included four days of operation under the 7-cent fare.

The service-at-cost contract became effective on Aug. 1 but the increased fare did not go into force until Aug. 28. Commissioner Barnes points out in his report that had the increased fare been in force throughout the month there would not have been a deficit. His report follows:

The following is the income statement for the month of August:

Revenues from transportation:		
Passenger revenues	$355,958	
Chartered car revenues	1,128	
Miscellaneous	146	
		$357,232
Revenue from other railway operations:		
Station and car privileges	$3,189	
Rent of track and facilities	1,294	
Rent of buildings and other property	686	
		$5,170
Railway operating revenues		$362,402
Railway operating expenses:		
Ways and structures	$31,242	
Equipment	42,712	
Power	23,462	
Conducting transportation	159,436	
General	36,280	
Depreciation	29,166	
		$322,701
Net revenue from railway operations		$39,701
Auxiliary operation revenues	$1,614	
Auxiliary operation expenses	564	
		$1,049
Net revenue		$40,751
Taxes assignable to operation		23,276
Gross income		$17,474
Return to the company		89,000
Deficit for August		$71,525

In commenting on the earnings, Mr. Barnes said:

> The above income statement is compiled from the accompanying detailed report of operation, and with a 5-cent fare shows a deficit for the month of August of $71,525. Included in the revenue for transportation of $357,232 are four days of operation at a 7-cent cash and a 6½-cent ticket fare. Had the fare been 7 cents during the whole of the month the deficit of $71,525 would not appear.
>
> The revenues in the above statement have been carefully checked by the auditing department of this office, payrolls have been examined and verified, vouchers for every item of expense in the detailed report have been audited both as to quantity and price, all of which has been done under my personal supervision. Therefore, I am able to verify these statements setting forth the results of operation for the month of August, 1920, of the New York State Railways within the territory affected by the contract.

Pacific Electric Improves

For the month of June, 1920, the Pacific Electric Railway, Los Angeles, Cal., showed a net loss of $28,269 compared with a loss of $147,671 for the month of June. The total net loss of the first six months of the year was $653,567. The total loss for the five years to last May 31 was $12,189,781. During 1919 the loss was $2,767,726; in 1918 it was $1,778,192, while in the years 1914, 1915, 1916, and 1917 the loss ran from a low $467,220 to $885,116. Wages in 1919 were $6,232,105 for 276 fewer men than were employed in 1915, when the wages were $3,610,942. It is estimated that the loss this year will be $2,364,656. This does not include expense of $400,000 for paving.

EARNINGS OF PACIFIC ELECTRIC RAILWAY FOR JUNE

Passenger revenue	$870,083
Freight and switching revenue	338,175
Other revenue	62,822
Total railway operating revenue	$1,271,080
Way and structures	133,482
Equipment	148,941
Power	147,631
Conducting transportation	364,477
Traffic	21,192
General and miscellaneous	90,627
Transportation for investment—Cr.	1,894
Total railway operating expenses	$904,456
Net operating revenue	366,624
Taxes assignable to railway opertions	49,735
Operating income	$316,889
Non-operating income	9,035
Gross income	$325,924
Deductions from gross income,	
Interest on bonds and other debt	294,918
Rents and miscellaneous income debentures	36,752
Depreciation	22,523
Total deductions from gross income	$354,193
Net income transferred to profit and loss	*$28,269
Net income for six months ended June 20, 1920	*653,567

*Deficit.

Court Agrees to Name Receiver

Judge Clarence Murphy at Hamilton, Ohio, on Sept. 27 rendered a decision in the suit of the Citizens Savings Bank & Trust Company, trustees, Cleveland, against the Cincinnati & Dayton Traction Company and twenty-eight other defendants seeking a foreclosure of mortgage and appointment of a receiver. Argument was heard last July.

The Cincinnati & Dayton Traction Company bought at a foreclosure sale in 1917 all the property of the Cincinnati, Dayton & Toledo Traction Company, subject to underlying mortgages amounting to $2,300,000. Holders of these mortgages brought action for foreclosure.

The court ruled that the property subsequently acquired by the consolidated company was not subject to the mortgages of the constituent companies, except where the original tracks were removed to property subsequently acquired, and that they did not constitute a lien upon equipment acquired later, except when the equipment of the consolidated company became mingled with and part of the equipment of the constituent companies.

It was further held that the mortgagees were entitled to judgment and foreclosure upon the property upon which mortgages are predicated, and, as this property is probably insufficient to pay the mortgage debt, that the mortgagees are entitled to a receiver. The receiver will be named later.

Abandonment Opposed

City of San Francisco Operates Switching Service on Ocean Shore Railroad

A petition asking permission to dissolve the Ocean Shore Railroad, a steam line running from San Francisco down the coast about 38 miles, was filed with the California Railroad Commission on Sept. 13. The grounds given were that the road had incurred a deficit of $364,187 during the past seven years because of the progress of automobile passenger and freight traffic between points which it also served and that no relief from the present unprofitable situation could be found. The road recently ceased operations entirely as mentioned in the ELECTRIC RAILWAY JOURNAL for Sept. 11.

In the hearing before the commission the auditor testified that assessments totaling $1,100,000 had been collected from the stockholders in an effort to put the road on a paying basis, but that the road has not shown a profit since 1912. He also said that rates were now as high as they could be and that an increase would tend to reduce further shipments over the line and would add to the deficit that has been accruing.

Proposals for tearing up the rails and constructing a private roadway for auto trucks have been considered. The Railroad Commission has announced an investigation in the hope of finding some way of enabling the railroad to continue operation. Shippers along the line protest against the discontinuance of service. The hearing was continued to Oct. 1.

Meantime, in order that the industries in San Francisco served by spurs from this line should not suffer, the city has secured a thirty-day permit for operating the electrified division of the system. This includes the main line tract from Army and Kansas Streets to the Twelfth and Market Streets depot and about sixteen sidings at industrial plants. All freight and passenger traffic on this part of the company's system has always been handled electrically, no permit having been issued for operation of the company's steam equipment inside the city limits.

The operation which the city has taken over, under the direction of its municipal railway department, is purely a switching service, requires only one freight crew and now includes the handling not more than 100 cars a month.

Municipal Road Still Going Behind

In connection with the announcement made at Attleboro, Mass., on Sept. 29, that a 10-cent fare will go into effect on the municipally owned Norton, Taunton & Attleboro Railway, the present zones being maintained, it was also announced that there is a deficit of about $25,000 under municipal operation since last fall.

The Kansas City Railways Receivership and Its Causes

Accumulated Deficit Overcomes Bondholders' Faith as Improvement in the Situation Seems at Hand—Company Suffered from Increased Costs and Failure of Authorities to Increase Fares

The trouble with the Kansas City (Mo.) Railways, now in receivership, is obvious enough—its gross revenue has been insufficient to keep pace with growing expenses. This fundamental has been greatly accentuated by the unfortunate labor conditions with which the company has had to contend during the last three years. The first of three strikes within a period of eighteen months occurred in August, 1917, and lasted ten days. The immediate cause of this was the unionization of the property.

OPERATING RATIO KANSAS CITY RAILWAYS

	1917–18 Per Cent	1918–19 Per Cent	1919–20 Per Cent
July	75.08	84 29	104 83
August	97.76	82.70	95.87
September	74 94	85 00	96.21
October	78 55	93.88	92.58
November	84.19	93.26	103 67
December	94.87	130.00	98.03
January	90.91	193.52	94.05
February	94.99	133.59	92 27
March	97.98	101.86	90 50
April	75.60	101.68	90.47
May	87.64	96.10	91 50
June	87.60	119.14	98.90
Average	86.16	106.34	95.74
July, 1920			86.50

The second strike took place in March, 1918, and was one with which the company had nothing whatever to do. It was brought about by local unions in sympathy with a strike of laundry workers which had been going on for some time. On this occasion the trainmen were out for a period of five days and came back without any concessions by the company. The most disastrous strike, and the one to which the present receivership may fairly be attributed, occurred Dec. 11, 1918. It was caused primarily by the union breaking its contract and refusing to abide by the decision of the War Labor Board. The receivership occurred since the abstract of the report of Mr. Woods, published elsewhere in this issue, was prepared.

$180,000 IN JUDGMENTS

The immediate cause of the receivership, if indeed any one thing can be assigned the immediate cause, was the necessity to meet judgments amounting to $180,000 rendered against the company in the last term of court, or put up $360,000 of appeal bonds to cover. The company's earnings have been used to pay off other pressing obligations; and in view of the accumulation of debt as noted in Mr. Woods' report, and the unfortunate financial showing made in June, no one felt optimistic enough to advance the cash necessary to secure these judgment appeals. Immediate action was necessary as the term for filing appeals was drawing to a close and receivership proceedings were accordingly brought.

NO NEW FACTORS

No new factor was interjected at this time that could change what had been known for many months as to expected earnings and expenses. A budget prepared by the operating officials for the Bondholders' Protective Committee, formed a year ago, stated that the net for the calendar year, 1920, would approximate $1,000,000. The experience of the first nine months of this year under this budget has shown that this estimate will be almost exactly realized. A new and detailed budget made in May, taking into account every classification of accounts, showed an expected net for the last six months of the calendar year of $600,000, and this estimate will be realized.

The fiscal year ended June 30, 1920, was completed with a deficit including taxes and all fixed charges of $1,599,812, the net revenue above operating expense and taxes having been $420,021. The July, 1920, statement, in spite of the wage increase effective on June 1, showed a net of $73,516 as against a budget estimate of $64,377.

On the basis of May coal and labor prices, this July showing would have included a net of $130,000, this giving a measure of the increase in gross revenue.

Comparing the results of the fiscal year ended June 30, 1920, with that of 1919, a considerable improvement is noted. For the year ended June 30, 1919, the company failed to earn operating expenses and taxes by $509,339, so that the net of $420,021 for 1920 would indicate an improvement of $929,360. Another evidence of the general improvement in the financial conditions of the company may be observed by comparing the statements for the last three six-month periods. For the six months ended June 30, 1919, the net operating income was recorded as a deficit of $838,249. For the six months ended Dec. 31, 1919, there was a net income of $88,149, while for the six months' period ended June 30, 1920, the net income was $298,901.

The Kansas City Railways has suffered from the same situation that has been the cause of precipitating receiverships generally throughout the country

GROSS OPERATING REVENUE (INCLUDING AUXILIARY REVENUE) WITH TOTAL OF OPERATING EXPENSES, AUXILIARY EXPENSES AND TAXES, KANSAS CITY RAILWAYS
(Last 000 revenue and expense figures omitted)

1917	Revenue	Expenses	Fare, Cents
July	$689	$517	5
August *	522	510	5
September	685	513	5
October	704	552	5
November	679	571	5
December	714	679	5
1918			
January	635	578	5
February	598	568	5
March **	603	592	5
April	722	554	5
May	722	634	5
June	700	553	5
July	775	653	5
			(up to July 16)
August ***	811	671	6
September	767	652	6
October	696	652	6
November	679	632	6
December****	477	624	6

* Strike Aug. 8 to Aug. 17.
** Strike Mar. 29 to Apr. 3.
*** Aug.-Nov.-Revenue affected by influenza epidemic and coal shortage.
**** Strike commencing Dec. 11, 1918, effects of which on revenue were not overcome until May, while expenses were affected for a much longer time.

1919	Revenue	Expenses	Fare, Cents
January	$467	$905	6
February	528	705	6
March	653	665	6
April	677	691	6
May	758	820	6
June	727	868	6
July	716	752	6
August	781	751	6
			(up to Aug. 20)
September	820	790	7
October	969	897	7
November*****	815	845	7
December	877	860	7
			(up to Dec. 14)
1920			
January	873	821	8 cash, 2 tickets 15c. 5 tickets 35c.
February	798	735	
March	888	807	
April	881	797	
May	931	852	
June	977	1,038	
July	943	870	

***** From Nov., 1919—Mar., 1920, both revenue and expenses were affected by influenza epidemic and coal shortage, due to strike.

WAGES OF TRAINMEN OF KANSAS CITY RAILWAYS

	Aug. 1, 1917*	July 16, 1918	March 1, 1919
First six months	25 cents	30 cents	35 cents
Second six months	26 cents	31 cents	36 cents
Second year	27 cents—one uniform	32 cents—one uniform	37 cents
Third year	28 cents—one uniform	33 cents—one uniform	38 cents
Fourth year	29 cents—one uniform	34 cents—one uniform	39 cents
Fifth year	30 cents—one uniform	35 cents—one uniform	40 cents
Sixth year and over	33 cents—two uniforms	38 cents—two uniforms	40 cents
	$60 minimum	$60 minimum	One-man car, 2½ cts. add.
*Agreement Nov. 12, 17.	One-man car, 2 cents add.	One-man car, 2 cents add.	$75 minimum

	July 1, 1919	10-16-1919	6-1-20
First three months	40 cents	45 cents	55 cents
Next nine months	42 cents	47 cents	52 cents
Second year	43 cents	48 cents	53 cents
Third year	44 cents	50 cents	55 cents
Fourth year and over	45 cents	50 cents	55 cents
Mail cars	4 cents add.	4 cents add.	
One-man cars	5 cents add.	5 cents add.	55-60 cents
	$85 min.	$105 min.	$110 min.

TABLE OF FARE INCREASES OF KANSAS CITY RAILWAYS

(*a*) 5 cents to 6 cents in Missouri only, July 16, 1918.
(*b*) 5 cents to 6 cents in Kansas, April 17, 1919.
(*c*) 6 cents to 7 cents in Missouri only, Aug. 20, 1919.
(*d*) 7 cents to 7, 7½ and 8 cents, Missouri only, Dec. 14, 1919.
(*e*) Extra 1 cent collected from interstate Kansas-to-Missouri passengers at state line, Nov. 11, 1919.
(*f*) 6 cents to 7, 7½ and 8 cents in Kansas, Jan. 4, 1920, abolishing (*e*).
Present results: 10 per cent cash fares; 72 per cent 7½ cent ticket fares; 18 per cent 7 cent ticket fares.
Average rate of fare now received, 7.46 cents.

EARNINGS OF KANSAS CITY RAILWAYS FOR SIX-MONTH PERIODS

	6 Months Ended June 30, 1919	6 Months Ended Dec. 31, 1919	6 Months Ended June 30, 1920
Transportation revenue	$3,061,483	$4,130,237	$4,567,434
Other revenue	46,320	55,298	57,187
Miscellaneous income	5,604	9,410	20,256
Total	3,113,408	4,194,947	4,644,878
Operating expenses:			
Way and Structure	$307,546	$390,373	$328,366
Equipment	674,482	581,753	552,920
Power	626,765	696,581	738,871
Transportation	1,702,428	1,682,866	1,708,168
Traffic	729	3,379	12,737
General and miscellaneous	459,289	630,999	769,689
Total operating expense	$3,771,242	$3,985,955	$4,110,853
Taxes	258,842	262,961	320,022
Total operating expenses and taxes	$4,030,084	$4,248,916	$4,430,875
Net operating revenue	* 916,676	* 53,969	214,002
Auxiliary operating revenue	701,857	787,364	705,100
Auxiliary operating expenses	623,430	645,245	620,201
Auxiliary net revenue	$78,426	$142,118	$84,898
Net operating income	* 838,249	88,149	298,901

*Deficit.

in the traction industry; namely, the failure of public authority to grant fare increases promptly enough to care for the rapidly mounting expenses. This is particularly well illustrated by the comparison of the actual deficit for March, April and May, 1920, with what the operating results would have been provided fuel and labor prices had remained the same as in August, 1919.

The deficit is seen to check almost exactly with the increased cost of fuel and labor, this fact incidentally pointing to the accuracy of the rate of fare set up by the commission, had prices in effect when the rate was made remained the same. The increase in the total operating expenses of the company since 1916 has been 110 per cent in spite of the fact that, based on 1916 prices for materials and labor, the present operation of the property is 10.7 per cent more economical than in 1916. On the other hand, the increase in fare since 1916 has been only 48 per cent, the fare in 1916 having been 5 cents and the present average fare per revenue passenger 7.4 cents.

TRAFFIC STUDY HELPFUL

Of the things which are contributing to this more economical operation, perhaps the most important is the work which has been done by John A. Beeler in relieving the congestion in the business center by revising the number and location of car stops, double-berthing of cars, use of loading platforms, etc. This has contributed materially to the increase in the system average schedule speed from 8.9 miles per hour to 9.2 miles per hour. A material rearrangement of schedules by which short looping and turnbacks have been inaugurated has enabled the company to keep the cars working in the thickly built-up districts, thus providing what in reality amounts to about 20 per cent more service than was formerly derived from the same number of cars.

$1,000,000 A YEAR TO THE JITNEYS

Following the strike in August, 1917, the jitneys, which prior to that time had shown a tendency to disappear, were again revived. They were not a serious menace, however, until the first fare increase in July, 1918, gave them encouragement. The strike in December, 1918, brought them out in constantly increasing numbers, and the other fare increases also served to induce more jitneys to go into the business. As a result, the company for the past year and a half has been losing, according to various estimates and checks, from $2,500 to $3,000 a day through this form of competition. Approximately 500 jitneys are today operating in Kansas City and have been for the past year.

They have a well organized association, they are powerful politically, and are well intrenched. Ordinance regulations defining bonds, restrictions, etc., have been loosely applied, so that their effect has been practically nothing and jitney competition, as a result, is unrestrained. The effect of this has been to deprive the company of approximately $1,000,000 in revenue for the past fiscal year ended June 30, 1920, which would have reduced the company's deficit to in the neighborhood of $500,000.

THE OUTLOOK

Despite the discouraging factors which have brought about the present situation, indications point out that with proper support, and with the carrying out of plans already formulated and ready for execution, the property can be put upon a self-sustaining basis in the near future. For example, a rerouting plan now before Council, in addition to providing better service where it is most needed, will make possible a saving in operating expenses of at least $620,000 a year. In addition, there is now pending before the Missouri Public Service Commission an application for a 10-cent cash fare with three tickets for 25 cents. This, it is expected, would substantially improve the gross earnings of the railway company.

This application provides for a sliding

STATEMENT OF INCOME OF KANSAS CITY RAILWAYS FOR ELEVEN MONTHS ENDED JUNE 30, 1920, AND FOR JULY, 1920

	August 1919	September 1919	October 1919	November 1919	December 1919	January 1920	February 1920	March 1920	April 1920	May 1920	June 1920	Year Ended June 30, 1920	July 1920
Transportation revenue	$640,858	$672,400	$825,820	$707,782	$692,812	$732,598	$684,702	$779,512	$766,120	$807,790	$796,709	$8,697,672	$800,204
Other revenue	7,847	9,789	11,596	8,790	9,523	11,027	8 991	9,274	9,143	8,776	9,974	112,486	4,357
Miscellaneous income	1,510	1,204	1,823	1,767	1,776	1,865	1,973	2,052	3,451	*316	11,230	29,666	11,557
Total	650,217	683,394	839,241	718,340	704,112	745,490	695,667	790,839	778,715	816,249	817,914	8,839,825	816,119
Operating expenses:													
Way and structures	66,189	83,882	79,787	60,989	40,878	23,892	29,163	47,573	50,112	83,061	91,762	715,940	72,837
Equipment	86,536	90,958	102,516	93,639	129,651	87,847	84,574	111,105	87,264	87,055	95,073	1,134,674	87,919
Power	107,391	95,242	117,960	132,206	135,107	124,555	110,462	109,535	119,779	117,890	156,648	1,435,452	128,016
Transportation	266,960	268,012	291,238	300,622	289,147	290,350	269,141	284,213	270,081	283,899	310,607	3,391,161	305,012
Traffic	341	556	1,692	455	332	6,786	3,368	593	755	398	835	16,117	473
General and miscellaneous	67,297	98,617	135,311	116,474	117,631	114,021	101,797	116,121	122,460	122,055	167,721	1,375,178	113,426
Total operating expenses	594,717	637,269	728,507	704,388	712,748	647,453	598,508	669,142	650,454	694,361	822,648	8,068,523	707,685
Taxes	43,318	44,719	47,999	46,692	37,052	53,508	51,911	52,940	53,887	53,887	53,887	582,983	53,887
Total operating and taxes	$638,035	$681,988	$776,506	$751,081	$749,800	$700,961	$650,419	$722,083	$704,341	$748,248	$876,536	$8,651,507	$761,572
Net operating revenue	$12,181	$1,406	$62,734	*$32,741	*$45,687	$44,529	$45,248	$68,756	$74,374	$68,001	*$58,622	$188,318	$545,546
Auxiliary operating revenue	132,773	138,083	129,456	96,601	172,580	127,271	101,115	99,573	102,613	114,975	159,552	1,492,465	127,597
Auxiliary operating expense	112,646	108,342	120,041	93,682	109,746	119,917	84,832	85,381	93,031	103,819	133,219	1,265,447	108,627
Auxiliary net revenue	$20,126	$29,741	$9,414	$2,919	$62,834	$7,354	$16,282	$14,191	$9,581	$11,156	$26,332	$227,017	$18,969
Net operating income	$32,308	$31,147	$72,149	$29,822	$17,146	$51,883	$61,530	$82,948	$83,955	$79,157	*$32,289	$415,335	$73,516

*Deficit.

scale of fares adjustable every sixty days to take care of variations in the cost of coal and labor. The case is in and no opposition was introduced, the company's figures having been admitted. While no one can say what the commission will do, it is felt that it must grant some relief.

As a further reason for optimism, negotiations for power are now under way with the Kansas City Power & Light Company, which, when consummated, are expected to result in a substantial saving for the railway in its power costs.

The city is beginning to realize that the competition of jitneys has a direct effect upon the rate of carfare, and that it means that a penalty must be imposed upon the 350,000 daily streetcar riders in order to provide jitney service for from 40,000 to 50,000. This revenue alone would increase the company's gross income approximately $1,000,000 a year.

Furthermore, the riding habit is improving, due, no doubt, in large measuse, to the improved service. Another favorable circumstance is the fact that the peak in material and labor prices has probably been reached and passed.

The winning of the 1918 strike and the reorganization, while exceedingly costly at the time, are not without compensation. With normal service restored and normal operating conditions practically obtaining, department heads throughout the company now feel that the morale of the employees is better than they have ever known it to be before, and that this labor situation is about to bear fruit in great advantage to the company. Inasmuch as a loyal and efficient operating force is the key to success on any property, it seems that the company should now be in a position to give a service that would attract patronage and reduce unit operating costs.

Valuation Report Near Completion

The Public Utilities Commission of Connecticut has practically concluded its task of placing a valuation on all electric railways in the State of Connecticut. Until the report is complete the facts will be withheld from the public. Consideration is being given to the average prices of all equipment for the period of 1910-1914 and the cost of things as of Dec. 31, 1919. Those working on the valuation work are E. Irvine Rudd, chief engineer; Joseph P. Wadhams, assistant engineer, and A. E. Knowlton, electrical engineer of the utilities commission. Mr. Knowlton is assisted by Prof. Charles F. Scott, Prof. L. P. Breckenridge and R. G. Warner of Yale University.

Interest Payment Postponed

The board of directors of the Denver (Col.) Tramway has announced the postponement of the interest payment on the $2,500,000 of outstanding notes of the company. Changes in the personnel of the company are announced elsewhere in this issue.

Financial News Notes

Receivership Hearing Again Postponed.—The hearing set to be held before the Federal court in Kansas City, Mo., on Sept. 30, on the matter of the appointment of a permanent receiver for the Kansas City Railways, and which was postponed until Oct. 14, has again been postponed until Oct. 21. Frank C. Niles was appointed temporary receiver on Sept. 9.

Sale at Foreclosure Ordered.—The property of the Norfolk & Bristol Street Railway, a Massachusetts corporation, will be sold at public auction in Walpole, Mass., on Oct. 23, 1920. It is to be offered for sale at the behest of the American Trust Company, representing holders of bonds of the company secured by a mortgage against the property.

Illinois Road Sold.—The Aurora, Plainfield & Joilet Railroad has been authorized by the Illinois Public Utilities Commission to sell its electric interurban line to the Aurora, Plainfield & Joliet Railroad for $757,000. The transfer was consummated on Oct. 1. The buying company assumes the accounts payable and obligations of the selling company.

Tax Valuation Announced in Wisconsin.—The twenty-three electric railways in Wisconsin were valued by the Wisconsin Tax Commission at $71,000,000 this year as compared with $69,417,000 last year. The companies will pay $1,352,498 in taxes this year as compared with $1,015,640 last year. The Milwaukee Electric Railway & Light Company was assessed by the State Tax Commission at $40,000,000 and will pay $758,137 in taxes for the year.

Missouri Short Line to Readjust Capital.—The Kansas City, Clay County & St. Joseph Railroad, Kansas City, Mo., has applied to the State Public Service Commission for authority to reclassify its capital stock of $10,000,000. Only $4,000,000 of the stock so far has been issued, the petition stated. It is proposed to issue $3,000,000 of cumulative preferred stock bearing 7 per cent dividends, of which $1,450,000 is to be held for future issue, and to issue $7,000,000 of common stock. Of the common stock, $2,450,000 is to be reserved for future issue, according to the petition.

Sale Under Foreclosure Confirmed.—George Whysall, receiver of the Springfield Terminal Railway & Power Company, Springfield, Ohio, has filed in the United States District Court his report of the sale of the properties of the company to W. P. Sturtevant, representing the stockholders, for $300,000, the upset price fixed by the court. The decree of U. S. District Judge John E. Sater, confirming the sale, also has been filed along with an order of court authorizing the receiver at once to pay off $14,000 in receiver's certificates issued to meet operating deficits, together with accrued interest.

Resolutions Adopted Revoking Franchise.—Resolutions have been adopted by the Board of Estimate of New York revoking all the franchises of the Richmond Light & Railroad Company, Staten Island, N. Y. The resolutions were presented by Commissioner Whalen of the Department of Plant and Structures, who pointed out that the ninety-day period had expired which was required since the company and its temporary receiver had been notified by the city of forfeiture of its franchises because of failure to provide adequate service. Under an injunction of the Federal court the city is prevented from interfering with the company's cars, tracks, etc., but it is stated that the city will now ask that the injunction order be rescinded.

Reno Company Abandons Franchise Rights.—A written release abandoning certain franchise rights it has enjoyed in the city of Reno, Nev., has been filed with City Clerk Sullivan by the Reno Traction Company. The release abandons all rights to exercise the privilege of maintaining electric railway service on Second Street from Sierra to the west city limits; Sierra Street from Fourth to Ninth and Ninth from Sierra to Center; from the intersection of Second and Virginia to Moran Street, thence westerly on Moran to Wells Avenue and on Wells Avenue to Cheney Street; on California Avenue to Plumas Street and on Plumas Street to Reno Avenue at the south city limits. These are presumably the rights included in the order of service abandonment approved by the Public Service Commission as noted in the ELECTRIC RAILWAY JOURNAL for Sept. 4, page 477.

Electric Operation Discontinued.—The electrical equipment left on the Rock Island (Ill.) Southern Railroad will be discarded and all trains operated by steam or gasoline, according to an order of the Illinois Public Utilities Commission. An order has also been issued for the company to sell its power house, poles, wires and other equipment. The order comes as the result of the hearing in Rock Island before an examiner of the commission. Receivers of the Rock Island Southern Railroad were cited to show cause why an order of the commission for rehabilitation of its service issued in November, 1919, had not been complied with. The plea was that the company's financial condition would not allow it to rehabilitate its lines properly with electrical equipment. Gasoline cars were suggested as a solution to the difficulty and will probably be tried. For the last year trains have been operated by steam. The receivers have filed a petition with Federal Judge Louis FitzHenry asking permission to borrow funds for the rehabilitation of the road.

Traffic and Transportation

Syracuse Plea Made

New York State Railways Asks Immediate Action Looking Toward Financial Relief

Benjamin E. Tilton, general manager of the Syracuse lines of the New York State Railways, has issued a statement in which he says the Syracuse unit is running behind $1,000 a day and that the company has the right to ask for immediate action in the matter of relief. Mr. Tilton says that the company was called upon to make an expenditure of $20,000 in supplying information in connection with the investigation referred to in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 25, page 610, and that in carrying out agreements with the city the company has sustained a loss of $150,000.

LOCAL SETTLEMENT FAVORED

Last February it was decided by the Mayor of the city to appoint a committee of citizens to look into the whole matter of transportation in the city and report back to the Mayor and Common Council, the idea being at that time that the matter should be settled locally as it was strictly a problem which is the concern of the citizens of Syracuse.

The New York State Railways was asked at that time to place the determination of its case as to revenue and valuation in the hands of this commission, giving the fullest co-operation possible. Since the formation of the commission the company has been called upon to make an expenditure of $20,000 in supplying information in connection with the investigation. It has also been called upon to bear the cost of the increases in wages granted by the arbitration board to the employees amounting to $25,000 a month, or $300,000 a year.

The company has, therefore, in carrying out its agreement with the city to co-operate to the fullest extent with the commission, sustained a loss of $150,000 to date and is at present running behind in bond interest at the rate of $1,000 a day.

ASKS DECISION ON MERITS

Now that the work of the commission has been concluded and the report submitted, the company feels that it is justified in asking that immediate consideration of its case, at least as to fares, should be given on its merits. All facts that enter into the determination of the fixing of a rate according to law have been made available.

The matter may be settled in one of three ways—locally, by appeal to the Public Service Commission or by curtailment of service to a sufficient degree to make up the loss.

As regards the comparisons made in the newspapers between the valuation of the Syracuse lines and the valuation of the Rochester lines, Mr. Tilton points out that they are entirely unfair for the reason, first, that they are incorrect, and, second, that they do not take into account the comparison of the property included in the two amounts, an omission which obviously destroys the value of such a comparison. Mr. Tilton said:

> To make a true comparison, if the matter in Syracuse is to be settled by comparisons with other cities, an adjustment would have to be made as between the very much greater mileage of unpaved tracks in Rochester as against Syracuse. While we are not going to get anywhere by making comparisons with other cities, it is only fair, in view of the fact that these comparisons have been made here, to state that the difference in cost between the paved and unpaved track is $10 a foot, and that there are 67 miles of unpaved track covered under the Rochester contract and only 24 miles covered under the Syracuse contract.
>
> This difference would add approximately $2,000,000 to the Rochester valuation in order to bring it on the same basis as Syracuse, which is approximately $117,000 a mile instead of $100,000 a mile as has been given to the public as the tentative Rochester valuation.
>
> It has also been stated that this company has spent practically nothing for additions or improvements to its Syracuse lines since 1917. The fact is that the following expenditures for improvements and additions have been made:
>
> In 1917, $491,630; in 1918, $283,147; in 1919, $325,838.
>
> During that period 12 miles of track have been replaced.

Fast Train on North Shore Line

"The Badger Limited" is the name of a new fast train which the Chicago, North Shore & Milwaukee Railroad has recently installed for the particular convenience of business men out of Chicago to Kenosha, Racine and Milwaukee in the morning and back in the evening. The road now operates a limited train every hour between Chicago and Milwaukee which makes the run in two hours and thirty-five minutes.

It was found that the largest number of through passengers were carried on the 9 o'clock and 10 o'clock morning trains, northbound, and on the 4 o'clock and 5 o'clock afternoon trains southbound from Milwaukee. The new train, scheduled to make the run with only the two intermediate stops indicated above, in two hours and fifteen minutes, was therefore timed to leave Chicago at 9:30 a.m., arriving at Milwaukee at 11:45; and on the return trip, leaving Milwaukee at 4:30 p.m. and arriving at Chicago at 6:40. The running time indicated is the total time required for the run between the Adams and Wabash Elevated Station in Chicago, over the structure to Wilmette, through the streets of some of the Nort Shore towns and to the new terminal at Sixth and Sycamore Streets, Milwaukee, Wis. This is a distance of 86 miles, giving an average schedule speed for the run of practically 40 miles an hour.

Voters Refuse Relief

Six-Cent Fare Ordinance Again Defeated at Duluth—Union Labor Blamed for Failure

The voters of Duluth, Minn., at a special municipal election on Oct. 4, refused to ratify the referendum ordinance granting to the Duluth Street Railway the right to charge 6 cents instead of 5 cents on its city lines. The ordinance was lost by 637 votes. The vote was 7,561 for and 8,198 against the measure.

A similar 6-cent fare ordinance was defeated at a special city election held on primary election day, June 21. At that time the fare proposition was rejected by 1,297 votes, the poll being 6,076 for and 7,373 against. An amendment to the city charter granting the Council the right to levy on a rate of 16 mills for municipal taxes, instead of 13 mills, which was decisively defeated at the primary election in June, was carried by a substantial majority at the Oct. 4 election. The vote on this measure was 10,655 for; 5,042 against.

Upon learning the result of the election, Herbert Warren, vice-president and general manager of the railway, gave out a statement in which he said:

> The company and its employees are, of course, very much disappointed in what seems to be the defeat of the ordinance by a majority of some 600 votes. Since the ordinance has been defeated I can see no other possible course for the company than to make the best of the situation by giving as much and as good a service as is possible under a 5-cent fare. All extensions and improvements requiring the expenditure of cash will necessarily have to be indefinitely postponed. All I can say at this time is that the company will do its best under the circumstances.

WAGE INCREASE PROMISED

The rejected ordinance provided that the company should share with its employees the additional revenue obtained by the additional cent in fare. The management had promised all employees an increase in wages of 10 per cent, retroactive to July 1, in case that ordinance carried. An intensive campaign to "put across" the ordinance was waged by a publicity committee of the carmen's association.

Union labor is credited with having turned the tide against the proposal. Voters in the industrial end of the city voted almost solidly against the increase. The unfriendly feeling of the labor element is believed to have grown out of a feud of long standing between the unions and the railway, which has not permitted its men to organize and affiliate with the American Federation of Labor.

The company announced on Oct. 7 that it would substantially reduce its service and would lay off several crews. At the same time it stated that it would raise the pay of the men retained 10 per cent. Mr. Warren declared that the number of employees would be reduced to a minimum and that all cars not "paying their way" would be taken off. Owl cars will be discontinued. The new schedule will take effect on Oct. 11.

Five Cents Flat or Failure

Mr. Mitten Appeals to Public for Immediate Relief to Save P. R. T. from Disaster—Riders Forego Free Transfers

In a desperate attempt to preserve the basic nickel fare which, a year ago, he termed his "religion," Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, on Sept. 30 appealed to the people of Philadelphia to pay flat 5-cent fares. Mr. Mitten asked the car riders to forego the privilege of free transfers and 3-cent "exchanges" to save the city's transportation system from disaster. Response to Mr. Mitten's appeal on the part of the public was immediate. On Oct. 1 thousands of passengers refrained from demanding transfers. As a result of the public's stand the company's revenue for the first three days of the month was increased by a total of $20,857. As a final means of financial relief the company on Oct. 4 asked the State Public Service Commission for authority to make the 5-cent flat rate universal beginning Oct. 6, without giving the thirty days' notice ordinarily required. At a hearing before the commission on Wednesday, Mr. Mitten begged for an immediate decision. The commission, however, declined to act until it had obtained the opinion of the City Council.

MR. MITTEN asked the car rider to pay 5 cents every time he changed cars. He pointed out that the present delay in getting the straight 5-cent fare from the City Council and the Public Service Commission would plunge the company deeper into financial difficulties and that unless there was a response to the "voluntary contribution" plea, the accumulating deficit would be so great that in order to avoid bankruptcy, the company might have to ask for an 8- or a 10-cent fare.

No effort was made to force the riders to avoid asking for transfers or exchange tickets. The conductors have been instructed to give the transfer or exchange whenever it is asked for by the passenger, but great faith is being placed by the P. R. T. in the public's response to the no transfer or exchange plea.

"Will You Pay Five Cents for Each Ride Now?" is the text of the signs posted outside and inside the cars.

"FIREBRANDS" PROPOSE STRIKE

The latest move of the company to get more funds was made known by Mr. Mitten at a meeting on Sept. 29 of the Co-operative Welfare Association delegates. The meeting was called hurriedly to end talk of a strike against the public that had been urged by firebrands in the ranks of the men. Carmen, impatient at the delay in getting the higher fare that would enable the company to pay them the back wages to which they are entitled, thought to bring the fare question to a "showdown" by taking a "vacation" as a protest against continued delay in the consideration of the higher-fare proposal now before Council.

Mr. Mitten urged the men not to strike or do anything to inconvenience the riding public. He told them of his plans for the appeal to the public, and put his proposal up to them for approval.

The men, who unanimously approved the plan, were instructed to inform their associates of the manner in which the appeal to the public would be made. Officials pointed to the fact that $3,000 had been collected from persons who refused to accept transfers when the company first put the no-transfer, no-exchange up to Council. They said they expected the plea to result in the daily receipts being greatly increased. In addition, other plans to tide the company over the present difficulty are being considered.

President Mitten, in appealing for the public's aid, said:

> If P. R. T. waits longer for city consent and then files its tariff, to become effective under the law thirty days later, P. R. T.'s accumulating deficit will be too great to be overcome by the proposed 5-cent fare, without exchanges or transfers, so that P. R. T., if further delayed, will then, to avoid bankruptcy, be forced to file its new tariff for a still higher fare.
>
> P. R. T. must commence to collect the added revenue now—immediately—if the collection of an 8-cent or even 10-cent fare is to be avoided during the coming winter; 476,027 persons have signed a petition to the Mayor, City Council and the Public Service Commission, requesting necessary assent to the immediate collection of the proposed 5-cent fare, without transfers or exchanges.
>
> Since the car-riders, including these petitioners, must be later subjected to an 8-cent or 10-cent fare, in the event that P. R. T.'s looked for relief is longer delayed, P. R. T. has decided that, commencing Oct. 1, 1920, the car-rider will be given an opportunity to insure against higher fares by the voluntary payment of the proposed 5-cent fare, without transfers or exchanges. If the response is not such as to provide the increased revenue necessary to insure the continuance of the proposed 5-cent fare, without transfers or exchanges, then P. R. T. must perforce file its tariff at the proper time for a higher rate of fare.
>
> P. R. T. has confidence in the fairness of its car-riders and looks forward to a rapid reduction of requests for transfers and exchanges; thereby increasing the revenue to the volume necessary to carry the company through and justify the management in filing its tariff for not more than a 5-cent fare, without transfers or exchanges, as soon as such action can properly be taken.

The P. R. T. employees have voluntarily agreed to forego the use of their pass-books in order to aid the company. Many of the employees are paying 5 cents fare when they carry a free pass in their pockets.

The "pay-your-fare" movement of the employees started, it was said, at a meeting of sixty-five employees of the utility department. They agreed to pay their fares and not take advantage of the pass-books or the unwritten law of the company that an employee does not have to pay fare for himself or his family.

Word of that action reached the stenographers, telephone operators, clerks and executives employed at the Land Title Building offices of the company and they immediately decided to emulate the example of the mechanics. As a result, the movement has spread through the ranks of the company employees and cases of where conductors off duty insisted on paying fare for themselves and their families were reported.

APPEAL GETS RESULTS

The company announced on Oct. 3 that its appeal to car riders to forego transfers and exchanges had been successful. Furthermore, the company officials said that the entire scheme was working smoothly and that the distribution of the cards setting forth the reasons for the appeal for the voluntary payment of the straight 5-cent fare had been attended by no disorder. The statement further read:

> P. R. T. men and management are greatly encouraged by the added interest of the car riders and are now settling down to a campaign of earnest solicitation and salesmanship, fully determined to save Philadelphia from the higher rates of fare that would unquestionably follow the abandonment of the straight 5-cent plan.

A second statement was issued by the management on Oct. 4, as follows:

> P. R. T.'s increased earnings resulting from the voluntary disuse of transfers and exchanges for Sunday, over the Sunday preceding, were $9,591, as against the increase of Saturday, the second day, of $6,697, and Friday, the first day, of $4,569.
>
> The campaign of the men and management to retain the straight 5-cent fare for Philadelphia is now on in real earnest, and the car rider is responding in a truly wonderful way.
>
> The management is limiting the men to a campaign of solicitation and salesmanship. If, however, there be instances where the men become over-zealous the kindly consideration of the public is bespoken, as much may be forgiven these men when they express their feelings in an effort to collect the money necessary to keep the fare down and the cars running, as compared to the old-time practice of tying up the service to enforce their demands.

It was announced on Oct. 4 that Robert M. Feustel, president of the Indiana Service Corporation, Fort Wayne, Ind., had been appointed as the city's representative in checking up the inventory and valuation of the P. R. T. property. There was also a postponement until Oct. 18 of the argument before the Superior Court on the question as to whether the Public Service Commission has a right to probe into the rentals paid to the underlying companies.

Buses Perplex Seattle Authorities

Mayor Hugh M. Caldwell of Seattle, Wash., in a recent letter to the City Council, expresses the strongest opposition to the proposal to hold a special referendum on general election day, Nov. 2, to obtain the expression of voters on two jitney bills, one barring jitneys from the downtown section of the city and the other an initiative bill drawn by the jitney men, which would allow operation of buses on the jitney men's own terms. The Mayor favors the present jitney ordinance over either of the two proposed measures. Court cases on the present ordinance are pending to determine the right of the Council to refuse to issue licenses under an ordinance which expressly authorizes the operation of jitneys under bona fide regulations to be fixed by the city. Mayor Caldwell has returned to the Council without his signature the bill passed recently by which jitneys would be barred from the downtown district. Mayor Caldwell said:

> This Council bill impresses me as an indirect effort to abolish the jitneys, and until the city of Seattle can offer some form of transportation that will take the place of the jitneys as a means of rapid transportation I am opposed to excluding them from the streets, provided they can be subjected to reasonable regulation.

Mayor Caldwell expresses the opinion that if the Council bill prohibiting the use of any downtown streets by the jitneys is submitted to the voters it will be defeated. Failure of the Mayor to approve the election ordinance would mean that the Council would have to change the measure to a thirty-day bill, and pass it over his veto to put it into effect. It would be impossible to take this action in time to call a special election for November 2. The Mayor has since asked the Council to prepare an alternative measure, similar to the ordinance now in effect, to submit with the initiative bill proposed by jitney interests.

Underground Challenges London County Council

A cable dispatch from London, England, dated Sept. 25, indicated that omnibuses in London would start a counter offensive against the tram cars on Sept 26 by cutting fares during the non-rush hours to practically a flat 5-cent basis. The London Electric Railway, which owns all the subways and omnibuses in London, believes it will be able to show that the municipally-owned tram cars are operated at a loss, which the taxpayers have to make up, and that these tram cars constitute a costly and unfair competition to private enterprises. For six months the tram cars have been selling "tuppeny" (4 cents) tickets, which are good on any line between 10 o'clock in the morning and 4 o'clock in the afternoon. The management of the London Electric Railway believes it will be able to show that the tram cars cannot earn more money on the basis on which they are operated now and will challenge the London County Council, owning the tramways, to publish a statement of earnings and operating cost, hoping thus to be able ultimately to replace the tramcars and substitute omnibuses on many routes after showing the taxpayers what the tramways actually cost them.

Seven Cents in Trinidad

The Colorado Public Utilities Commission has authorized the Trinidad Electric Transmission, Railway & Gas Company, Trinidad, to raise its fare from 6 cents to 7 cents. The company some time ago applied to the commission for authority to discontinue service on its line in Pine Street and to remove the tracks. This petition is denied by the commission, which has allowed the rate increase as an alternative. The 6-cent fare took effect about a year ago.

Ten-Cent Fare Imperative

Connecticut Company Appeals to State Commission for Further Rate Increase—Seven-Cent Rate Proves Insufficient

Declaring that the Connecticut Company, New Haven, Conn., must have more revenue if it is to continue operation, Lucius S. Storrs, president, and other officials of the company appeared before the State Public Utilities Commission at a hearing on Oct. 1 to ask authority to charge a 10-cent fare. The railway management had previously intimated that a 10-cent fare was necessary. Although the 7-cent rate now in effect has yielded the company larger returns than the former zone fare system, the increase has not been sufficient to meet the operating expenses. The company officials declared that the 10-cent rate is imperative. The company is already charging a 10-cent fare on its lines in New London, formerly operated by the Shore Line Electric Railway.

THE opening arguments for the company were presented by President Storrs. He was followed in turn by George D. Watrous of New Haven, general counsel for the company, and Joseph D. Berry of Hartford, associate counsel.

P. J. MacCreevy of New Haven, statistician, spent most of the forenoon presenting figures tending to show the company's receipts and expenditures. The cities and towns of Hartford, East Hartford, New Haven, West Haven, Vernon, Rockville and Hamden were represented at the hearing

GAIN IN RECEIPTS

The increases in fare last fall and in August of this year showed the following percentages of increase in receipts over the year preceding, as shown by Mr. MacCreevy's figures: November, 1919, 18; December, 21.96; January, 1920, 23.29; February, 25.9; March, 18.98; April, 17.20; May, 15.71; June, 2.62 loss; July, 0.96 loss; August, 6.62 increase. The receipts in Bridgeport for 1919 were not included in the lists, the discontinuance of the service there making it inadvisable in order to secure actual figures of gain or loss for the rest of the system.

Total receipts for 1920 to date are $12,715,017, while for the same period in 1919 they were $12,638,979, or an increase of $76,037 or 2.88 per cent. Redemptions of $34,344 for zone cards sold were made, which left the net increase $41,692 or 1.58 per cent. The estimated expenses of the company to Dec. 31, 1920, are $15,657,222, not including dividends or surplus. The operating expenses to Dec. 31 are given as $12,833,995. In 1916 these figures read $6,554,304. This gives an increase in the past four years of 95.81 per cent. The operating expenses for 1919 were stated to have been $9,210,376.

WAGES UP 97.4 PER CENT

It was shown that in 1916 wages amounted to $3,925,854 as against $5,959,332 for 1919, or an increase of 51.8 per cent. In 1920 with four months estimated the wages will be $7,750,000 or an increase of 97.4 per cent. Fuel cost $571,589 in 1916 and $850,979 in 1919, an increase of 48.9 per cent. In 1920 the fuel expense will be $1,400,000, an increase of 145 per cent. The cost of materials in 1916 was $374,560. In 1919 this expense was $515,111, an advance of 37.5 per cent. This year the cost of materials will be $800,000.

It was stated that one-half of the operating expenses are charged to wages and 30 per cent to fuel. The maximum cost of materials over prewar prices was given as 595 per cent and the lowest increase as 27 per cent. In 1914 coal was delivered for $3.15 a ton. Now it costs $16 and the company has paid as high as $20.

No figures were given showing the increases individually for the various branches of employment over the figures for 1916. No data were presented to show to what an extent the jitneys had cut into the company's business throughout the State. Mr. MacCreevy said that in August, 1920, under the 7-cent rate it would have required 40 per cent more revenue to care for the fixed charges and allow a fair return, and as the conditions were unchanged for September, this percentage applies for that month.

WOULD RETAIN TRANSFERS

Walter C. Noyes, chairman of the board of directors of the Connecticut Company, expressed the belief that the elimination of the transfer privilege would not help the company much, though it might possibly add a few hundred dollars in revenue. He admitted that it might be possible to raise the fares to such a figure as to induce patrons to ride on the steam cars but he estimated that 70 per cent of the traffic would stand the fare increase to 10 cents and that such a rate would produce the needed revenue.

Judge Noyes thought that the proposed 10-cent fare would pull the company out of the financial hole it is now in though it would be far in the future before the railway could pay off its debts. He said the problems of the company could be solved with the 10-cent rate or not at all.

It was pointed out to the commission that the debts of the company, in addition to the operating expenses, included $1,500,000 owed to the State of Connecticut and between $4,000,000 and $5,000,000 due to the New York, New Haven & Hartford Railroad, which it would take some time to pay off. Judge Noyes thought it far better to have the State take over the company's lines as a unit rather than to have the system split up.

Personal Mention

H. R. Fehr Retires

Veteran Traction Operator Resigns as President of the Lehigh Valley Transit Company

Harrison R. Fehr has resigned as president and a director of the Lehigh Valley Transit Company, Allentown, Pa., as vice-president of the Pennsylvania Power & Light Company and as an official and a director of all subsidiary and affiliated properties. At the urgent request of the boards of directors of the various companies with which he has been connected, Mr. Fehr has consented to remain with them in an advisory capacity, so that the interests which he has served for many years will be in a position to consult him and will have the advantage of his judgment. At the same time Mr. Fehr will be relieved of the active management.

H. R. FEHR

The news of Mr. Fehr's resignation was received with regret not only in business and professional circles in Allentown, but also among the general public of the Lehigh Valley, where he has been a dominant figure in engineering and transportation affairs for more than a quarter of a century. There had been rumors of his desire to retire ever since his recovery from a recent illness. When Mr. Fehr first broached the matter of resigning the board of directors of the Lehigh Valley Transit Company appointed a committee to induce Mr. Fehr to reconsider his action, but he remained firm in his determination.

Mr. Fehr's career has been one of growth matching that of the community in which he had resided, and with whose development he has been actively identified. He was born in Nazareth, Pa., in 1863. At an early age he took up engineering and in the spring of 1883 he accepted a position with the engineering corps of the Lehigh Valley Railroad and later became assistant engineer. In the fall of 1891 he was elected city engineer of Easton, Pa., and occupied that position for eight years. He next engaged in engineering construction work on electric railways and in general contracting. In May, 1904, he was appointed general manager of the Easton Transit Company. In the following year he was elected president of the company. Seven years ago he was called to Allentown to become president of the Lehigh Valley Transit System, of which the Easton Transit Company is now a part.

Mr. Fehr's administration of the property has been characterized by vision and progress. Under his management the system has been largely rebuilt, including the construction of the Philadelphia line cutoffs, the erection of the Fairview carhouse, the extension of the Front Street power station and the completion of the Eighth Street bridge. He has for many years taken an active interest in the work of the American Electric Railway Association and of the Pennsylvania Street Railway Association. During 1911 he served as president of the latter body.

M. V. Dommech has been elected president and general manager of the Porto Rico Railway, Light & Power Company, San Juan, Porto Rico. Mr. Dommech succeeds E. M. Sewell, resigned.

H. R. Domby has resigned as purchasing agent of the Birmingham Railway, Light & Power Company, Birmingham, Ala. Mr. Domby has been in the employ of the company since September, 1906, all of his work being in connection with the purchasing and stores department, which he entered as a clerk.

Benjamin F. Thomas, who has been connected with the United Railways of St. Louis, Mo, for the past three years as mechanical engineer, has resigned, effective Oct. 1. Mr. Thomas has been appointed assistant superintendent of power of the Scullin Steel Company, St. Louis, Mo. He is a graduate of the Massachusetts Institute of Technology, Boston.

Charles S. Ruffner, vice-president of the American Institute of Electrical Engineers and vice-president of the North American Company, New York, N. Y., has been appointed chairman of the traction and transportation committee of the American Institute of Electrical Engineers, succeeding W. S. Murray, who is at present devoting his attention to his work for the Super Power Survey.

Bigger Louisville Staff

President Barnes Brings F. E. Belleville and E. F. Kelley from Schenectady —Operating Personnel Complete

Two additions have recently been made to the staff of James P. Barnes, president of the Louisville (Ky.) Railway. The new members of Mr. Barnes' official family are F. E. Belleville, who becomes general auditor of the company, and Edward F. Kelley, who has been appointed secretary to Mr. Barnes. Both Mr. Belleville and Mr. Kelley served under Mr. Barnes when the latter was general manager of the Schenectady (N. Y.) Railway.

Since assuming the duties of president of the Louisville system last July, Mr. Barnes has spared neither time nor energy in building up an organization composed of picked men upon whom he can fully depend. With the appointment of Mr. Belleville and Mr. Kelley, the new administrative force has been completed. The executive committee made up of three of the company's directors which has been in charge of the railway's affairs since the resignation of Thomas A. Minary early this year, has therefore been relieved of the task of administration. The committee, composed of John W. Barr, Jr., W. H. Kaye, and W. S. Speed, will continue to serve in an advisory capacity for an indefinite period.

F. E. BELLEVILLE

Under the reorganization plan the operating staff is made up as follows: Mr. Barnes, president; Samuel Riddle, vice-president in charge of transportation and traffic; Frances H. Miller, vice-president with supervision over engineering and construction matters; Samuel G. Boyle, secretary-treasurer; F. E. Belleville, general auditor; Judge A. P. Humphrey, general counsel, Churchill Humphrey, assistant general counsel. With but three exceptions, the present executive force was with the company before the resignation of Mr. Minary.

Mr. Belleville's electric railway career began nineteen years ago when, at the age of seventeen years, he entered the service of the Rutland Railway, Light

& Power Company, Rutland, Vt., as a stenographer and clerk. In 1907 he was made chief clerk in the accounting department of the United Traction Company, Albany, N. Y. Two years later he went to Schenectady, where he served in various capacities with the Schenectady Railway, finally being appointed general auditor.

Mr. Kelley became connected with the New York State Railways in 1909 when he entered the mechanical and engineering department of the company's Utica and Syracuse lines. In 1914, when the Buffalo, Lockport & Rochester Railway, Rochester, passed into the control of Allen & Peck, Inc., Mr. Barnes, then general manager of the property, made Mr. Kelley chef clerk. Later Mr. Kelley was appointed purchasing agent of the company in addition. He resigned this position to accompany Mr. Barnes to Schenectady when the latter was made general manager of the system there.

R. W. George, a division superintendent of the Georgia Railway & Power Company, Atlanta, Ga., has resigned.

F. R. Murrie has been elected president of the Hershey (Pa.) Transit Company. Mr. Murrie succeeds M. F. Hershey.

F. Pefferkorn has succeeded E. C. Brister as general manager of the Alexandria (La.) Municipal Street Railway.

W. R. Bell has resigned as commercial agent of the Baton Rouge (La.) Electric Company, to accept a similar position with the Haverhill Gas Light Company, Haverill, Mass.

W. D. Chalmers, formerly connected with the Columbus (Ga.) Electric Company, has succeded E. P. Williams as assistant treasurer of the Baton Rouge (La.) Electric Company.

J. M. Strike, superintendent of production of the Toledo Railways & Light Company, Toledo, Ohio, has been transferred by the Cities Service Company to be results engineer for the Western District with headquarters at St. Joseph, Mo. Mr. Strike joined the Doherty organization in 1917. After working with the Acme Power Company as superintendent and the Toledo Railways & Light Company as results engineer, and assistant superintendent of production, he was placed in charge of the production department as superintendent.

George Carson, claim agent Fifth Avenue Coach Company, New York, N. Y., has resigned. Mr. Carson has removed to Seattle, Wash., his former home to organize and to become manager of the Pacific Investigation, Adjustment & Lawyers' Service Bureau. The purpose of this bureau is to conduct a business in the adjustment of all classes of claims, prepare cases for trial, carry on investigations, etc. Mr. Carson was formerly claim agent of the Puget Sound Traction, Light & Power Company and has been president of the Pacific Claim Agents Association and of the American Electric Railway Claims Association.

Ernest Stenger, New Denver President

Steam Railroad Executive Is Chosen Head of Denver Tramway—Vice-President F. W. Hild to Retire on Jan. 1

Ernest Stenger, superintendent of the Southern Division of the Union Pacific Railroad, was elected president of the Denver (Col.) Tramway by the board of directors on Sept. 29. At the same time F. W. Hild, general manager, was elected vice-president. Immediately thereafter Mr. Hild submitted his resignation. Mr. Hild will probably remain with the company until Jan. 1, when he will retire to devote his attention to other activities. The board also announced the postponement of payment of interest on $2,500,000 of outstanding notes. Mr. Stenger arrived in Denver on Oct. 6 to take up his new duties.

SIMULTANEOUSLY with the announcement of Mr. Stenger's election, officials of the carmen's union declared that they would reopen negotiations with the company. They stated that they were optimistic that the new management would recognize the union and would take back the strikers. Mr. Stenger stated, however, that hopes of the reinstatement of the men with full seniority rights were absolutely without foundation. The directors stated that their position remains unchanged and that "there is not a chance in the world" for the recognition of the union and the reinstatement of the strikers.

F. W. HILD

Mr. Stenger is a newcomer in the electric railway field, his previous experience having been entirely in steam railroading. Shortly after his arrival he stated that he had come to Denver to operate the tramway in such a way as to best serve the public. He outlined his position as follows:

> I have no antagonisms or prejudices and am actuated by a desire to get on well with everybody. Throughout the country the Denver Tramway is regarded as one of the best street railway systems in the United States. There will be no changes in policies or officers that I know of.

Mr. Hild stated that he would remain with the company until the reorganization of the operating force had been completed. He has had many offers in the past two years from other lines of business presenting much greater opportunities, but has stuck by the tramway because of its many difficulties. A high tribute was paid to Mr. Hild in the following statement:

> At the meeting of the board of directors of the Denver Tramway held on Sept. 29, Ernest Stenger, of Kansas City, Mo., was elected president of the company and Mr. F. W. Hild, present general manager, was elected to the vice-presidency. The position of president has been vacant for a great many years, and while the board regrets that the Tramway will within a few months lose the services of Vice-President Hild, it believes that in Mr. Stenger the company has a man who will carry on successfully the Tramway policies so efficiently handled by Mr. Hild.
>
> As only a small measure of tribute and appreciation, the board takes this opportunity of stating publicly that for some time past General Manager Hild has asked that he be relieved in order that he might be free to devote himself to fields and other activities that would permit the reward and compensation not possible with the Tramway. The board appreciates fully his fine sense of loyalty and self-sacrifice in sticking to his post during the Tramway's worst and darkest periods, and in the face of attractive offers elsewhere. The Tramway now being over the worst crisis, Mr. Hild has consented to remain until such time as may be necessary to reorganize the operating forces and to help the new President, Mr. Stenger, to take over the work. The board of directors unanimously and in all respects indorses and approves the policies and management of Mr. Hild, and they will be continued by President Stenger.
>
> The difficult and trying conditionsu under which the Tramway has been compelled to operate during the past several years, arising from very great increases in labor and material costs, culminating in the strike of August, has at this time used up all of the company's available funds. The board of directors has therefore decided to postpone payment of interest due Oct. 1 on its outstanding convertible notes, with the hope and expectation that a solution of the Tramway's problems can be worked out within the next few months.
>
> Mr. Stenger is the general superintendent of the Union Pacific Railroad in Kansas City. He comes here highly recommended as an able executive.

The statement just quoted was made over the signature of C. Boettcher, chairman of the board of directors.

Mr. Hild became vice-president and general manager of the tramway four years ago. Prior to that time he had served as general manager of the Portland Railway, Light & Power Company, Portland, Ore. He was graduated as an electrical engineer from Union College, Schenectady, N. Y., in 1898, and was for a time connected with the General Electric Company. He was one of the originators of the idea of forming an association to represent the electric railway industry on the Pacific Coast, and was chosen president of the Pacific Coast Electric Railway Association upon its organization in San Francisco in April, 1913.

Will Raise Suburban Rates

The Syracuse & Northern Electric Railway, Syracuse, N. Y., under a tariff filed recently with the Public Service Commission, Second District, effective on Sept. 30, will increase present one-way cash and ticket fares approximately 25 per cent, with a minimum fare, except in Syracuse, of 10 cents. It is also proposed to increase commutation ticket and mileage book fares 25 per cent.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Shortage of Guy Wire Relieved

Scarcity of Wire Rods Has Impeded Production—Deliveries Now Made in Thirty Days

The shortage in guy wire seems to have been due in large measure to the number of different types of mills required to make the finished product. Because of better labor supply and improved transportation facilities, however, the shortage is gradually being overcome.

The stranding mills have been held up waiting for supplies from the wire mills, and it seems that the wire mills, on the other hand, have been unable to get a sufficient supply of wire rods to permit them to draw sufficient wire to supply the demand for both wire and strands. Trouble started in the steel mills last fall when the stocks of the stranding and wire mills became depleted, and the demand has been so heavy since that time that they have been unable to build up any reserve stock of raw materials to tide over temporary labor and transportation difficulties.

On the higher grade steel strands, such as high-strength and extra-high-strength strands, the shortage is more accute because it has been practically impossible to secure from the wire-rod mills the high-grade steel from which these strands are made. Deliveries from the mills have been running from sixty to ninety days, but now they are promising thirty-day shipments and even better than this on some kinds and sizes of strand.

Supply of Wood Handles Improving

Demand Is Heavy and Stocks Not Large, but Raw Material Is Received in Better Shape

Manufacturers of wooden handles for track and boiler room tools report that the condition of shortage is easing up slightly now that transportation is improving and they are able to obtain raw material more readily. No letup in the demand is seen, in fact, in some quarters the pressure of orders is said to have increased within the last month, as the heavier buying of steam railroads on account of their new rate increases makes itself felt. Not only is a good domestic market available but foreign countries have been buying consistently, it is stated. Good sales are made to South Africa, Australia, England, Cuba, and other countries.

A considerable volume of back orders has accumulated with manufacturers. Production is said to be proceeding normally on the whole, but consumption is going ahead at a faster rate than goods can be turned out. Many producers have had considerable difficulty in securing first grade and extra quality hickory to go into the making of sledge, pick, scoop and shovel handles, etc. Consequently in many cases an inferior grade of wood has been used, but because of the high prices prevailing for the finest quality matetrial, many buyers have been satisfied to accept second grade wood. Deliveries of the finished products are now encompassed within a period of one to three months, according to representative manufacturers. The extra quality handles require the longest time, in one or two cases ranging up to even six or eight months. Stocks are spotty, as some factories have fairly good supplies while others report none on hand.

One of the factors which has been hampering handle makers is the handicap that has all along been imposed by the unfavorable winter last season. Rain and the lack of frozen ground interfered with getting out the timber to a serious extent. Furthermore, during the Federal control railroads allowed their stocks of wood handles to become depleted and factories never fully caught up with the volume of orders that eventually piled up. Prices on handles used in track tools have not advanced for the last three or four months. Opinions differ as to whether a change is to be expected.

Manufacturers See Small Hope of Immediate Price Reductions

Labor and Raw Material Costs Are at High Level, Although Copper and Cotton Show Slight Decline—Outlook for Future Business Is Held to Be Favorable

Considerable speculation is manifest as to the effect that price cuts in many lines may have upon prices of material used by electric traction companies. As yet it seems there has been no decided reaction in this line. In the East the view is expressed in authoritative quarters that conservatism in buying will rule for the next few months until business conditions become more settled. Further than that, while many manufacturers will not venture predictions, a very large number seem to feel optimistic over the outlook for 1921. The basis for this is held to be the undersold condition of the railway market. Traction companies in the past have curtailed equipment buying to a minimum commensurate with their financial condition. As the buying power of money increases, however, orders are expected to multiply, according to one of the largest manufacturers of electric railway equipment.

The general feeling seems to be that no decided price decline can be looked for in the immediate future. Labor is one of the largest factors in the cost of production. Labor prices remain high and existing contracts in many cases have considerable time to run yet. Furthermore, it is pointed out that a great part of the manufacture of goods in this line is dependent upon finished products in other lines. For this reason, though the same basic condition of supply and demand is existent, producers hold that raw material costs must first drop before their prices can come down. As yet about the only materials reported easier in price are copper and cotton, so that products of which these materials form an important part may be expected to soften in price first, it is stated. A similar factor largely governs chances of lower prices on other material. The trend of iron and steel quotations should have an important bearing upon prices of goods employing that material in large quantity, according to manufacturers. Others oppose this view on the ground that if the market is largely undersupplied with any article, that circumstance will defeat a trend toward lower prices regardless of raw material costs.

General Tone Is Favorable

The point upon which all interests apparently agree is a persistent optimism regarding the future of the industry. In this connection, an analysis of statements recently received by the Electric Railway Journal from about sixty of the largest manufacturers of equipment representing thirty different lines of material is interesting. Barring the non-committal replies in each case, only two manufacturers reported an appreciable number of cancellations while four others received a few. The number of companies that are hampered by a scarcity of raw material were slightly in the majority. Stocks of finished goods are also unfavorable, those whose stocks are low outnumbering those whose supplies are good by more than two to one. On the other hand, transportation is very generally improving. Manufacturers who reported a decidedly better labor situation were in the majority by more than five to one. Production in two out of three instances was reported up to normal capacity. Another encouraging feature is that thirty-eight companies are meeting a strong even demand, three find it fair and only nine report a poor or slackening volume of sales. With regard to the trend of prices, sixteen manufacturers believe slightly higher levels are in order, twenty-five think present quotations will hold firm, and three look for lower prices.

The latter views covered bare and insulated wire and trolley wheels, though other opinions on the same material differed. In forty-three of the replies the tone is optimistic, five are pessimistic and the remainder are noncommittal.

2,400 Power Saving Recorders Ordered for Brooklyn

The Arthur Power-Saving Recorder Company announces that it has just received an order through its Eastern agent, J. H. Denton, for 2,400 recorders for surface cars of the Brooklyn Rapid Transit System. This is the largest order of power-saving instruments ever placed at one time and the choice was made after very thorough tests had shown the value and desirability of these instruments.

London Asks for Bids on Cars and Equipment

The London County Council invites tenders for the manufacture, supply, delivery and maintenance of:

"A" 125 complete bodies for electric tramcars.

"B" 125 complete sets of maximum traction bogie trucks for electric tramcars.

"C" 125 complete sets of electrical equipments for tramcars, together with the assembly of 125 car bodies, sets of trucks, electrical equipments and brakes into complete tramcars, and the preparation thereof in readiness for service operation.

Specifications, forms of tender, and other particulars may be obtained on application to the Clerk of the Council, at the County Hall, Spring Gardens, S.W.1, upon payment to the cashier of the Council of a fee of £2 each for either "A," "B," or "C," or £5 for the three sets complete, according to the *Electric Railway and Tramway Journal* of London.

All the drawings and samples which are referred to in the specifications can be inspected by appointment with the general manager, London County Council, Tramways Department, 23 Belvedere Road, S.E.1, on production of either a copy of the specification concerned, or a signed receipt for the fee paid in respect thereof. Each tender submitted must be upon the respective official form and with its accompanying documents is to be enclosed in a sealed cover and addressed to the Clerk of the Council. No tender received at the County Hall, Spring Gardens, London, S.W., after 4 p.m. on Monday the 25th day of October, 1920, will be considered.

Rolling Stock

Birmingham (Ala.) Railway, Light & Power Company, it is announced, expects the arrival of fifteen new one-man cars about the middle of October.

The Chicago (Ill.) Surface Lines now has under construction in its west side shops fifty two-way trailers similar to the sample car described in the July 17 issue of ELECTRIC RAILWAY JOURNAL. The company is also preparing plans and specifications for new motor cars.

Dallas (Tex.) Railway Company has received eight of the fifty new safety cars ordered some time ago from the J. G. Brill Company, Philadelphia, Pa. Each car is propelled by two 25-hp. interpole motors of the very latest design and is equipped with H.B. lifeguards. The complete weight of each car is a little over eight tons. It is the plan of officials of the company to operate twenty-five of the new cars on one line, and with the remainder to operate two crosstown lines.

Northern Ohio Traction & Light Company, Akron, Ohio, mentioned in the Aug. 14 issue of the ELECTRIC RAILWAY JOURNAL as having just received authority from the Public Utilities Commission to purchase fifty-six city cars, among other equipment, has specified the following details on thirty-one of these cars:

Number of cars ordered	31
Date of order	Feb. 11, 1920
Delivery	August
Builder	G. C. Kuhlman Car Company
Type	"Peter Witt" Steel
Seating capacity	54
Weight, total	42,880 lb.
Bolster centers, length	25 ft. 6 in.
Length over all	50 ft. 1½ in.
Truck wheelbase	0 ft. 58½ in.
Width over all	8 ft. 4 in.
Height	11 ft. 1⅝ in.
Body	Steel
Interior trim	Cherry
Headlining	Agasote-Buff
Roof	Arch
Air brakes	G. E.
Axles	Penna. R.R., Ltd.
Bumpers	Hedley Anti-Climber
Signal System	Faraday
Control	Westinghouse HLM Modified
Couplers	Ohio Brass
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Designation signs	Hunter
Door operating mechanism	National Pneumatic Company
Fare boxes	Cleveland Fare Box Company
Fenders or wheelguards	N. O. T. & L. Co., Ltd.
Hand brakes	American Brake Company
Heaters	Peter Smith Heater Company
Headlights	Crouse-Hinds Company, Type W
Lightning arresters	Westinghouse
Motors	Westinghouse 532-A
Sanders	Nichols Lintern Company
Seats	Brill
Seating material	Rattan
Trolley catchers or retrievers	Trolley Supply Company
Trolley wheels	More-Jones Brass & Metal Company
Trucks	Brill 68-E
Ventilators	Nichols-Lintern Company
Wheels	Forged Steel Wheel Company, 26 in.

The remaining twenty-five city cars were ordered from the same company on Feb. 16, 1920, and specified the same equipment as above except that in this case the control is Westinghouse K-35-G-2, and the trucks Brill 51-E.

Track and Roadway

San Diego (Cal.) Electric Railway.—The San Diego Electric Railway is planning to use heavier rail and to reconstruct its lines on Sixteenth Street, Logan Avenue and National Avenue.

Carolina Power & Light Company, Raleigh, N. C.—The Carolina Power & Light Company is preparing to extend the double-tracking of its line on Hillsboro Street, Raleigh, from the place where the single-tracking begins near Park Avenue to the College Court Pharmacy in West Raleigh. This improvement will cost approximately $10,000.

Hamilton (Ont.) Street Railway.—The City Council has approved the report of the street railway committee providing for an extension on King Street West, from Margaret Street to Paradise Road. The proposal of the company to construct this line was referred to in the ELECTRIC RAILWAY JOURNAL of Aug. 7.

Ottawa (Ont.) Electric Railway.—The acquisition of the Ottawa Electric Railway was discussed at a private meeting of the board of control of the city. The matter is due for discussion at the next meeting of the City Council.

Sarnia (Ont.) Street Railway.—Citizens of Sarnia are anxious to obtain a better railway service along the river front, and local men are endeavoring to get support for a radial proposition here. A suggestion that the line be extended to Corunna has received much support.

Montreal, Que.—F. W. Cowie, chief engineer of the port of Montreal, has stated that the electrification of the Montreal harbor railway terminals is now well in hand and about 42 miles of track will be in operation next spring. The remaining 16 miles will be electrified later.

Rhode Island Company, Providence, R. I.—It is possible that the Rhode Island Company within the next few months may discontinue the line from Crescent Park to Bristol. This line has been operated at a loss for some time according to the general manager.

Cincinnati, Ohio.—An additional strip of the canal, approximately 1½ miles long, is sought by the Rapid Transit Commission for the subway system now in process of construction. A resolution will be introduced in Council providing for the leasing of the section from the state. The strip sought extends from a point 300 ft. west of Mitchel Avenue to a point 1,000 ft. beyond the crossing of the canal at the intersection of the B. &

O. Railroad in St. Bernard. Governor Cox will be requested to appoint a commission to place a value upon the strip as a basis for the lease.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—City Solicitor Saul Zielonka has requested an opinion from Street Railway Director William C. Culkins as to the legal right of the Interurban Railway & Terminal Company to remove a track extending to California, Ohio, along Kellog Avenue, a distance of approximately 300 ft. The company asserts the track is no longer required for the operation of its cars since only a single track is used. In a letter to the City Solicitor, Attorney Eli G. Frankenstein states the action of the company is prompted by a desire to prevent the extension of the East End line to California, an initiative ordinance which is to be submitted to the voters at the November election.

Dallas (Tex.) Railway.—The City of Dallas has asked the Dallas Railway to rebuild its tracks on South Lamar Street, in connection with the opening up, widening and paving of this street so as to provide a cross-town thoroughfare for that part of the city. Rebuilding of the tracks on this street will be one of the largest improvement projects of the railway now in prospect.

Houston, Bay Shore & Texas City Traction Company, Houston, Tex.—The Houston, Bay Shore & Texas City Traction Company, a recent incorporation, is making headway toward the construction of its interurban line.

Fort William (Ont.) Electric Railway.—A by-law authorizing raising of $12,150 for the extension of the Fort William Electric Railway to the site of the new pulp mill, which is under erection in Fort William, will be submitted to ratepayers on Oct. 13.

Canadian National Railways, Montreal, Que.—The Hydro-Electric radial policy of taking over branch lines of the Canadian National Railways, electrifying them and using them as feeders for the national lines, has been approved by the City Council.

Seattle (Wash.) Municipal Railway.—Work of laying tracks on Washington Street from Second Avenue west to the approach of the elevated railroad at First Avenue and Washington Street has been ordered by the Municipal Street Railway Department. When these tracks are in, it will permit of Second Avenue cars reaching the elevated direct without detouring.

Walla Walla Valley Railway, Walla Walla, Wash.—The Walla Walla Valley Railway is considering the extension of its interurban line from the State line to Umapine. The proposed extension is six miles in length and if built will tap a big alfalfa and fruit belt which now has no railroad facilities. It is said that the company is now tearing up rails in Walla Walla on several abandoned lines and will have steel sufficient for the proposed new work. It is expected definite action will be taken shortly by company officials.

Power Houses, Shops and Buildings

Eastern Massachusetts Street Railway, Boston, Mass.—The Eastern Massachusetts Street Railway plans to convert the carhouse at Washington Avenue, Chelsea, into a repair shop.

Connecticut Company, New Haven, Conn.—A permit has been granted by the city of Rockville to the Connecticut Company to build a waiting station at Spring Street, Rockville. This convenience was requested about a year ago, but the construction work was held up because it encroached on railroad property and extended into the street several feet.

Trade Notes

The Chicago (Ill.) Surface Lines has purchased ten Johnson registering fare boxes for installation on the ten safety cars, purchase of which was recently announced in Electric Railway Journal.

The General Electric Company, Schenectady, N. Y., has acquired the five-story, 60 ft. x 242-ft. factory of the Randal-Faichney Company at 76 Atherton Street, Roxbury, Boston, together with a large power plant.

A. C. Streamer, manager of the switchboard section of the supply department, Westinghouse Electric & Manufacturing Company, has been appointed industrial assistant to the manager of the supply department of that company, with headquarters at East Pittsburgh, Pa.

The M. H. Detrick Company has opened an Eastern branch at 30 Church Street, New York. The company makes suspended arches and steam-set ash conveyors. The office will be under the direction of R. D. Foltz, Eastern sales manager. H. S. Sleicher will handle sales in New York as before.

Charles Piez, president of the Link-Belt Company, 910 S. Michigan Avenue, Chicago, Ill., and former director-general of the Emergency Fleet Corporation, has written a report on the steel strike. Copies of the article can be secured by applying to the executive offices of the company.

Ackley Brake & Supply Corporation, 50 Church Street, New York, N. Y., has appointed A. W. Arlin, who is located at 772 Pacific Electric Building, Los Angeles, Cal., as its Pacific Coast representative. Mr. Arlin's experience in the railway field dates back twenty years to his connection with the General Electric Company, with which he has been connected at the Salt Lake City and Denver offices.

R. A. Bull of Pittsburgh has been appointed consulting metallurgist for a number of prominent steel foundries grouped for the purpose of developing and perfecting higher standards in the production of steel castings, it is announced. Mr. Bull will devote his entire time to preliminary research work and has resigned his position as vice-president of the Duquesne Steel Foundry Company. The members of the group include Electric Steel Company, Chicago; Fort Pitt Steel Castings Company, McKeesport, Pa.; Isaac G. Johnson Company, Spuyten Duyvil, N. Y.; Lebanon Steel Foundry Company, Lebanon, Pa.; Michigan Steel Castings Company, Detroit, Mich., and Sivyer Steel Castings Company, Milwaukee, Wis. Mr. Bull is a member of numerous technical associations and since 1911 has been a director of the American Foundrymen's Association. During 1916 and 1917 he served two terms as its president. His connection with the foundry industry covers a period of more than twenty years.

Whiting Foundry Equipment Company, Harvey, Ill., specializing in electric traveling cranes and complete foundry plants, announces its consolidation with the American Foundry Equipment Company of New York City. The new organization will be known as the Whiting Corporation and will be capitalized at $5,000,000. J. H. Whiting, president of the Whiting Foundry Equipment Company, becomes chairman of the board, and V. E. Minich, president of the American Foundry Equipment Company (Sand-Mixing Machine Company) and of the Foundry Equipment Manufacturers' Association, will be president. As the lines of manufacture do not overlap it is the intention to maintain all present manufacturing facilities. The plans include maintaining and enlarging the present offices of the American Foundry Equipment Company, 366 Madison Avenue, New York, N. Y., as the eastern sales and export office of the combined companies. Important economies in manufacture and distribution are expected to result.

New Advertising Literature

Carbon Electrodes.—National Carbon Company, Inc., New York, N. Y., is distributing an eighteen-page booklet on "The Carbon Electrode." Copies may be obtained upon request.

Wire.—Habirshaw Electric Cable Company, Yonkers, N. Y., has issued a new 172-page, flexible-cover illustrated handbook, entitled "Habirshaw Manual of Wires and Cables."

Trolley Equipment.—"Nuttall Products for Electric Railway Service" is the title of illustrated bulletin No. 28, issued by R. D. Nuttall Company, Pittsburgh, Pa., describing its gears, trolley bases, poles, wheels, harps and sleet wheels and scrapers.

Electric Hoists.—Link-Belt Company, 910 South Michigan Avenue, Chicago, Ill., is distributing the ninety-six page revised edition of catalog No. 38, covering the Link-Belt line of standardized monorail electric hoists and overhead electric traveling cranes in capacities of one-half to three tons.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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P. H. Gadsden for President of the Association

THE selection of Philip H. Gadsden for president of the American Electric Railway Association is a wise choice. His very important part in the work of the Federal Electric Railways Commission has given him a vision of the industry as a whole and a comprehension of its problems that make him pre-eminently fitted for the place. The responsibilities of the office at this time are exceedingly great and critical, for upon the manner in which the industry proceeds to rehabilitate itself and carry into execution the recommendations of the Federal commission depends the future of the electric railway business. Mr. Gadsden also has a very keen and enlightened understanding of the problem of public relations, which is undoubtedly a vital part of the reconstruction work to be done.

In connection with its report the committee on nominations made a recommendation of great importance in connection with future workings of the association. It set up this year as the fixed policy of the association that in the selection of officers the association should be guided by the requirements of the time, unaffected by the choice of previous years. This is contrary to the custom of advancing the vice-president in succession. Without reference to the elections just consummated, the wisdom of this general principle is obvious.

American Executive Committee Enlarged

THE action of the association in enlarging the executive committee from fourteen to twenty members by the addition of six members-at-large is also a good move for the reasons given for this change by President Pardee in his presidential address. The association has always been fortunate in the composition of its executive committee. The constitution adopted at the time of the reorganization in 1905 has brought to the body the services of distinguished executives who have given unstintingly of their time and thought to the welfare of the association. Nevertheless, it is at least theoretically true that changes in policy considered desirable by the body at large cannot quickly be registered under the practice which has really meant that but one railway man is elected an officer of the parent association each year. This, with the fact that past-presidents of the parent association are members of the executive committee, though without vote, has still further tended to prevent changes in policies which have once been adopted.

The recognition of the interests of the manufacturer members of the association by the addition of five members to the executive committee when the manufacturers were admitted to membership was a step in the right direction, and we believe that the changes authorized at Atlantic City are in the interests of the association.

An Appropriate Conclusion of an Eventful Year

THE convention as a whole was a fitting conclusion of the association year, which has been a most eventful one. In October, 1919, the association had just completed the greatest task it had up to that time ever undertaken, namely, the collection and presentation to a Federal commission of a complete analysis with statistics of the status of the industry. The evidence was in, but the result was in doubt.

Every one knows now the successful outcome of this task. With the facts before them the commissioners could give but one verdict, and while the decision has no legal binding value its effect is already being widely seen in a better popular recognition of electric railway conditions. The improved feeling in the industry was reflected in the convention just past, where the prevailing note was optimism and a renewed courage to solve the problems of better serving the transportation needs of the public.

A review of the association year, even so brief as this, would not be complete without a statement in regard to the administration under which these changes have taken place. President Pardee was well fitted for the task to which he was called two years ago, possessing as he does that combination of conservatism and progressiveness which insures results. He has given ungrudgingly of his time and energy to the association and the industry during his term of office; has wisely guided its affairs during this critical period, and has been most succesful in inspiring his fellow members with his faith in the future. To his constructive policy is due largely the present more hopeful condition in the industry today.

The Motor Bus Is at the Convention

A NOTABLE innovation at the 1920 convention was the exhibition on the pier of gasoline-propelled motor buses by two manufacturers. This, and the reading of three important papers before the parent association, may be said to constitute the formal introduction of the motor bus into the transportation business of the electric railway industry. The railways have thus recognized the place of the bus as an ally, and the manufacturers acknowledged the electric railway field as a proper and logical one in which to develop the use and consequent sale of their product. The other vehicle much in evidence at the convention was of course the standard safety car. One might muse that here was the last word in the electric rail car and the beginning of the development of the non-rail vehicle.

The significance of the motor bus is certainly becoming more apparent and its place better defined in the problems of urban and interurban transportation. Where extensions to city systems are needed the use of the bus as a feeder to the end of the electric line is very attractive as a means of avoiding the investment in track and overhead extension. The advantages of this use of the bus were very generally recognized by the railway men as well as by the representatives present from the automotive industry. And looking ahead, it seems probable that where interurban transportation in limited amount has to be cared for the merits of buses will be considered carefully before an electric railroad will be built. The low investment required is the chief merit of the bus for such service.

Effective Schedules Impossible Without Traffic Regulation

MORE or less correlated were the reports of the committees on code of traffic principles and economics of schedules, presented at two sessions of the T. & T. Association. No time-table, however safeguarded for elimination of wasteful hours and for efficient placing of cars, can be effective without sensible regulation of traffic. It is, of course, too much to expect that the model traffic ordinance will gain universal support at its inception. Opposition must be expected in the endeavor to give street cars absolute right of way at intersections, and the railway interests should be content if at the start they can secure the support of public authorities and civic bodies for a majority of the items listed in the proposed ordinance.

Those who had to do with the framing of standard rules for transportation some years ago will recall how disheartening were their early efforts because of the timidity of operators who could see nothing but insurmountable obstacles in different "local conditions." The standard rule book is still "standard," however, although changes were made here and there to suit individual company requirements. Public officials who have charge of the regulation of traffic are keen for concerted action because of the growing density of vehicle congestion. If the railway interests are not too insistent on 100 per cent approval of their views they are likely to get through a code of traffic principles which if enforced will make safer the public streets, expedite traffic in general and give users of public conveyances preference over other vehicles and over pedestrians. The convenience of the few must in the end yield to the convenience of the many.

The committee on economics of schedules has performed a helpful service to the industry in showing how deceptive are all prevailing comparisons of car speed as indicated by car-miles and car-hours. Analysis of the latter factor shows that few properties have an identical list of items making up "bonus time," and while this has to be included with revenue-hours to show the cost of platform expense, it is necessary to segregate the actual time of operating between terminals to reach a satisfactory basis for determination of "speed." Perhaps added value will come of this investigation in showing how expensive are the terms forced by labor contracts, some companies having as high as 15 per cent of bonus time as a burden on the cost of service. The "minimum day" and "straight time" for platform help are undoubtedly a serious handicap on tripper service, and when the public interest suffers because of a too grasping union it is well that car patrons should know what stands in the way of possible reduction in rates of fare or of improved schedules which will speed up traffic. The truth cannot harm the railway cause.

Has the Paper Ticket Become Obsolete?

SINCE the use of metal tokens on street cars has become common practice on a large number of properties, big and little, their practicability has been thoroughly established. If one stops to consider, then, when paper tickets should be used and when metal tickets in regular city service the metal tickets seem to show up more favorably in practically every point. On the basis of cost of tickets, the cost of handling or the accuracy with which the conductor's turn-in may be checked, either with or without registering or locked fare boxes, the comparison seems to be strongly in favor of the metal token. We refer particularly to regular city service, because on rapid transit lines where the tickets are sold from a reel and immediately destroyed in a chopper after being used another set of conditions applies.

Let us first consider the question of cost and assume that the trolley company hauls 100,000 passengers a day, of whom 75 per cent ride on tickets, or 75,000 tickets used per day. This would require the purchase of 27,000,000 paper tickets a year. While it used to be possible to buy paper tickets in large quantities at 9 cents a thousand or thereabouts, they now cost about 35 cents for a good lithographed job. At present prices, then, the first cost of the year's supply of paper tickets for this assumed traffic would be $9,450.

Experience has shown that where there is a good reduction in cost per ride to induce the use of tickets, ten times the daily number of tickets used gives an ample supply of the metal tokens. In our assumed case, then, the number of metal tickets necessary would be 750,000. For this small quantity the price would probably be $8.25 a thousand, or a total first cost of $6,187.50. This is $3,262.50 less than the cost of one year's supply of paper tickets, and since the metal tickets can be used over and over again, this cost may be spread over at least ten years, for the life of the tokens is about the same as that of coins and the shrinkage through loss is very small—less than 1 per cent a year. Hence it would seem to be a fair comparison to state that the relative annual costs would be $618.75 for metal tickets, against $9,450 for paper tickets, or, for ten years, a cost of $6,187.50, as against $94,500, not taking into account the extra cost of handling paper tickets in the accounting department. Or even assuming old pre-war paper-ticket prices and post-war metal-ticket prices, we have an annual cost of $618.75, against $2,430.

From the standpoint of the public, the metal tokens are preferable because they do not become crumpled, dirty, soft from perspiration, perhaps to the point of rejection and consequent argument. The conductor likes them better for these same reasons. The accounting department finds the metal tokens can be accurately counted and separated from other coins by machines. While paper tickets can be counted by machines if in perfect condition, there is more or less trouble because of an occasional crumpled or soft ticket, and hence counting by hand or weighing is resorted to usually. Also, there is the advantage that metal tokens can be used with registering fare boxes while paper tickets cannot. As to the opportunity for counterfeiting, the metal tickets seem to offer an even less attraction than paper tickets. The metal tickets are made of german silver and have a high intrinsic value, and to make them requires very expensive dies and other machinery. What few counterfeits have been observed in the cities using them have been made of lead and were so crude and different in appearance from the regular tickets that they could escape the scrutiny of the conductor only through the most careless inspection. The fact that there has been almost no counterfeiting of the metal tokens on the properties using them seems to bear out the theories advanced as to why there would not be any.

All of these advantages for the metal tokens noted thus far apply whether a company is using a registering fare box, a locked fare box or no fare box at all. Where a registering fare box is used several other advantages accrue.

We are acquainted, it is true, with cities where paper tickets are still preferred, but the tendency is certainly in the direction of the metal token.

"Load Factor" Is a Term of Wide Application

WE ALL remember the fable of the hare and the tortoise. The latter won in the long run because he kept steadily at it, while the speedier fellow ran only in spurts. In other words, the tortoise operated at the higher load factor. That's the whole story in a nutshell, and the same principle holds whether it is a footrace, a power plant load, an electric car line or a coal mine. The point is that when any kind of equipment is used uniformly, rather than in spurts, the operation is most efficient and the least amount of investment is needed.

Take the matter raised by Eugene McAuliffe in his paper on the coal supply, read at the convention of the American Association on Oct. 12. He applied the load-factor idea to the basic fuel industry, and showed that the seasonal congestion in the production and utilization of coal plays an important part in making the cost of fuel high. Obviously, coal cannot be consumed uniformly. Hence, if it is to be produced uniformly, it must be stored somewhere, and if it is to be produced and transported uniformly the storage must be at or near the point of consumption. Fortunately coal is a commodity which can be stored practically without loss, and, considering the amount of energy contained in a cubic foot, two hundred kilowatt-hours or more, an enormous amount of potential energy can be stored on a reasonable space, say an acre. The losses due to weathering and overhead cost in consumption during storage are more than offset by the insurance against interruption, and if the purchase price per ton can be cut down also, the saving here is "so much velvet." The problem is to get consumers to spread out their fuel orders so as to bring about the desired consummation outlined by Mr. McAuliffe.

The possibilities in the line of saving through improved load factor in the fuel field are even greater than they are in the boiler and turbine rooms, where presumably the idea was first extensively developed. Electrical energy cannot be stored to any great extent. In the waterpower realm some water storage is possible, but topographical conditions must be favorable. But there are few places where an acre or two cannot be found within easy reach of the power plant for coal or oil storage purposes. Such areas would be found even more extensively than they are if the coal producers and the railroads would provide a seasonal variation in price to accelerate buying during the "off-peak" seasons.

Some of the Ramifications of Standardization

THE outstanding thing in regard to electric railway equipment and practices is the effort, one might almost say the struggle, of manufacturers and railway companies to standardize. Now the ultimate aim in this effort is economy, and it is only the promise of money saving that will convince individuals and companies that they must give up pet notions if necessary in order to bring standardization about. There is increasing evidence that they are giving up at least some fads and using stock products to an increasing extent. The engineers have pushed standardization the hardest, and the designs promulgated by the Engineering Association are coming to be regarded in the same light as those which for years have made the Master Car Builders' and other steam road associations famous. And now the association is going into the American Engineering standards committee, a step which will enhance the reputation of its efforts.

A good example of the benefits of standardization was cited in the paper by P. F. McCall before the Engineering Association at Atlantic City on Tuesday. Mr. McCall is storekeeper for a large railway property and is therefore in a position to know what is to be saved and gained by reducing the number of stock parts which must be kept on hand. The same idea was brought out before the accountants. It is simple enough, and it can be put into a few words, like these: If one part can be put to two possible uses, fewer items need be kept in stock; if manufacturers' stock parts are ordered, delay will be avoided, and if many purchasers will use the same designs, manufacturing costs will be lowered. Here are three money-saving considerations. Are they not enough and convincing?

The Millionaire in the Subway; the Bricklayer in the Taxicab

ACCORDING to a New York paper, times have changed. A young lady writes an interesting article about the prominent bankers and business men she elbowed in the subway on her way to and from work.

Next we read of a taxicab drawing up in front of a well-known hotel from which two well-dressed men emerge carrying real leather bags. Paying their taxi driver from a fat roll of bills, they entered the hotel, and curious bystanders were startled a little later to see them emerge dressed in overalls and carrying trowels. They were bricklayers working near by.

Why do the millionaires now ride in the subway when they have cars of their own?

The answer is congestion of streets and the value of time. With the bricklayers going to work in taxicabs the bankers can't possibly get downtown quickly in their cars, so they take the subway. The bricklayers have plenty of money, comparatively speaking, and are enjoying an unaccustomed luxury. Both bricklayers and bankers are good natured about such conditions, but here is something for railway men to think about.

What factors caused the decrease in the population of Manhattan and are causing the movement of banks and offices from Wall Street to Forty-second Street and vicinity? Congestion of streets by automobiles and lack of adequate transportation facilities are important factors in the growth of any city with more than 2,000,000 inhabitants.

Industry on Road to Better Days*

By John H. Pardee

President American Electric Railway Association

Recognition by Public of Essential Nature of Electric Railway Industry Is Growing—General Situation Discussed—Internal Affairs of Association—Increase in Size of Executive Committee on Publicity and Committee of One Hundred Suggested

Mr. Pardee has steered the association ship through the storms and stress of the most trying period in the history of this country. He retires from the presidency at a time when the skies are clearing and when the haven of a reasonable net income is in sight.

THIS, the thirty-ninth annual convention of the association is assembled under circumstances which give us good cause for optimism, both as to the future of the industry, which the association represents, and as to the part that the association will play in the development of that future.

I have no hesitancy in saying that never before in its history have the affairs of the association been in such a satisfactory condition. The membership has increased and is still increasing and the industry generally is giving to the organization splendid support. These conditions are reflexes of the work which the association is performing. In every respect its usefulness to the industry has been increased, and the co-operation given to its officers plainly indicates that the railway companies of the country and their executives are coming to appreciate more and more not only the essential nature of the service which the association renders, but the absolute necessity of that service and the desirability of increasing the association's ability to perform it in the most efficient manner.

The secretary will later give you a detailed account of the association's activities. You will, I believe, be surprised at their variety and extent. Their recital indicates to me that the association has reached a stage in its development where it is performing for the member companies a necessary, practical service that has an important bearing upon the economy and efficiency of their operation, and that could be performed in no other way so completely or so well.

There is scarcely a phase of electric railway operation and management, financial, engineering, operating, or those dealing with policy, that has not been the subject of investigation by the headquarters staff during the past year, and concerning which information has not been compiled and distributed. In no other way than through the association could this work have been done, and the most significant report that I have to make to you today is that there is a real and growing appreciation by the industry of the value of these efforts, and a constantly increasing spirit of co-operation in the task of making the association of greater and greater usefulness in this respect. When I assumed the office of president, two years ago, I asked of the association members a full measure of that co-operation without which the officers of the organization could not hope to accomplish the work that was committed to their charge. That co-operation has been forthcoming in the fullest degree, and whatever has been achieved for the association and for the industry has been made possible because of the loyal response made by both railway and manufacturer members whenever they were called upon for assistance.

The association, now as never before, is representative of the entire industry. At the last convention, through amendments to the constitution and by-laws, providing for representation of manufacturer members upon the executive committee, the final steps in the process of welding together the two major interests—railway and manufacturing—were taken, with a most harmonious result. In the conduct of the association's affairs, and especially in the work that is being performed by the technical committees of the affiliated associations, the admission of manufacturer members on terms of absolute equality is producing good results, and the association is now prepared for the consideration of any problem, assured of the best thought and best advice from the two most important angles.

Our problem for some years has been not so much the creation of an efficient working organization, since that was largely a matter of proper organization and proper direction, but to bring to the electric railways of the country a better realization of what the association was actually accomplishing, and of its potential powers of accomplishment, in order that the necessary financial and moral support might be forthcoming. We are making real strides in this direction. The very substantial increase in dues made effective in 1919 brought comparatively few resignations, and of the companies that withdrew a substantial number have rejoined. In addition, thanks to the well-directed efforts of our very efficient committee on company membership, a considerable number of companies not before members have been enrolled, and the committee's experience indicates that by persistent personal effort further gain can be made.

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*Presidential address delivered at annual convention at Atlantic City, N. J., Oct. 12, 1920.

Once more I wish emphatically to state my belief that it is the absolute duty of every railway company to be a member of this association, and executives who do not authorize such membership are not properly conserving the interests of their stockholders and investors.

INCREASE IN SIZE OF EXECUTIVE COMMITTEE

Efforts should be made to bring the membership of the association in closer touch and closer harmony with the association's work. Our present form of organization, while, in my opinion, particularly efficient from the standpoint of getting things done, is not sufficiently democratic to insure the most complete understanding between those in direct charge of the association's affairs and the membership as a whole.

The association is now administered by an executive committee consisting of the president and the four vice-presidents, the presidents of the four affiliated associations and five manufacturer members. I am convinced that a much closer relationship between the actual directing force and the members may be obtained without any diminution in the organization's effectiveness.

Accordingly, I recommend that the constitution and by-laws of the association be so amended as to create an executive committee of twenty instead of fourteen as at the present time, the committee to consist of the president, the four vice-presidents, the four presidents of the affiliated associations, five manufacturer members, as at present, and six members elected at large, each to serve for a term of one year, and to be ineligible for re-election for one year from the date when his term expires. If this is looked upon favorably I recommend that you elect at this convention these additional members of the executive committee, which members can act without vote until the constitution is amended at the mid-winter meeting.

It seems to me that in this way there will be a constant influx of new blood into the direction of the association's affairs, and that the thought and wishes of the industry will be more fully and directly registered than under the conditions now obtaining.

CHANGES RECOMMENDED IN COMMITTEES

It has been possible for the association to perform an increasingly important work along the lines of broad publicity for the industry during the last year. The importance of this work cannot be overestimated. The so-called electric railway problem has come to be recognized as a matter of profound public interest, and public attention is everywhere being devoted to the readjustment of present conditions. Our course of conduct is well indicated for us. It is our duty to work with the public and not as an independent group. The information, the knowledge, the experience necessary to a proper and satisfactory solution are in our possession and to the degree which we make this available to the public, the outcome will be satisfactory. The field of our useful activity in this respect is well defined. It is distinct from purely local publicity and should confine itself to the more general and universal phases of its subjects.

A publicity committee of exceptional personnel was organized during the year. It has carefully considered the possibilities before it and is convinced that a work of great benefit and importance may be performed. The success that attended the efforts of the Committee of One Hundred in this respect is well known to it. It may be truthfully said that through the work of that organization, the popular conception of the electric railway problem has been so changed that it is no longer regarded merely as a local question involving only local issues, but is considered in its true light as a national problem, involving great economic and political principles, and that its correct solution is a concern of all the public.

At a meeting of the executive committee of the Committee of One Hundred in New York recently the question of the future of the committee was thoroughly discussed and a resolution unanimously adopted recommending that the committee be continued for the purpose of carrying on the public dissemination of information. This resolution will come up for consideration at a meeting of the entire Committee of One Hundred to be held in Atlantic City later in the week. I trust that it will then be approved and that the committee will then be continued in the interest of the industry. If this be done, I recommend that the work of the association's committee on publicity be amalgamated with that of the Committee of One Hundred and carried on under its direction.

AFFILIATED ASSOCIATIONS HAVE BEEN EFFICIENT

Your affiliated associations have during the year just passed functioned in a manner particularly efficient. Their activities, interrupted during the war, are now again under way, and the investigation of those subjects which most intimately affect problems of accounting, engineering, operation and the disposition of claims have been resumed. Attendance has been as large and the work has been as actively pursued as heretofore. A study of the program of the affiliated associations will disclose to you better than I can do it the nature of the work that they are doing, as well as its great value.

STABILITY OF INDUSTRY DEMONSTRATED

The industry which we represent has, I am firmly convinced, passed through its period of greatest travail, and is now upon the road to better days. Statistics indicate for practically all companies both larger earnings and increased riding. Some companies are now earning a satisfactory return, and many are earning an amount above their operating expenses and fixed charges, while few are in that desperate financial condition that was present with nearly all of them two years, or even a year, ago.

This showing emphasizes the inherent stability of the electric railway industry. The troubles that have come to it are not the result of any causes involving the nature of the enterprise. No business in the world is more certain or assured. The service performed is a necessary service. It will be essential so long as communities exist. From the disaster that has overtaken it, it emerges with none of the demand for its service destroyed, and, under conditions that would have caused the disintegration of most private industrial enterprises, it has remained intact.

Its misfortunes have been the result of mistaken policy in conduct by the men who operated it and mistaken policy in its control and regulation by public authorities. There has been too wide a departure from basic economic law in both instances, so that when an emergency came, the industry was in no condition and without the means to guard itself. What then was and is needed to restore it to a completely sound condition is the recognition and the adoption of a certain few common-sense principles that are by no means new, but which because of the rapid development of the industry have been lost sight of.

The most encouraging sign of the present times in so far as electric railways are concerned is the growing public recognition of these principles. A perusal of the reports of the numerous commissions, national, state and local, that have investigated and studied electric railway affairs discloses a striking unanimity in the conclusions reached. The three foundation conclusions met with in the report of the Federal Electric Railways Commission are distinctly stated and alone more than compensate for the time and effort of the commission. This report carries an authority which is most beneficial and far reaching.

These basic principles are:

First—That the industry is an essential industry and that there is in sight no means of local transportation that can adequately perform its function.

Second—That under existing conditions public ownership and operation is inadvisable in the interest of the public.

Third—That in the regulation of electric railways provision must be made through fares for such an adequate return upon the capital used and useful in the public service as will restore general credit, inspire confidence in investors, and insure a continuing flow of new capital.

These principles are being reflected in all of the other reports which I have examined and seem to me to indicate a growing public knowledge of the economics of the situation and to form a basis for a lasting readjustment of the industry's affairs.

Cardinal Points Made by President Pardee

The electric railway industry is essentially stable. The troubles that have come to it are not the result of any causes involving the nature of the enterprise. No business in the world is more certain or assured. The service performed is a necessary service. It will be essential so long as communities exist. From the disaster that has overtaken it, it emerges with none of the demand for its service destroyed, and under conditions that would have caused the disintegration of most private industrial enterprises it has remained intact. Its misfortunes have been the result of mistaken policy in conduct by the men who operated it and mistaken policy in its control and regulation by public authorities. There has been too wide a departure from basic economic law in both instances, so that when an emergency came, the industry was in no condition and without the means to guard itself. What then was and is needed to restore it to a completely sound condition is the recognition and the adoption of a certain few common-sense principles that are by no means new, but which, because of the rapid development of the industry, have been lost sight of.

Re-established Credit for Electric Railways Necessary

There is general recognition of the necessity of higher fares. Statistics gathered by the association show that in more than 500 cities in the country electric railways have increased their fares. In 81 such communities having a combined population of more than 6,500,000 people a 10-cent base fare is charged, in 58 others the base fare is 8 or 9 cents, while in more than 300 it is either 6 or 7 cents. And contrary to prophecies and statements, made in connection with the subject, there has been no general decrease in the number of passengers occasioned by these increases. Fares are but responding to the influence of the general higher price level. They have not, however, kept pace with the increase in individual income and the ability of the public to pay them, and that is a sufficient guarantee that there will be no general falling off in the riding habit for this reason.

But neither increased revenue, increased riding or the public disposition to permit of increased fares has as yet restored the credit of these companies, and without credit the future usefulness of this utility will most certainly be destroyed. The investor has been badly used in the last few years. He has been compelled to shoulder the entire burden of costs caused by the failure of the machinery of public utility regulation to respond to a great economic emergency. His confidence has been destroyed to a degree that makes its restoration impossible until there is some satisfying assurance that his interests will not again be sacrificed through a failure to apply the fair and just principles of upright business dealings to the regulation and control of the electric railway industry.

I can see plain signs that this assurance will be forthcoming. I can read in recent decisions of courts and commissions and in settlements that have taken place in many communities not only a desire for equitable adjustment but a growing recognition of the right of investors in the public utility securities to receive the same treatment that is accorded to other enterprises, and of the necessity of providing such safeguards to capital in these utilities as will preserve its integrity and assure to it an adequate and satisfactory return. Flexibility in fares and charges, flexibility in the rate of return, a greater freedom of management, public protection against unfair competition—these are essential to the restoration of credit, and it is these essentials that are being more and more frankly recognized by the representatives of the public and by the public itself.

The day is not far distant when these principles will everywhere be so fully understood and appreciated that regulating laws, ordinances and franchise contracts will be based upon them, and when this is done the question of electric railway credit will be solved, the railways will be able fully to function in the public interest, and public utility investment will regain its proper place as the soundest, safest and most conservative investment next to government securities.

With this convention I am ending my service of two years as president of your association. When I assumed office I asked for the co-operation of all the membership, railway and manufacturer. It has most willingly and fully been accorded me. I am sincerely appreciative and regret that I have not words in which adequately to convey my sense of gratitude for the support that has been given me by my fellow officers, by our able and efficient secretary and his staff, by the technical press, and by each and all of you whom I have called upon for advice and assistance. It is with feeling of pride in the association, with confidence in its future and with the greatest hopes and belief in the future of the industry that I am relinquishing my charge.

The Settlement of Labor Disputes*

By Hon. Henry J. Allen

Governor of Kansas

The Government Has a Right to Insure the Continuity of Public Service—The Right to Work Is as Sacred as the Right to Loaf—Experience in Kansas Cited to Illustrate Fundamental Relations of Workers and the Public Welfare

Gov. Henry J. Allen

THERE is coming to the people of our country a new appreciation of the fact that electric railways are obliged to take in more than they pay out, a new appreciation of the fact that this industry is essential to the growth of institutional life and community life. There has been existent in the country for a long while the unjust feeling that the electric railways are a necessary evil, but the situation will improve. Out in my State, during the last nine months, a court which I appointed has increased street car fares in four localities and there is still a reasonable probability that I may be re-elected, although I do not deny that it is not helping my vote any.

I am going to discuss a theme which is probably the most challenging one in the United States today, the theme of industrial relationship. After we have settled everything else, after we have decided whether we are going into the league with Harding or stay out of the league with Cox, after we have made all these arrangements, we shall still have with us the industrial problem.

In Kansas we have sought to stabilize this relationship by turning over to a Court of Industrial Relations the age-old quarrel. I shall relate the progress made in the few months since this court was provided for in our statutes, giving first a little of the background against which we built this new expression of justice.

How the Coal Strike Was Broken

You all remember that when the coal strike came on last winter, a monstrous attack on the public, made in the interest of what in very polite phrase is called "economic pressure," most of the people of Kansas were soon out of coal. In two weeks we closed the schoolhouses and the business houses closed. There was suffering in the homes and some suffering in the hospitals.

I asked the Supreme Court to turn over to the State the custody of some 300 or 400 coal mines, in order that we might produce coal for the people who would suffer otherwise. I shall never forget the look of surprise that came over the face of Chief Justice Johnson, who has been at the head of our Supreme Court for forty years. He asked, "What allegation will you make on which to take these mines over?" I replied, "Judge, any allegation you think will work."

Although I am credited with considerable courage in straightening out that strike at the coal mines, the first and great credit for courage in that matter belongs to the Supreme Court of the State. The judges of that court did not hesitate to do a needful thing merely because it had never been done before.

After we took over the mines I pleaded for a week with the miners to go to work for the State, realizing they would not go to work for the operators. I offered them increased wages and guaranteed that whatever benefits came to them out of the controversy, going on there at that time between their officials and various of the operators, the benefits would be retroactive. In justice to the miners I think that many of them would have been glad to go back to work when I placed before them the picture of suffering that would ensue in case they did not do so. But they entered the plea that unless the president of this district ordered them back to work they could not return. Later, when the strike had been broken, one man who had remained loyal to his task was blacklisted and driven from the district.

When we took over the operation of the mines I called for volunteers to dig coal. I was not concerned at that moment in the justice of the fight between the operators and the miners. I was concerned only for the relief of the public. Within twenty-four hours more than 11,000 people in Kansas had volunteered.

From among the volunteers I selected several hundred young men to man the mines, men who had been in service overseas. I had seen them over there overcoming obstacles of great difficulty, so that when I heard the district president of the miners' union say that not a pound of coal would be produced in that district except by union men I knew that the district was in for a surprise.

The morning when the first trainload of volunteers arrived in Pittsburg the miners were assembled at the station to give them a proper welcome. When the miners realized that they were a group of good-natured young Kansans, who had come there to relieve the emergency of the public and not to take part in a labor war, they received them in silence.

Well, these fine Americans went to work, and that night, while they were throwing out the guard line, they began to pump the water from the pits. The next day, against obstacles which seemed to be insuperable, at one of the mines they had produced a carload of coal. The next day they mined ten carloads of coal, and on the next day thirty. In ten days these young chaps, who had never seen a coal mine but who were trained in all the fundamentals of American belief in American justice, had produced enough coal to relieve the emergency in more than 200 Kansas communities that were suffering from lack of coal.

But as these boys were performing this great task they did another thing, fundamentally of greater value even than the coal we needed; they arrived at the conclusion for themselves and for all of us that the State has the right to protect the public against anybody's strike in an essential industry.

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*Abstract of address delivered before American Electric Railway Association, Atlantic City, N. J., Oct. 13, 1920.

THE ESTABLISHMENT OF THE INDUSTRIAL COURT

Next a special session of the Legislature was called to deal with the situation and to write into the statute that the paramount right is the right of the public. After suggestions had been received from all quarters and considered a law was passed essentially as originally drafted. It was passed almost unanimously. It has since been held to be constitutional by the Supreme Court of the State. It is the law of the State, and everybody expects that it is to be enforced just as every other law in the State is enforced.

It may be said that we have taken from labor the only weapon it had, its right to strike. If we had taken away from labor that weapon and had provided nothing in its place we should have had a very unjust law. But every one of us must realize that the history of progress in our day is the history of the better condition of the workingman. It is true we have taken from him in Kansas the weapon of the strike, but we have given him for use in every honorable controversy a more dependable and usable weapon; we have given him the backing of the State government, and it is the first time he has ever had a weapon that will do business.

Down in the Pittsburg district, where the need for this legislation first occurred, there had been in the forty-five months that preceded the writing of the Kansas court bill 705 strikes at various mines, which cost the miners more than their victories brought in. Surely, the strike, the weapon that cost the men so much and can do so little, is not so effective a weapon as the weight of justice guaranteed by an impartial and righteous government.

RIGHT TO LOAF NOT NECESSARILY SACRED

Out there the most frequently uttered misrepresentation of the law is that it takes away from a man his God-given right to quit work. What the law really says to a man or to a group of men is: "You may quit work whenever you wish, but you cannot come here tomorrow with your pockets full of dynamite, to keep from working this group of men who wish to continue on the job." The right to work is just as sacred as the right to loaf. The court holds that the basis of industrial business is founded upon collective bargaining, and when there is any effort to get together through conciliation and arbitration, the court encourages it. But when a strike threatens the public, then the court steps in with its substitute for the strike, and for the protection of the public it says that these industries shall keep functioning while the justice of the matter is being determined. That is all there is to it.

A man representing railroad labor asked me the other day: "Why don't you put on the court a representative of organized labor?" I answered: "For the same reason that we did not put on the court a representative of the employing capital." If a representative of organized labor, a representative of employing capital and a so-called representative of the public had been put upon this court should we have had a court of justice? No, we would have had a board of arbitration. We have discovered in the last sixty years of trial that arbitration does not work; or if it does work, it does not do any good. A board of arbitration does not properly care for the rights of the public, which in all essential industries is justly concerned in a quarrel which it was not responsible for bringing about. We have discarded arbitration and established a court of adjudication, comprising men appointed because of their impartiality, their justice, their honesty. Their justice, honesty and integrity are guaranteed by a responsible government. We have appointed them upon the broad principle that the public, labor and capital are entitled to protection.

They say our plan is regulative. Well, we are all regulated, or ought to be, but we never realize it until we come to the point where regulation hits us and we realize we are in a government of law and that liberty does not mean license.

Why, government regulates us from the hour we are born until the day we are buried. How absurd it is to presume that government may not also find justice for labor and capital in the quarrels of which they have made the public the victims during the last fifty years in the United States.

As I see it, we have based our law upon the oldest principle of state government and there never was any question as to whether we could do this. There is no difference in the classes of quarrels; there is merely a difference in their names. There has never been any reason why government should not supply justice for the laboring man and for the employer in those quarrels. The reason why that action has never been taken is that statesmanship has not dared to brave the wrath of the classes on either side. The fundamental principle has been there since there has been an organized society.

COURT HAS DECIDED SEVERAL RAILWAY CASES

If we are going to have protection, there must be a guarantee that justice shall go with that protection. In Kansas, where we have substituted impartial adjudication for the strike, or arbitration that precedes the strike, we are getting good results. The court has been in operation four and one-half months. We have decided over a dozen cases brought by the heads of organized labor. We have decided some cases brought by capital, but organized labor has made more use of the court than capital has.

Our first one was an electric railway case.* The interurban system known as the Joplin & Pittsburg Railway had two expensive strikes in the last three years. In 1918 there was a strike that brought the company to the verge of a receivership, and cost the public untold millions. At the end of ninety days the strikers came back and solicited from the employers the privilege of going back to work under the old wages and under the old conditions. When the court had been established, the president of the Kansas Federation of Labor asked for a living wage for the men. Then the presiding officer of our court called his attention to the fact that that is a line of language which we do not use in the Kansas Court of Industrial Relations. The law says that every such man is entitled to a fair and just wage and wholesome place in which to work. What is a living wage? It is a wage sufficient to meet the costs of subsistence. What is a fair and just wage? It is a wage sufficient to meet the cost of subsistence, plus sufficient to give the laboring man an opportunity to enjoy for himself and his family some of the various forms of modern civilization, plus sufficient to enable him with reasonable frugality to build up a safeguard against sickness and old age. The court awarded a fair and just wage, but the railway said that while it would have to grant this wage it would not have enough money to pay it." The court, then, after analyzing conditions in the district gave to the railway sufficient increases in freight and passenger rates to enable it to meet the obligation of the new order. The public, which would not have been satisfied with the results of a strike, the public, whose attitude probably kept the railway from raising rates, accepted the order with satisfaction.

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*See article in issue of ELECTRIC RAILWAY JOURNAL for May 15, 1920, page 1013, for details of this case.

In the case of the Topeka street railway there had been strikes without effect. When the Court of Industrial Relations was created the motormen petitioned for an increase. The increase was given them and they were satisfied. The street car company officials said that they would try it for three months, but thought they could not carry the burden. Later the court, taking their condition into consideration, increased passenger fares, and now nobody is opposed to the arrangement. The organization is functioning and the public is satisfied.

The following incident shows the curative effect of the court. At Goodland there was an open car shop. For thirteen years the employees had been trying to get the Rock Island Railroad to inclose it. It was out on the plains where the wind blows violently at times. It was no place to have an open shop of that kind.

In 1905 the railway employees got a bill through the Kansas Legislature requiring every railroad company to inclose its repair shops, but through a technicality it was not effective. Then the Court of Industrial Relations was created, and after considering that every man is entitled to a healthful place in which to labor it took up this case on application of the employees. It took just a week to try the case, and the railway was ordered to inclose the roundhouse and have it ready by a certain date.

SOME OPPOSITION TO THE INDUSTRIAL COURT

Society is formed in three layers. At the top 2½ per cent represents the employers, at the bottom 5½ per cent represents the employees, and in between 92 per cent represents a good-natured protoplasmic mass, having no power of self-defence except the good-natured powers of natural resistance, and then at the top and bottom begins this economic pressure. Out in Kansas the 92 per cent have come out and said the hitherto submerged nine-tenths of the population is going to fight for itself under the protection of government.

Out in our state some labor leaders are advising the defeat of every candidate for the State Legislature who voted in favor of the industrial court bill, and the support for Congress of the men who will represent the cause of labor. Do we want that sort of Congress, a Congress of men not representing the country, but representing the group? If not, the challenge to America at this hour is to hold fast to the political type of government and to meet the challenge of any class that thinks it can live above the law. Why do the labor leaders fight these laws? They fight them because labor leadership realizes that if government may find justice for the laboring man in his quarrel with capital then there is no need any longer that the laboring man should pay out of his pockets every week a share of his wages to support those who live off labor.

It is my belief that this law will give a new atmosphere, a new moral tone and functioning power to organized labor. In the first place, it removes that which is the very worst thing about organized labor, its feature of compulsory unionization. It leaves the laboring man free, and that is what we want. It only takes away the power to start a civil war when he does not get what he wants, or when somebody else does not get what he wants; when somebody in Seattle falls off a dock and Seattle goes on a strike and a group of men strike in Atlantic City through sympathy.

It does away with the far-flung system of making class war upon the public, and it leaves to them the power they may use through their solidarity when they come into what they call collective bargaining. We say to labor: "You shall have your solidarity for proper purposes, to increase the good of those who labor with you. But when you come into certain communities that are 100 per cent against you you realize in those communities that you have not secured the best expression of brotherhood."

A poor woman came to me to my door with all the earmarks of hopeless poverty. She said, "I spent all the money I had to come in here from Weir City to tell my troubles. My husband is on strike and has been on strike for six months, but he does not know what the strike is about. We have tried to keep the family alive on the strike benefits of $8 per week, and when your volunteers came down to the mine I went to see if I could get some mending to do for the men. I brought home a lot of it, but last night a committee from my husband's union called on me and said that I was not to do that work and could not go back to the mine." I said, "Go ahead with your work, and I will see that they do not molest you." She said, "I cannot do that because when you go away they will burn down my house." Surely a government may foster a better spirit of brotherhood than that.

What we are hoping to do in Kansas is to give to labor a new hope and to the public a new sense of protection. The temper of labor is growing mellower over the operation of the court. The other night I spoke in my State in a great railroad center. Many of the public men were nervous about the attitude of labor, but we had a wonderful meeting, and I explained to these railroad men what this law will do for them. All reasonable men, whether they belong in the ranks of capital or labor, realize that we are working under modern conditions and that all the elements of manufacturing, production, transportation and distribution are mixed together in a common machine; that a break in one part of the far-flung machinery breaks down the whole public relations.

I hope the railway men, who represent powerful interests in their communities, will get acquainted with the members of their legislatures and insist upon the provision of industrial courts by the legislatures of their states. This legislation is bringing forward that day which will place in the right relationship the whole body politic, the subject of industrial quarrels. Several states plan to have industrial courts and the movement is spreading.

The day is here for this legislation. The program is simple and the foundation ample. All that is needed is to get the politicians away from their dread of the labor leaders.

The Problems of Coal Supply*

By Eugene McAuliffe
President Union Colliery Company, St. Louis, Mo.

Storage at Point of Consumption Will Improve "Load Factor" of Fuel Production and Distribution—National Legislation Providing for Seasonal Variation in Coal-Haulage Rates Would Encourage Uniformity of Demand for Coal and Reduce Mining Costs

AS A people we are slow to see great changes in the making. We long ago came to the conclusion that coal was plentiful and cheap and classified the fuel problem as one easily to be disposed of. Of late, however, the job of fueling an electric railway, a power plant or even a modest household seems to offer some difficulty. The unexpected and grievous interruptions in supply and the startling increases in the cost of coal experienced during the past three years have aroused greater attention and have forced some measure of understanding of the vital importance of the coal industry. Appreciation of the problems of coal production and distribution must become still more general and the co-operation and interest of all users must be obtained if we are to secure a solution of these problems and any permanent improvement in the conditions that surround our coal supply.

In 1870, five years after the close of the Civil War, our annual coal production of all grades was 0.857 ton per capita, while in 1918, less than half a century later, it had increased to 6.44 tons per capita. During 1919, notwithstanding the falling off in business after the armistice and the loss in production due to the five weeks' strike in the fall of that year, our per capita consumption was 5.17 tons. To this extent and at this rate has coal grown into our national life. Any interference with the production of coal, however occasioned, is reflected immediately in the activity and earnings of the thousand lines of endeavor dependent upon it. To men so thoroughly aware of the facts as electric railway men are it is unnecessary to enlarge upon the magnitude and the fundamental importance of the coal industry, nor do I need to emphasize its vital relation to their own business. Electric railways use a large and growing proportion of all the coal produced and its cost to them is a very heavy share of their operating expenses.

THE SITUATION AS IT EXISTS TODAY

Our present chaos is due to causes which are always at work in the coal business, but which have operated in aggravated form during the last twenty months—a depressed and waiting market, with coal stocks deliberately allowed to become exhausted, followed by (and in large measure the cause of) the most protracted and widespread strike that the industry has experienced since 1910, when 215,640 out of a total of 555,553 men employed in bituminous coal mining lost an average of eighty-nine days each, or 19,234,785 man-days. The facts are so little understood as to warrant their brief review. Let us therefore go back to the bitter experiences of the winter of 1917-18, now largely forgotten, when the Fuel Administration found it necessary to issue orders partially suspending the use of fuel. From this experience and the urgency of the war demands came a vigorous campaign to increase coal production, in response to which the mines of the country during 1918 produced 579,385,820 net tons of soft coal and 98,826,084 net tons of anthracite—by far the greatest tonnage ever turned out in twelve months. Of this amount, 550,000,000 tons of soft coal were consumed or exported and about 30,000,000 tons surplus were added to storage stocks.

After the signing of the armistice in November, 1918, and during the mild winter which followed, the demand for fuel slackened and the coal industry entered a six months' period of poor market and low production, from which we have not yet recovered and which laid the foundation of our present shortage and confusion.

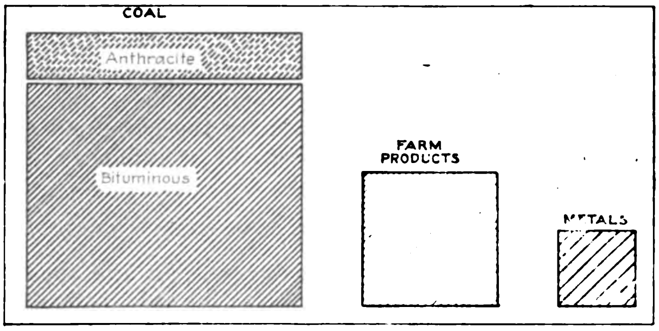

FIG. 1—COMPARATIVE WEIGHTS OF SEVERAL BASIC COMMODITIES PRODUCED IN THE UNITED STATES

We entered the year 1919 with about 30,000,000 tons of bituminous coal in reserve and with the opinion prevailing among buyers that prices of coal and other commodities would at once decline. During the spring of that year the Railroad Administration unfortunately entered into a controversy with the coal operators over contracts for the ensuing year, the former insisting upon a lower price and the re-establishment of the policy of "assigned cars," and the operators demanding the prices previously fixed by the Fuel Administration, while public utilities and other buyers awaited the outcome of the controversy. Meanwhile the railroads and other consumers were using up their reserve stocks, 250,000 open-top cars stood idle on sidings for lack of traffic, and the coal miners became daily more and more restive, due to the fact that in many instances they could work but one or two days a week. This was the gestation period of the strike of Nov. 1, 1919. Toward the middle of the year, as mutterings of the coming mine-labor storm became audible, every consumer sought to buy; by July 15 the car surplus was exhausted and in August a car shortage existed from southeastern Kansas to Roanoke, Va. This outcome had been clearly foreseen by the operators, and their national association, in good faith, outlined and attempted to carry on an advertising campaign to stimulate buying, which, however, was discontinued early in the summer largely because of the criticism leveled at it by officials of the Railroad Administration. In July, for the first time, orders became available and the mines worked steadily for three or four weeks until the car shortage developed, this shortage continuing until Sept. 15, when cars in adequate numbers were again furnished preparatory to the strike.

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*Abstract of address delivered before the American Electric Railway Association, Atlantic City, N. J., Oct. 12, 1920.

On Nov. 1, 1919, came the coal strike which lasted until Dec. 12; during this time soft coal production fell behind about 42,000,000 tons and the 30,000,000 tons in reserve at the beginning of the year had been largely consumed. The year 1919 closed about 30,000,000 tons short of a safe supply, or about 6 per cent of the estimated consumption for the current year. During the first six months of 1920 we fell still further behind, chiefly because of a continued shortage in car supply, which was greatly aggravated by the strike of railroad switchmen. I do not hesitate to say that the publicity given to the quarrel between the Railroad Administration and the coal operators, which encouraged the general public to refrain from purchasing fuel and to burn up their reserve stocks, was the last pound which sunk the industry in the morass of strikes, with their attendant disregard of contract obligations, defiance of law and economic loss, from which we are still suffering.

As intimated above, the present situation had its origin in adverse conditions which are inherent and chronic in the industry, and it is to these conditions that I wish chiefly to direct attention in this paper. They are fundamental and general and they cannot be cured without the assistance of the entire buying public. The operator by himself can do little. The permanent remedy of these conditions will require the co-operation of the operators, the railroads, such large buyers as the members of the American Electric Railway Association, and some governmental or other agency to correlate their efforts.

THE JOB IS A BIG ONE

The magnitude of the coal problem has always been underestimated. A comparison of the coal requirements of the nation with the aggregate tonnage of small grains—wheat, corn, oats, rye and barley—plus our potato crop, presents this vital subject in a new light, and comparison with the tonnage of our basic metals also offers food for reflection. The relation of the weights of these products is shown in Fig. 1, herewith.

The coal tonnage amounts to 310 per cent of the combined weight of the grains, the potato crop and the basic metals. The data serve to reveal the enormous physical proportions of the coal business and to give us some idea of the task which the transportation of coal imposes on our railroads. The movement of coal is the largest job confronting them and it constitutes more than one-third of their total ton-mileage.

The coal industry produces an essential commodity for which the year's demand can be fairly well predicted, and it has always attracted sufficient labor of good grade. Why then has it suffered such frequent disruption and difficulty? Chiefly on two accounts: (a) The demand is extremely variable and the mines run under an exceptionally bad "load factor," (b) the industry cannot store any considerable portion of its product and it must have, day by day, an adequate supply of cars to take away the coal as it is produced.

From these two conditions arise all the other difficulties of the industry — overdevelopment, unattractive labor conditions and strikes, unreliable supply, high and variable production costs and unstable prices.

While, of course, demand and production are interwoven as they are in all business and react on each other to some extent, there are inherent seasonal variations in demand which have no relation whatever to the ability of the mines to produce. The mines of the country could work at a fairly uniform rate throughout the year provided their product were regularly taken away. What actually happens year after year is illustrated in Fig. 3, which applies to the four years preceding our entrance into the war and in which the wide seasonal variations are clearly shown. The conditions during the two pre-war years, 1913 and 1914, are the most typical. The conditions prevailing during the following four years are illustrated in Fig. 2. It may be noted that in 1914 the production for March is 123 per cent of the average, whereas the minimum production immediately follows in April and reaches only 68 per cent of the average, and speaking generally for the whole industry the minimum monthly demand is only two-thirds of the maximum demand.

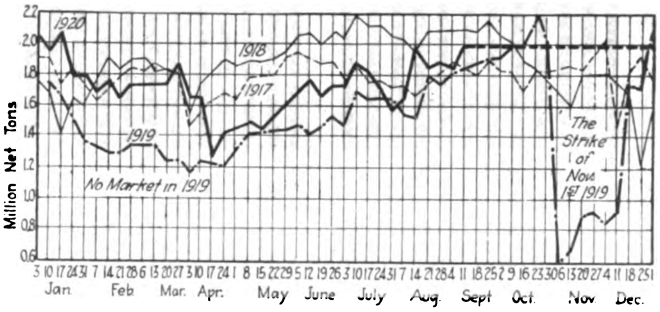

FIG. 2—RECORD OF COAL PRODUCTION IN THE UNITED STATES

STORAGE AT THE MINES IS OUT OF THE QUESTION

Storage at the mines is frequently suggested as a remedy for the poor load factor, but there are few mines provided with storage and rehandling facilities for even a few days' supply. Storage at the mines on any large scale is out of the question, quite aside from any consideration of the cost of providing storage facilities. It would entail the storing of enormous stocks of coal at a few points, and the danger and expense arising from fires would be vastly greater when in relatively small storage piles at the numerous points of consumption. Furthermore, mine storage would result in the degradation through weathering and rehandling of a far larger proportion of the country's coal supply than is entailed by storage at destination. With mine storage piles in general use, the mines would inevitably pass through them more than just the amount necessary to even off the peak of the load, for instead of loading from storage only during the time of maximum demand, they would undoubtedly have to do so to a considerable extent at other times in order to minimize undue weathering and fire risks. Again, there are hundreds of mines throughout the country at which there is not adequate space for storage.

Serious as are these objections, they are less important than the fact that storage at the mines would in no sense solve our present transportation problem.

The railroads suffer as much as the mines from their present badly distributed load; the number of open-top cars, the capacity of tracks and terminal facilities are all inadequate for their winter peak load, nor would it be sound economics to require them to provide facilities adequate for four months' maximum traffic, a large share of which would have to lie idle during the remainder of the year. We should, if possible, try to move more coal during the summer than in the winter, for the summer is not only the time of low transportation load, but the cost of train operation is very much less under the favorable weather conditions which then prevail. These considerations constitute by far the most serious objection to the widespread storage of coal at the mines. Coal production and transportation are inseparable and the permanent remedy lies not in producing and *storing* during the summer months enough coal to provide for the peak of the demand, but in producing, selling and *transporting* during these months enough coal to supplement normal production during the four months of the winter.

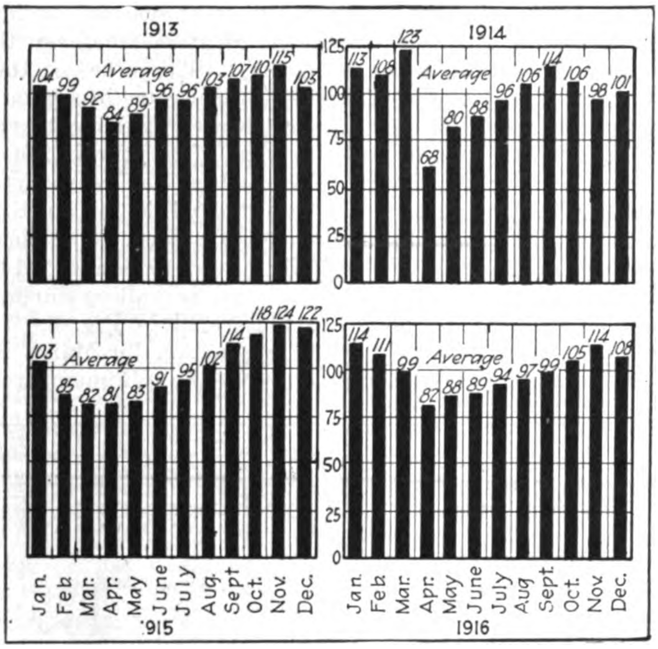

FIG. 3—DIAGRAM INTRODUCED TO SHOW SEASONAL VARIATIONS IN COAL SUPPLY CONDUCING TO HIGH MINING AND DISTRIBUTION COSTS

If we admit the impracticability of general storage at the mines, it follows as a matter of course that they must have day by day enough cars to carry off their day's production. Car supply is therefore the determining factor in coal production. There are always periods of the year when cars are unavailable in sufficient numbers and there are frequently periods when car shortage is serious and widespread. This chronic deficiency in car supply has been for years the subject of mutual recrimination between the operators and the railroads. We shall never have a steady and adequate car supply until we get a proper conception of the magnitude of the coal tonnage and lay down a definite program for leveling up the general load on the railroads.

Another factor in the situation, closely related to car supply, which still further impedes mine output, is the coal-car distribution rules which prohibit a mine from loading coal during more than one shift per day, even during the mine's development period. These rules, promulgated by the United States Railroad Administration, were originally advocated by mine owners whose properties were being strangled by labor union legislation and who sought to deny double-shift working to competitors in non-union fields. I know of no other industry which suffers under such a disability, and I do not believe there is sufficient warrant for transportation authorities to deny the producer the privilege of loading coal during any hour of the twenty-four, if the demand is heavy enough to warrant working two shifts.

IRREGULAR WORKING INCREASES MINE COSTS

Superimposed on the loss of output due to variable demand and the lack of cars is the loss occasioned by the voluntary absence of the mine workers at times when cars are available and when the opportunity for work exists. This loss—one of the internal problems of the industry—is a serious obstacle to low mine costs and to the welfare of the individual miner. There are very few mines in which the average number of men absent does not amount to 10 per cent, and at many mines this average ranges from 16 to 30 per cent. This bad habit arises, in part at least, from the example and influence of irregularity of operation due to causes beyond the workers' control, and it constitutes a serious drain on output.

The cost of production is increased by such irregularities in working time and output as have been cited above. As in any business, the heavy fixed charges run on, and there are important items of operating expense and maintenance which must be incurred whether the mine is producing or standing idle. The amount by which lost time increases the cost of production is strikingly shown by a study of this matter made during 1917 by the engineers' committee of the United States Fuel Administration. This dealt with cost data covering a period of twelve months and derived from seventy-three mines located in the New River district of West Virginia. It discloses the increases in the cost of producing coal occasioned by an insufficient car supply, shown in Fig. 4.

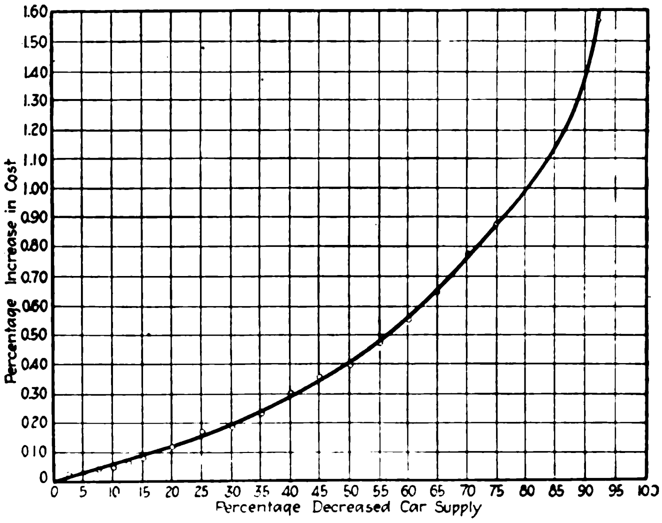

FIG. 4—RELATION OF RAILROAD CAR SUPPLY TO COST OF COAL

Irregularity in working time due to variations in demand and deficient car supply is chiefly responsible for the unsatisfactory conditions of mine labor. There is no other great industry in which the workers are so constantly subjected to such variations in the opportunity to work and in their earning capacity. The number of working days lost each year from 1913 to 1919 for each of the mining regions of the country is shown in Fig. 5. The days lost include the idle time due to lack of demand, lack of cars, and all other causes except voluntary absence on the workers' part; that is, the chart shows the number of working days that the miners were compelled to miss. For the whole bituminous industry, during these seven years, the least number of days lost in any field was thirty and the maximum 145; conditions in the anthracite region were better.

The economic and sociological effects of such conditions are obvious. They lead to periodic hardship, they foster discontent and exorbitant wage-scale demands, and they are the basis of most of our mine strikes. They are responsible for the fact that mine workers are migratory and unstable; forced to be idle a quarter of their time, they seek other fields or leave the industry. Mine workers as a class are renters, rarely establish permanent connection and eat up their income in moving, rents and perpetual buying on expensive installment plans.

The frequency with which mine workers resort to the strike weapon has become appalling. There are two distinct forms of striking; one the result of orders emanating from the general officers of the union, such as that which took place on Nov. 1, 1919, the other the lawless strike at individual mines, more recently camouflaged as a "vacation." There is a grievous lack of integrity and discipline within the ranks of the mine workers, and the internal workings of the individual local union, as well as of the parent body, are not infrequently dictated by a few individuals of American nationality or British origin who ruthlessly overwhelm the more staid foreign element, which is frequently unjustly reported as lawless and lacking in the qualities that make for good citizenship. I speak plainly when I say that the rivalry for office that exists within the union's ranks has not only menaced all organized labor but has not hesitated to threaten and menace society. The complacency with which this situation has been viewed by the public at large largely absolves the coal operators from the charge of indifference to the evils that flow therefrom.

As a people we know too little of the industry and its inner workings; we do not adequately sense its vital relation to our economic welfare; we have been little concerned with the causes that inspired the building up of the strongest single labor organization in the country, the United Mine Workers of America. This union, which in 1897 had a scattered following of only 9,737, now has a membership upward of 615,000 men of diverse nationalities and varying degrees of intelligence, who carry out the orders of their officers with an obedience sometimes worthy of a better cause. Its strength has not always been used unselfishly and wisely, but many of its acts have arisen from indefensible conditions within the industry, some of which still persist, and the responsibility rests with the operators, the heads of our transportation companies and the public to remedy these conditions.

THE MINING INDUSTRY IS GREATLY OVERDEVELOPED

Some of the conditions thus far outlined have encouraged an overdevelopment of the industry and the mining of much coal which would better have remained in the ground. The bituminous mines of the country have a potential annual capacity of from 675,000,000 to 700,000,000 tons, which is about 125,000,000 or 150,000,000 tons in excess of our present needs. The bulk of this capacity is in permanent mines of good size. The overdevelopment is largely in permanent facilities which represent an investment in excess of $2.50 per ton of annual output.

The conditions have encouraged, also, the development of so-called wagon mines, the operation of most of which may be characterized as a public nuisance. While they constitute nearly a third of the whole number of mines in the country, they produce less than 2 per cent of our coal, and they not only disturb labor and market conditions but they also pour out in times when demand is brisk a product which is largely unfit for use.

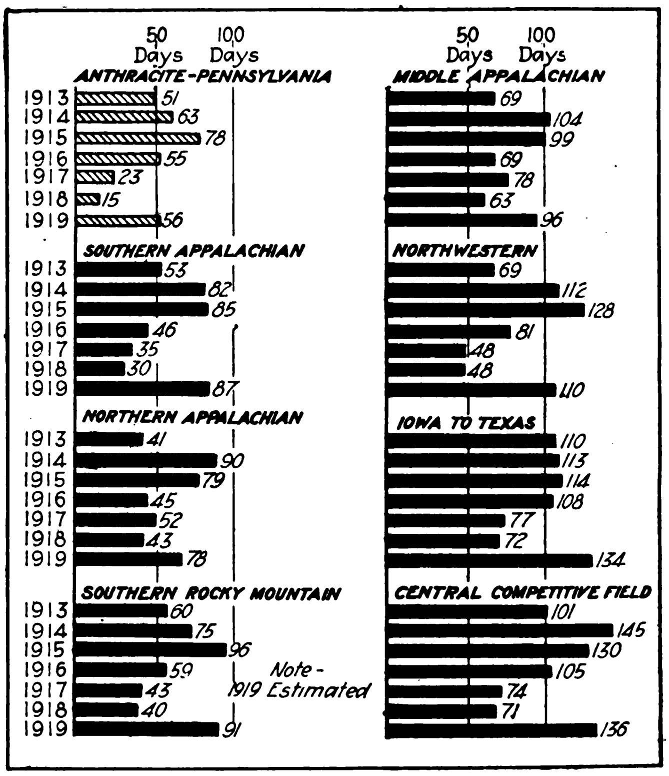

FIG. 5—LOST TIME IN COAL REGION FROM 1913 TO 1919

Less complete statistics compiled by the Geological Survey indicate that during 1918 production reports were received from 2,719 small mines (very few of which were equipped with tipples) whose total contribution to the coal production of the country was 1,108,000 tons, or an average of 406 tons each, per year. A summary of the 1918 reports shows that there are not less than 3,300 small so-called country banks and local commercial mines, producing less than 3,000 tons each per year.

The 5,888 small mines producing less than 2 per cent of the nation's bituminous coal in the year 1917 can be best compared to the jitney competition from which the electric railways suffer. These small openings, like the jitney, come out of their hiding places only in times of coal shortage and excessive prices. Instead of relieving the situation, they aggravate it by offering, for short periods, high rates of wages, which draw the migratory element in mine labor away from competent and well-equipped mines where their output would be more than twice as much per man. These small mines also make a demand on railroad facilities out of all proportion to the number of loaded cars which they ship each day. Their cars, placed one at a time, frequently absorb the limited space available on congested team tracks, delaying the placing, unloading and removal of general freight for which such tracks were built. With the disappearance of coal famine and high prices, the wagon mine operator takes his team or truck to the barn, balances his accounts and seeks new lines of endeavor.

Not only do these small mines absorb an undue share of our labor and transportation facilities, but they turn out a grossly inferior product, containing often a non-combustible content reaching 40 per cent. Improper preparation of coal is one of the great sins of the industry and the wagon mine is not the only offender. The bituminous coal produced in 1917 showed that about one-third of it contained 5 per cent of non-combustible material that could readily have been removed. An improvement in preparation took place during early 1919 when the demand was slack, but quality deteriorated again during the six weeks preceding the strike of last fall, and this unnecessary tax on transportation and the industries continues unabated at present.

CONDITIONS OF MINING ARE UNDERGOING CHANGES

State and Federal enactments, resulting from the growing demand for better mine labor conditions, have multiplied the cost of developing a permanent and dependable coal property. Furthermore, notwithstanding the enormous tonnage computed as still remaining in the ground, the opportunities for securing a location for a coal mine which will stand competition are rapidly diminishing.

During the twenty years preceding 1917 the coal industry presented a sorry spectacle. It was overdeveloped, its employees were underpaid and mines were opened and operated without due regard to the safety of the workers. The record of disastrous explosions and accidents is a dark page in the history of mining. The sharp competition invariably existing between individual mines and between mine districts was largely responsible for such conditions and for their continuance. When the operator decided that a certain tonnage was necessary to enable him to run, he frequently accepted orders for it at less than the cost of production, and then went back to his employees with the request that they consent to a cut in wages—already too low—to enable him to break even. Such an arrangement, when put into effect, was frequently followed by a secret freight rate agreement through which the operator received rebates that represented his total margin of profit. After the Mine Workers' Union became strong enough to enable it to refuse these temporary wage reductions and anti-rebate legislation closed the door to relief in that direction the operator turned to the "recurring strike," frequently prearranged for a definite period, in order to create the return that would enable him to pay interest on his paper, which the banks were carrying to the point of saturation.

I am reviewing this period to illustrate the ways in which instability of the industry operates to the disadvantage of all concerned and to emphasize the point that coal should be produced and marketed under conditions which promote the health of the industry, justice to the public and the welfare of the workers and their families. Every ton of coal produced should bring in a margin above the cost of production sufficient to create an adequate return on the investment, with due regard to the hazards of the business. With such a return assured, exorbitant prices should be discountenanced and prohibited.

The limits of the area underlying the so-called smokeless coals are now well defined, and this coal, which under former freight rates and low costs of production was shipped far afield, must now be conserved for a market located east of the Appalachian range, including the navy and the merchant marine. The Northwest, which heretofore has absorbed a large tonnage of smokeless coal, has definitely and permanently turned to bituminous coals produced nearer the points of consumption. England, which hitherto has enjoyed the world's coal export trade, has suffered an extraordinary loss of production and increase in unit production costs as a result of conditions largely chargeable to the war and a large share of her former trade is bound to come to us. We must, therefore, prepare to supply a material portion of the Western Hemisphere with coal. The South American republics are practically without coal of their own; they are growing rapidly in wealth and population, and it is not unreasonable to suppose that their consumption of fuel will increase at a rate comparable with the growth in consumption in our own country during the past fifty years.

SOME REMEDIES ARE AVAILABLE

While I am not prepared to offer remedies for all the ills found in the foregoing diagnosis, I wish to offer my opinions as to what should be done to cure the more fundamental troubles. There is much to be done within the industry itself, but the more important defects require general and national treatment.

The purely mechanical problems of coal mining have not reached their final solution; while we have a considerable proportion of finely equipped properties operating under modern methods, there is room for improvement even in them. We should have larger individual mine openings, hand mining should give place to mining machines, electric drills and mechanical loaders and heavy underground tracks, cars and electric locomotives should, as far as possible, replace animal haulage. The economic and social aspects also need improvement. The men must have more regular employment; their lives must be adequately safeguarded, and they must be given the opportunity for, and be taught the advantages of, better homes, a more liberal education, industry and thrift.

Under old freight rates and the play of unrestricted competition between mines and among railroads there has grown up a system of coal distribution which places an undue burden on our transportation facilities and an unnecessary tax on the public. A large proportion of our coal moves long distances over the country, without regard to the relative location of the consumer and the mines.

This practice is a great tax on our railroad capacity and a drain on railroad income. Freight rates have frequently been made for coal which do not reimburse the carrier for the cost of hauling it and the deficit of course has to be added to the general freight rates. The public suffers not only through the unnecessary clogging of the railroad machine, but through this increase in the general rate level, and under our new railroad legislation no one can escape some share of the general increase in the cost of transportation which this haphazard scheme of distribution causes. We have recently had two radical increases in coal freight rates, one of 25 per cent and the second of about 40 per cent, making a total of approximately 75 per cent. These increases, because they are on a percentage basis, will of course automatically operate to diminish the evils of excess haul, and they will force many consumers to consider carefully the coals near at hand, but the radical cure can only come through some general plan of distribution and control of freight rates. Gradually and without violence to establish business interests a system of coal market zones should be built up through the medium of rate control. Excessively long and overlapping coal hauls should be penalized; the last two or three hundred miles should bear a prohibitive rate instead of being given away, as the carriers have frequently done in the past.

LEGISLATIVE AID IS NECESSARY

By far the most important problem in coal supply is the equalization of the load on the mines and on the railroads, and its solution can only be effected by the consumer, who will have to equalize his demand. Just now the consumer is aroused, but he will quickly forget his present experiences. The summer of 1921, with probable decreases in the cost of living, will perhaps see mine labor tranquil and willing or even anxious to "maintain the integrity of wage contracts"; strikes will become less frequent and the public will quickly forget the experiences of the last few months. Some way must be sought to keep consumers alive to the necessity of foreseeing their needs, equalizing their demand and storing a portion of their requirements. I believe this can only be done by offering them the inducement of lower freight rates during the early months of the year.

Such a remedy requires, of course, legislative action, and to be effective this action must be taken for the nation at large and not locally. What we need is a federal law providing seasonal variations in coal freight rates. A bill establishing such variation in rates was introduced in the Senate last spring at the request of a committee appointed by the American Institute of Mining and Metallurgical Engineers. This bill, which is given in full in the appendix of this paper,* provides for increases and reductions in the schedule base rates per ton as follows:

Increases		Reductions	
Month	Amount Cents	Month	Amount Cents
August	5	February	10
September	15	March	25
October	25	April	25
November	25	May	25
December	25	June	15
January	10	July	5

The bill did not get out of the hands of the committee to which it was referred, although it held protracted hearings. I hope that it, or some equivalent measure, will be introduced and passed at the next session, and I bespeak for such legislation your support. Similar variations in cost heretofore locally applied have failed of their full effect because the consumers did not have confidence in their persistence. We have faith in our government, however, and with such a law in force throughout the country consumers would be encouraged to buy during what is now the period of low demand on the mines and railroads and to store enough of their coal to lower the demand during what is now the period of the peak load on both industries. Except in rare instances the general annual cost of their fuel supply would not be increased under the terms of such an act.

INFORMATION CONCERNING THE INDUSTRY MUST BE DISSEMINATED ALSO

Comprehensive treatment of the problems of an industry so fundamental and so national in scope as coal mining must proceed from a full knowledge of the facts, which must obviously be authoritative and above reproach.

For some years the United States Geological Survey has compiled statistics relating to production which have proved of the greatest value to the industry. This work of collecting the facts should be placed on a permanent footing and its scope should be greatly enlarged, so that the country will have available a full knowledge of the fundamental facts for the solution of all problems of supply, costs, labor and transportation in the industry.

Looking toward the establishment of an agency for doing this there was presented at the last session of Congress another bill, likewise suggested by the American Institute of Mining and Metallurgical Engineers. It provides in substance that the Secretary of the Department of the Interior shall "in person, or through such agency within his department as he may designate":

(a) Investigate from time to time the wages, working conditions and practices, terms of employment and the living expenses of miners and other workmen employed in the coal and its collateral industries.

(b) Investigate methods and processes for the storage of coal and conduct such research work as will conduce to the economical use of coal.

(c) Investigate methods employed in the consumption of coal, including the distribution of coal cars.

(d) Investigate the desirability of a central governmental coal purchasing agency for all coal used by the Federal government.

(e) Investigate the desirability of establishing a statutory coal zoning system.

(f) Examine the mines, etc., and have access to and copy any book, record, paper or correspondence relating thereto.

(g) Subpœna witnesses and require the presentation of all documents used in connection with the coal mining industry, and invoke the aid of the United States courts in enforcing such demands.

(h) Require operators and dealers to file statements as to costs, prices, profits, etc., and place at the disposal of any private or public board, commission or other group engaged in the arbitration, conciliation or settlement of any wage dispute such information so secured as in his opinion relates to the controversy.

This law if enacted would put the coal industry and all the facts relating to it under the close supervision of a cabinet officer, would insure their permanent collection and would place at our disposal dependable information which could not fail to contribute to the stabilization of the industry and the general welfare of the nation. With these facts in the possession of the public few issues would go to dispute, coal earnings and prices would be steadied and the way would be paved for the solution of most of the industry's labor problems.

I trust that this bill also will be introduced and passed by the next Congress, and that it will have the support of such organizations as the American Electric Railway Association.

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*Mr. McAuliffe appended to his paper the full text of this bill, S-5278, and also that of Senate bill S-4080, referred to later in his paper. On account of space limitations these have not been reproduced here, as copies are obtainable through official sources.

Utility Regulation and Rate of Return[*]

By Cecil F. Elmes
Sanderson & Porter, New York City

The Dual Standard of Commerce Regulation Which Affects Utilities, but Exempts Other Industries, Has No Justification on Historical Grounds or as Matter of Public Policy—Effect on Financing of Utilities Analyzed

CECIL F. ELMES

THERE is every reason why utility securities, in the absence of undue influences, should command a wide measure of public favor. They are issued by merchants whose wares are a public necessity. The demand is, in general, less liable to capricious fluctuation than almost any other department of commerce. In the great majority of states utilities are subject to regulation by public service commissions and these commissions openly express an intent not merely to safeguard the interests of the public but to promote the stability of the utility concerns which are to give that public a high standard of service. Nevertheless, utility securities do not reflect optimism as a result of these expressions of good will. The present paper is an effort to find out why. It is not directed, in the main, to the work of the public service commissions. Rather, it is an effort to go deeper, to analyze the underlying causes of the present state of the industry.

It is infrequently observed, but nevertheless true, that utility men are today so much in a class by themselves that most of them scarcely realize how different is the authority to which they are subject compared with the control exercised over almost any other form of business. The public service commission is their court, distinct from the courts to which all other citizens may have recourse. They have an extensive and varied literature of their own, and it is interesting to note how this literature tends more and more to take present methods of regulation for granted. Methods of regulation which have just come into existence are spoken of as though centuries of precedent stood behind them.

This paper will have served a useful purpose if it leads some utility men not to assume that whatever is customary today in the public utility business is right; if it leads them to take note of how far they are subjected to treatment—especially economic treatment—different from that accorded to the general body of citizens, and to investigate, in a broad spirit, the grounds for such discrimination.

A DUAL STANDARD OF COMMERCE REGULATION

There exists in the United States today a dual standard for the regulation of commerce. On the one hand is a well-defined and compact body of precept and practice put into force by public service commissions and applied solely to those few businesses known popularly as "public utilities." On the other hand is a lack of regulation applied to every other branch of commerce, including businesses so vital to the public welfare that a serious breakdown in them might prove a national tragedy. That the public, if fully informed, might regard a dual standard of commerce regulation as equivalent to a dual standard of morality is not too much to assert. And, upon the single occasion since the evolution of the dual standard that public interest in commerce regulation became intense—during the war period—the dual standard was swept out of sight without ceremony and literally almost overnight. In an incredibly short time, with rough but effective governmental machinery, all commerce in which public interest was vital was placed under control. No distinction was raised as to whether the commodity was or was not controlled by a monopoly, or whether it could or could not be defined as a public utility. Unlimited technicalities and legal questions might have been raised, but no one ventured to raise them.

How, then, has the dual standard of commerce regulation been justified or condoned? It is defended on three main grounds:

First—That the commodities dealt in by utilities are a public necessity.

Second—That utilities are, in a measure, monopolies, and inferentially, that other businesses are not.

Third—That utilities are possessed of valuable franchises derived from the public.

Each of these reasons is open to attack. If the rule of public necessity is to be our guide, why overlook bread and meat, and coal? If monopolies are the only business to be regulated, why select this limited group when so many other unregulated but equally powerful monopolies exist? If the value of franchises be the test, have public utilities been excused from regulation where the franchise is not merely valueless but a liability?

MISTAKEN IMPRESSIONS AS TO THE HISTORY OF COMMERCE REGULATION

In justifying the regulation of utilities, authorities usually, and properly, appeal to the body of legal enactment and of unwritten law evolved in England during the Middle Ages, yet the commercial history of the Middle Ages does not bear out their claims in the slightest. Not only was the commercial world of the Middle Ages entirely clear as to the economic principles upon which commerce regulation should be based, but public opinion sanctioned and demanded a much more comprehensive scheme of regulation than is even contemplated today. The principles underlying such regulation may be summarized as follows: (a) All commerce was a fit subject for regulation; (b) not only sellers were regulated, as now, but both buyers and sellers were held equally fit subjects for regulation;

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[*] Abstract of address presented at annual meeting of American Electric Railway Association, Atlantic City, N. J., Oct. 12-14, 1920.

(c) the regulatory duty regarded as foremost was regulation as to the quality of merchandise, *i.e.*, the principle that quality of service is more important than its price; (d) it was understood that fluctuations were natural and must be looked for and given prompt recognition.

In Colonial days, especially in the New England colonies, there was little question as to the right of the state to set prices for commodities. Examples of general regulation of commerce during the first half of the Nineteenth Century can also be given. Such is the power conferred by Congress in 1820 upon the city of Washington: "to regulate . . . the rights of wharfage at private wharves . . . the sweeping of chimneys, and to fix the rates of fees therefor . . . and the weight and quality of bread." In 1841 the Supreme Court of Alabama decided that the city of Mobile had the power to regulate the weight and price of bread. In 1876, in Munn vs. Illinois, and again in 1891, in Budd vs. New York, the United States Supreme Court upheld the right of a state to fix rates for warehouse and handling charges upon grain. In both cases there were dissenting opinions, but they were not based upon the question of whether or not grain elevators were a "public utility," but upon the emphatic ground that price regulation of any kind is not within the powers of any Legislature.

RECENT COMMERCE REGULATION IN THE UNITED STATES

In the period which has elapsed since the case of Budd vs. New York court decisions have done little to clarify the entire question of the rights possessed by the states or the United States to regulate prices of commodities. In large measure this has resulted from a development which set in about the time this decision was rendered, and which forms an outstanding feature in latter-day commercial history. This was the formation of the so-called "trusts," the popular demand for their regulation and control and the legislative and judicial efforts to give effect to this demand. The court decisions of the last generation have, in general, not been upon the direct question whether prices should or should not be regulated. The essential question has been whether the defendant was or was not a monopoly. At first sight this appears an eminently practical question, yet the great monopoly cases before the courts in recent years have taken on a curiously theoretical aspect.

The Sherman act was passed in the year preceding the Budd vs. New York decision. Its provisions were aimed at preventing the formation of monopolies rather than in punishing commercial and economic malpractices in which they might be expected to indulge. The issue thus raised before the court being essentially a theoretical one, the action of the court in each case and the penalties imposed have been little better than theory.

Elaborate dissolutions and reorganizations have been ordered, securities have been ordered distributed, properties have been made to go through the formalities of compulsory sale. But no practical step whatever has been taken toward preventing exactions or inflated prices. The law enjoined none, the court could take none. Not a line in these important decisions makes an effective step in this direction. The court could merely harass and fetter the scheme of financial or intercorporate relationship. It is fair to say that no action taken by the highest courts within the last quarter of a century has borne fruit in lower commodity prices or had the slightest real promise of doing so. And yet this is the only tangible result in which the public has the slightest real interest.

Out of this latter-day concentration on the abstract question of monopoly, together with a general acceptance of pseudo-history and incorrect statements regarding commerce regulation in the past, there has arisen a distinctly novel and modern notion. This is the idea, prevalent among utility men, and creeping, to an extent, into recent court decisions, that there is an immemorial distinction between "public business" and "private business" and that "private business" is something sacred.

The idea is, of course, utterly at variance both with public opinion and public practice during the war period. Price regulation, under the urging of overwhelming public opinion, was distinctly and clearly enforced in the first instance, as against those very commodities, such as meats, upon which the life of the community depends. They were then and there treated as true public utilities. Public opinion was infinitely more concerned about their regulation than about some of the admitted "public utilities" of today.

In spite of the fact that this phase of regulation had behind it a degree of popular approval seldom accorded to governmental acts in any land, there are not wanting those, even in the legal profession, who feel that no such "power to govern men and things" resides within the people, the ultimate source of all governmental power. These timid brethren justify such regulation to themselves only on the ground of emergency, of its being a life and death matter. When, in December, 1919, at Indianapolis, a Federal injunction was employed to balk a strike of coal miners, they could not concede, in any broad sense, to the whole body of the people the right to take any action which, even if technically improper, might be necessary to avert widespread calamity, suffering and death. Such technical minds, when sympathetically seeking to justify so broad an exercise of public authority and public will, can only do so upon the polite fiction that this country, a year after the armistice and with its great war machine disbanded, was still technically at war.

RESULTS OF THE DUAL STANDARD

The dual standard of commerce regulation, therefore, centers almost entirely around present-day efforts to curb monopolies. There is no question as to the public desire to see them controlled. Where public opinion recognizes that conditions make monopoly essential, it is permitted only upon sufferance. Public action in giving effect to this sentiment took two forms. It passed the Sherman act. It evolved public service commissions, including the Interstate Commerce Commission.

The first of these steps has proved, upon the whole, a sorry failure. In the only direction in which such a monopoly really affects the public it may not, under the present system, be restrained at all. The second step, by the very vigor of its application, has gone a long way toward the evolution of the dual standard. No one disputes the correctness of the view that electric light or gas or transportation are "public utilities" and, as such, have a vital public interest. It is entirely fitting that they be controlled and that public interest be safeguarded, but street car lines and telephone systems, electric light or gas, important as they are, are far from being the only commodities by which we live. There are many who manage to exist without either electricity or gas. There are those to whom a street car ride is an unusual event. But to all, bread, meat, fuel and clothing are truly essential. Nothing in our economic life today justifies vigorous regulation of the purveyor of electric light on the score of being a public necessity while, at the same time, the baker is to be under no other restriction in regard to his prices or terms of business than his fancy may dictate. Neither can it be said that this anomaly corresponds to some expressed and general public opinion.

INVESTMENT ISSUES—A WELL-MEANT LEGISLATIVE BUNGLE

Out of the great concentration of capital into trusts and other combinations in the '90s and the first years of the present century there grew a spirit of unrest against indiscriminate increase of capitalization. How far the movement was justified by fact is a subject which space forbids us to consider. Let us assume for the purpose of this article that there were abuses and that it was the part of legislative wisdom to check them. Be this as it may, the fact is that an almost country-wide movement ensued, with legislation in most of the states, in regard to the issuance of capital stock. The intent of practically all such legislation is to compel a dollar of capitalization to represent a dollar of cash investment.

The laws regulating capital stock issues at first blush apply equally to every corporation. But since there is, in effect, supervision and control of utilities through public service commissions, and little or no control by anybody over other corporations, these statutes, in their working, operate to the peculiar disadvantage of utilities. Commissions have no choice but to enforce the law against a utility company and insist that capital stock issues shall represent cash investment at par. There is, generally speaking, no similar body to compel equally rigid obedience to law by other corporations.

Further, the legislation in question affects only capital stock. It does not prevent the sale of bonds or notes at a discount. The investing public naturally enough will not pay par for offerings of second quality where investments of the first class are available for less. Out of this condition has come the present state of affairs where utilities are forced, against their will, to secure capital necessary for their growth by the unhealthy device of increasing the ratio of bonds to stock.

The net result of this legislation and its enforcement has been that the only corporations effectively compelled to its obedience—*i.e.*, public utilities—selling their bonds or senior securities at a discount, as they often must, are practically debarred from selling their junior and speculative securities since they must sell them at par.

Now, however wise or prudent the regulation of public utilities or steam railroads may be by the commissions charged with this duty, the purchaser of securities has become aware that in buying the stocks or bonds of these enterprises he is adventuring his savings into a highly restricted and regulated form of commerce. In the meantime there are presented to him a great range of other enterprises in which he may invest, and as to which regulation of any kind is either nominal or substantially non-existent. All regulation operates, in his mind, substantially as a limitation or a check upon commerce. The security quotations of the day give us the answer as to which of the two groups the investor is favoring at the present time, and frankly it is difficult to see why we should express surprise at his choice.

PUBLIC UTILITIES IN THE INVESTMENT MARKET

Public utilities labor under three important handicaps when entering the money market as compared with other seekers after capital.

The first of these applies to issues of capital stock. The investing public, being free to place its money where it will, takes note of the fact, as set forth above, that the profits of the utility are subject to regulation, whereas the profits of other enterprises are not. For years the bulk of such regulation had the effect of reducing rates, thus curtailing earnings. Within recent times rate increases became inevitable; nevertheless, the spirit of the regulation remains unchanged. It is essentially directed toward making certain that utilities shall earn no more than a certain maximum and usually quite a modest one. The investing public further recognizes that while commissions may restrict the maximum earning, they have neither the power to guarantee minimum earnings nor funds with which to make such a guarantee good.

The second handicap applies to sale of short-term obligations, *i.e.*, notes. Lenders of capital and credit show a marked preference for borrowers who speedily liquidate their loans and a reluctance to accommodate those unable to wipe out their indebtedness in a reasonable time, even though interest payments are certain and there is no question as to the safety of the loan. Where utilities seek this class of assistance, it is recognized that they have scant prospect of rapidly amortizing the loan, and often no sure prospect of repaying it when due. Further, they have usually little in the way of attractive conversion privileges to offer.

The third disadvantage from which utilities frequently suffer is an unhealthy relation between bonds and stock. The investing public is quite properly accustomed to favor a low ratio of funded debt, including notes, to capital stock. Due in part to the above-mentioned features, in part to state legislation as to the issue of capital stock as already mentioned, an undue fraction of the entire growth of utilities in the last decade has had to be financed by issues of bonds or notes. A healthy balance between bonds and stocks is needed in the best interest of all; the lack of it adversely affects those seeking new capital. Changes in the legislation which brought about this condition or changes in its unequal application will be a public benefit.

PRESENT YIELD ON INVESTMENTS—INTEREST RATES

The investing public ranges in character from those buyers whose chief, indeed sole, preoccupation is security of their principal to those whose prime demand is a high rate of return, even at the expense of safety. The problem before the public utility manager is to determine the form his securities must take in the way of both safety and yield, so that he will make a sufficiently wide appeal both to the conservative as well as to the somewhat more speculative elements in the investing public. The support of both classes in due measure is essential to the successful financing of any enterprise.

Considering first the investor who places security before all, the highest form of investment available to him consists of bonds of the United States Government. These are secured not only upon the property of the body of citizens in the United States but, in the last analysis, upon the life and honor of every individual citizen. We are unable to conceive of a higher form of security which can be offered to an investor. For securities of this character, which in past years commanded rates as low as 2¼ per cent, 5¾ and 6 per cent are now being offered. This would appear to establish a minimum figure, to be exceeded by all other security offerings in measure based upon their lesser reliability as compared with this maximum of safety.

Taking next the yield upon investments, the security for which is more speculative, but upon which the investor seeks for high dividends, it is more difficult to specify an exact figure. Very high figures are often quoted and frequently earned, not only in enterprises of purely speculative character but also in businesses of a solid and conservative type. From published statements of bankers and others it would appear that a yield of 25 per cent is not regarded as excessive where the investor subordinates security to the prospects of profit. These two figures, the former definite and the latter somewhat elastic, may be taken as indicating the limits of the investing market in either direction as it must be faced by the public utility manager.

As to interest rates, all money borrowed at the present time is being loaned at far higher rates than have heretofore prevailed in the money market. Time money, borrowed on commercial and other paper, which formerly commanded interest rates of 4 and 4½ per cent, today fetches 8 and 8½ per cent. Weighty testimony has been given before public utility commissions by bankers and others to the effect that public utility bonds, where salable at the present time to investors, must net to these investors not less than 7½ per cent, and will, therefore, cost the borrowing utility 9 per cent and over.

Any one who consumes midnight oil reading decisions in rate cases might fall into the error of thinking, as a result of extended treatment therein of the subject of rate of return, that commissions actually awarded and set aside a certain definite rate of return to the utility whose rates are adjudicated. In point of fact, this is not what happens. All that is definitely decided upon and awarded is a schedule of tariffs which the utility may charge for the service it renders. What rate of return will accrue to the company's investors therefrom is little better than a guess.

If the commission's guesses as to the future business and its guess as to the future operating expenses, together with the tariff schedule awarded, produce the rate of return stated to be desirable, well and good. If it fails to produce this rate of return, the company stands the loss. In spite, therefore, of any language in rate decisions specifying a desirable or permitted rate of return, this does not insure the company any such rate of return.

Assuming, however, that some rate of return has been earned and that the sum, large or small, is available for distribution, the following are the purposes to which it is devoted:

1. To meet interest requirements upon funded and unfunded debt.
2. To amortize or discharge maturing obligations.
3. So to compensate the owners of the utility for (a) their services, (b) the use of their property as to deal justly with them as merchants and public servants, and to make their enterprise sufficiently attractive so that investors and operators shall be attracted to the field of public utilities.

It will be well briefly to glance first over each of these in turn.

INTEREST ON DEBT AND AMORTIZATION OF OBLIGATIONS

The item of interest on funded and unfunded debt involves a recognition of the conditions affecting not only public utility operators but every business man who has occasion to borrow money or make use of credit facilities. Such a business man must have regard, among other items, to the following features: (a) Actually meeting his interest requirements; (b) maintaining such a margin of net earnings above mere present interest requirements as will not impair his standing among borrowers and users of credit as a class; (c) knowing the present, and intelligently anticipating the probable future money market, in order to make the best possible adjustment both in the quantity and method of his borrowings.

Failure to meet interest requirements when due requires little comment. Such failure involves not merely a collapse in the credit of the enterprise, but its financial ruin.

One of the financial customs which prudence has dictated is that the borrower shall show a margin of earnings over and above interest requirements varying in extent according to the hazards of the business. Public utility enterprises, based upon past experience, appear to require a margin of not less than twice the interest requirements. In spite of much that has been written upon this point, this margin, whatever its extent, does not form a proper criterion for computing the proper return upon the property as a whole. It is merely one of several elements which must be considered and given its due weight in arriving at a fair conclusion. If, by misfortune or poor judgment, a large fraction of its funded or other indebtedness falls due, to be refunded at a time when money rates are high, the company will suffer in consequence.

Amortization of debt is a duty, the discharge of which is only second to and almost equally essential with the meeting of interest requirements. Failure to meet this requirement subjects the utility to the same penalty of bankruptcy visited upon a failure to meet interest requirements, with the exception that, where amortization is not compelled by the terms of a mortgage or similar instrument, relief is frequently had by the renewal or refunding of the indebtedness. This is usually open to the following two objections: (a) An increase in the cost of such borrowed funds by an increase in the interest rate for money, or, what amounts to the same thing, a renewal of the load at a discount, and, (b) the distaste evinced by bankers and financial institutions toward borrowers whose loans are constantly renewed and must be carried continuously, as compared with borrowers, such as industrials, whose loans are liquidated within a reasonable time, thus releasing funds for other enterprises.

It must be recognized as a quality inherent in public utilities, as compared with other enterprises, that, where successful, there is ordinarily little prospect of a reduction in the total investment in them. A healthy utility shares in the growth of its community and is usually an important factor in producing that growth. The larger communities could not exist upon anything approaching their present scale without electric railways. The utility, and the investment in it, is, therefore, continuously growing, and this fact, which on its face should be a strong factor in its favor, may actually place it in a relatively disadvantageous condition in the money markets of the world. It may be unfavorably compared by certain bankers or investors with industrials and other enterprises in which accruing earnings may at any time be diverted to the extinguishment of debt or retirement of invested capital. Recognition of this disability is an important present need.

RETURN TO STOCKHOLDERS OF PUBLIC UTILITIES

It is essential to realize that none of the items covered in the previous section in any way compensate the true owners of the public utility. Regulation of public utilities which fails to protect bondholders and creditors will, of course, lead to ruin. Nevertheless, regulation carried out solely with an eye to protecting the lenders of funds can never bring about real success or a healthy condition in the utility business. The vast wealth of the United States, the whole fabric of its present-day civilization, did not result solely from the availability of funds for investment.

Success has sprung in large measure from the leadership of great captains of industry, ably supported by loyal organizations of copartners and workers. All of these men are free agents, able to devote their efforts, their enterprise and their capital to whatever line of activity they may elect. If in the public utility field they are cut off from prospects of gain commensurate with those which they can anticipate in other lines, it is inevitable that they and their associates will desert public utilities and betake themselves to those avenues of progress where they will obtain adequate reward. Such a result will be a lasting disaster not merely to the industry, but to the entire country.

PRESENT REGULATORY METHODS

Comment has been made above as to the present-day interpretation by the public of the powers of public utility commissions as intended for use solely in a quasi-judicial or restrictive sense. A public benefit will result from drawing attention to the fact that there is little or nothing in the laws creating public service commissions which compels action solely in such a sense. Further, this method of regulation is inherently defective in that it creates a divergence of interest between a utility's investors and its public. The public is led to regard every payment of dividends to the investor as a burden upon the price paid for service, while the investor sees in every reduction of rates an elimination of anticipated earnings. This divergence of interest does not exist. Perhaps the most revolutionary step in the history of public utilities will occur when the public recognizes that neither the spirit nor the letter of the laws creating commissions in general compels the adoption of any such methods.

Just as soon as regulation passes from the stage of merely limiting earnings to the wholesome stage of offering continuously expanding earnings in return for continuous improvement in service, including rates, public utility securities will begin to command a high degree of public favor. With regulation of this character they will deserve this favor, because they will combine the solidity and conservatism inherent in the public utility business with that prospect of reasonable increase in earning power which every healthy business must have, and these two qualities will make them ideal securities in the eyes of investors.

It is to be clearly understood that nothing in this section, or anywhere in this entire paper, in reference to public utility commissions, or their practices, is written in either a critical or a hostile sense. Everything contained herein is offered solely in a spirit of constructive criticism and with a full recognition that these bodies are acting fairly and with wisdom in dealing with the difficult task before them today. Some may feel that the commission might have been more indulgent to the utility companies, but plenty of others will be found to regard them as having been, if anything, overindulgent. The truth is that they have acted wisely and with intent to be fair. Our troubles lie, in considerable measure, beyond their reach. Only an enlightened and instructed public opinion will cure them.

CONCLUSIONS

The extensive ground covered in the foregoing pages may be summed up as follows:

1. Setting aside commerce regulation during the war period, utilities are today completely regulated, and practically all other industry is unregulated. The grounds alleged to justify this are wholly unsatisfactory.
2. Educational specialization, the existence of separate tribunals for utility matters, and other elements tend to make many utility men ignorant of or indifferent to this discrimination against them.
3. Wartime universal regulation of commerce, including prices, had hearty public approval. Some find it necessary to invent technical excuses for this regulation; the general public does not. The policy had the public's hearty support and so would a continuation of it.
4. The present custom of regulating only utilities is defended on alleged historical grounds, particularly as to commerce regulation in the Middle Ages and the practices sanctioned by common law.
5. Actual research into this period proves that much of this pseudo-history is directly contrary to the fact. Commerce regulation was then complete, nation-wide and highly developed. Regulation in this country in the seventeenth, eighteenth and first half of the nineteenth century has followed the same general lines.
6. Present-day practice in the United Staates is not in accord with historical precedent. The change is contemporary with the great body of ineffective anti-trust litigation under the Sherman act.
7. What the public desires is a protection from possible extortion or abuse. Sherman act litigation, successful or otherwise, never could protect the public along these lines.
8. State legislation in regard to capital security issues has not achieved its purpose and is a source of hardship and inequality. Utilities are especially and injuriously affected.
9. Utilities are regulated, but the money market is not. Utility commissions have no power to compel investment. Utility security offerings must attract investors on their own merits or they will fail.
10. In rate decisions, though the commission may approve and specify a rate of return, the utility has no certainty of receiving it.
11. In regard to rate of return and regulation generally attention is often centered on the bond and note holder and not enough recognition given the stockholder —the true owner of the property.
12. Present regulatory methods might well give place to others offering progressively greater profit for progressively improved service to the public. There is every opportunity for the development of this special feature.

Service-at-Cost Accounting in Cleveland[*]

By H. J. Davies
Secretary-Treasurer Cleveland (Ohio) Railway

Practical Difficulties Encountered Are More Frequently Questions of Interpretation and Operation of the Ordinance Rather than Technical Accounting Problems — Specific Examples of Difficulties Encountered Under Cleveland Agreement Are Explained

H. J. DAVIES

ALL service-at-cost franchises provide for accounting in accordance with the standard classification of this association, or the classifications of state commissions or the Interstate Commerce Commission, based upon the standard classification of the American Electric Railway Accountants' Association. What better scheme of accounting could be asked? But the franchises are not perfect. Even then the principal trouble in Cleveland is not so much with the franchise itself as with the failure to carry it out or to understand it. 'Tis a contract more dishonored in the breach than in the observance. May I point out some of the respects in which it requires amendment, some in which it has been misinterpreted and which may be corrected without amendment, and others which are not understood?

We have been unable to convince the City Council of the necessity of adequate reserves for depreciation and renewal, for accident liabilities, for other deferred obligations, for the amortization of the cost of pavement owned by the city, for the amortization of all capital value in excess of the value of the physical property. Such reserves are desirable in the interest of both parties to the contract; of the stockholders, because, if the property is worth the capitalization, their investment is secure; of the car riders, because, first, if the capitalization does not exceed the value of the physical property, interest, and probably taxes, will be less per car-mile and per passenger than if the capitalization is excessive, and, secondly, the purchase price, if the city elects to buy, will be somewhere near the real value of the property.

One of the inadequate provisions of the Cleveland grant, as it has been interpreted, is that the physical property of the company, including a reserve for maintenance, depreciation and renewal, shall be kept in such a condition of repair that its value shall be 70 per cent (not 100 per cent) of its cost. As the physical property in existence at the time the contract was made was appraised and capitalized at 70 per cent of the cost of reproducing it new on Jan. 1, 1908, the provision for its maintenance in that 70 per cent condition was proper. It was provided, however, and properly, that all additional property should be capitalized at its actual cost. But it was also provided that this new property, as well as the original property, should be maintained at a value equal to 70 per cent of cost. There is no requirement for the amortization of the difference between cost and 70 per cent of cost.

Theoretically, the company is expected to limit its expenditures for expenses to certain amounts per car-mile, fixed in advance, as a budget. The original allowances were 5 cents per car-mile for maintenance expenses and 11½ cents per car-mile for operating expenses. In practice the allowances have not been sufficient to provide for the expenses. The reason for this has been, not that the company underestimated its expenses, but that the Council, in the hope of keeping the cost of service as low as possible, refused to "allow" enough to meet the actual necessary, legitimate expenses.

At the close of August there was a debit balance in the maintenance reserve account of $20,114 and a debit balance in the operating reserve account, accumulated since March 1, of $332,582, and there was a further deficit in the operating reserve of $60,000, for expenses incurred before March 1, a total of $412,696.

RESORTED TO "SPECIAL ALLOWANCES"

It has been the practice to provide for such deficits by what are called "special allowances." For illustration, on Feb. 29, 1920, the last day of the last ordinance year, there was a debit balance in the operating reserve account of $237,530.73. Of course, the balance in these reserve accounts should always be on the credit side. In order to start the new year without a deficit in the operating expense reserve account the $237,530.73 was charged to a "suspense account" and credited to the operating expense reserve account, wiping it out. This was reduced by a special allowance of $77,530.72 in March, leaving a balance in the suspense account of $160,000, which we are reducing at the rate of $20,000 per month by a "special allowance."

These suspense accounts are a method of transferring by bookkeeping entries the accumulated allowance deficits of past months or years to future months and years and assessing upon the car riders of the future a part of the cost of the service rendered the car riders of the past. The allowances should be sufficient to provide for the estimated expenses. A maintenance reserve is absolutely necessary for the protection of the investment of the stockholders. How can the company hope to sell stock at par on a 6 per cent interest basis, or even on a 7 per cent basis, when it has no such reserve, and no prospect of one? Yet such a reserve must come. And, in my judgment, no amendment of the franchise is necessary for it; it is already provided for, although not imperatively required, by the franchise. But the Council seems to have a right to refuse a reserve larger than the difference between depreciated value and 70 per cent of cost. The present value of the physical property, by the way, disregarding the high prices due to war conditions, which are, to a large extent, if not entirely, temporary, and disregarding also overhead charges, interest during construction and taxes during construction, is now less than 70 per cent of its cost. Other companies have reserves of millions of dollars and surpluses of other millions. The Cleveland railway is not permitted to accumulate a surplus. If a surplus should be earned it is to be absorbed in reducing the rate of fare.

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[*] Abstract of address presented at annual convention of the American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 12, 1920.

A substantial accident reserve should be accumulated from current earnings and not wiped out at the end of the ordinance year. There should be money on hand to meet all unadjusted liabilities when they have been determined. Future customers of the company should not be expected to pay today's liabilities.

More than $2,000,000 of the Cleveland Railway's capitalization has been issued for pavement. The city's representatives claim that the pavement belongs to the city. If this is so, the value of the pavement should be amortized and the capital stock representing it should be retired. This would mean another saving in taxes and interest, thus benefiting both car riders and stockholders.

OLD FRANCHISE VALUES CAPITALIZED

Another respect in which the franchise is imperfect is in the carrying of $3,700,000 in capitalization as the so-called value of old franchises. The company does not own the franchises; they were surrendered when the Tayler grant was accepted. That capital represents the present worth on Jan. 1, 1908, of what the net earnings of the company would have been if the company had continued to operate under the surrendered franchises until their expiration. It does not represent any property owned by the company. Instead of providing for the gradual payment to the stockholders of those net earnings, the framers of the franchise ordered that capital stock for the amount of them be given to the stockholders and that interest be paid at the rate of 6 per cent per year upon that capital stock throughout the life of the new franchise and any renewal or extension of it. This treatment of the old franchise led to taxation troubles. The taxing officers took the position that as the capital stock and bonds of the company were worth par or more in the market, the company's property must be of a value equal to the market value of its securities. We argued that the company had no property represented by the capitalized net earnings; that the capital stock of the company was a liability rather than an asset of the company; that if the capital stock in question was property, it was the property of the holders of the certificates of stock, and not of the company, and that, if capital stock were taxable in Ohio, those certificates would be taxable as property of their holders, not as property of the company. The franchise should be amended so as to permit the amortization of that liability or the retirement and cancellation of the stock. This would mean a saving in interest of nearly a quarter of a million dollars per year to the car riders, and the value of the physical property would be nearer the capital value. The value of the remaining capital stock would be thereby enhanced. Thus the amendment would benefit both the car riders and the stockholders.

Another imperfection has recently developed—the difficulty of financing needed extensions and other betterments because of the inflexibility of the rate of interest—not more than 6 per cent on bonds, floating debt or capital stock. Negotiations begun more than a year ago for an increase to 7 per cent have so far failed. We find it impossible to sell 6 per cent stock at par, and so have been compelled to stop all improvements.

I am optimistic enough to believe, however, that all these defects and difficulties will be corrected.

The city has complained, in past years, of the provision in section 26 of the franchise for the capitalization of the difference between the cost of renewals of property and the reproduction value new of the superseded property, claiming that we should capitalize the difference between the cost of the renewals and the capital value of the retired property, that capital value being about 70 per cent of original cost or reproduction value. This provision, it was said, was in the interest of the company, and we admitted it, but said we were willing to have it changed if the city would also amend the franchise so as to provide for a reserve equal to the difference between capital value and depreciated value. To this the city has been unwilling to agree, although the amendment would be to the advantage of the car riders as well as of the stockholders. The cost of reproducing new the physical property that was in existence Jan. 1, 1908, has until now been greater than the capital value of that property. But if the provision of section 26 is to remain in effect and to be strictly complied with because the city fails to see clearly its own interest and still has the idea that what is bad for the company is good for the city, then it will work to the disadvantage of the company in the future, because prices are coming down and the cost of reproduction new five years from now, or ten years from now, of property acquired in the past five or six years will be less than the capital value of that property. Neither is arithmetically and exactly right. To retire at 100 per cent of the cost of reproduction, new, property that was capitalized at 70 per cent of its cost is of advantage to both parties, although the other party cannot see it. To retire at reproduction value in 1930 property that in 1920 cost 150 or 200 per cent of that value will be of disadvantage to both parties to the contract, because the remaining property will not be worth its cost, and so the investment will not be backed by assets worth the capitalization, and the cost of service will be more than it ought to be by the amount of interest and taxes on the overcapitalization.

VARIABLE DIVIDENDS ARE DANGEROUS

There is a provision in the Cincinnati franchise for variable dividends, but it is of doubtful advantage either to the car riders or to the stockholders. It is a provision that if the company's expenses in any period are less than its annual budget or estimate a larger dividend than 6 per cent may be paid to the stockholders. This provision is likely to tempt both the managers of the company and the representatives of the city to charge to capital accounts what should be charged to expense. This would result in overcapitalization. If the stockholders of today can increase their dividends, and if the car riders at the same time can reduce or keep down the rate of fare, by this method they will be tempted to do so. When the renewal of our franchise was discussed in the spring of 1919 the City Council offered us what was said to be a similar opportunity to increase the rate of interest on our stock to 6¼ per cent instead of 6 per cent per year. The offer was to amend section 19 of the original franchise by the insertion of a provision that at least thirty days before the first of May of each year the Council, in connection with the city Street Railroad Commissioner, prepare a budget of the probable expenses of the company for the ensuing year; that the company should not be permitted to expend more than the amount of the budget "except for extreme necessity, emergency or unavoidable and extraordinary contingency in the rendition of service demanded, and then not to the extent of more than 2 per cent of the gross allowances," and "if, at the end of any year, the Council shall find that the company has kept within its allowances, or shall not have exceeded the same by more than 2 per cent under the conditions above specified, then Council shall permit the company to take out of the interest fund an operating bonus of one-fourth of 1 per cent on the total average capital value for that year and distribute the same as interest to its stockholders," but that "if the company shall have spent more than the allowances, and if the Council shall find that the said overexpenditure was unnecessary for or not unavoidable in the rendition of service demanded, and not authorized by Council, then the company shall deduct from its interest allowance to stockholders the amount by which such overexpenditure exceeds the allowances."

We declined to accept the proposed amendment, saying, "It is, as was pointed out years ago by Mr. Johnson and Judge Tayler, inconsistent with the Tayler plan. It is an invitation to scrimp service—to the Council in order to keep the fare low, to the company in order to get the extra interest. In the interest of both parties to the contract, nothing should be written into that contract to threaten either the condition of the property or the quality of the service." The amendment tendered us an ostensible opportunity to pay 6¼ per cent a year to our stockholders, instead of 6 per cent. The opportunity was only apparent, not real, because the Council would not be likely to authorize an expense budget in excess of the cost of operation. Neither would a board of arbitration. Under the best possible management, expenses would probably exceed allowance, and this amendment provided that, if they did, the stockholders should not only not receive the additional quarter of 1 per cent but should suffer a loss in interest of the difference between 6 per cent and the amount of expenses in excess of allowances. It was said in oral arguments before the Council that the Cincinnati Traction Company's franchise contained a similar provision—a provision that, if the company's expenses were less than its annual budget, an increased dividend might be paid to the stockholders above the basic 6 per cent provided for in the grant, and that the greater the saving in expenses the higher the dividend might be. We answered that under the Cincinnati franchise the budget was to be prepared by the company, not by the city, and that we would be willing to accept as an amendment a provision similar to the Cincinnati provision. Then, as the chairman of the committee said at one of the meetings, there would be a great temptation to let the property deteriorate, and perhaps to pay for repairs out of new capital instead of out of earnings, thus impairing the security of the investment of the stockholders, increasing the amount on which interest would have to be paid, permitting service to become unsatisfactory, because of poor track and equipment, leading to increases in the rate of fare. In the interest of both parties to the contract, the road ought to be kept in good condition and the service ought to be adequate for public needs.

At the same time the Council also offered to amend the section which defines extensions, betterments and permanent inprovements, so that it would provide for the retirement of wornout or obsolete property at its capital value instead of at the cost of reproducing it new. We said we would accept the proposed amendment if the Council would amend section 21 correspondingly by substituting the words capital value for the phrase 70 per cent of reproduction value. Section 21 declared:

> The intent hereof with regard to the sum authorized by section 20 hereof to be set aside for maintenance, depreciation and renewal is to enable the company to maintain, renew, replace, preserve and keep its railway system and property, and every part thereof, and all extensions, betterments and permanent improvements hereafter made pursuant hereto, in good condition, thorough repair and working order, the standard of such condition, repair and working order being an average for the entire system of 70 per cent of its reproduction value; and the car-mile allowance provided by section 20 hereof for the purpose of maintenance and renewal shall not at any time be diminished unless the value of the property and the amount accumulated in the maintenance and renewal fund aggregate more than 70 per cent of the reproduction value of the said entire system.

And it has been held—erroneously, I think—that the allowance may not be increased unless the value of the property and the amount in the reserve are less than 70 per cent of the reproduction value of the entire system.

SHALL RETIREMENTS BE AT CAPITAL VALUE OR REPRODUCTION VALUE?

We were willing that this section should be amended so as to provide that obsolete or worn-out property should be written off the books at its capital value, instead of its reproduction value, but we wished that the amendment should also provide that no property should be retired at less than its capital value. We wanted a provision for a reserve equal to the difference between capital value and the actual or depreciated value of the property, so that the value of the property at any time, plus the amount in reserve, should be at least equal to the capitalization. In other words, we wanted to make the stockholders' investment more secure—secure beyond any doubt or question—by a provision that would make the physical assets of the company worth as much as or more than the amount of capitalization. Such a provision would not harm the city in any way, because the price at which the city may buy the property is fixed in the franchise and the city's bargain in case of purchase will be better if the value of the physical property is equal to or exceeds the option price than if it is below that price. The provision that the maintenance, renewal and depreciation reserve need not be greater than the difference between the depreciated value of the property and 70 per cent of its reproduction value, we argued, was inconsistent with the declaration of the preamble of the franchise, and with the provision of section 47 that the ordinance was to be a contract between the city and the company which would secure to the company unimpaired the capital value described in section 16, and inconsistent with section 16 itself.

Our contract with the city implies a trust. Both parties to it are trustees, the city for the car riders, the company for the stockholders. The city is, in a sense, also a trustee for the stockholders—to the extent, at least, that the property be maintained at a value equal to its cost, so that the capital stock may be always worth par. If it does not owe this duty to the stockholders, it should do this as trustee for the public, so that the company may be able to finance its extensions and other betterments and to finance them at the low rate of interest permitted by the franchise. If the company cannot obtain money by the sale of its capital stock, the public will lose the benefits that would result from the growth of the system as the city grows in population—not at equal pace with the growth of the city, perhaps, but at a substantial percentage of that growth.

The directors and officers of the company have regarded their duty under the franchise as something more than to pay 6 per cent interest to the stockholders. They have regarded themselves as trustees for the car riders, with an obligation to furnish street railway service at cost, and to make the cost as low as possible consistently with proper maintenance of the property and other legitimate expenses of operation, such proper maintenance being of advantage to the car riders as well as to the stockholders. There has been no attempt on the part of the company to make expenses unnecessarily high, or to urge the construction of extensions not needed in order that stockholders might have the benefit of purchasing additional stock at par, with the hope of selling it to the city at a bonus of 10 per cent. During most of the ten years under the operation of the service-at-cost plan, the stock of the company has sold on the Cleveland exchange at premiums ranging from a fraction of 1 per cent above par to $114 per share.

The management has a responsibility not to let the property deteriorate as a whole—a responsibility to accumulate a fund as the property wears out or approaches obsolescence from which to renew or replace it, that fund being equal to the difference between cost or capital value of the property and its depreciated value, the depreciation being based on the departed years and months of its probable life. In the interest of all concerned, this should be done. Not to have a fund ample for this purpose leads to overcapitalization, to renewal or replacement of obsolete or worn-out property from new capital, increasing interest and injuring credit because of failure to protect the investment by a property worth par of the investment, and so leading to a possible increase, not only in the amount of interest but in the rate of return.

CAPITALIZATION SHOULD BE FAIR

The city, too, should be diligent to see that the company is not overcapitalized, and that the property, by means of an adequate reserve, is kept in as valuable a condition as when it was new. The city has a right to a good property, in order that it may have good service, and that the company may be able, by reason of the value of its assets, to sell capital stock with ease at par. It should see that there is no deterioration in the property; that the property, including the reserve, is fully equal in value to the capitalization, or, putting it the other way, that the capitalization is never in excess of present value.

It has been suggested that the principal efforts of the directors and officers of the company should be to put out as much capital stock as possible by urging the acquisition of additional property in order that the stockholders may profit by a sale to the city, which has an option to buy at par for the company's bonds and floating debt and $110 per share for its capital stock. Of course, the city ought not to consent to any such program. It should insist that the property be maintained at a value fully equal to the par of the outstanding capital by means of an ample reserve. That reserve may be in cash, may be invested in approved securities or in additional physical property, or may be used to retire bonds, floating debt or capital stock. But the suggestion is a short-sighted one, even from the stockholders' point of view. They should protest against any increase in the difference between capital value and asset value, especially as the prospect of purchase by the municipality recedes. The likelihood of the city exercising its option to buy is less now than it was ten years ago. Municipal ownership and operation are not so popular as they were then; at least, among those who advocated them at that time. That consummation is more devoutly and earnestly wished by the owners than by politicians or public.

It may seem strange that this preachment should come from an officer of the company rather than from a representative of the city. But I assure you I speak for the stockholders.

Why cannot the city see that service cannot be improved, nor fares reduced, except temporarily, by permitting the property to deteriorate without filling, by a reserve built up from earnings, the void created by mechanical depreciation, wear and tear, obsolescence, accidents and the postponement of payment of debts, between the real value of existing property and its capital value or cost? I suppose because they are as short-sighted as the old bachelor pedagogue who, when urged to do something for posterity, asked, "What has posterity ever done for me?" Let the car rider of today pay the entire cost of the service he gets, and not shift any part of it to his children or grandchildren, or any other car riders of the future.

Ten years ago, at the close of the first six months of operation under the Tayler franchise, I prepared a paper for you on some of the accounting features of the franchise and included in it tables showing the earnings and cost of operation in those six months and in the corresponding six months of four previous years. I append to today's paper tables showing the earnings and costs in each year from 1911 to and including 1919, that you may see the variations in fare and expenses. The year 1906 was the last in which the company operated for private profit at the rate of fare fixed in its franchise, *viz.*, 5 cents cash, eleven tickets for 50 cents, free transfers. In 1907 it made experiments with six-for-a-quarter and seven-for-a-quarter tickets, and the Forest City Railway operated two lines throughout the year at a fare of 3 cents. On April 27, 1908, our property was leased to the Municipal Traction Company, which operated it at 3-cent fare until it went into the hands of a receiver in October. During a part of that year no transfers were issued; a person who desired to transfer paid a second 3-cent fare; some paid a third. From Oct. 22, 1908, to Feb. 28, 1910, the road was operated by receivers, at two or three rates of fare. On March 1, 1910, the property passed out of the receivership into the hands of the Cleveland Railway, and ever since has been operated under the Tayler franchise. The tables show the average fare in each year. They show, also, the earnings and the cost of operation, including taxes and interest, per car-mile, and in these respects should be more interesting to you than they are to us of the Cleveland Railway, because each of you can compare them with your own operations and we cannot, except as we have been favored with copies of your annual reports.

Our operating revenue in 1919 was 42.791 cents, our non-operating income 0.5583 cent, a total of 43.3493 cents. Our allowances for expenses, including "special" allowances, were 32.4781 cents, our taxes amounted to 3.4728 cents, and our interest charges, including interest on capital stock, to 5.5450 cents. Our revenue per mile of track operated was $39,200; maintenance expenses were $9,300, operating expenses $20,100, taxes $3,200, and interest, including interest on capital stock, $5,088. Maintenance expenses were 23 per cent, operating

TABLE I—ALLOWANCES FOR MAINTENANCE AND ACTUAL PAYMENTS

	Allowances		Actual	
Year	Amount	Per Car-Mile, Cents	Amount	Per Car-Mile, Cents
1911	$1,390,079	4.95	$1,506,651	5.36
1912	1,438,662	4.94	1,387,427	4.77
1913	1,499,339	4.95	1,775,372	5.86
1914	1,662,397	5.14	2,048,437	6.34
1915	1,676,708	5.17	1,916,712	5.91
1916	2,492,512	7.36	2,303,693	6.79
1917	2,587,519	7.22	2,592,698	7.23
1918	3,137,337	8.94	3,106,717	8.86
1919	3,968,059	10.98	3,667,513	10.15

TABLE II—ALLOWANCES, TOTAL AND PER CAR-MILE

	Allowances	
Year	Amount	Per Car-Mile, Cents
1911	$3,423,634.40	12.19
1912	3,347,558.13	11.50
1913	3,688,360.13	12.17
1914	4,030,933.82	11.95
1915	4,247,065.22	12.44
1916	4,609,768.52	13.61
1917	5,416,432.89	15.12
1918	6,793,036.63	19.36
1919	7,765,416.00	21.49

expenses 50 per cent, taxes 8 per cent and interest 12.79 per cent, of revenue. We furnished ten and one-half rides (fares, transfers and deadheads) per car-mile.

Trailer car-miles are calculated at 60 per cent of the actual number of car-miles run by trail-cars. Of the 38,000,000 miles run in the year 2,000,000 were run by trailers.

Today our allowances are 11 cents for maintenance and 29 cents for operation, plus "special" allowances of about 2 cents per car-mile, a total of 42 cents. Compare these allowances with your expenses.

TABLE III—INCOME BY YEARS

	Passenger Revenue, Cents per Car-Mile	Operating Revenue	Total Income
1910	22.91	23.57	23.72
1911	22.01	22.67	22.87
1912	22.11	22.84	22.95
1913	22.89	23.55	23.68
1914	23.24	23.80	23.93
1915	25.56	26.12	26.34
1916	27.52	28.11	28.33
1917	27.85	28.41	28.63
1918	34.55	35.17	35.47
1919	42.14	42.79	43.35
	Cents per Fare		
1910	3.48	3.58	3.60
1911	3.25	3.35	3.38
1912	3.15	3.26	3.27
1913	3.14	3.23	3.25
1914	3.25	3.33	3.35
1915	3.44	3.51	3.54
1916	3.42	3.49	3.52
1917	3.42	3.49	3.52
1918	4.42	4.50	4.54
1919	5.21	5.29	5.36

TABLE IV—MAINTENANCE AND OPERATING EXPENSES

	Maintenance, Cents per Car-Mile	Operating	Total
1911	5.36	12.07	17.43
1912	4.77	12.19	16.96
1913	5.86	12.23	18.09
1914	5.97	12.22	18.19
1915	5.27	12.56	17.83
1916	5.66	14.00	19.66
1917	5.77	15.34	21.11
1918	6.74	18.21	24.95
1919	8.44	21.96	30.40

Table I shows the regular and "special" allowances for maintenance, and the actual expenditures for maintenance, in the past ten years, and the amounts per car-mile.

Table II shows the regular and "special" allowances for operating expenses and the amounts per car-mile in the past ten years.

The Accounting Profession*

By George L. Vannais
Certified Public Accountant, Hartford, Conn.

Opportunities Are Unlimited, but High Class Training Is Necessary to Make the Most of These Opportunities. Accountants Make Possible Present Business Systems

TO TREAT this subject comprehensively we must consider some definitions: First, What is accountancy? I am pleased to call it the "Science of Business Control." Let us contemplate this definition for a moment. A generation ago there were many business successes controlled by the genius of a single man or group of men. Such an organization usually had a pioneer field, and by virtue of its patents or its superior service maintained its commercial supremacy. But as time went on new inventions were made, old patents became obsolete, competition set in and the necessity arose for more accurate records which would show the cost of production and the expense of distribution. The rule of thumb gave way to the significant per cent sign. Successful business control became possible only through the use of comparison sheets.

Many trade associations were formed, and where once petty jealousies existed between men in the same lines of endeavor there came about mutual friendships and the interchange of confidences and comparisons that were to benefit not only the producer but the consumer. These comparisons could only be made when the records were uniform; standards had to be set.

You men before me and all the interests you represent are to be congratulated on the foresight of the men in the street railway business who, from the beginning, saw the necessity for uniform accounting and appreciated the benefits of standardization. If your industry, which has been so potent in the development of the industrial, educational and social life of America, fell on evil times, you have the satisfaction of knowing that the general managers of the street railway systems did not go ahead blindly.

The keeping of records is an art; the creation of them a science. Ten thousand men are busy with the art in your one line alone. A few hundred of you men are developing and perfecting the science.

This leads us to another query: What is an accountant? And I venture this definition: An accountant is one who, by natural aptitude, extensive study and wide experience, is able to analyze accounts, correlate them, reconstruct them if necessary, and then, from the written record, visualize, for himself and others, a true picture of the condition of a business.

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*Abstract of paper presented at annual convention of the American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 13, 1920.

Accountants may be divided into two great classes—the public accountant and the private accountant. The public accountant occupies an important place in business life. To show you the ideals of the profession, let me quote from an address by one of the leading men of the public accounting profession, Edward L. Suffern:

> The public accountant must be trained, not alone in the technical school but through outside observation, practice and knowledge of the affairs of the world He must learn to observe. In order that he may know how to observe and to observe wisely, he must learn something of the economic conditions and principles which govern the making, handling and distributing of all products. He must know something about commercial law; he must know a great deal about the science of business administration; in fact, he must have a more broad and general training than is at present required in any other profession. But he must have learned something else, without which his other acquisitions are as nothing at all. He must have learned to be honest, truthful and conscientious, so that in no circumstances and for no consideration will he ever do one thing which his best developed, highest conscience cannot approve.

These are the qualifications of an educated man; these are the qualifications of a man of highest ideals; these are the qualifications of the men in the public accounting field who have won for the profession the respect and the confidence of the financial world.

The other class, the private accountant, in my opinion holds an equally important place in the economics of our times. He must have a wide knowledge of his own particular line of business. He must be well versed enough in general business to know the effect on his own particular business of all other industries. But he need not have a technical knowledge of their activities. Usually a private accountant has not made a deep study of the science of accounts. In the majority of cases he was graduated from the college of experience. His first textbook was the office broom and he learned the elements of his profession by doing the detail work. His ambition urged him on to every succeeding step in his upward progress until the day came when he was made chief accountant, and looked back over the long road he had so faithfully followed. Every man in this association who has reached this goal I have just described has found it necessary to develop himself to the highest degree of efficiency as he climbed onward and upward.

But our subject is "The Accounting Profession," and that word "profession" indicates an organization, a collective body, or, as Webster defines it: A collective body of persons engaged in a calling," and I presume, strictly speaking, private accountants would not be included in the profession of accountancy. It is sometimes thought that only those public accountants who are certified are in the profession, but this is not so, for there are many good professional accountants who have never been certified by any state. And again membership in the American Institute of Accountants has been held to be necessary for a man to be in the profession, but this cannot be, for there are also many men who are good professional accountants who are not members of the American Institute. Some of them are certified public accountants and still, for one reason or another, they are not members of the American Institute. However, I think it safe to say that the visible line which decides whether a man is in or out of the profession is found by applying the query as to whether or not the man is in public practice.

Assuming, then, for the sake of argument, that the profession is circumscribed by those in public practice, let us consider for a moment the status of the profession. Nearly every state in the Union has passed what is known as the C.P.A. law. It purports to regulate the practice of accountancy by issuing to all those who can qualify by test a certificate from state officials certifying that these men are of good moral character and are competent to serve the business of the commonwealth as public accountants.

The first C.P.A. law was passed in New York State on April 18, 1896. In 1905 the American Association of Public Accountants was formed. The membership was made up principally of the several state societies of certified public accountants. As each state had a different C.P.A. law, the membership requirements were not uniform, thus reciprocal relations were often denied. To establish the profession on a higher plane, on Sept. 19, 1916, the entire plan of national organization was changed. The name was changed to the American Institute of Accountants; state representation was abolished and individual membership substituted.

The American Institute of Accountants has today a membership of about 1,400. It meets annually in convention, four out of five years in the city of Washington. All members of the old American Association automatically became members of the new Institute when the Institute was established. Now, all admissions to the American Institute are by examinations.

It is estimated that there are at the present time about 3,000 certified public accountants in the United States. Less than half of them, however, are in public practice, and this leads to a peculiar situation in the profession of accountancy. When a man studies law, in nearly all cases he is a lawyer all the days of his life. If he studies medicine, he seldom forsakes the profession, but if he qualifies for the profession of accountancy, and goes out into public practice, he is continually tempted to leave the public field. Everywhere he does a fine piece of work the client looks on him with envious eyes and time and again he is offered such a flattering salary that he turns his certificate to the wall and becomes an executive. Within the last ten years I personally have known many men high up in the profession who have done this very thing. A few of them are today at the heads of great industrial organizations.

This is the reason why the accountancy profession can never be overcrowded. It used to be said that a public accountant was a bookkeeper out of a job. Today I think it is universally acknowledged that the public accountant is the bookkeeper who has grown out of his job, and as proof that this is so I wish to call your attention to the fact that bookkeepers often become public accountants, but men who have been public accountants long enough to have made any kind of start never become bookkeepers again. They may become office managers and executives, but they never go back to the old ledgers.

The accountant, whether private or public, who measures up to the ideals I have outlined occupies an important place in the world's work. He is the right hand of progress; he is the counselor of the captains of industry; his financial reward is such that he can educate his children and surround his home with the comforts and many of the luxuries of life, and before him always is the opportunity for better and greater work.

Transporting Other than Passengers on Interurban Lines*

By Britton I. Budd
President Chicago, Milwaukee & North Shore Railway

An Opportunity Is Presented to a Great Many Roads at Present to Develop a Merchandise Business—Higher Rates than Those Charged by the Steam Roads Are Warranted and Will Be Paid

BRITTON I. BUDD

IF THE electric railroad can increase its usefulness to the communities it serves by the transporting of merchandise as well as passengers it will be more apt to gain and hold that good will which is so essential to success. Moreover, no road can afford to overlook any business which may increase its revenues.

The steam railroads have been so handicapped for lack of equipment that they have not been able adequately to meet the demands upon them. From every city there has arisen a cry for additional transportation facilities. One result of this demand has been the development of the motor truck as a competitor of the electric railroad for the transportation of merchandise. Although the motor truck is neither as economical nor as reliable as the electric railroad and is unpopular with the taxpayer because of the damage which heavy trucks do to public highways, still it is a serious competitor in some sections of the country. In our Northern climate the competition of the motor truck is less to be feared on account of the difficulty and expense of operating on the snowbound highways, while the interurban railroad is dependable every day in the year. Nevertheless, it is a factor which cannot be ignored.

If we admit that there is a field for such business and that the time to exploit that field is opportune the question turns upon two chief points:

1. Is the transportation of merchandise by the electric railroad on a large scale practical from an operating point of view?
2. Can the business be made profitable?

To both questions I would answer affirmatively in a general way, although conditions are not alike on all interurban railways and what might be practicable on one road might be impracticable on another.

The principal function of the interurban railroad is to furnish quick and convenient transportation for passengers. That must remain its chief function, and should a local condition obtain where the handling of merchandise will interfere seriously with the more important business of carrying passengers it would be better for the road so situated not to attempt it. But where terminal and track facilities are such that an interurban road can engage in merchandise traffic without impairing its passenger service I think it both expedient and advisable that it should do so.

To make comparison of conditions easier, I have separated into three classes interurban railroads which are engaged in handling merchandise:

1. The comparatively small road with few passenger cars and limited facilities on which merchandise and passengers must be carried on the same train.
2. The interurban road whose passenger business is of such a character that it must establish a separate operation for merchandise.
3. The electric railroad having connection with steam roads which handles standard freight cars.

ROAD WITH COMBINED PASSENGER AND EXPRESS CARS

The first road named in the classification, in spite of its limited facilities, may develop a profitable business and add greatly to its usefulness to the communities it serves by carrying merchandise in an express compartment in its passenger cars. Such a business does not require additional investment in power and needs little in the way of equipment, as the bulkheads can be set at a point in the car which will give a proper balance between the number of passengers and the amount of merchandise to be carried.

The service which a road of this class is capable of giving is frequent and expeditious, and customers will gladly pay rates for it higher than those prevailing on steam roads. Of course, such a service involves an investment in terminal and local station facilities, but as these would be maintained in connection with passenger stations the business which might be developed would easily justify the comparatively small investment.

The point to be guarded against in developing a business of this kind is whether it might hurt the passenger business. The handling of merchandise would necessarily involve longer station stops, due to loading and unloading. Should this result in undue irritation of passengers it might prove unprofitable from every point of view. That is the reason that I say the subject should be carefully studied from every angle.

OPERATION WITH SPECIAL PASSENGER AND MERCHANDISE CARS

On the second type of interurban in the foregoing classification a considerable investment in car equipment, sidetracks and freight houses is necessary to successful operation. Usually this type of road operates through cities and towns on public streets where the use of standard freight equipment is impracticable, even if it is not prohibited by local ordinances. Freight cars arouse the hostility of the people when operated on streets, so that special express cars are essential if a successful business is to be built up.

In addition to the capital investment in equipment, stations and sidetracks, a complete and capable organization must be developed properly to handle the merchandise business. This organization should be made up of men experienced in the handling and transportation of freight, as it is easily possible through inefficiency and inexperience to allow operating expenses to run so high as to make what should be a profitable business a financial failure. In other words, if an interurban railroad undertakes to handle merchandise as a separate branch of its business it should go into it in earnest and not look on it as a side issue. The road must go after the business, not wait for it to come.

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*Abstract of paper presented at annual meeting of American Electric Railway Association, Atlantic City, N. J., Oct. 13, 1920.

To build up a profitable merchandise business is not such an easy matter as it may seem. To begin with, there is a natural prejudice against the electric road. That prejudice must be "sold" on the advantages offered by the interurban, and the transportation department must see to it that all claims of superiority made by traffic solicitors actually are made good by the quality of the service. If the traffic agent assures the shipper that his goods will be delivered within a specified number of hours after being received, such promises should be fulfilled to the letter. The road must make good on everything it claims it can do through its advertising and direct solicitation of business.

A most important part of the organization of which I speak is the claim department. The prompt settlement of claims will go a long way toward obtaining the good will of the shipper. On the other hand, dilatory tactics in the adjustment of claims will drive away desirable business.

The volume of traffic on the electric road is so small in comparison with that on the steam road that the superior quality of its service should be reflected not only in the quicker transportation of goods but in every detail connected with the business. The consignee should be promptly notified on the arrival of shipments. Facilities should be provided at terminals for the prompt loading and unloading of delivery trucks. That is one of the best talking points in soliciting business. To have trucks held up for hours at a terminal is an expensive arrangement for the shipper. Congestion at steam railroad terminals usually is great, and it is possible for the interurban road to relieve the shipper of this expense and gain his good will and business, even at a considerably higher rate than charged by the steam roads. The average shipper wants to get service. This service should begin when the truck carrying the merchandise appears at the receiving station and should follow that shipment until it is turned over for delivery to the consignee. It makes quite a difference in the mind of the shipper if he feels assured that his shipment will be given a personal attention which it cannot get on the steam roads where the volume of business is too great to permit of that.

HIGHER RATE IS WARRANTED

The expeditious handling of shipments means a great deal to the shipper and justifies a higher rate for the service. The interurban road as a rule can make delivery overnight, so that orders can be filled from one city instead of carrying a stock in a storehouse in another city 50 or 100 miles distant. This means less capital tied up in transit. I know of an instance where an interurban road receives a carload every night for the reason that double the quantity of goods would be tied up in transit on the steam road because of the longer time required to deliver them.

Another important part of the organization is the accounting department. The cost of handling different classes of merchandise should be analyzed in detail, for the interurban road seeking to build up a merchandise branch may adopt a policy of accepting any kind of business offered and learn later that it has made a grave mistake. There are some classes of business which an interurban railroad cannot handle with profit. It should, therefore, discriminate carefully in its selection of the business it accepts, taking only that where quick handling and superior service warrant a rate that will show a profit. In order to be able to use such discrimination the accounting methods must be up to date. The traffic department must know what it costs to handle every description of merchandise, so that it can be governed accordingly in soliciting business. Shippers are ready and willing to pay a higher rate for such service because it is worth it from a business standpoint. But to give that kind of service the road must have adequate facilities and it must give the strictest attention to every detail. It is a mistake to suppose that a service like that necessarily means such high operating expenses as to make the business unprofitable. It does, of course, mean higher operating expenses than on steam roads, but efficient methods in every department will produce the service without swallowing up the profits in operating charges.

INTERCHANGE OPERATION WITH STANDARD STEAM EQUIPMENT

On the third road in my classification, that which has direct connection with a steam road and handles standard freight equipment, the same methods outlined for the second road largely apply. Real service appeals to the farmer just as strongly as it does to the merchant or manufacturer. That has been fully demonstrated within my own observation.

The farmer has great difficulty in getting cars and service, both in the way of delivery of farm supplies and for the shipment of farm products. If an interurban which has connection with a steam road runs close to his farm it is an easy matter to get him interested in its possibilities. Indeed, it is easy to interest a group of farmers into paying the cost of a siding which will be of service to them. I know of instances where farmers drove past a steam railroad to load their product onto standard freight cars on an interurban and pay a considerable additional price, for no other reason than that the electric line could offer them a faster service and was able to give them cars when they wanted them.

"MERCHANDISE" VERSUS "FREIGHT"

It will be observed that throughout this paper I have generally used the word "merchandise" instead of "freight." The service given by the electric railroad is nothing like the freight service of the steam road. The rates on the electric road are higher than freight rates, because the quality of the service commands a higher charge. Most electric roads cannot give a freight service.

Since neither the service nor the rate is comparable with freight service on the steam road, why confuse the shipper in the use of terms? If you call your service on an interurban road a freight service, how can you convince the shipper that it is different from that given by the steam roads? How can you justify in his mind the higher rate you must charge for your service? The business is more in the nature of an express except that it usually is faster and that it has no pick-up and delivery service. Personally, I am not in favor of a pick-up and delivery service in connection with the transporting of merchandise on an electric railroad. I think it is difficult to conduct it profitably. The railroad should confine its functions to handling merchandise delivered to its stations.

In conclusion I would say there is no question in my mind that the electric railroad should come forward and assist in solving the transportation needs of the country. If it is provided with the proper facilities and furnished a suitable organization I am satisfied that a profitable business can be developed, a business which the electric railroads need and which the shipper will appreciate.

Problems and Principles of Public Safety*

By C. M. Talbert

Director of Streets and Sewers, St. Louis, Mo., and Chairman
Public Utility Section National Safety Council

Experience at St. Louis and Elsewhere Shows that Accidents in Public Streets Can Be Controlled by Organized and Persistent Effort of Public, Insurance Interests and Industries

C. M. TALBERT

APPROXIMATELY one-fourth of our population is subject to industrial hazards. Under conditions subject to quite considerable control, both of men and surroundings, practically every man, woman and child is subject to some form of public hazard on leaving the home. A classification of fatalities by a large insurance company covering a period of five years showed 51 per cent public, 14.5 per cent home and 34.5 per cent industrial. Of the non-fatal "claims" 45.1 per cent were public, 17.2 per cent home and 37.7 per cent industrial. This company in 1919 paid $450,742 for personal injuries arising from automobile accidents.

In 1907 the automobile fatalities numbered nine per million population and in 1919, 100, and the number estimated for 1920 is 110. Thus in the United States one death occurs every thirty-one minutes of the sixteen hours commonly assumed to be working hours. Fatalities are not increasing with machines in use, there being a drop from 2,756 in 1912 to 1,282 in 1919 for each million automobiles. Steam railroad fatalities decreased from 178.4 per million of population in 1907 to 105.2 in 1918; street railway fatalities from 43.7 to 28.9, and fatalities from all other vehicles from 36.3 to 27.3.

The total for all vehicular accidents increased from 245 per million in 1906 to 253.3 in 1918, although deaths from all other forms of accidents decreased from 685.3 per million in 1906 to 563.9 in 1918, a reduction of 18 per cent.

These figures are from tables prepared by F. H. Crum and may be taken as accurate. Mr. Crum states in his report:

> In those cities in which the National Safety Council, through co-operation with local safety councils, has been conducting campaigns of public safety during 1919 the percentage of increase in the automobile fatalities is shown to have been far below the average for the thirty-six cities combined, with the single exception of Pittsburgh. In St. Louis, Chicago, Rochester and Detroit intensive campaigns against all accidents, and particularly industrial and public accidents, have unquestionably already resulted in the saving of many lives.

Statistics show that but 10 per cent of the claims originate within the shops or property of the companies and that 90 per cent originate with the general public. It is safe to assume that the electric railway, in common with other business interests, is guarding the 10 per cent of industrial accidents. Its real problem is, therefore, the public hazard of 90 per cent.

Most progressive street railway companies have exerted efforts to remedy conditions and have spent considerable money and worked out campaigns for accident prevention so far as their particular interests are concerned. I do not believe the companies would claim that any great benefits had accrued to them, and we know that at least no such success has been attained as to create a following among electric railways generally. The fact is that public accident prevention cannot be made effective by individual corporations or public utilities. The situation, however, is without hope, but the methods employed are not the proper ones.

PUBLIC SAFETY IS A FERTILE FIELD FOR ENDEAVOR

Within the past ten years or less industrial safety has been thoroughly systematized and established as a business proposition. Public safety, while much more difficult to approach and while probably less tangible in results, is yet just as susceptible of control and has just as definite principles and foundations as industrial safety. The one great cardinal principle to which all others must be made subordinate is education. Force, control or direction, whether by ordinance, the courts, by police force, by signs or by other means, will not be greatly effective nor produce the desired results until the general public is educated to recognize the public hazard, its possible effect upon each individual and the means by which it can be controlled.

It is not possible to detach or isolate any particular public hazard and make any very successful attempt to better it, whether the attempt be made by steam railroads as to highway crossings, electric railways as to public highways, insurance companies as to automobile collisions or any other of the quite numerous items of public hazard. These interests should see that a particular hazard can be reached better, if not only, through the general effort to secure the vital and powerful aid of public sentiment. Only through a pooling of the common purpose of those who from humanitarian, official or financial interests are interested in public safety can any great and permanent good be achieved.

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*Address delivered before joint meeting of American Electric Railway Transportation & Traffic and Claims Associations, Atlantic City, N. J., Oct. 11, 1920.

The meaning of the accident problem to electric railways as a matter of finance is shown by Table I, which contains statistics compiled from the records of sixteen of the largest cities of the United States, widely scattered.

TABLE I—FINANCIAL ASPECTS OF ACCIDENTS

	1914	1918
Accidents per million passengers	51	48
Accident reports	213,796	208,400
Claims disposed of	62,320	72,304
Percentage of claims to accidents	22	33
Total expenditures for claims	$7,211,968	$9,450,592
Cost per accident	$35	$45
Total cost per claim settled	$139.37	$148.37
Percentage of claim cost to gross revenue	4.5	4.9
Suits pending	13,411	20,203

The total expenditure for claims of the largest seven systems, reported for the year 1918, was $6,300,000, or 4½ per cent of the total gross revenue. The claim agent of the United Railways of St. Louis states his conclusion that 90 per cent of all the claims paid by his company result from accidents in which the public is concerned. The claims costs in two instances, namely, Buffalo and New York, approximate 10 per cent of gross revenue.

ANNUAL CONGRESS SAFETY WEEK NOTABLE SUCCESS

That accident prevention does react to an aroused public sentiment was first shown conclusively during the 1918 annual convention of the National Safety Council at St. Louis. A somewhat elaborate safety campaign was planned by the local branch, the details of which included a window card for each school child receipted for by the parents, store window decorations and placards, safety slogans printed on fans and held in the hands of traffic officers while discharging their duties, slogans placed on safety zone standards, signs carried on fronts of service cars and placed on trolley poles, placards on automobile windshields, demonstration in one of the principal streets by the fire department, use of Boy Scouts to check "jay walking," etc. The records of the coronor's office for this week showed one fatal accident, as against twenty-four for the same week of the previous year and an average of ten per week for the year before.

During the 1919 convention week at Cleveland somewhat similar methods were employed. The fatalities here numbered five, as compared with fourteen in the previous year. The 1920 convention was held in Milwaukee, closing on Oct. 2. During this safety week there were no fatalities, as compared with seven during the same period in 1919.

The record at St. Louis might have been an accident and the one at Cleveland a coincidence, but that at Milwaukee must surely establish the safety week accident reduction as a habit. In these compaigns the electric railways were very active and were valuable co-ordinating influences. The business interests identified with the automobile industry also were active and efficient workers for public safety, and because of their position they were peculiarly effective in reaching drivers of cars.

As a result of the developments following the first St. Louis experience these conclusions have been reached:

1. An aroused public sentiment is the most forceful influence that can be brought to bear upon accident prevention, and from the nature and psychology of the public no corporation or business interest can do such arousing.

2. Men and women of every walk of life will give freely of time, money and influence if they can be made to feel that what they are giving will be made effective and will form part of a well-developed and consistent plan bearing promise of definite results.

3. Any plan devised must be continuous in its operation and a trained and salaried officer must be placed in charge.

4. The law-making and law-enforcing officials of every community will gladly welcome and co-operate with a public safety committee, when once convinced that it is to be helpful and not merely critical.

5. As public safety is a matter of education, the most fruitful grounds for ultimate results are the public and parochial schools, and principles of safety can just as well be made a part of the curriculum as the principles of grammar, arithmetic or any other of the usual studies.

6. Industries can be made to see that the loss to them of a trained man's time through injury is just as great whether it occurs inside or outside the walls of their plants.

The practical question which must naturally arise in mind is: "What are the details of the plans by which these results are to be accomplished?"

A DEFINITE PROGRAM FOR PUBLIC SAFETY PROMOTION

Omitting the steps by which the present accepted plan is arrived at, except to say that the first plan was too meager and the second too elaborate, I could summarize the procedure as follows:

1. Form a public safety committee, affiliated with and a part of the chamber of commerce or other comparable body of the city, selecting as sponsors and guarantors for this committee the busiest and most influential men of the city. This has been done during the past two years in sixteen cities, including St. Louis, Cleveland, Rochester, Kansas City, Pittsburgh, Grand Rapids, Milwaukee and Cincinnati.

2. Collect a fund to guarantee expenses until such time as a permanent scheme of financing can be put into operation.

3. Form committees as follows and whose duties will be as indicated by the titles: (a) A police committee, with the chief of police as chairman, (b) a school committee, with the superintendent of schools as chairman, (c) a publicity and bulletin committee, (d) a women's club committee, (e) a Boy Scout committee, (f) a church committee, (g) a motion-picture committee, (h) an automobile legislation and traffic committee and (i) a law-enforcement committee.

The number and character of the members of these should, of course, be given the most careful consideration, with due consideration of the amount of active work that can reasonably be expected from each man as well as the influence to be wielded by him as a leader in the community. It is in the membership and work of these committees that the very great contribution (aside from financial) can be made by the electric railways. Some of the most valuable men in most of the cities have been the claim agents of the electric railway companies. They, by reason of their long study of conditions, are peculiarly fitted at once to enter into active work. The importance of this fact, and the advantages of the cars and trolley poles as an advertising possibility can hardly be overestimated. The claim agent in St. Louis is, as I can testify, ranked as one of the most valuable of the leaders.

ST. LOUIS HAS IN OPERATION A SUCCESSFUL PLAN FOR SAFETY EDUCATION

In the public schools of St. Louis there has been worked out by a St. Louis man within the last two years a system of safety education which has been formulated in a textbook. This has been indorsed by the National Educational Association and the National Safety Council and is coming into considerable use. It is based upon the use of the subject of safety to illustrate, for instance, problems in arithmetic, studies in English, etc., and is co-ordinated with the formation of safety committees of the school children. Among the duties of these committees are the following: To assist the traffic officer in the vicinity of the school and take his place if absent; to watch the younger children at stairs; to watch danger points in corridors; to place, care for and remove "Slow—Drive with Care" signs in the streets at schools, and to do a number of other things of this kind. The plan can be seen in active operation on any school day in schools in St. Louis and a number of other cities. Dr. Payne, the author of the textbook mentioned, has condensed his observations on school children and street cars as follows:

I. This is a big problem because children are not directly under the supervision of parents or teachers when they are on the streets. Moreover, the streets in the school district cannot be policed in such a way that would protect children from the innumerable street dangers and especially danger from street cars.

II. Children have a special fondness for stealing rides on street cars and seek every opportunity to take unusual chances in connection with them.

III. Since these hazards are always present, and it is impossible to exercise direct control by parents, teachers or policemen, controls must be developed within the children themselves that will lead to the elimination of the hazards.

IV. Therefore, the problem of education in safety against the dangers of the street railways is simply the development of controls in the children that will secure the proper results.

(a) These controls are fundamentally a matter of habit, and the habit of care with reference to street cars is merely a part of a group of habits that affect the control of the children on the streets generally. That is, the places and methods of crossing and remaining away from the street cars in motion. The method of developing these habits is to utilize older school children to station at street crossings to direct the children traffic. The direction of the children across the street will not in itself insure correct habits, but it is necessary to develop in the school itself public opinion on the question of care with reference to street cars and other street dangers. This is done by the study of newspapers, newspaper reports of accidents and numerous other sources of accident satistics in the regular class work.

(b) Not only must habits be developed but there must be intelligence or knowledge of accidents that will take care of children in unusual situations and also give a comprehension of the whole problem of their relation to a public utility. This is done through direct instruction in everything that relates to street control and the relation of children to it.

V. The result of this instruction which has been carried on throughout the city this year is one death in street railway accident to a child of school age in St. Louis in the first eight months of the year as opposed to an average of six covering a number of years and an increasing number from year to year.

An electric railway could do no better service to a community nor to itself than to furnish this book to the schools in its locality and see that it has at least a fair trial and chance for adoption.

SOME OTHER THINGS THAT CAN BE DONE

Among other helpful agencies, a properly formed vigilance committee, to report to the proper authorities traffic violations but not to make arrests, is proving a valuable aid in several cities. Chauffeurs' schools, as conducted by local councils and by some of the truck manufacturers, are showing unexpected attendance and are demonstrating that the men who drive for hire, and particularly those who drive commercial vehicles, are as a class far more interested in driving safely and carefully, or at least in making a study of safe driving, than are those who own cars and drive them merely incidentally. The good truck driver who is sure of his ground is himself a valuable traffic officer. The council has worked out a series of twelve lessons, of which more than 60,000 sets have actually been sold before publication.

The placing of bulletin boards in garages and at gasoline stations, changed often enough to keep them clean and presentable; the painting of white lines on the street, establishing of safety zones, placing of traffic lamps and caution signals, are all part of the safety movement, which do not call for any special comment at this time.

One of the most effective measures yet devised was the formation of a "Safe Drivers' Club" in Milwaukee in connection with the recent convention there. Although no organized efforts toward public safety had ever been attempted in that city, the officers of the council, in co-operation with the Association of Commerce and the public utilities of the city, had, within sixty days of its inception, enrolled between 10,000 and 12,000 members at a fee of $1 each, thus combining the value of the personal interest of that number of individuals with a very substantial financial foundation for further work. The details of the methods used are being formulated and will shortly be available for other communities. St. Louis expects to form such a club with at least 25,000 members.

Every city should have a strictly enforced ordinance calling for registration and examination of every individual who operates an automobile and providing for the suspension or revocation of the driver's license for cause.

A FINAL WORD

It is, of course, the desire and the duty of every official of an electric railway to serve the interest by which he is employed and in the furtherance of that duty to use his best endeavor to make the financial accident burden bear as lightly as possible upon the balance sheet, but one who has entered upon a study of the prevention of maiming or death by accident cannot go far without realizing that there are much greater obligations and rewards than those indicated by figures preceded by a dollar mark. It has long been said that "a corporation has no soul." Let not the same be said of those who are given authority in these public service corporations and who may, by a proper exercise of that authority, help to make the highways of our cities safer for our people.

Purpose and Organization of the Super-Power Survey

By W. S. Murray
Chairman Super-Power Survey, United States
Geological Survey

W. S. MURRAY

Studies Which Will Lay the Foundation for Allocation of Wastes in Power Production and for the Elimination of These Wastes Will Constitute the Survey

ANY man who knows that the steam freight locomotives of today waste three out of every five tons of coal that they burn and at the same time knows that there are means available to eliminate this disastrous waste of the nation's natural resources cannot keep silence. If that same man knew that a similar waste of fuel was going on throughout the factories of this land, and that this in turn could be corrected, for him silence would indeed be consuming.

These are a part of the conditions that exist. Now, what do they represent in cost to the nation? At the lowest estimate they cost $300,000,000 per annum, which figure will be doubled in four years if the rate of our industrial expansion continues on the order of past progress. But, alas, these very wastes, this improper form of power production and distribution, if continued, will throttle our expansion, and in lieu of progress we shall continue to wallow in our wastes.

The two giant arms that support industrial expansion are power and transportation. The present inhibition of their development is the common knowledge of the nation. When a ton of freight moves but five miles a day and this keeps up for a solid month; when a public utility central station system must refuse an offered load of 100,000 kw., crying "No capacity"; when—but why go on? Were the situation not so paralyzingly serious it would be ridiculous. We are nothing less than nationally negligent to acknowledge such a situation and not act upon it, and with all the world's progress in our hands if we are but moved to action. It would be to betray a trust of national sincerity not to speak thus frankly. I do not fear, but rather detest, the man who says, "Oh, everything is all right; this last year has been the biggest year of my life. I have made more money than I ever made before." That is a man not to be feared, but he is the man to be reached, and the sooner we segregate all of his type the sooner we shall allocate our distressing wastes.

I have been propelled to a conclusion which, if the judgment of engineering is taken seriously, should bring progressive alarm in what is at present a negative and false progress. I hope that within the specific confines of the training of my associates on the super-power survey and myself we may point a way in our report looking toward a power policy which will "kill" the inhibition now controlling the two great adjuncts of our national industrial progress—power and transportation.

Power is the father of all accomplishment; moral, intellectual and physical. High load factor is the measure of successful operation in every business. Its importance of application can find no greater field than in the generation and distribution of power. Good business is entirely dependent upon good agencies. Electricity is the most economic and is the true agent of power. Steam increased the power of man a hundredfold; electricity repeated this multiplication.

Load factor is the ratio of average to maximum load. Conditions exist where load factor may be 100 per cent. The average load factor of the steam locomotive is less than 10 per cent. Even the average load factor of our central stations is less than 35 per cent. The average load factor in the great zone of the super-power survey is 15 per cent. Such a figure comprehends the present operation of the railroads and industries of the super-power zone.

This brings us to the specific problem of the super-power system. What does it portend? In a territory, approximately speaking, between Boston and Washington, averaging 150 miles inland from the coast and comprising withal some 60,000 square miles, such a territory representing 2 per cent of the land area of the United States, there is a demand in machine capacity for 17,000,000 hp., divided 10,000,000 hp. for the industries and 7,000,000 hp. for the railroads.

Through the application of a plan outlined below, the load factor can be lifted from its present value of 15 per cent to 50 per cent. Capacity can be conserved threefold; that is, one horsepower can be made to do the work of three and one pound of coal of two.

AN ANALOGY FROM THE MINING FIELD

Some years ago in the great mining district of Logan County, West Virginia, there was installed in scattered plants some 4,000-hp. capacity in boilers, the steam from which supplied the power mains of the mines. Today the power from a 500-hp. boiler, converted into electricity, takes its place. Here is a conservation of capacity in the ratio of eight to one; a very large conservation made possible by the great diversity factor existing in the mining industry. The example serves, however, as an excellent illustration of what may be done in the great territory now under consideration.

As in Logan County, where the mines now receive their power from one common bus, so in the super-power territory it is proposed to deliver power to a great transmission and distribution system fed by high-power, high-economy, steam-generating stations erected at points on tidewater and at mouths of mines where condensing water and coal storage are available. Added to such a supply of power will be that obtained from the great rivers of this territory, the Delaware, the Susquehanna and the Potomac. Reaching into this area of 60,000 square miles may come the great water powers of the St. Lawrence, which will supply the New England districts of the zone. Every kilowatt-hour of energy so supplied will conserve in nature's storehouse two pounds of coal which would have been required to replace it. Threading through the super-power zone will be a trunk transmission system which will be common to all of these great sources of power, in which will be included also the great central stations of the character now built at Boston, Providence, New York, Newark, Philadelphia, Baltimore and Washington.

Approximately speaking, there will be some 2,700,000 kw. of new capacity to be added to that of the great stations just named and their function will be to furnish the base load in this great power reservoir for joint use by the railroads and industries. This, it is believed, can be done at an expenditure of from 1 to 1½ lb. of coal per horsepower-hour; the peak loads being furnished from the present stations.

Contrast this with steam locomotives now using 7 lb. of coal per horsepower-hour, and again with the factory use of coal at even a greater rate. With these figures before us it is but a simple calculation in arithmetic to show that a saving of 30,000,000 tons of coal per annum is a conservative estimate for this zone now using 25,000,000,000 kw.-hr. a year and with the demand for power doubling itself every four years.

From information already secured, it appears that the average capacity of a central station in this zone is on the order of 3,000 kw. How can such a station compete in the economic production of power with one one hundred times as large. It is quite possible that the super-power system will justify the installation of 300,000 kw. or more in a single station.

DENSITY OF TRAFFIC THE DOMINATING ELEMENT IN ELECTRIFICATION

The conservation of 30,000,000 tons of coal means a direct saving of $150,000,000 per annum, and there may be added to that figure $150,000,000 more due to the lesser cost of maintenance of electrical as compared with steam machinery. In the latter figure are also included certain savings effected through the reduction of train-miles by virtue of the higher speeds and the higher tractive efforts obtainable in the electric locomotives.

But not all of the steam railroads in this territory are to be converted for electrical operation. Only those where the density of traffic justifies will be electrified. Density of traffic is the prime and true factor in the determination as between the economics of railway operation by electricity or by steam. In the matter of electrification the three great economic components of density lie in the saving of fuel, motive-power repairs and train-miles, these with reference to open-track operation. While the economic considerations are most important in the matter of yard and terminal electrification, here the physical conditions in their relation to outside trackage may be controlling.

A point of paramount importance in this connection is that the present rights of electric public utilities, their entities and their franchises, are sacred. These and their vested interests must be respected. The super-power system is not suggested as competitive with existing power agencies. It is suggested that they carry on in larger degree and to higher economies the work so ably started and now being carried on. They have made possible the super-power system. I have been called the "father of the super-power system" because I visualized the zone of such an application between Boston and Washington. Dr. George Otis Smith, director of the United States Geological Survey, has well said "that no particular man could be considered the creator of the super-power system idea; that it has come as a matter of gradual evolution." I agree with Doctor Smith, but I would go further and say that the electric public utilities are the true parents of such a system.

Let us think for a moment what the saving of 30,000,000 tons of coal a year means. As a miner will do well to average a thousand tons a year, 30,000 miners become available either for other work or continued mining productivity if 30,000,000 tons can be saved. Coal is fighting with the finished and unfinished products in the yards, sidings and on the main lines of the railroads, and it occupies 40 per cent of the total cargo space now used. I shall not attempt to follow this 30,000,000 tons of coal back to the mine from tidewater, but every ton of it will probably average 200 miles in transportation. Think of the release of cars for other service, the saving of coal now burned to haul coal, and the rendering available of train crews for productive rather than wasteful effort.

WATER POWER A SMALL BUT IMPORTANT FACTOR IN THE SUPER-POWER ZONE

Let us now for the moment drop coal power and think of water power. Large as are the rivers in the super-power zone, their contribution to the power requirement will be less than 15 per cent of the total. Small as this may seem, yet so great is the value of this water power in its contribution to conservation that every respect must be accorded the power to be obtained from such a source. However, the necessity of addressing ourselves to the problem of producing power with coal at the highest efficiency is the urgent matter, for in four years the proportion of water power to steam will sink to 7½ per cent of the total.

Today we build a plant and a quarter for every one we require, because we place in that plant spare capacity to guard against breakdown. While we are building these little plants, which uncompromising experience has taught us are inadequate to our industrial expansion, we pay twice as much per kilowatt of capacity as would be required in the large super-power stations, which can be built with capacity which not only cares for the present but for the future also.

Recently, Philip Torchio, electric engineer, New York Edison Company, cited a dilemma in which this great company found itself when an unusually black thunderstorm enveloped New York City. So much darkness was substituted for light that with the switching on of the load the great plants of this system were taxed beyond their immediate operating capacity. The steam pressure in the boilers fell to a dangerous limit and the situation was only partially saved by the switching on of some available storage battery capacity. This peak, in midsummer, was greater than any peak during the winter months. Had the New York Edison Company been a part of a super-power system it would have been possible to have supplied not only the 60,000 kw. required but probably twice that amount within five minutes. The power might well have come from Niagara Falls or the St. Lawrence River, to say nothing of the possibility of it coming from one of our own rivers in the immediate vicinity, such as the Delaware or the Susquehanna. Or still again it might have been supplied from one or two steam turbo-generators located in a super-power station either at tidewater or at the mouth of a mine.

"FACILITY" A CHARACTERISTIC OF ELECTRIC POWER

Electricity has long been known as an agent of the highest efficiency in the matter of transmission and distribution of power. We are coming now, however, to a fuller recognition of its efficiency as an agent of facility. Because of the possession of these two elements, electricity is an effective weapon with which to vitalize the fibers of our power and transportation resources. The slogan of this country's future progress is "Produce!" and then "Produce More!" Let us facilitate manufacture and speed up the production of our factories by speeding up the railroads that transport their finished and unfinished products. All the elements of a steam locomotive are conducive to delay. The electric engine has 6,000 out of the 8,760 hours a year available for revenue work; the steam engine but 2,500. The capacity of the electric engine is maximum when we need it the most—in winter. The steam engine during this crucial period offers its minimum capacity for service and is never dependent upon the human arm; the arm behind the electric engine is machine-made.

In a trip throughout the super-power zone to meet the executives of various railways, public utility companies and industrial chiefs, while expecting a sympathetic point of view on their part, I have been amazed at the alacrity of their offers of assistance, backed up by the flood of information pouring in as the result of questionnaires addressed to them. This leads me to describe the organization by means of which we are securing the information necessary to our report.

AS TO THE SURVEY ITSELF

The objects of the super-power survey are two: (1) The allocation and valuation of the waste incident to the present improper forms of power production and distribution and (2) the recommendation of a regional plan by means of which this waste can be eliminated. Through President E. G. Buckland of the New Haven Railroad, who has ever had New England's interests at heart, I met Secretary Lane and laid before him the plan of the Boston-Washington super-power system. The plan was indorsed by the Secretary and Dr. George Otis Smith, under whose department, the United States Geological Survey, the power survey is now being conducted. Then followed presentation to Congress, action being delayed on the bill due to President Wilson's absence from the country. On presentation, however, to the Sixty-sixth Congress, Judge Payne, who indorsed the plan, having then become Secretary of the Interior, it passed both the House and the Senate, was approved by the President, and it now forms a part of the sundry civil bill for 1921.

I take this opportunity to express appreciation of the broad-minded policy of Doctor Smith, to whom I report as chairman of the super-power survey. To Director Smith I outlined the engineering policy which I believed should be followed in the conduct of the survey. First I believed that it should be divided into two principal parts; the first consisting of an engineering staff, the second of an advisory board. The engineering staff was to comprise three departments of investigation, one for power and transmission, one for railways and one for industries. Working with these three departments I suggested an engineer-secretary, to co-ordinate and prepare the field data collected by the departmental organizations for the report text. The advisory board was to consist of men representative in the fields of power production and power utilization, who were looking toward the establishment of a national power policy. Doctor Smith approved and accorded to me the duty and privilege of appointing, for confirmation by the Secretary, the members of the engineering staff and the advisory board. The work of these bodies will be better known after the report has been completed and made public.

On our advisory board appear such names as Breckenridge of Yale, Buckland of the New Haven, Hardin of the New York Central, Alexander, executive director National Industrial Conference Board; Edgar of the Boston Edison, Sloan of the Brooklyn Edison, Pardee of the American Electric Railway Association, Little, America's foremost chemist and the author of "Rehabilitating the Estate"; McGraw, the head of technical publicity in this country, and last, but only because he joined last, Herbert Hoover, representing mines.

Throughout the trip from Boston to Washington it seemed as if every man wanted to impress upon me that what we needed most was a sufficiency and a reliability of power. The cry for power seemed to pervade the atmosphere, and when that was not mentioned, coal, or rather the lack of it, took its place. Every one seemed to say, "When the foundation is laid for the super-power system, see to it that you know where your coal is coming from, and how you are going to get it," and "See to it that your power-plant capacity is sufficient not only to take care of this immediate present but the future as well."

THE MINING END OF THE PROBLEM

This leads me to the great mining problem, so intimately related to the super-power system in securing continuity of power. None of the super-power stations should, I think, be erected within the confines of large cities. Around them should be placed ring buses from which power may be drawn, and the new super-power stations should be built far outside the limits of such cities. A prerequisite of as much importance as securing water is that of securing ground for coal storage. Such storage will amount to millions of tons and will be a regulating feature paramount to a continuity of power production, while answering also the fluctuating labor conditions at the mine.

The great coal roads to the mines must be "revamped," and these will offer opportunity for electrification, even outside the immediate limits of the electrification zone, to permit the speeding up of that important traffic. It is patent that if, by the means described, we can make one ton of coal do the work of two, the effect will be simply to accelerate the expansion of our industrialism. Thus these same coal roads will be required to handle more, rather than less, coal.

We are looking toward the establishment of power continuity, among other things, through the selection of a coastal point where three co-ordinated plants may be erected; one a coaling station where the coal can be received in bulk from the mines and loaded into barges for transport by sea to the super-power stations erected at tidewater; another a power station generating its quota of energy for the super-power system, and a third, a byproduct plant which will extract the gas, ammonium sulphate, benzol, tar and coke. The coke will be used for metallurgical or power purposes as conditions may dictate.

The growth of the power demand in this country is not in proportion to the growth of population, but at a rate much higher. During the last ten years the horsepower per wage earner has increased 25 per cent. The wages of labor in this country have risen far above those of other countries, and therefore it is to machine-made power and not to man-made power that we must look in order that American industry may fairly meet the competition of the rest of the world.

The northeast seaboard, of which the super-power zone forms the most important part, is the finishing shop of American industry. Into it flow the country's raw materials, and when the highly skilled and highly paid American labor has turned them into finished products our new merchant marine, with its building record of 6,000,000 tons in a single year, stands ready to secure our supremacy in world trade.

In conclusion, I desire to outline a few salients which stand out in the consideration of the establishment of a national policy. These are:

1. Power is the father of all accomplishment, moral, intellectual and physical.
2. Power in the form of coal is maximum in bulk and minimum in efficiency; in the form of electricity it is minimum in bulk and maximum in efficiency.
3. We have spent billions to develop the natural resources of the United States and render them available. Can we now afford to throttle the burst of industrial expansion which is upon us, not only for ourselves but for the world, by refusing to recognize the necessity of stimulating the two giant arms which are supporting it —power and transportation?
4. We have spent billions in destruction for preservation; now let us spend billions in construction for conservation!

Stores Accounting as a Means to Stock Regulation*

By R. A. Weston
Certified Public Accountant
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By Means of Careful Attention to Store Accounting Necessary Stock to Keep in Store May Be Kept to a Minimum—Possible Savings for All Electric Railways Estimated to Be as Much as $7,500,000 to $15,000,000 Annually

R. A. WESTON

BY THE term "Stores accounting as a means to stock regulation," I mean a regulation of the amount of stock to be carried, so that, on the one hand, there will be a minimum delay, or expense due to delay, by not having material on hand when it is wanted for use in repair work, and, on the other hand, there will be a minimum amount of the company's cash capital tied up in the inventory, thus enabling such capital to be put to other uses.

Not only is it disadvantageous to tie up the funds so that they cannot be used, but it is a matter of serious expense to carry surplus material in stock. It may at first be thought that the expense is only the amount of the interest on the capital invested. This is far from all. There is in addition the cost of handling the material when received, and at inventory times, and when rearranging and straightening out the storehouses; there is the loss of the use of the storage space occupied by the material; there are taxes and insurance; there is more wastefulness occasioned on account of having an abundance of material, and a disinclination to make use of serviceable second-hand materials; there is the cost of unnecessary transportation over longer or shorter distances, and finally, and perhaps more important, there are the losses due to deterioration and obsolescence. All this expense has been variously estimated as amounting to from 15 per cent to 30 per cent per annum, depending upon the value of the material.

The storekeeping problems of a railway company are quite different from and much more difficult than those of a manufacturing industry. In the latter case the management determines what the production is to be. The production engineer prepares plans and bills of material and the definite quantities are ordered that are known to be needed and must be used in the manufacture. Within a reasonable time after it is received the material is all used.

With a railway it is quite a different matter. Omitting the consideration of new construction work, the problem is one of repairs and upkeep, and it is not possible to determine definitely and exactly in advance just what repairs are going to be necessary, or just when it is going to be necessary to perform them. These things depend upon the quality of the materials that have been used in the construction and the skill with which the work has been done, the action of the elements, unforeseen accidents and emergencies and the policy, or the ability, of the company with respect to the state of repair in which it keeps its property, or allows it to depreciate. A stitch in time saves nine, but sometimes it is not possible to take the stitch in time and then the nine stitches become necessary.

Experience has proved that in the long run the law of averages is the best guide to go by in maintaining a stock of material for repairs and renewals; the average of past consumptions when similar conditions have obtained. Such a record, to serve as a basis for ordering, is immeasurably better than the estimates that will be made by shop, track or line foremen of the quantities that are going to be required, in a given period, for ordinary maintenance work. Of course such records need to be supplemented by special knowledge, or special orders relating to character of work laid out to be done, and the tendency of equipment to become obsolete and to be superseded by improved designs must always be borne in mind and considered in determining quantities; but with all such reasonable limitations, past consumption is the best guide to follow.

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*Abstract of paper presented at annual convention of American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 12, 1920.

HOW CAN ACCOUNTING REGULATE STOCK?

This being the case, how shall we shape our accounting tools so that they will afford the guide to assist us in properly regulating our stock? If we can make our records show us in a practical way what the periodical consumption of material is, that will guide us in the quantities to order and maintain in stock.

To take a concrete example. Let us suppose that our record shows that we use on an average 200 trolley wheels per month, and that this consumption has varied between a minimum of 160 and a maximum of 240. Let us further assume that it takes thirty days after placing an order for trolley wheels before they are delivered.

If we regulated our stock so that, in each month, we had available for use 240 or slightly in excess, we then would consider that we were protecting the service with a minimum of stock on hand. If we had an average of 240 available for use each month and an average consumption of 200 per month our per cent of disbursements would be 200 ÷ 240, or 83⅓ per cent. Our stock on hand at times would tend to approach 40, which would be only a six-day supply. If we had to divide our stock and distribute it in several places, and if deliveries were somewhat erratic, we would be working on too low a margin. The storekeeper would be more likely to feel that his average stock balance throughout the month should not fall below a month's consumption, or 200. Working on that basis, he would be always maintaining a stock of 200 and receiving and issuing 200 besides. This would mean that he had available 400 in the month and used 200, and his rate of disbursement would be 200 ÷ 400, or 50 per cent.

With other stock items the case will be different. Let us take the case of a set of armature coils for a large generator in a main power station. A set of such coils is held in stock to guard against an interruption to the service. It may be months before such an item is used. It may even never be used, but must be carried as an insurance against interruption. Here we have an instance where the percent of disbursements will be zero.

With regard to practically every item of material carried in stock, the storekeeper will find that experience will enable him to determine a minimum stock that can be carried with safety. This will vary with different kinds of material, market conditions, time required for delivery, effect of the seasons on consumption, etc. The point I want to make is that experience and good records will show, within quite close limits, the goal to work for or the size of a properly regulated stock.

It is impracticable, however, for a general officer to attempt to govern the regulation of the stock, through lists of all the stock items, and the quantities available and consumed, as per our illustration. There are too many items; the list would be too long; time would not permit. The same relationship can be shown just as well by considering the money value. This gives us a common unit for all items of material, and enables us to group items into classes, and reduce to dollars and cents the aggregate, for the class, in material available, and in material used.

Therefore we may say that the first step in the regulation of stock should be a classification of the materials carried and used. If we can make this classification a standard classification that can apply to railways in general, we will have accomplished a further step of great importance, because we then afford a means of comparison between roads. We can

MATERIAL STOCK REPORT, ALL STORES, DECEMBER, 1915

On Hand First of Month	Purchased		Transferred		Received by Credit	Total Available for Use	Classes of Material	Used	Transferred		Sold	Total Disbursed	On Hand Last of Month	Percent Disbursed to Total Available	Working Stock
	Vouchers	Freight Charges	From Other Classes	From Other Stores					To Other Classes	To Other Stores					
220,597	269	3	5,881	6,901	1,381	235,032	1-A Frogs, switches, crossings and parts	9,736	1,993	6,336	97	18,162	216,870	4.4	...
192,275	38,293	738	1,426	8,099	292	241,123	4 Lumber and piling for bridges, buildings, fencing, etc	33,920	1,645	6,404	335	42,304	198,819	14 8	...
							Total, Maintenance of Way and Structures								
101,762	12,673	146	4,073	6,252	55	124,961	11 Bolts, nuts, washers, etc.	11,760	1,424	6,480	157	19,821	105,140	10 4	12,372
68,686	22,224	5	5,317	5,695	574	102,501	21 Brass castings and journal bearings	28,226	3,427	5,667	103	37,423	65,078	31 0	8,663
							Total, Maintenance of Equipment								
51,492	12,264	59	3,157	8,163	118	75,253	36 Locomotive, train and station supplies	15,338	217	8,145	143	23,843	51,410	24.2	1,021
							Total, Conducting Transportation								
56,175	274	82	......	11,769	50,229	118,529	50 Scrap—Except rail	1,060	842	11,904	59,778	73,584	44,945	57 0	
3,397,512	342,903	7,308	132,624	152,524	153,499	4,186,370	Grand total	451,121	132,625	152,523	85,696	821,970	3,364,400	13.8	90,671

FIG. 1. MATERIAL STATEMENT. FIFTY-EIGHT CLASSES OF MATERIAL ARE PROVIDED ON THIS BLANK. TYPICAL CLASSES AND TYPICAL FIGURES ARE GIVEN IN THIS EXAMPLE

compare our performance with that of our neighbor, and profit by his experience and attainments. Now a classification of material was recommended for steam roads by the Railway Storekeepers' Association, at its convention in St. Louis in 1910. This was later incorporated in the "Rules for Railroad Store Department Operation," by the Director General of Railroads, under federal control. With one or two unimportant additions, this classification can be equally as well used by the electric roads. Under it, all materials will be included in about fifty-eight groups or classes. The names of these classes are shown upon the material statement, which illustrates this paper and to which I now refer. It will be noted that on the statement the classes are grouped according to the I. C. C. general accounts. This frequently enables very interesting statistics to be presented to the operating department officials.

AMOUNT OF MATERIAL RECEIVED, PERCENTAGE DISBURSED AND COST PER $1,000 FOR HANDLING
MONTH OF JUNE, 1915 AND 1916

Storehouses	Year	Amount on Hand First of Month	Amount Received During Month	Total Debits	Material Disbursed During Month	Balance on Hand Close of Month	Percentage of Stock Disbursed	Day's Supply on Hand
"A" Storehouse	*1915*	*718,285*	*163,927*	*882,212*	*163,864*	*718,348*	*19*	*128*
	1916	1,231,481	348,968	1,580,449	244,914	1,335,535	15	170
"B" Storehouse	*1915*	*280,237*	*78,743*	*358,980*	*80,181*	*278,799*	*22*	*106*
	1916	380,729	94,571	475,300	85,827	389,473	18	137
"C" Storehouse	*1915*	*366,751*	*41,180*	*407,931*	*46,921*	*361,010*	*12*	*220*
	1916	373,739	164,425	538,164	136,783	401,381	25	90
"E" Storehouse	*1915*	*58,458*	*41,741*	*100,200*	*37,869*	*62,331*	*38*	*49*
	1916	68,468	37,914	106,382	32,548	73,834	31	67
"F" Storehouse	*1915*	*162,363*	*72,893*	*235,256*	*74,440*	*160,816*	*32*	*64*
	1916	174,974	127,774	302,748	111,423	191,325	37	51
System totals	*1915*	*3,397,502*	......	....	......	*3,364,417*	...	...
	1916	4,165,358	......	....	......	4,381,192	...	...

FIG. 2—CONSOLIDATED REPORT FROM ALL STORES

Each store of the system will have a material classification ledger, in which will be kept an account with each class of material. The class will be charged with the inventory and with the receipts and will be credited with the materials issued and used. These accounts will be controlled by the one account of "General Stores" in the general ledger. When the accounts are closed each month a statement will be drawn off the ledger on the statement form to which I have referred.

It will be noted that this form shows certain information each month about each class of material. The left side of the form shows what is started out with, and then what is received, showing also the source from which it is received. These are totaled to show all the material that was available for use. The right side of the form shows the disbursements and how the materials are disbursed and what is left at the close. Column 14 is very important, being an index figure for each class, to show the percentage of disbursements to the total material available. Column 15 shows the value of working stocks or fixed repair stocks that are carried at small points, too small at which to keep a storekeeper and maintain a detailed accounting. Column 16 shows the value of special materials included in the stock for new construction and authorization work. These amounts are oftentimes large and important and are usually beyond the control of the storekeeper. The construction work may be delayed, or deferred, so that the material really constitutes so much inactive and dead stock, and it is desirable that it be possible to segregate it in the statements so that they will not be distorted and misleading.

The information contained in this report permits an intelligent judgment to be formed, in considerable detail, as to the efficiency with which each store is being managed, and, by a consolidation of all reports into one report, a judgment as to the department as a whole. It is a report that needs to be studied by the storekeeper, the general storekeeper and the executive who has jurisdiction over the department.

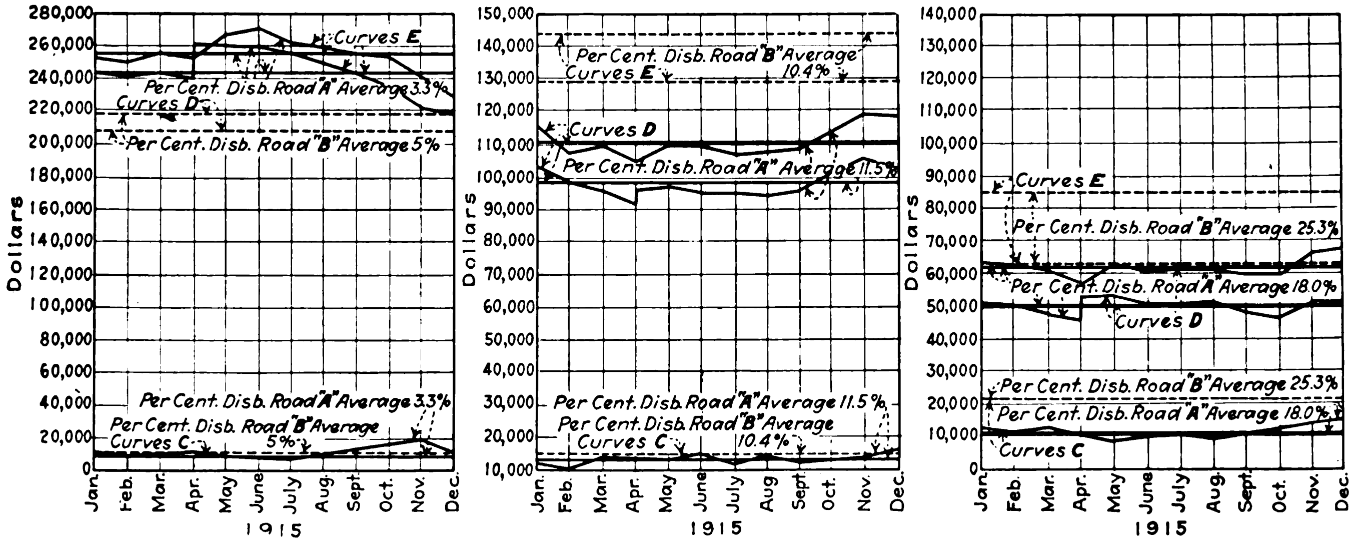
On the form that I have used for illustration, some figures have been placed that are illustrative of actual operating conditions. It is interesting to note how the percentage figures vary, in the different classes. As previously stated, for a particular store, or for a particular road, it should be possible to determine, fairly closely, what the per cent of disbursements should be, or, in other words, how large a stock should be carried of a certain character based upon the amount of material being consumed. This gives a criterion by which to judge a storekeeper's ability. By making comparisons between stores, by making allowances for different conditions, by gradually bringing each store up to the mark of the one that makes the best showing, by establishing a mark at which to aim—all these things bring about a rise in the standard of operation, and a gradual approach to the maximum percentage, compatible with satisfactory service, and when this is accomplished we have obtained good regulation.

A good supply agent will aim to keep most of his surplus material at his main supply point and not permit its accumulation to any extent at division and small stores. He will also keep his dead, inactive and obsolete stock at his general store. Carrying out this policy, the stock at the other points should be fairly active in its turnover. Bearing this in mind, the material statement can be studied. No final conclusion can very well be drawn from a report for a single month, as a number of things might occur to make a report abnormal and misleading. It is from the average figures over a period of months that reliable conclusions can be drawn.

The supply agent can, after some experience, judge what each store's turnover ought to be for each class of material, and as a whole. Some classes of material should be turned over in thirty days, some in forty-five, sixty or ninety days. If the average does not show that this is being done, he can generally conclude that the investment at that particular store is higher than it should be and take the necessary steps to transfer some of the stock to the general store, thus making it more available for use on other divisions and reducing the investment on one division. This may save the purchase of some new materials and reduce the investment on the road as a whole.

The supply agent cannot, of course, tell from the statement the kinds and sizes of material that is surplus, but it tells him where to look, and he can then have examined the detail stock books, stock cards or stock sheets at the store for more detailed information.

The next step in the study, after that of the operation of each individual store, will be a study of the stock on the road as a whole. This study is made from a consolidated report from all stores made on the same form. In studying this report the effect of the transfers is eliminated. That is, material transferred is not material consumed, but remains available for use. The amount of the materials transferred may, in some degree, measure inefficiency, poor storekeeping and faulty distribution. Eliminating the transfers on the consolidated statement, the ratio which the material used and sold bears to the total available is the figure that tells the story.



Class 1-A, Frogs, Switches, Crossings and Parts.

Class 15, Bar Iron and Steel, Sheet Steel, etc.

Class 36, Locomotive, Station and Train Supplies

FIG. 3—SPECIMEN CHARTS, SHOWING DISBURSEMENT RATES AS COMPARED WITH STOCK ON HAND. VALUES ARE FOR TYPICAL STEAM RAILROAD ITEMS

Lower Line—Monthly Consumption. Middle Line—Monthly Stock Balance. Top Line—Monthly Material Available. Straight Lines Represent Yearly Averages.

Here again after a certain amount of experience it is feasible to determine what a minimum stock should be to fill the needs, give a reasonable service and hold down the investment in supplies. This minimum is the thing for which to work, holding it available for the very most elastic distribution and not permitting it to remain where it is not needed. It is of course absolutely essential that all material shall remain in stock account until used, and that there shall not be stocks of material that have been shipped to different parts of the road, and charged out, when shipped. This is not only bad accounting, although frequently done, but is fatal to control of stock.

These reports can be made to tell their story much more quickly and interestingly by means of pictures or graphic charts. Three lines on the chart, one showing total material available, one showing consumption and one showing stock balance on hand, will be found to be most satisfactory. These charts can be made for each storehouse and for the entire system, considering all the material as a whole, and also made for each class of material, for each store, and for the system as a whole. Such pictures as these catch the eye quickly, and carry to the brain the salient points, that are lost and confused in a maze of figures. They show how conditions are tending, and permit prompt action to be taken, to prevent undesirable results.

While it is a good thing to have our reports show us what has happened when our stock has got somewhat out of control, so that we can curb it, it is a better thing if we can be told beforehand that such a thing will happen, so that we can stop it. Our accounting will assist us also in this respect. Surplus materials once got on hand are oftentimes most difficult to get rid of. They often remain for years, to clog the stock account and cause a poor operating showing in the store department. Care in ordering is of the utmost importance to prevent accumulation. An ounce of prevention here is worth many pounds of cure. Storekeepers are prone to order loosely and in excess of the real necessities of the case. This is not hard to understand, as their daily life with those who use the materials is apt to be more pleasant if they have an abundance of material on hand. It is also very hard for an approving officer to tell whether a storekeeper's stock requisitions are reasonable or not, in the absence of the necessary detailed information. Consequently most such requisitions are taken on faith and put through for the purchase. If, however, we cause our storekeeper to order his stock monthly, each class of material on separate requisitions, and have prices applied to the requisitions, it is comparatively simple to get the money value of the requisition, and another simple operation to look at the chart and see the value of the material that is being consumed, monthly, from that store. If the requisition should prove to be excessive, it can be corrected before it is too late.

A specimen copy of the material chart is given by way of illustration, as is also one other form which is in the nature of a comparative summary of totals by different store points. These forms, it is submitted, contain the essential features of the store accounting, to permit of accomplishing good regulation.

I would like to make a few comments on these charts and forms. Fig. 1 has been explained. Fig. 2 is a summary of grand totals by storehouse points. For comparative purposes it is well to group the stores together that have similar characteristics and that might be expected to produce similar results. On the specimen, storehouse "A" might perhaps represent the general store, being in a class by itself. Stores "B" and "C" might be of the next importance, such as principal division stores. Stores "E" and "F" might represent smaller points. Store "C" makes a disbursement of 25 per cent, which would suggest that store "B" ought to do equally as well and should be investigated. Store "C," it is also noted, shows an increase in stock during the month of $28,000.

Now by examining the material statement for each of these stores we can see quickly the particular classes in which "B's" percentage falls below that of "C," and also in what classes "C's" increase of $28,000 occurred. By looking back further to our storehouse charts of stores "B" and "C" we can see what has been the trend, in these classes, for a period of time, and thus get a clue to the classes in which the operation of store "B" is weak.

I would like now to refer for a moment to the specimen charts shown. One shows perhaps the hardest class to deal with on steam roads, namely, "Frogs, Switches, Crossings and Parts." Notice the tremendous stock carried during the year, of $255,000 a month, to provide for a consumption of only $8,000 a month. The chart shows the result of efforts made to bring this stock down, showing that the peak in June of $270,000 was reduced to $228,000, on Dec. 31. Another shows the class of "Bar and Sheet Iron and Steel." This is not so bad, showing a disbursement of 11.5 against 3.3 in the case of "Frogs, Switches, etc." The third, Class 36, "Locomotive, Station and Train Supplies," shows still better, or 18 per cent. The fourth shows all classes and an average of 13.8 per cent. The dotted lines show the averages of another road, of not dissimilar characteristics, and in the same section of the country, which shows a disbursement of 16.7 per cent. If road "A" had held its stock down, so that its consumption was the same per cent of its material available, namely, 16.7 per cent, its average investment in materials and supplies would have been about $2,800,000 instead of $3,500,000, or $700,000 less.

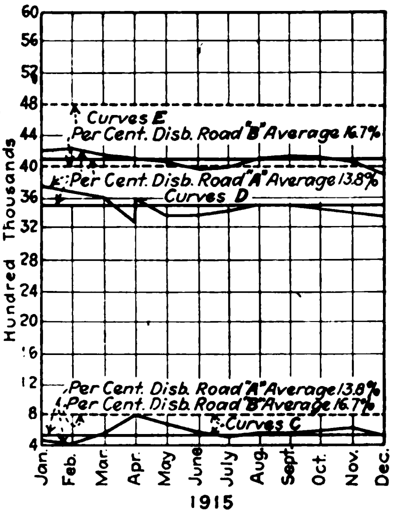


FIG. 4. SPECIMEN CHART SHOWING DISBURSEMENT COMPARED WITH STOCK ON HAND FOR MATERIAL

POSSIBLE ELECTRIC RAILWAY SAVINGS

Let us consider briefly what this might mean to the electric railroads of the country. The latest statistics that I have seen state the total mileage of the electric railways as approximately 48,500 miles. Moody's Manual for 1919 shows that fourteen representative systems, in different parts of the United States, having a mileage of 6,758 miles, were in 1918 carrying in their materials and supplies account approximately $19,000,000. In the same ratio the total mileage would be carrying $137,000,000. However, as the mileage included electrified steam roads, and as perhaps the mileage picked out may not have included enough suburban mileage, to be entirely conservative let us assume that $100,000,000 might be nearer correct. Moody's Manual does not publish any statistics relative to the value of material used. One system of considerable size, whose figures I have seen, was carrying about a million dollars in its stock account and had an average per cent of disbursements for the year of 9.1. This seems very low. Steam railroads in the same section of the country show 13 per cent to 17 per cent, and they certainly should do considerably better. Generally speaking, I believe the steam roads are more advanced in their storekeeping methods that the trolley roads, and I believe the turnovers of the steam roads are higher.

However, generally trolley systems are more compact than steam railroad systems and do not scatter their stocks so widely. This should enable higher percentages of disbursements. Therefore it would seem to me entirely reasonable that a trolley system should have an average of at least 20 per cent. If the road to which I have alluded had made such an average, its investment in materials and supplies would have been less by half a million dollars. If that system should chance to be typical of the electric roads in general there would have been a reduction in the investment for all of $50,000,000. I venture to say that at this particular time the executives could make very good use of this capital for other purposes. If this was surplus material, unnecessary to have been carried, and if it costs from 15 to 30 per cent to carry surplus material, there would have been a direct saving of from $7,500,000 to $15,000,000 of expense per annum. The saving of the transportation of this material, and of the raw material that had to be hauled before it could be manufactured, would certainly not have added any to congestion of traffic.

These figures may perhaps seem unreasonable or even visionary or absurd to you, but I am by no means convinced that they are either one or the other. When all factors are taken into consideration these figures are certainly well within the order of magnitude of possible savings.

An expert in the handling of materials and supplies speaking of the steam railroads of the country five years ago made the statement that the capital invested in materials and supplies on the railroads of the country was $240,000,000, and he estimated that $100,000,000 was surplus, unnecessary investment, resulting from absence of exact information in regard to handling this large investment, and a reluctance to depart from long-established precedent and custom. The carrying charges he estimated at 15 per cent to 20 per cent, which meant a wholly unnecessary expense of fifteen to twenty million dollars a year. In view of the vast increase in the value of stocks of material in the last five years, if these figures were revised to date they would probably be very much more startling.

The problem is a large one, difficult and complicated by various conditions. It requires all the light that can be thrown upon it. If a better and more scientific accounting method is a key to the problem, and I believe that it is, then the accounting departments of the railways have a very important field in which to expend some of their energies.

The Motor Bus as a Supplement to Electric Railways*

By R. Gilman Smith
Milwaukee Electric Railway & Light Company

Its Place Is in Extension of Car Lines Into Territory of Light Traffic Possibilities and Over Routes on Which Extra Fares Can Be Charged

R. GILMAN SMITH

THE present discussion will be limited to a consideration of the various factors affecting the advantages or disadvantages arising out of the use of motor buses in conjunction with an electric railway system. Such use will in general classify as follows:

(a) The operation of motor buses over routes forming extensions of existing electric railway routes.
(b) The operation of motor buses over routes independent of electric railway routes.
(c) The operation of motor buses over routes identical with electric railway routes.

With any of the three types of service just enumerated the motor bus may be operated as an integral part of an existing railway system, or it may be operated as a separate transportation agency furnishing a special class of service.

In making an inquiry as to whether motor bus or rail service is the more economical and at the same time the more satisfactory type of installation, a consideration of the local requirements plays an important part. These requirements differ widely under different local conditions of operation and have a marked effect upon the costs of the service to be furnished. Some of the factors to be considered are as follows:

(a) Volume of traffic.
(b) Distribution of traffic throughout the day.
(c) Frequency of stops.
(d) Character of pavement.
(e) Climatic conditions.
(f) Operating costs.

Motor bus service is especially adaptable where the traffic to be handled is more or less uniform throughout the day. The motor bus has a limited overload capacity and is not suited to care for rush-hour crowds. If peak-load conditions must be met, it requires the operation of a large number of additional units of equipment for a few hours daily, the fixed charges on which may offset whatever differential in operating costs there may be as compared with rail service.

The present rush-hour conditions in most American cities necessitates the operation during the morning and evening peak-load periods of approximately double the number of cars in use during the remaining hours of the day. This means that the actual carrying capacity of the system is increased during these periods by 100 per cent plus the amount by which the maximum load of cars exceeds the seating capacity. For a standard double-truck car this is an increase from about fifty passengers to about one hundred, or an additional 100 per cent, making the traffic ratio four to one. For a safety car the corresponding increase is from thirty passengers to about sixty, or the same percentage.

If this peak-load traffic is to be handled by motor bus, the smaller over-normal capacity of the bus will necessitate a greater increase in short-hour service. A large double-deck bus with a seating capacity of about fifty has a maximum capacity of not more than seventy, an increase of 40 per cent. A large single-deck bus seating twenty-four has a maximum capacity of forty, an increase of 67 per cent. This indicates that to obtain an equivalent increase in carrying capacity the number of bus units operated during the peak load periods would have to be increased by 120 per cent to 140 per cent over the base schedules, as compared with an increase of 100 per cent in the number of rail units.

The character of the street surface over which a motor bus is to be operated has a considerable effect in determining the desirability of the service. In the suburban districts of many cities the unimproved condition of the streets would make the operation of this type of service very difficult, and would at the same time decrease the initial investment required for the installation of rail service.

Another point is that, in Northern cities, climatic conditions experienced in winter raise serious problems. The transportation difficulties encountered in New York City as the results of the severe blizzards in the spring of 1920 indicate the helplessness of the motor bus as a snow fighter. A four-motor double-truck car or snowplow running on rails has at its disposal not only an unlimited supply of electric energy but also a large amount of kinetic energy arising from its weight. This can be effectively utilized in fighting snow by bucking large drifts at relatively high rates of speed. For equipment operating on rails this is a comparatively safe procedure. A motor bus or an auto truck equipped with a snowplow and depending upon a slippery pavement for its traction cannot safely fight the drifts in this manner.

COMPARATIVE COSTS THE CRITERION

The question of comparative operating costs for bus service and rail service is a vital one in an inquiry as to which of the two is the proper installation under a given set of conditions. Unfortunately data covering the operation of bus lines for recent periods are available in a limited number of instances only, and in the material available the detail underlying the total figures is not always known. The American Electric Railway Association recently published as a summary of the replies to a questionnaire on this subject its Data Sheet No. 201, containing data for seven companies which

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*Abstract of paper presented at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 14, 1920.

TABLE I—MOTOR BUS OPERATING DATA
(From A. E. R. A. Data Sheet No. 201) August 31, 1920

Name of Company and Location	One Way Mileage	Miles per Bus per Day	Number of Buses Operated	Average Passengers per Bus Mile	Seating Capacity per Bus	Operating Revenue per Bus Mile	Operating Expenses per Bus Mile
Fort Worth Auto Bus Company, Fort Worth, Tex	4.90	33.4	8	1.80	17	$0.18	$0.47
Fort Wayne and Northern Indiana Traction Company, Fort Wayne*	2.25	159.6	2	1.26	16	.06	.12
Connecticut Valley Street Railway, Greenfield, Mass	3.14	135.0	2	3.58	19	.22	.17
Minnetonka & White Bear Navigation Company, Minneapolis*	3.80	144.0	13	3.53	14	18	.35
Baltimore Transit Company, Baltimore, Md	2.90	78.0	18	4.80	16	.34	.37
Manufacturing company in city of 200,000	2.00	124.0	8	8.81	21	.37	.36
Experimental operation in city of 400,000*	.....	89.9	1	4.00	15	.20	.22

*Operation abandoned.

are now or have recently been operating motor bus service. These seven companies show revenues per bus-mile ranging from six to thirty-seven cents and operating expenses from twelve to forty-seven cents per bus-mile. The number of passengers per bus-mile runs from 1.26 to 8.81, and the average bus-mileage per day per bus from 33.4 to 159.6. Two out of the seven companies had operating revenues per bus-mile in excess of the operating expenses shown; in one case the revenues exceeded the expenses by 1 cent per bus-mile, and in the other case by 5 cents per bus-mile. No fixed charges are included in the figures quoted. A summary of these figures is shown in Table I.

Operating costs have fluctuated so widely during the last two years that it is difficult to set up a statement of comparative unit expenses for rail and bus service. Such a set-up has, however, been attempted by developing certain figures from the experience of various companies, and by estimating certain others on what would appear to be reasonable bases under normal operating conditions. The result shows that the direct operating costs, including only maintenance, operating labor and supplies, power and general expenses, but excluding taxes, depreciation and return, are as follows for four more or less standardized types of equipment:

Double-truck—two-man—car	33.75c. per car-mile
Safety—one-man—car	21.50c. per car-mile
Double-deck—two-man—bus	39.10c. per bus-mile
Single-deck—one-man—bus	27.00c. per bus-mile

The above costs include for the rail service allowances of 2.5c. and 2.0c. per car-mile respectively for the double truck and the safety car for the maintenance of way and structures, and an allowance of 0.5c. per bus-mile for snow removal. Drivers' wages are figured at seventy cents an hour, and the average speed of operation is taken as 9 miles per hour for all rail service and 10 miles per hour for bus service.

If allowance be made for taxes at 2 per cent per year, depreciation at 5 per cent per year on cars and 25 per cent per year on buses, and 3 per cent per year on general equipment and power equipment, and for return at 7.5 per cent per year the unit costs will be materially increased. Assuming an annual mileage of 20,000 miles per year per unit of equipment, the total costs, excluding any depreciation or return on investment in roadway and track, become as follows:

Double-truck car	47.87c. per car-mile
Safety car	29.90c. per car-mile
Double-deck bus	53.80c. per bus-mile
Single-deck bus	37.19c. per bus-mile

TABLE II—COMPARISON OF OPERATING COSTS PER MILE OF CAR AND BUS OPERATION

	Standard Double-Truck Car, Cents	Standard Safety Car, Cents	Double-Deck Bus, Cents	Single-Deck Bus, Cents
Direct Operating Costs:				
Maintenance of way and structures	2.50	2.00	0.50	0.50
Maintenance of equipment	4.25	3.00	12.00	10.00
Conducting transportation	19.00	10.00	17.10	9.00
Power (electric or gasoline)	4.50	3.00	6.00	4.00
General expenses	3.50	3.50	3.50	3.50
Total	33.75	21.50	39.10	27.00
Fixed Expenses and Charges:				
Taxes, depreciation and return on basis of 20,000 miles per year	14.12	8.40	14.70	10.19
Total	47.87	29.90	53.80	37.19
Total cost per revenue passenger	6.84	6.35	9.27	10.74

The results of these figures are shown in Table II.

Analysis of fixed charges is as seen in Table III.

From this study it appears that there is a differential between the double-truck car and the double-deck bus of 5.93 cents per mile of operation. The car-mile is not, however, an equitable unit of comparison, because of the difference in carrying capacity. Assuming an average of seven revenue passengers per car-mile for the double-truck car and a typical distribution of traffic between rush hours and non-rush hours a fleet of double-deck buses carrying the same traffic would average only 5.81 revenue passengers per bus-mile. On this basis the per passenger cost of the two types of equipment is 6.84 cents for the car and 9.27 cents for the bus, a difference of 2.43 cents in favor of the car. To make the bus operation more economical the density of traffic per mile of route operated must be such that the fixed charges on the permanent way required for rail operation will be more than 2.43 cents per passenger. If the cost of permanent way be taken as $50,000 per mile of single track and the fixed charges as 14.5 per cent, or $7,250 per year, the density of traffic need not exceed 300,000 revenue passengers per mile of

TABLE III—STATISTICAL DATA AND COMPARISON OF INVESTMENT AND FIXED CHARGES

	Standard Double-Truck Car	Standard Safety Car	Double-Deck Bus	Single-Deck Bus
Investment per Unit:				
Equipment	$10,000	$6,500	$7,000	$5,000
Power plant equipment	6,000	2,500	....	......
General equipment	5,000	3,400	4,200	2,500
Total	$21,000	$12,400	$11,200	$7,500
Fixed Charges per Year:				
Taxes, 2 per cent	$420	$248	$224	$150
Depreciation, 5 per cent on cars	500	325	....	......
25 per cent on buses	....	....	1,750	1,250
3 per cent on power plant	180	75	....	......
3 per cent on general equipment	150	102	126	75
Return, 7.5 per cent	1,575	930	840	563
Total	$2,825	$1,680	$2,940	$2,038
Fixed charges per mile of operation on basis of 20,000 miles per year	14.12c.	8.40c.	14.70c.	10.19c.
Average number of revenue passengers per mile of operation	7.00	4.71	5.81	3.46
(Assuming normal urban distribution of traffic)				
Seating capacity	52	32	51	24
Maximum capacity	100	60	70	40
Average speed, miles per hour	9	9	10	10

single track in order to make the rail service the more economical. Even with the cost of permanent way as high as $80,000 per mile of single track—approximately the present cost—the traffic density need be only 480,000 revenue passengers per mile of single track to offset the differential in operating costs. At the present time urban railway systems average from 650,000 to 900,000 revenue passengers per mile of single track.

Referring again to the direct operating costs plus fixed charges it will be seen that the one-man bus shows a per mile cost of 37.17 cents as compared with 47.87 cents for the double-truck car, the differential being in favor of the bus. If, however, these costs be reduced to a per passenger basis, as were those for the double-deck bus, the per passenger cost of this unit becomes 10.74 cents, or 3.90 cents more than for the double-truck car. Applying this on the fixed charges for permanent way at $80,000 per mile of single track, a traffic density of 300,000 revenue passengers per mile of single track would make the rail service more economical.

In the case of the single-deck, one-man bus seating twenty-four passengers and with a maximum capacity of forty, which is the unit referred to above, its application to traffic having typical rush-hour peaks would mean an increase in the number of units necessary during rush hours of 120 per cent over those required during the balance of the day, as was shown earlier in this discussion. If these units were used on a system or on a line where the increase required to handle rush-hour traffic were less than 120 per cent, the average number of revenue passengers per bus-mile would be increased and the average cost per passenger would be reduced.

With operating costs as they are at present, the motor bus cannot compete with the electric railway for mass transportation. The comparatively low initial investment of the motor bus makes it adaptable for service over routes where the traffic density will not support the additional investment necessary for rail service. As this traffic density increases each additional motor bus unit placed in operation adds to the total investment as much as the initial unit, and there is therefore no gain in economy in motor bus operation through a gain in traffic density as long as this requires the operation of additional units. With rail service, however, the operation of additional units requires only the capital outlay for cars, car storage facilities and power facilities, the original investment in track being available to handle the increased traffic. From these general observations and the analysis of operating costs set forth above it appears that it is economical to utilize the motor bus as a supplement to electric railways only under certain conditions of operation, which may be summarized as follows:

(a) For the operation of extensions to existing car lines or new lines in outlying districts where the traffic density will not run in excess of 1,000 revenue passengers per mile of single track per day and will therefore not be sufficient to support the necessary investment in permanent way, or where the distribution of traffic throughout the day is more nearly uniform. Even such operation may perhaps be economically abandoned if construction costs of permanent way recede from the present high level.

(b) For the operation of service over routes where the public will pay an increased fare for what it believes to be a special service and where therefore loading conditions can be somewhat controlled and the small over-normal capacity of the motor bus is not a handicap.

Financial Problems Confronting Utilities During Reconstruction Period*

By Henry E. Mendes
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Delicately Adjusted Position of the Utilities Has Made Them More Responsive to Financial Disturbance of the War—Some Accounting Problems Must Be Clarified, but Solution Lies Chiefly in Frank and Full Publicity and Efficient Economy

HENRY E. MENDES

THE history of every important war teaches that immediately thereafter a so-called period of reconstruction sets in, its length depending largely upon the extent of the conflict, the havoc wrought, both in lives and property, and the extent to which the morale of the population, generally, may have been affected through individual or personal losses, and also depending upon either the favorable or the unfavorable conclusion of the conflict.

It would seem that in this country the present period is very much like that which existed during the decade or so immediately following the Civil War, but greatly aggravated because of the vastness of the World War, and this despite the fact that the actual conflict, fortunately, did not reach our shores. A period of reconstruction is generally when certain businesses, wage earners and others derive extraordinary income or benefit in contrast to those who, unhappily, find themselves in the opposite condition, in which plight, it must be admitted, are to be found practically all public utilities comprising interurban, telephone, telegraph, gas, electric and water companies.

By reason of the supervision exercised by the commonwealth, public utilities, as such, are not in as favorable a position as most industries. Without the permission of either State or Federal commissions, they are unable, usually, to increase their revenue to conform to increased costs. Considerable time usually elapses, therefore, between the date of the application for an increase in rates or tariffs and the date that it is granted, if at all, and the increase, if granted, does not always come up to the expectations of the public utility as evidenced by its application, the decisions of the commissions being necessarily governed or dominated to a considerable degree by public sentiment, or in some cases even by political expediency. Unfortunately, public sentiment, as a rule, is biased, being molded largely through the opinions expressed in the press, which may either be based upon incomplete information regarding the pertinent facts or may be deliberately suppressed by it.

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*Abstract of address delivered before the annual convention of the American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 13, 1920.

In order to give proper and efficient service for any length of time, a public utility must be in a healthy financial condition. The question naturally arises, then, when is a public utility in a healthy financial condition? The answer would seem to be: When the utility receives reasonable or ample compensation for the services it renders; sufficient to pay the necessary operating expenses commensurate with the service demanded by the public, sufficient to pay for renewals and replacements of worn-out and obsolete equipment, sufficient to provide necessary funds for the purpose of extending its service along with the development of the community served, and lastly, though not the least important factor, sufficient to reasonably compensate capital for its investment and the consequent hazard undertaken. The notion seems to prevail quite generally nowadays that, because of the comparatively large capital investments in them, public utilities have unlimited and inexhaustible resources, to which the ordinary rule that income must at least balance expenditure does not apply, the public failing to realize that such a situation cannot exist and that, to use an old expression, "it is impossible to draw water from a stone."

To give adequate service in a growing community a public utility must interest new capital, thus enabling it to secure the additional facilities required for an extension of service. At the prevailing high rates of interest occasioned by the general financial situation the problem of interesting new capital is indeed a very serious one.

Strictly speaking, public utilities are not in a position to compete in a tight money market. The margin between their gross revenue and expenses is never sufficient to warrant paying what might appear to be exorbitant rates of interest, even if they were willing. Because of the regulations and attitude of the commissions, however, and in some instances, the restrictions placed upon them by statute, public utilities are not permitted to sell their securities at a discount, this term not only comprehending "discount" in its usually accepted meaning but including expenses incidental to the refinancing which proper accounting procedure would permit as a part of the cost of the new money.

SHORT TERM NOTES RECOMMENDED

Without necessarily desiring to lay down a fixed rule, under the present abnormal conditions it is probably the best theory for public utilities to issue short term notes at market rates, secured by long term treasury bonds at normal rates deposited as collateral for the short term notes. This is on the assumption, of course, that upon maturity of the short term notes conditions in the financial world will have adjusted themselves to a more normal basis, and it will then be possible to issue the long term bonds in substitution for the notes. In this connection, the fact should not be overlooked that in some instances refinancing may be prevented through the fact that other long term bonds already are outstanding, to which the new issue would necessarily be subordinated and would therefore have to bear a much higher rate than ordinarily rules for that class of security. This condition was one of the factors prevailing in some recent refinancings.

SERVICE-AT-COST ORDINANCES AND FRANCHISES

Consideration of this subject would not be complete without some reference to the so-called "service-at-cost" ordinances and franchises, which, so far, have only been applied effectively to electric street railways in several large cities—including Cleveland, Cincinnati, Youngstown, Rochester, Dallas and Montreal—although there is now agitation for the operation of gas and electric companies, and possibly other public utilities, on the same basis. In theory this is a commendable scheme, but the advantages to the community, on the one hand, and the proprietary interest, on the other hand, are frequently not as real as they may seem. The plan has a tendency to restrict service in some instances and, more particularly in a period during which abnormal conditions prevail, almost invariably prevents extension of property and improvement of service. The incentive to economy and efficiency is also to a very great extent removed by the guarantee of the return on the fixed capital investment of the company. Furthermore, a certain duplication of expense is almost inevitable under the plan, the ordinance usually providing for a traction commissioner with authority to organize a department of his own. To counteract the tendency to extravagance and to cultivate an incentive for economical management bonus systems are in effect in some cities in conjunction with the "service-at-cost" plan. It should also be noted that in some instances the communities affected have been known to object to a proper interest return, even on the reduced valuation placed on the property involved. Again, it should be noted that while the theory of the plan is good, it would seem that those who conceived and first advocated it were rather attempting to place themselves in a favorable light with the public, without regard to all of the essential elements; the result being that, in some "service-at-cost" franchises, no reference is made to such an important factor as depreciation, it being impossible, therefore, for the public utility to provide a fund for that purpose. Incidentally, the company is started out on an altogether unsound and erroneous basis, especially in relation to the public, which, once having formulated an idea, usually more or less hazy, regarding the provisions of the ordinance, can only adjust itself to the proper attitude with extreme difficulty, necessitating propaganda of an educational nature, which in certain communities the press is not willing to support.

Public utilities are not altogether blameless for the predicament in which they find themselves. They are largely responsible for a number of conditions that now give them embarrassment which, with a little foresight in the past, very easily could have been obviated. Perhaps the point most subject to criticism or, at any rate, the matter which has been responsible for the major part of the adverse criticism, is the overcapitalization and, it may be stated, the cumulative capitalization that unfortunately has prevailed in not a few instances, but which during later years has been prevented by the supervision of the commissions under the regulatory powers conferred upon them by statutes. Of course, some of the reorganizations and consolidations effected in the past were justified by the peculiar conditions prevailing in certain communities, and, while sometimes the apparent effect may have been to inject water into the undertaking, the actual result was to provide a more efficient and better co-ordinated organization, capable of expanding the service in direct relation to the increased demands of the community served. Subsequent benefits derived by the community, arising through these mergers, usually have justified them, as they not only tend toward economy in management, with consequent better service, but also make it possible to give more extended service. The objectionable features, by reason of the supervision exercised by the commissions, have been corrected and practically eliminated during recent years.

SOME ACCOUNTING SUGGESTIONS

Certain erroneous principles of accounting, as reflected on the books of some public utility companies, are also partly responsible for their predicament. These may be summarized briefly as follows:

(a) Not a few companies accrue taxes and other expenses that are of a recurring nature on anything but a scientific basis. It is asserted quite often that public utilities, because of their peculiar nature, should not accrue taxes and other similar items of expense in that which most industries and businesses find the most desirable procedure to follow in order to reflect proper operating results. The claim is made that taxes should only be accrued, if at all, in an amount sufficient to take care of actual cash disbursements that must be made for taxes during a given period as and when they fall due. From an accounting standpoint such a procedure is indefensible, and as a practical proposition its merit can be questioned quite seriously. Proper accounting, whether it be either for an industrial organization or for public utility, demands that taxes be accrued for the period covering which they are payable in relation to the expenditures of the state, or municipality, as evidenced by information usually shown on the tax bills, and if not so shown by information that always can be obtained from the tax officials, and not necessarily for the period to the last date by which the taxes must be paid in order to obviate the assessment of fines or penalties. This seems to be so obvious as to require no further argument.

(b) Depreciation also seems to be quite a bone of contention, the amount provided for this item on the books of some public utilities being dependent, in a great measure, on how much tariff the gross income can stand. The manner in which reserve accounts for depreciation are handled quite often indicates that the first principles of good accounting theory and practice are ignored altogether. A reserve account, as such, is only an account established for the purpose of equalizing the expense or loss entailed through the gradual wearing away, or passing out of existence of property, by reason of its use or otherwise, so that when it eventually becomes necessary to replace the property, the entire charge will not be made to the operations of the period in which the replacement is made, or possibly capitalized, but may instead be borne by the reserve account. Properly to create a reserve for depreciation it is necessary to credit currently to the reserve account definite amounts, calculated on the basis of rates of depreciation developed as the result of experience, by corresponding reductions of the gross earnings derived from operations. Any other treatment of a reserve account, such, for instance, as crediting to it arbitrary amounts at irregular intervals, serves no useful purpose whatsoever and might as well be abandoned. From a financial point of view, of course, the stockholder and investor is interested in seeing, and is entitled to know, that adequate reserves are being made by a public utility in arriving at the results from operations shown in its published statements. It should be emphasized, furthermore, that a reserve account of itself does not provide the funds necessary for replacements and obsolescence. A proper program to insure that any business will be uniformly successful over a period of years where the investment in plant is a vital and important factor contemplates the laying aside, or earmarking, of specific funds or investments for the purposes stated. Any amount of bookkeeping would not provide the funds necessary to achieve the desired result as they can only be derived from the usual sources.

(c) Another questionable practice adopted by some public utilities, which is related very closely to the foregoing, is to write off over a term of years the capital investment in wornout, old or obsolete equipment, after its replacement by new equipment, instead of, in the first instance, having written off the equipment over the period during which it was used, and providing a reserve for depreciation covering the new equipment, on the basis of recognized rates of depreciation, over the term of its probable life. Such practice merely tends to put off the evil day when an accounting eventually must be made, but, aside from a miracle, does not prevent it. Many public utilities, finding themselves in the predicament of having exhausted important units of their plant investment without having made due provision for their replacement, as explained, are confronted today with this situation.

(d) A further inconsistency that seems to prevail more or less generally is that of including allowances for depreciation in arriving at the basis for establishing rates and then, on the other hand, objecting to the reduction of the plant or investment account for the determination of capital values for the same purpose or of invested capital for Federal tax purposes and, occasionally, also for the purposes of the published financial statements.

Concerning the foregoing fallacies, no sound reasons can be advanced for handling the accounts of public utilities in any other manner than on the basis recognized by proper accounting procedure developed as the result of the experience gained in other sound businesses and representative industries. Public accountants are often confronted with the argument that certain features, by reason of conditions peculiar to a business under examination, must be considered from a different angle than that from which similar items may be treated in other unrelated businesses. While, admittedly, differences do occur which require special treatment, the matters set forth above are fundamental, and should apply to all businesses, not even excepting public utilities.

To conclude, then, the principal financial problems which must be solved by public utilities during the so-called period of reconstruction through which we are now passing may be considered to arise, on the one hand, from the abnormally high interest rates which preclude the possibility of obtaining funds for development or of refinancing maturing obligations on anything short of the most ruinous terms; from the urgent necessity which exists for the carrying out of long deferred improvements and from the excessively high cost of new construction and equipment; and, on the other hand, from the shrinking margin between operating revenue and expenses, due to increasing costs and the indifference of the public to the vital need for adequate increases in rates. The remedy appears largely to lie in the presentation of facts and figures to the public and to the public service commissions, stated upon the soundest basis and with the utmost measure of frankness; in the education of the public to the justice of the claims of the public utilities and to a realization of the truth that efficient service cannot be rendered for any length of time without adequate compensation to capital and, lastly, in the practical exemplification of the truth that a penny saved is a penny earned, by a continuance of the measures tending toward rigid economy.

The Motor Bus in Urban Transportation[*]

By George J. Shave[†] and Frank C. Pick[‡]
London General Omnibus Company, Ltd.

The Superiority of the Motor Bus for Light Continuous Traffic Is Shown, the Tramway Being Economical for Heavy Continuous and Peak-Load Traffic

THE WRITERS of this paper are engaged in the management of motor omnibus services in Greater London. Their position is unique in that London, unlike any other metropolitan city in the world, has depended, and still depends, upon the omnibus for a large proportion of its passenger movement. In the year 1920, that is now closing, it is estimated that the underground railways will have carried 675,000,000 passengers, the suburban steam and electric railways 350,000,000, the tramways or street railways 1,100,000,000 and the motor omnibuses 1,035,000,000, so that each instrument of transport: railway, tramway and motor omnibus, will have approximately a third share in the total movement.

The motor omnibus is the successor of the horse omnibus, and the horse omnibus occupied in the past those streets in London which are now traversed by electric tramways. The tramway is the usurper. The mileage of streets and roads in Greater London occupied by electric tramways is 348. The mileage of streets and roads still occupied by motor omnibuses is 577, of which 222 miles are over the tracks of the tramways.

The problem of the relationships between tramways or street railways on the one hand and motor omnibus routes on the other is thus a peculiar problem in London. This paper makes no profession of dealing with it, although many of the facts given in the paper are necessarily drawn from London experience. Last year the writers had the pleasure and advantage of visiting the United States of America and seeing some of the important systems of street railways which now serve the great cities of that country, and they have endeavored to keep in mind the fact of the existence of the street railway as the predominant factor in urban development in expressing the views which follow.

A HISTORICAL NOTE

It must be admitted that the motor omnibus is a late comer into the field of urban transportation and has therefore provoked controversy. Every controversy has a historical background, and so it is in this case.

The origin of things always seems to be involved in obscurity, even though the origin is quite recent. It is therefore difficult to be certain of the truth of what is next stated. When was the first electric railway built? The answer would seem to be in 1881 at Lichtenfeld, near Berlin. The first tramway or street railway would seem to date back to 1883, several places in Great Britain competing for the priority being almost contemporaneous. In the United States, Cleveland (Ohio) apparently enjoys priority with a short section built in 1884. Whatever the settlement of this jealous dispute, the fact remains that the street railway is not very old, but yet much older than the motor omnibus. For the first motor omnibus in public service occurred in London in 1897. It was experimental only and from that date to 1902 remained in an experimental state; 1904 is the first year of effective motor omnibus operation. The motor omnibus then advanced a little more each year until by 1911 it had entirely supplanted its predecessor the horse omnibus. London is distinguished in being the pioneer of the motor omnibus in public service.

Between the introduction of the street railway and the perfection of the motor omnibus for public service there is a gap of about twenty-five years. These years were crowded with every sort of improvement and development of street railways, especially in America, so that by the time the motor omnibus was in a position to become a competitor the street railway had established itself as the one generally accepted means of dealing with urban passenger transport. By that time there would be, at a guess, over 35,000 track-miles of street railway in the United States, built at a cost of some $3,600,000,000, and carrying 9,000,000,000 passengers in the year.

Further, it is of especial interest to observe that the underground and elevated railways of American cities were not a new departure in urban transport, the intrusion of a new factor, so much as a progressive specialization of the street railway, the provision of the street railway not on the surface of the street but above or below the street proper, running over its own right of way to avoid delay and reduce congestion. Similarly, the interurban railways, which correspond closely to the branch lines of our English main line railways, are merely an extension or adaptation over the country of the urban street railway. And this is a continuing process. The motor omnibus comes in to disturb a situation which is primarily based upon the street railway as the one dominant factor.

Unlike London, therefore, the motor omnibus in America finds a large portion of its prospective field occupied by a well organized and established rival, and this historical accident accounts largely for the controversy which is now being waged.

THE STREET CAR AND MOTOR OMNIBUS COMPARED

In any discussion of the relative merits and capacities of the street railway and the motor omnibus route, it is first of all important to compare the vehicles employed as instruments of transport. The principal factors in such a comparison are four: Speed of operation, road occupation, convenience and flexibility of operation, and passenger accommodation.

In London the authorized maximum speed of a motor omnibus under the regulations governing its use on the streets is 12 m.p.h. This is generally agreed to be too low a speed and there could be little opposition to its increase to 18 m.p.h. It is hoped soon to effect this amendment. The average speed in actual operation under urban conditions of traffic is about 10 m.p.h. This allows for an average of three or four stops to the mile. The practice has not hitherto been to mark out fixed stops for the motor omnibuses but to require the vehicles to stop to pick up and set down as required by the traffic. Recently a scheme of fixed stops has been adopted experimentally on certain routes. The stops are carefully surveyed to cover traffic holdups which are not included above, and average four compulsory and two optional stops to the mile. This alteration has been instrumental in slightly raising the average speed of operation.

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[*] Abstract of address before American Electric Railway Association, Atlantic City, N. J., Oct. 14, 1920.

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[‡] Commercial manager.

In London the tramways have maximum authorized speeds ranging from 6 to 16 m.p.h., according to varying physical conditions governing the track, such as gradients, curves, width of streets, and so forth, the normal speed being 12 m.p.h., as for omnibuses. Again this is thought to be too low for modern improved conditions, and it is expected that it will be raised to a figure comparable with that for the motor omnibus given above. The actual average speed of operation under urban conditions of traffic is about 9 m.p.h., which covers an average of five stops to the mile. These stops are fixed and marked and are of two kinds, compulsory and optional. There are on the average nine to ten to the mile of track and actual stops are made at 50 per cent of them. The too great frequency of the stops, even looked at from the point of view of reasonable public convenience, is a determining cause in the relatively less efficient speed of the tramcar compared with the motor omnibus. There will, however, always be a slight gain of speed in favor of the motor omnibus because of its quicker stopping and starting. And there will always be a factor operating in favor of the motor omnibus in that the tramway speed is necessarily that of the slowest, most labored car.

Turning to New York, the figures given to us as the average working speed of street cars in Manhattan was 7 m.p.h. (while the maximum speed was only 9), and of the motor omnibuses in Fifth Avenue 8.5 m.p.h. The same feature would, therefore, seem to be present, but at a lower general level of speed, which is a curious trait. In the other cities of which we have data there is improvement. Detroit showed an average speed of 10 m.p.h. and Cleveland of 11 m.p.h. This improvement we ascertained was wholly due to a judicial revision of stops and a limitation in the number of them. In Broadway, New York, the stops have mounted to nearly fifteen to the mile, a usual number was twelve, but the desired number was not more than eight. Stops are the real determinant of speed, and the larger the vehicle the longer the stop, because the greater the load. This must be borne in memory in connection with the accommodation afforded by street car and motor omnibus, to be discussed later.

Having regard to the fact that the street railway or tramway usually occupied the center of the road allotted to fast-moving traffic there is every reason why it should operate at a relatively high speed, because it will then be less obstructive to other fast-moving traffic in that position. This and the danger to passengers boarding and alighting in the center of the road would seem to dictate a policy of few and well-regulated stops as the right one.

Road occupation is a function of the speed of operation, and the size of the vehicle. There has always been bitter argument as to whether a motor omnibus or a street car occupies the roadway to the greater extent and so contributes in the greater degree to cause congestion. In London there is fortunately the testimony of the London Traffic Branch of the Board of Trade. In its report for the year 1914 it says:

> The extent of occupation of the carriageway, both in regard to time and space, and the physical obstacle that each moving vehicle presents to other users of the road, considered in conjunction with the nature of its movements, are the main points that have to be taken into account in arriving at the coefficient of obstruction for each class of vehicle, quite apart from the actual work done by the vehicle, whether it be the quantity of goods conveyed or the number of passengers carried. Such matters as the general convenience that a public conveyance may afford, or the freedom from accident that it may enjoy, do not directly affect the point under consideration, however important a bearing they may have on the problem generally.
>
> It was hoped that the publication of a scale of units in 1910 would evoke some discussion of this matter, but it attracted very little attention, and for want of any better suggestion, the original scale has been adhered to hitherto in the census calculations. A certain amount of criticism, however, has more recently been disclosed, and in the light of the further four years' experience, it is recognized that some modification of the scale might make these figures compare more satisfactorily. The very large increase in the number of motor omnibuses in service has brought more prominently to notice the inconvenience and delay to other traffic caused by their drawing-in toward the pavement and stopping at intervals, and it is now realized that sufficient importance was not attributed to this movement originally. The development of the commercial motor and the introduction of the motor parcel car also entail some adjustment of the classification, and of the values allotted to these vehicles.

A resurvey of the table was therefore undertaken with a view to arriving at some more authoritative figures that will insure sound comparison in the future, and after obtaining many well qualified opinions, the following revised scale has been decided on, and the census returns of previous years have been recalculated accordingly:

Passenger Vehicles			Trade Vehicles		
Electric tram		9	One horse	Fast	3
Omnibus	Horse	5		Slow	7
	Motor	4	Two horse	Fast	4
Cabs	Horse	2		Slow	10
	Motor	1	Light motor, fast		1
Carriages	Horse	2	Heavy motor	Fast	3
	Motor	1		Slow	5
			Barrows		4
			Cycles		½

With the increase in the seating capacity of the motor omnibus first to forty-six and then to fifty-seven, which is now taking place in London, there can really be no question at all left that as a cause of congestion the motor omnibus is a smaller contributor than a tramcar. The importance of this factor is, however, reduced where roads, as in America, are so wide that there is no congestion. Where there is room for all and to spare it cannot matter.

CONVENIENCE AND FLEXIBILITY OF OPERATION

This factor is almost a corollary of the preceding one, that of road occupation, but it opens up two or three fresh observations.

The motor omnibus can accommodate itself to the other vehicular traffic of the road. It can pull out to the middle when its speed is good and fall in with the quick-moving traffic. It can pull into the side when its speed is poor or when it is picking up or setting down and so fall in with the slow-moving traffic. It also by this facility of movement directly contributes to the safety of the passenger by keeping him always on the footwalk and obviates the creation of islands or safety zones, which occupy part of the available road space and often prove seriously obstructive.

Again, there is no limit to the extent to which passenger traffic can be dispersed by the use of motor omnibuses. Unlike street cars, they are not confined to expensive tracks or dependent upon continuous connection with a source of power. This permits of the routes and services being taken much more nearly to the actual points at which passengers arise in the residential districts or to which they proceed in the commercial districts, and vice versa. This is a great gain. It is a gain in convenience to the passenger. It is also a gain in street capacity, for a wide dispersal, whether of passenger or vehicular traffic, avoids congestion at particular points. Parallel roads may readily be worked in relief of each other. The services in an arterial road may branch out into secondary roads on either side at intervals, helping to reduce the pressure on space in the roadway.

This reminds us of the striking difference which exists between the layout of the system of routes of street cars in an American city and the layout of the system of motor omnibus routes in London. In an American city the routes are few and direct to some central point or diametrically across some central point. Passengers not desiring to make rides on this direct route are given transfer tickets to change onto another car to reach the destination required, which is not on the line of route of the original car. In London, on the other hand, routes are many and are interlaced so that in a given main radial there may be service proceeding to five or six different destinations by different routes, in fact to all destinations for which there is an appreciable traffic. This wide choice of rides removes the need for any transfer or exchange ticket, and when such tickets have been tried in London they have never been taken up and used in any numbers worth recording. The tramways of London copy as far as possible the motor omnibus routes in their complexity, but the delays at junction points of tramway tracks are a deterrent obstacle to the practice. The motor omnibus lends itself to such a layout of routes much more easily than the tramcar.

Against the merits of dispersal and flexibility is to be set the cost of maintaining many more roads suitable for heavy motor car traffic. It is only fair to note this, although main roads and first class roads, and even secondary roads in metropolitan cities, must under modern conditions always be made up to this expensive standard quite apart from the running of motor omnibuses over them.

PASSENGER ACCOMMODATION

While, therefore, the motor omnibus must be held to have the advantage of the tramcar or street car under the three factors already discussed, still a factor remains which somewhat adjusts the balance in favor of the street car, and that is the passenger accommodation.

In London up to the year 1919 the standard double-decked motor omnibus seated only thirty-four (sixteen inside and eighteen outside), while the standard double-decked tramcar seated seventy-eight (thirty-two inside and forty-six in a covered upper deck). This was a heavy handicap. With the rise in the costs of operation consequent on the war the smaller capacity of the omnibus restricted earnings and became uneconomical.

Prior to the war, in spite of the difference in size, the earning capacity per mile run of both vehicles had been approximately equal. With the war and the growth of the volume of traffic occasioned by it the tramcar drew ahead of the motor omnibus, and the problem of enlarging the motor omnibus became acute. Fortunately progress in design since 1906, when the pre-war type of omnibus had been last settled, made enlargement an easy matter. Early in 1920 a 46-seat omnibus (twenty-two inside and twenty-four outside) was built and proved successful. The comparison of the old and the new vehicles with the regulations establishing the standard approved by the police is briefly outlined in the following figures:

Item	Police Regulations	Pre-War or B Type	Post-War or K Type
Length	Not to exceed 23 ft.	22 ft. 6½ in.	22 ft. 7¾ in.
Height	12 ft. 6 in.	12 ft. 7 in.	12 ft. 2 in.
Width	Not to exceed 7 ft. 2 in.	6 ft. 11½ in.	7 ft. 1½ in.
Wheelbase	Not to exceed 14 ft. 6 in.	12 ft. 10¾ in.	14 ft. 2½ in.
Overhang over back axle	7 ft. 6 in.	7 ft. 7¼ in.	6 ft. 7¾ in.
Weight* unladen	Not to exceed 3 tons 10 cwt.	3 tons 12 cwt.	3 tons 9 cwt.
Weight laden	Not to exceed 6 tons	6 tons	6 tons 13 cwt.

The police have permitted variations in the weights.

It may be observed: (a) That the increased load was obtained without any increase in the over-all dimensions permitted; (b) that with a lengthened wheelbase and improved springing the additional weight meant less and not more road shock; (c) that the general safety of the vehicle when fully laden has been improved by lowering the floor of the vehicle from 35 in. above the road surface to only 29 in. above the road surface, and consequently the center of gravity is lower too.

Once a new departure in design was initiated development was speedy. The 46-seat omnibus was not final. Experience with its operation almost instantly revealed the possibility of something still more commodius, and a 57-seat omnibus has been built experimentally. This too proved successful and 250 of the type are now under manufacture. The handicap of the motor omnibus has therefore been appreciably reduced. The principal tramway authority in London is so much moved by the success of the new omnibus that it is seeking from Parliament powers to run omnibuses itself, and has offered a prize of £1,000 for a design of a new tramcar.

Reverting to the other side of the account, the street car scores by its ability to draw a trailer. This doubles the seating capacity of a traffic unit and might be a conclusive advantage if it were not that a track cannot carry as many double units as it can single units under actual working conditions. There is talk of a motor omnibus trailer, but up to the present this is idle.

A standing load is not at this time permitted in London, the concessions of the war period being withdrawn. The policy that resists a standing load is open to question, especially when the large number of short riders on street vehicles and the popularity of the open crush spaces on French and German street cars and motor omnibuses is considered. America enjoys exactly the reverse policy, for the writers discovered that even the various traffic commissioners expected in the rush hours some fair percentage (50 to 75 per cent) of the load carried to be standing. This introduces a new element into the discussion of passenger accommodation in America.

The street car of the usual type seats fifty to sixty passengers, and easily accommodates as many more standing. The motor omnibus of the predominant type now in use seats forty-two to forty-four, but accommodates at the most eight or ten others. Motor omnibuses to seat up to sixty are projected, but, so far as the writers are aware, are not in effective operation.

The handicap of the motor omnibus therefore persists under American conditions, and there can be no question that accommodation afforded must tend to become the crucial test of efficiency in street transportation with the growing congestion of the streets of the great cities.

COST OF OPERATION

Although not quite in the same category as the four foregoing factors, the factor of comparative cost of operation still remains to be reviewed. The cost per car-mile of operating an electric street railway in London is slightly more than the cost of a motor-omnibus-mile. The difference is negligible. This is what might be expected, for both vehicles have a driver and a conductor, and need garaging and repairs. The principal chance of divergence must rest in the cost of fuel, electricity based on coal and petrol based on oil. The danger to the motor omnibus industry seems to center in the fuel problem. The world stocks of oil seem less than the world stocks of coal. There is a time, calculated to be not very far off, when the oil will be exhausted. Fortunately the use of petrol substitutes throws open a door to a wider future. Before the crisis comes benzol or power alcohol may have achieved commercial success. Therefore there is no reason to fear that there will ever be a marked divergence in the costs of the two methods of transport.

On the other hand, the capital cost of tramways far exceeds the capital cost of providing motor-omnibus routes (the ratio is over three to one) and unless this capital cost can be spread over a dense service it becomes a burdensome charge per car-mile, and definitely places the tramcar in a worse position. It is estimated that, to enable competition by these two instruments of transport to be conducted on approximately equal terms as to cost per car-mile, the street-car service must amount to not less than an average of twenty-five in the hour throughout the day in each direction. Then some one will remark that the competition is not to be measured in car-miles, but in passenger-place-miles, and so the load factor comes in as a corrective. As it varies from city to city with the conditions and circumstances of the traffic, argument about it is fruitless. In London the average passenger load per omnibus-mile was last year twenty-seven for the 34-seat vehicle against thirty-one per tramcar-mile for the 78-seat vehicle.

THE PASSENGER MOVEMENT OF THE STREETS

It is not expedient to weigh up the case for and against the motor omnibus as it has been developed so far, for there is an entirely new aspect to be opened up. Even if a conclusion could be reached in the comparison of the two vehicles, the street car and the motor omnibus, still the problem to be solved is hardly fully stated. What do these two vehicles aim at accomplishing? What is the passenger movement of the streets to which they are to be applied? What is the traffic problem to be tackled? It is impossible here to answer these queries in full and a brief examination under two heads must suffice, namely, street capacity and passenger density.

One reason why London has remained a motor omnibus city is the narrowness of its main streets, and the irregularity of its planning. To provide double-track tramways in the main arterial roads has not been possible, and the tramway tracks in some of the roads even now contain lengths of single track, or double tracks with interlaced lines. This happens because of what may be termed a general requirement of all tramways in England, a clear space between the outer rail and the curb of not less than 9 ft. 6 in. Yet this 9 ft. 6 in. barely allows for one line of traffic either side of the tramway, and is obviously inadequate to make proper provision for the other vehicular traffic in such a street. One would have thought that an arterial road of a city carrying a tramway would have been of a width sufficient for the movement of three lines of traffic in each direction, of which the two center lines would have mainly consisted of street cars. London is a shameful way behind such a standard. London has tramways which ought never to have been constructed as they are.

This narrowness of the streets and the pressure of other forms of vehicular traffic on the tramway tracks react on the capacity of these tracks themselves. Under favorable conditions the maximum number of cars passing in one direction across a point in a continuous running track is only about sixty-five in the hour with trailers attached, or eighty without trailers. This falls short of the results obtained in America, but there the wideness of the streets tends to insure continuous free passage to the street cars. The fact of roads being wide and generously laid out invites and justifies the building of street car tracks. It is this entire change in the aspect of the streets which makes the new American cities tend to street railways while the ancient European cities tend to motor omnibuses.

Perhaps it may serve to impress this difference on the mind if the widths of a few principal London streets are recorded. The Strand, which is a main east and west channel of traffic, is in places only 32 ft. wide in the carriageway. It is now being slowly widened throughout to give a carriageway of 60 ft. This street carries motor-omnibus services mounting to 170 vehicles in the hour in each direction in its present unsatisfactory state. Oxford Street, the other main east and west channel of traffic, is 52 ft. wide in the carriageway, and it carries motor-omnibus services mounting to 199 vehicles in the hour in each direction, and carried prior to the war as many as 246. [The best result for an American street track that we can quote for comparison is 120 in one direction in the hour.] When the other vehicular traffic of these streets is considered, the above results are emphatic testimony to the flexibility of the motor omnibus and its adaptability to streets of such a character. The maximum-motor omnibus movement in any street in London at the present time is only 216 vehicles per hour in each direction. This occurs in Whitehall. The physical characteristics of the streets and roads used must govern the choice of the instrument of transport to a large extent.

PASSENGER DENSITY

The second head is the volume of passengers offering for transport, and this must be looked at not only as a total number offering in a given time, such as a day, month or year, but as a volume unevenly distributed over the given time. After all, whatever instrument of transport is chosen it must be capable of dealing with the passengers when the movement is at a peak. Here again, while some features are common to all cities, the range in density from the slack hour to the rush hour varies much. Observation in London, however, shows one curious feature. The motor omnibus is more successful than the tramcar in attracting passengers during the slack hour, and experiences, therefore, a less disparity in its loadings throughout the day. It creates a traffic which cannot be secured by a tramcar because it enjoys a greater esteem or a higher prestige. In New York the same feature is observed, only there the higher fare helps to accentuate the distinction. It is more fashionable to pay the higher fare.

It is possible to frame an ascending scale of densities of traffic, and to note the limits in the scale which mark the service capacity of different instruments of transport. Such a rough scale prepared for London would be as follows:

Description of Traffic	
Very light..........	Under 500,000 passengers per mile of route per annum
Light..................	From 500,000 up to 1,000,000
Medium................	From 1,000,000 up to 4,000,000
Heavy..................	From 4,000,000 up to 6,000,000
Very heavy..........	Over 6,000,000 passengers per mile of route per annum

Then, calculating the maximum possible carrying capacity of the flow of motor omnibuses or tramcars through the streets or of trains on a railway and the minimum possible load for each class of service which would be economical we can decide as follows:

Very light passenger traffic can only be economically carried by motor omnibus.

Light passenger traffic is best carried by motor omnibus, but can also be economically carried by street car.

Medium passenger traffic can be carried by motor omnibus, street car or railway train.

Heavy passenger traffic can only be carried by street car or railway train.

Very heavy passenger traffic can only be carried by railway train.

Such a scale may be applicable to American conditions without change, but probably the maximum limits for medium and heavy traffics are slightly higher.

Another method of analysis is interesting. The local passenger movement of a metropolitan city is of three types, convergent, incidental and dispersed. Convergent traffic flows inward and outward on the main radial routes chiefly between homes and workplaces. Its characteristics are, first, that it flows irregularly in peaks and shallows, following the customary divisions of the working day; second, that it covers moderate and long distances. Tramways or railways are the most suitable means for its conveyance. Incidental traffic is traffic arising in and around the various centers of activity both main and subsidiary. Its characteristics are, first, that it flows evenly throughout the day; second, that it covers short distances. Motor omnibus routes or tramways are the most suitable means for its conveyance. Dispersed traffic is traffic moving transversely or otherwise eccentrically in the area. The characteristics of this traffic are ill-defined, but generally it covers moderate or long distances. It is usually a light traffic and comprises a large element of pleasure riding. Motor-omnibus routes or railways are the most suitable means of transport employed. Convergent or incidental traffics are medium to heavy. It is estimated that in London 40 per cent of the total movement is convergent, 40 per cent incidental and 20 per cent dispersed.

This analytical method of approach is not suggested to lead to accuracy of diagnosis, but it helps to clear up the judgment of those who must prescribe for the traffic problem.

Having set out briefly the pertinent factors that must determine the judgment, it only remains to indicate the conclusions which can fairly be drawn from them. When is a motor-omnibus route the correct solution of a street traffic problem?

But before commencing to give an answer it is necessary to ask another question. Is there a street railway? If there is a street railway then two new questions come into view. Is the street railway capable of dealing satisfactorily with the problem? What new service can the motor-omnibus route afford?

COMPETITION JUSTIFIED

Clearly, where the street-car service at its maximum of efficiency is unable to deal with the traffic wanting to be carried at the time of maximum movement, it is only right to supplement it by a motor-omnibus service. This decision only presents new complications, for when the point of maximum movement is over, there is an excess of service and the task is to decide which of the competitors shall give way. There is no doubt that the motor omnibus is adapted to the convenient handling of all passenger traffic up to a density of 5,000 riders per hour in each direction (4,000,000 passengers per mile of route per annum). Hence the slack hours can usually be covered by motor-omnibus routes, leaving to the street cars the duty of coming in to relieve the heavy stream of the rush hours. The fact of the street car having the larger accommodation is only another index of the rightness of this. It is a peak-load vehicle. But then there is the capital sunk in track and overhead equipment, power plant and so forth, standing idle for the greater part of the day, so that questions of efficiency in operation must be qualified by financial considerations. Up to the limit indicated it becomes a question of expediency.

Clearly again, where the street-car service pursues a direct and single route and there is a reasonable volume of passengers desiring to diverge at some point on this route to destinations on either side, motor omnibus routes passing over the street-railway tracks and spreading out to suit the public requirements are justified as a public facility. Such routes develop and cater for new traffic.

Clearly again, where a motor-omnibus route proceeds over a street railway and advances beyond it it is affording a new facility which justifies it. The overlap of the motor-omnibus route onto the street railway should, however, not exceed such reasonable length of between one and two miles as will give a continuous ride to short distance passengers crossing over what would otherwise be the point of break in service.

There is not an instance in London where an omnibus route immediately parallels a tramway that is not justified under one or other of the above propositions, nor is there a single instance where the tramcar and the motor omnibus perform exactly the same service. Upon this it is pertinent to note that where a tramway route and motor-omnibus route work in parallel over a considerable distance it may be desirable that the service each provides should be differentiated. For example, by eliminating stops on the tramway the effective speed of the service may be increased and it becomes non-stop, or semi-express, and so affords improved facilities for moderate or long-distance traffic, while the motor omnibus service steps into its place to deal with the short-distance casual traffic. With the tramway in the center of the roadway, as already shown, the speeding up would be a natural development. This is merely a suggestion; no such step in co-ordination has been attempted in London, but it would seem worth trial.

Competition, as competition merely, in transport service cannot be justified where there is public regulation or control. The best service can be given under such circumstances by co-operation. In American cities with their elaborate transport commissions, therefore, there is always an independent body able to weigh up the merits and capacities of the various instruments of transport as roughly outlined in this paper and give a judicial and equitable decision. There can be no excuse for what is known as jitney competition. In London, where there is no such control organization in existence, and where the municipal authorities own part and private companies other part of the transport facilities, there is necessarily room for conflict, but even then commercial considerations always tend to secure adjustments of view and efforts at co-ordination. There is an inevitable tendency toward it, just as there must be an inevitable tendency for motor-omnibus routes to be conducted under conditions no less ordered than street-car routes, and carrying with them privileges no less great. In London the streets are open to all competitors. Any one obtaining a license from the police authorities may run a motor omnibus. This is false freedom, and as the control of motor-omnibus traffic is extended, it makes the situation unfair. The aim that is to be sought is a franchise with its essential concomitant public control, with co-ordination of all transport services in the best interests of the passengers and the undertakings.

THE PLACE OF THE MOTOR OMNIBUS

This is by the way, but sufficient has been said to indicate that where there is a tramway many considerations must enter into the judgment of the right use and employment of motor omnibuses other than those depending on the relative transport efficiency of these vehicles compared with street cars. On the contrary, where there is no tramway the judgment is clearly dependent on no other factors. It remains, therefore, briefly to summarize them once more.

For any traffic movement which does not exceed 5,000 passengers in any one hour in one direction the motor omnibus is the capable and efficient instrument on any ordinary street. On a wide street it is efficient and capable of handling a movement mounting to 8,500 passengers in any one hour in one direction, while for any traffic movement below 1,000 passengers in one direction *on the average* of every hour of the day the tramcar is uneconomical, or rather the motor omnibus can perform the work more cheaply. Therefore, for traffic up to an average throughout the day of 1,000 in the hour, which will most likely correspond to a maximum movement of 3,000 in the rush hour in one direction, the motor omnibus is the best practical solution, and between 3,000 and 5,000 both tramcar and motor bus are capable, with a preference in favor of the motor bus, and between 5,000 and 8,500 both are still capable, but now with a preference in favor of the tramcar. Over 8,500 up to 12,000 the tramcar is capable, after which a new means of transport must be introduced.

This means that for traffic on lightly or moderately loaded roads motor omnibuses should be used. This is the case on all cross-country routes, on cross-connecting roads, on extensions into the outskirts of cities. These are naturally motor-omnibus routes. Subject to a concluding caution set out later, main radial city routes are street railway routes, and as already indicated some of these call for both street railway and motor-omnibus routes.

As stated above the problem looks simple as A B C (even if the figures given are disputed). Every one can calculate the maximum possible movement of passengers with a vehicle of a given size and frequency, and every one can calculate at what point in density of service the capital cost per car-mile run on a street-railway system equates down to the capital cost per car-mile run of a motor-omnibus system. At a certain density this occurs and then the street car becomes an economic possibility. But alas, the traffic problem of any city is never stationary. Traffics come into being and disappear. They shift from place to place with shifts in trade, growth in populated areas, changes in neighborhood brought about by political and social influences. A city is always becoming a more and more specialized aggregation of people. There is a university quarter, a trade quarter, a theater quarter, a shopping quarter and so forth, and each quarter has its traffic idiosyncracies. How meet all this? Here is the great economical advantage of the motor-omnibus route; it can follow the traffic. Its garages can serve many streets and in its garages alone is it fixed to any spot. It can test changes in flow of traffic. It can seek out and create traffics. It need never be left desolate when its traffic has disappeared.

But more important than the shift and change of the traffic is the constant increase in the total volume which takes place year after year in all healthy progressive cities. Population drifts everlastingly into vast aggregations. London, with its 8,000,000 people, is a monstrous growth and still it goes on. Therefore, the rate of flow of traffic today is not the rate of flow of traffic tomorrow. There is no fixed measure by which to decide in favor of street car or motor omnibus. And here a new instrument of transport forces itself upon the attention. There is a limit to the capacity of the street car. Over 12,000 passengers in the hour in one direction means the breakdown of the service, after making liberal allowance all the while for strap-hangers. Then the underground or elevated railway, the specialized street with the specialized transport must appear. Once again there is a minimum limit. These railways are expensive to construct and probably a density of less on the average than 2,500 passengers per hour each way at any point would be uneconomical, but the maximum is advanced to much higher figures. Ten-car trains, each accommodating ninety passengers seated and as many more standing, running on a close headway giving thirty-six to the hour in one direction, multiply up to a grand total movement of 64,800 passengers.

All a reasonable man can do is to look ahead, and estimate as he is best able what the traffic requirements will be and provide accordingly. But he will use the motor omnibus whenever he can, because the risk of loss is much less an account of its transferability. He will not build a street railway when he knows that soon he will want an elevated or underground railway, for with an underground or elevated railway to handle the peak traffic and the long-distance traffic he will find the motor omnibus to be a sufficient auxiliary in the street above to deal with the casual short-distance traffic. This is the situation in large sections of London, and it is eminently satisfactory. This explains why London cannot ever be a tramway city. The tram has gone by, the phase is past. It may be a lesson for America, but who are we to say that?

The Motor Vehicle—Competitor or Ally?*

By George M. Graham
Vice-President Pierce-Arrow Motor Car Company

The Author Advocates the Operation of Auxiliary Bus Services by Electric Railways, but Expresses the Conviction That the Motor Truck Furnishes the Best Means of Giving Short-Haul "L. c. l." Freight Service

IN EXAMINING the big question of whether the motor vehicle can compete with the electric trolley car, can supplant it or can economically and profitably supplement it, there is difficulty in finding a specific "Yes" or "No." As in most things in life, no decision can be absolute. The trolleys are neither all good nor all bad, and motor buses come within the same category. The task is to find a place for both.

No motor-vehicle manufacturer has ever said that electric trolleys could everywhere be supplanted by motor vehicles. The statistics of passenger traffic on electric railways prove the essentiality of its service. We should not permit the trolley to be dealt with unjustly. The price the country paid for a narrow steam railway policy is a disastrous reality. We have corrected that injustice; we should not repeat the error with electric railways.

Nor should the electric railways be sacrified to the uncontrolled jitney bus. The trolley company has a responsibility to the entire community. It must be run or its franchise will be canceled. Bus operators, as a rule, are irresponsible for damages to property and liability to persons. They can get permits almost without investigation as to character, or as to the need of bus service. There are few laws or ordinances regulating the operation of buses, whereas in some cities the railways are subject to fines if they inadvertently fail to pick up passengers.

It is first vital to know whether the public will use motor buses, even at an increased rate of fare. Investigations show that the public is eager to use the bus. In London the buses carry more passengers than all the surface railways in the Borough of the Bronx and Manhattan in New York City. Paris has 1,000 highly profitable motor buses. Birmingham, Liverpool, Manchester and Sheffield have all found important applications for the motor bus. The most important bus company in the United States is the Fifth Avenue Coach Company, New York City, which for the fiscal year ended June 30, 1919, carried 36,488,447 passengers a distance of 8,022,026 miles in 279 buses. The drivers and conductors on these buses are the most courteous employees in the city. When all of the seats are occupied, no more passengers are admitted. Schedules are adhered to, and the service is so excellent that the buses are liberally patronized despite the 10-cent fare.

When contrasted with overcrowded, poorly ventilated trolley cars and the 5-cent fare, it is hard to believe that similar service could not at once be profitably installed in many cities of the United States with populations of 100,000 or more.

The question arises as to whether the bus can best be applied by independent agencies, as a competitor, or whether it should be operated by electric railways as part of their monopoly. The report of the Federal Electric Railways Commission recognizes the jitney and the motor bus as factors in transportation, and recommends that these forms of conveyance, when operated as public carriers, should properly be subject to equivalent regulations. This is in line with the expressed belief of J. H. Pardee, president of the American Electric Railway Association, that if there is to be a test of the two means of transportation, it should be conducted under the same conditions. Either the motor vehicle should be compelled to assume the burden of taxes, of imposts such as street paving, street cleaning and snow removal and of service requirements as to routes, schedules and equipment, or the electric railways should be relieved of these burdens.

There is a logic and equity about this viewpoint which is hardly to be disputed. Mr. Pardee has enunciated an unassailable principle, but in practical work there are other factors to be considered. The automobile industry is not immune from levies. In taxes and license fees it pays $100,000,000 yearly to city, state, and nation. Motor buses should bear their share of the taxes and other obligations, but the regulations imposed upon them should be equitable and not punitive, and should not be planned to protect monopolies that are defaulting in their obligations.

AFTER ALL IT IS A MATTER OF COST

The question of which can serve the public more cheaply is naturally important in any effort to determine the place of electric trolley or motor bus. While there is abundant material dealing with this subject, the conditions vary so greatly that no set of figures can have a general application. It costs the Fifth Avenue Coach Company about 8.5 cents to carry each passenger as compared with a 10-cent fare. In spite of its many advantages, this company has not been uniformly successful. There can be no question of profit on earnings with regard to New York's other bus lines, for they are backed by the city and any deficit comes from the taxpayers.

The lower cost of motor-bus equipment, as compared with electric railways, is shown by an examination of the figures of the London system. The number of passengers carried in 1912 by the London railways was about the same as the number carried by its omnibus system. The aggregate length of routes operated by railways was about 148 miles, and more than 300 miles by the motor buses. At the close of 1912 the total London railway investment, less the accumulated sinking funds, was $53,000,000, while the amount of capital employed by the omnibus company, as evidenced by its outstanding securities, was only about $15,500,000. Thus we find that the London railway investment was about three and a half times that in the omnibuses, to carry the same number of passengers. Manhattan and the Bronx surface railways, carrying only 20 per cent as many passengers, had an investment twelve times as great, or $190,000,000.

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*Abstract of address at the annual convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 14, 1920.

BUS HAS ADVANTAGE IN LOW OVERHEAD

Recognizing that actual figures vary widely according to conditions, I have sought to make a comparison that will be applicable to the average American city of more than 250,000 population. It is based on public report of electric railway costs and known figures of motor vehicle operation.

Let it be supposed that an electric railway company is confronted with the necessity of providing service in the suburb whose most remote point is three miles away from the present extreme of the line. The requirements involved are: The line is on city paved streets, fifteen-minute headway is to be furnished, 1,500 passengers per day are to be carried, sixteen-hour service is to be given during 365 days of the year, the territory is level, the electric railway line is single track, and the fare to be charged is 10 cents. The query is: Which is better, to extend the trolley tracks or establish a bus line? Figures on this point are given in Table I.

TABLE I—COMPARISON OF ELECTRIC RAILWAY AND MOTOR BUS FOR SUPPLEMENTARY SERVICE

	Railway	Bus
Investment required	$200,000	$35,000
Number of vehicles operated	3	3 (plus 1 reserve)
Speed in m.p.h	10	12
Number of operators per vehicle	2	1
Passenger capacity per vehicle	45	25
Passengers per trip per vehicle	12	12
Operating expense per mile of line	$17,000	$17,742
Operating expense per vehicle-mile, cents	36.3	37.9
Number of vehicle-miles operated	140,160	140,160
Revenue per vehicle-mile, cents	38.9	38.9
Cost per passenger, cents	9.19	9.72
Net revenue per passenger, cents	0.81	0.28
Total cost per day	$137.97	$145.82
Net revenue per day	12.03	4.18
Net revenue per year	4,390.95	1,525.70
Interest on the investment, per cent	2.2	4.3

If the above line were to be extended one mile and the fifteen-minute service maintained, that would involve $65,000 additional capital for the trolley line as against only $6,000 for the bus line. Obviously, the smaller the capital expenditure, the greater the return will be, provided the revenue remains constant.

Another angle to be considered is the increase of service after a project has been installed. Suppose in the above case the headway is reduced. This will involve the operation of additional vehicles and the handling of more passengers. For fifteen-minute headway, three cars or two buses would be required; for ten-minute headway the figures would be four and three, for five-minute headway eight and six, for three-minute headway twelve and eight, and for two-minute headway eighteen and twelve. This shows how the number of vehicles increases as the service is increased. Of course, it costs the railway more to place each additional car in service than to place a bus in service. The car costs new $15,000, as against $5,500 to $6,000 for a bus.

SOME FACTS FROM EXISTING BUS LINES

In many places successful, independent, suburban motor lines are already in operation. Among them are the following:

The Wilkes-Barre line operates forty-nine buses, 4 miles in the city and 7 miles interurban, on a seven-minute schedule, one man to a bus, as against a fifteen-minute trolley schedule, two men to a car.

The Suburban Transit Company, Plainfield, N. J., a subsidiary of the Spicer Manufacturing Corporation, operates thirteen motor buses, ranging from 1-ton to 5-ton, with a passenger capacity of from twelve to seventy-five. Under its contract with the Spicer Corporation, the company agrees to furnish, for those Spicer employees who live in Plainfield, free transportation to and from the plant. This line is operated at cost, monthly statements being sent to the Spicer company. For public service the company operates a line from Plainfield to South Plainfield, a distance of 3½ miles, for which a 10-cent fare is charged. Other trucks are available on arrangement for picnics, parties, tours, etc. The operating cost varies from 40 cents per mile to 80 cents per mile, the average being 45 to 60 cents, depending upon operating conditions.

The experiences of the Fifth Avenue Coach Company show that it could not operate on a 5-cent fare basis, even with its double-deck, forty-five-passenger bus. This system is most efficiently run, yet the operating cost, exclusive of taxes, was 29.03 per cent per bus-mile.

The Baltimore Transit Company, in spite of a passenger density of 5.5 passengers per bus-mile, was unable to make ends meet on a 6-cent fare, and can hardly hope to do better than break even on the present 7-cent fare.

Many instances here given argue against the bus as a competitor, but the service rendered by the Fay Motor Bus Company at Rockford, Ill., points the contrary. On the buses of this company a 10-cent fare is charged as against a 7-cent fare on the trolley. Workmen have shown a willingness to pay the extra fare in order to travel on the Fay buses.

It is claimed that the Fay buses operate at an average of 16 cents per bus-mile, as against 19.38 cents for the one-man safety car. Each Fay bus seats from twelve to nineteen passengers. The urban lines extend 4 miles from the center of the city, and the interurban lines 37 miles from Rockford. Outside the city limits the fare is 4 cents per mile. These lines have been in operation for three years, and even in the severe storms of 1919 missed only three trips through snow.

On this subject there are thus varied views. It is well to look at them soberly. Many excessive claims for the motor bus develop at times of tension between trolley companies and the public. There is, no doubt, a general public feeling that motor buses could well be applied to both urban and suburban transportation. The important factor in city transportation is freedom from traffic congestion. This is the great advantage of the Fifth Avenue buses, which load and unload passengers at the curb, keeping the center of the highway free for private vehicles. There is also a safety factor here, only twenty-three accidents having occurred on this system in 1919, of which only one proved fatal.

MUNICIPAL OWNERSHIP IS NOT THE ANSWER

Of the three ways that buses can be operated, namely, by the trolley companies, by independent companies and through municipal ownership, the last named is the least desirable. The events of the last four years have changed many of our ideas, and we no longer think of government ownership as a panacea. Motor buses should not be allowed to compete with established trolley lines. Duplicate transportation facilities never work out satisfactorily or permanently. Furthermore, trolley companies are entitled to protection on account of their capital invested.

There are many benefits to be gained by having the electric companies themselves operate buses in conjunction with their lines. Buses can give service on streets parallel to congested trolley tracks, and thus not only handle passengers on the parallel streets but make possible a faster trolley service. The bus could offer also a short cut between factories and principal residential districts, thus avoiding the transfer of large masses of rush-hour riders at a few overcrowded points. The bus would offer the possibility of a flexible fleet of vehicles to help in emergencies.

The problem among the smaller cities is very intelligently dealt with by the Waterbury Chamber of Commerce, which after a careful investigation recommends: (1) That the trolley must be given the exclusive business on the streets now occupied by its track; (2) that jitneys and motor buses shall be permitted to operate only on streets not now served by the trolley; (3) that if with such advantages the trolley cannot or does not provide adequate service at reasonable rates, provision shall be made to allow a supplementary use of motor vehicles.

THE CHANGE SHOULD BE GRADUAL

Wherever a trolley company can substitute motor-bus equipment for trolleys, it should do so, but the change should be gradual. This would to a considerable extent retard an over-rapid depreciation, and would make it possible to supply less costly facilities for those that wear out. But in the last analysis the trolley company should treat its inventories just as a manufacturer treats machinery which he finds out of date, and for which he substitutes new equipment even at a loss, remembering that that which is economically in error cannot be artificially kept alive.

One of the greatest problems that now confronts the electric railway company is the need of giving service into newly opened sections. This is a constant case of conflict. A new suburb develops; its residents demand service. The railway company investigates and finds that the utmost possible patronage to be gained will not permit an even break on the costs of installing a new line. Then it either declines to add a spur to its existing trackage, and thereby increases the public resentment against itself, or establishes such a line and accepts a loss.

Either of these alternatives involves an error. There is a better means. The motor bus affords the answer. It is but just that the electric railway should profit by suburban extension, for it was largely responsible for the early stages of the away-from-the-city movement. It has been argued as an objection to the use of buses in such service that they cannot be operated satisfactorily in winter weather. Experience has shown that the bus fares little worse under such conditions than the trolley. In Wilkes-Barre and Scranton last winter the regular electric service was handicapped for several days, whereas the bus line in Wilkes-Barre maintained almost normal schedules. The experience was somewhat similar in New York City. The Fifth Avenue Coach Company has a snow-fighting force patterned after the Fire Department, reducing interruption to traffic to a minimum.

In respect of accident fatalities, and damage suits resulting therefrom, London reports show that the buses kill five times as many persons as the electric railways, but it is to be remembered that in London the bus renders its service in the most densely crowded sections. The New York figures indicate that the bus accidents are not numerous. In one year there only one person was killed and twenty-two injured by the Fifth Avenue buses.

Already seventeen electric railway companies in this country are operating motor buses as feeders and auxiliaries. I believe that there is not an electric railway company in the United States that could not somewhere with profit apply motor vehicles in its system.

I would suggest that you bring in the motor vehicle man for consultation. Tell him your troubles. Get his ideas. He is an expert specialist in transportation subjects. It is more than likely that he will have some valuable suggestions.

At this point I desire to direct attention to some methods by which trucks could effect a direct economy in operation and maintenance: (1) Emergency trucks stationed in various zones and equipped with power and emergency equipment for temporary repairs can rerail cars, remove lines, shut off power in case of fires, repair overhead or underground construction, repair electric switches and string new wires. Cable can be laid and pulled with winch-equipped trucks. (2) For sand distribution trucks are useful. By this procedure one company has saved $8,260 per year. Salt can also be distributed thus advantageously. (3) Ties, rails, crossings, centers and paving material can be effectively handled by truck. (4) Pull-trailers, melters, sand-blast machines, welders and riveters can be placed by motor truck much more quickly than by horses.

I question often if the great public understands how enormously the resources of the American motor-vehicle manufacturer have grown. The United States, with one-sixteenth of the world's population, has ten times as many cars and trucks as the rest of the world put together. There are in the United States something like 8,000,000 motor vehicles, of which 800,000 are motor trucks. The total value of motor vehicles, parts, tires and accessories for 1919 exceeded $3,166,000,000,-000, This would seem to be a good industry to depend on for equipment.

WINNING THE PUBLIC GOOD WILL

So far I have looked at the subject largely from the standpoint of money making, but there is still another factor that is of most vital importance.

I believe that the greatest gain to the electric trolley company in the application of buses would not be in larger cash receipts, but in an increase of good will. A great gain could be made in public esteem by having a squadron of emergency vehicles to handle rush traffic. For such service additional street cars, even if available, cannot be readily operated on already overcrowded tracks, but I have never been able to understand why there could not be fleets of motor buses running over the congested routes during the morning and evening hours, on the same and parallel streets. I should call them "good-will-service" buses, and should make clear in newspaper advertising that they had been applied in an effort to win the friendship of the public.

These auxiliary buses could be routed from day to day as occasion demanded. They could be used in the afternoon to handle baseball crowds, and in the mornings to take women shoppers down town. They could be applied to special picnics, the hauling of circus crowds and various similar functions. They could carry their good-will service into the suburbs.

As to the cost of these buses, all of the items of expense are definitely known. Against these costs the railway official could set the revenues to be obtained at a rate of fare higher than the trolley fare.

USE OF TRUCK ADVANTAGEOUS IN FREIGHT HAULAGE

I have presented the doctrine that in respect to passenger traffic the motor vehicle is an ally—not a competitor. I wish exactly to reverse this position when dealing with the subject of freight haulage. Here I consider the motor truck not an ally, but a competitor; in fact, except in isolated cases the suburban trolley is barred from developing any considerable volume of freight haulage. Fifteen years ago there seemed a great opportunity for the electric railway in freight haulage but now it is in the middle position, with both ends being played against it. In long-distance movement of heavy tonnage it is surpassed by the steam railroad; in short-distance transit of less-than-carload lots, up to 100 miles, it cannot compete with the motor truck.

The trolley is limited by its trackage; it cannot reach the distant outlying points as can the truck. Nor can it economically use trucks as feeders to haul freight to central points, thence to be transported to cities by trolley, for the reason that such a system would mean trolley shipment only part of the journey. Whatever economies might be effected within this limited distance would be more than overcome by the cost of unloading from the truck, loading on the trolley freight car, unloading at the terminal and then reloading on truck or other vehicle to complete the journey.

The ability of the motor truck to give a door-to-door service over an extended distance is a distinctive and inestimable advantage, and one that applies especially in the handling of anything so perishable as food products.

The only chance for the trolley as a factor in freight movement is to cater to such factories, farms, mills, stores or warehouses as are located directly along its line, thus eliminating extra haulage by other vehicles. Actually the haulage of freight has never become a very great revenue producer for the electric railways, although data obtained from Secretary E. B. Burritt shows that 404 companies have special facilities for freight service.

Regarding truck freight transportation facilities it is true that only about 12 per cent of the roads in the United States are surfaced, but their mileage, 296,290, is greater than the total steam railroad trackage and sixteen times as great as the electric trolley. The use of the motor vehicle is becoming a habit. One man in every fourteen in the United States has passed the pedestrian or wagon stage of conducting his business and applies motorized efficiency. Iowa and Nebraska show one vehicle to every half dozen of population. Therefore, shipping by truck seems the natural development.

Nowhere has trolley freight transportation been more successfully applied than in Indianapolis, the yearly figures being 400,000 tons with a revenue value of $1,500,000; yet here the motor truck is cutting heavily into the interurban freight revenues. Lines radiate to Michigan, Ohio, Illinois and Kentucky, with an average radius of about 100 miles. There are four companies operating or connecting with seventeen different roads.

Some trolley companies are attempting to deal with the situation by operating their own trucks as feeders to their electric lines. The Chicago instance is typical. Four truck lines approach Chicago respectitvely from the north, west, southwest and south, but owing to their lack of terminal connections in Chicago their service is not yet available for the Chicago shipper. This motor express feeder service is already handling approximately 50 tons per day, and is operating six trucks and two trolleys.

There are in the United States 6,361,502 farms. Senator Capper of Kansas has estimated their total value at $70,000,000,000, and states that at some stage of its transit from point of production to point of consumption $21,000,000,000 worth of food, dairy products and live-stock products go over the highways. Just as I have conceded that the number of passengers in our great cities is too enormous to be handled by motor buses, so equally I am certain that electric railways cannot hope to make more than a dent in supplying transportation facilities to the American farmer. There are too many of him and he is too widely spread.

On the contrary, the motor truck is here rendering a service to which it is ideally adapted, and its application is already having a most considerable effect. The main advantages of the truck are: (1) It gives wider production area; (2) it definitely lowers cost of foodstuff without detriment to the farmer by saving much excess transportation cost; (3) it shortens time of transit to market, thereby increasing the farmer's producing hours on the farm, and (4) it assures the prompt arrival of perishable products at the door of the consumer when they are in best condition and command the highest prices.

There are possibly 10,000 motor haulage lines in the United States at this time, some of which have investments as high as $2,000,000. They are doing an enormous business. The volume of business being developed by the truck is not being drawn from the trolleys alone. R. C. Wright, general traffic manager Pennsylvania Railroad, expresses the opinion that the haulage of less-than-carload lots of freight for distances of less than forty miles cannot be made to pay. Of the 659 steam railways belonging to the Short Line Association, 419 have less than 25 miles of track. Hence, if Mr. Wright is correct, these roads are being operated in economic error and cannot hope to be successful. In the natural course of events they must give way to a better adapted medium, the motor truck, and I feel that this is equally true of the trolley car.

The electric railways dominate urban passenger transportation; they should concentrate on that. They should apply their highly developed organizations and go after public good will. They should eliminate the motor bus as a competitor by making it part of their equipment.

They should not figure too hopefully on freight revenues; in this field they are handicapped, and sound business would dictate the withdrawal of their facilities where they cannot successfully compete with steam railways and motor trucks.

Above all they should banish prejudice, forgetting past wrongs and unfair competition, and look to the future. They need revenues. Provided they can get these what difference does it make whether the power that mints the coin comes from the leap of the electric current or the explosion of the internal combustion motor?

American Association Proceedings

Notable Address by Gov. Henry J. Allen of Kansas a Feature of the Program—Addresses on the Place of the Motor Bus Attract Much Attention—Discussion on Public Relations, the Federal Commission Report and Training Electric Railway Personnel Were Other Important Subjects—Philip H. Gadsden Enthusiastically Acclaimed as New President

THE first session of the thirty-ninth annual convention of the American Electric Railway Association began about 9:45 a.m. Oct. 12, when President Pardee called the meeting to order in the Greek Temple. There was a large attendance. The first order of business was the president's address, which is published elsewhere in this issue.

Secretary Burritt then presented the report of the executive committee, which was not read as it consists of the minutes of the different meetings of the committee and will appear in the printed report. Mr. Burritt then read the report of the secretary and treasurer. This was followed by the reports of the committee on compensation for carrying United States mail. Both of these reports appear in abstract below.

By electing Philip H. Gadsden to its presidency the American Association showed its appreciation of the notable contribution to the rehabilitation of the industry which he made during his service as a member of the Federal Electric Railways Commission.

REPORT OF THE SECRETARY-TREASURER

The report of the secretary described the activities of the year. The mid-year meeting at Cleveland on Jan. 8 was first mentioned. A brief summary of the other principal activities follow.

The association assisted in the distribution of the report of the Federal Electric Railways Commission and in the work of securing for it proper publicity in the press of the country. Addresses delivered by President Pardee before the annual convention of the Chamber of Commerce in the United States in April and the National Association of Credit Men in June were abstracted and advance copies furnished with release date to about 1,200 newspapers. Other special bulletins and statements and special reports of the Bureau of Information and Service have been furnished to the financial and daily press. In the coal situation the association has co-operated closely with the National Electric Light Association and the American Gas Association in the presentation of all matters before the governmental authorities, and at hearings before the Interstate Commerce Commission on priority coal orders.

It has also been represented at the hearing before the Interstate Commerce Commission in the electric railway mail pay case, and has printed and forwarded copies of the complete findings of the commission to all member companies. *Aera* has satisfactorily fulfilled its function. It has recorded fully the activities of the association and of the various company sections and has continued to aid in the general publicity work of the industry. The August issue contained probably the most complete presentation of the work and aims of the association that has ever been printed. Announcement of the resignation of Harlow C. Clark, for the past seven years the editor of *Aera,* is made with regret. Mr. Clark brought the magazine to its present high standard and his personal contribution to its pages, embodying the results of constant and intelligent study of the electric railway problems over this period of years, has set a high mark in the literature of the industry. The publication of a book, "Service-at-Cost Plans," by Harlow C. Clark, by the association in June is mentioned.

In accordance with the action of the executive committee at the Cleveland meeting in January, Charles L. Henry, chairman of the committee on national relations, was appointed in charge of the Washington office. The membership of the association in the Chamber of Commerce of the United States is maintained, and there should be no question that the association membership and active participation in the activities of the body will be of great benefit to the industry. The association has recently taken membership in the National Industrial Conference Board. Other national meetings and conferences at which the association has been represented officially have been those of the United States Chamber of Commerce, Federated American Engineering Societies, National Association of Traffic Officers' Convention, National Industrial Conference Board and Federal Highway Council. From Nov. 1, 1919, to Sept. 30, 1920, twenty-one railways have been enrolled as new members, with a number of others in immediate prospect, and eighteen have resigned. Eighteen manufacturing companies were enrolled and twenty-four have resigned. Individual membership during this period showed a net loss of forty, and the

INCOME STATEMENT TEN MONTHS ENDED AUG 31, 1920

Revenues:	
Admission fees:	
Railway companies	$140
Manufacturer companies	140
Total	$280
Annual Dues:	
Railway companies	82,496
Manufacturer companies	15,497
Individuals	2,157
Total	$100,150
Miscellaneous Income:	
Interest on deposits	228
Interest on investments	557
Sale of year books and proceedings	105
Sale of engineering manuals and binders	102
Sale of "Cost of Urban Transportation Service"	700
Sale of bibliography on valuation	1
Sale of miscellaneous pamphlets	270
Sale of dinner tickets	5,480
Contribution hotel men's assn	4,483
Total	$11,928
***Aera*:**	
Advertising	13,197
Subscriptions—Railway companies	2,460
Subscriptions—Manufacturer companies	1,410
Subscriptions—Individuals	1,438
Subscriptions—Company section members	2,455
Paid subscriptions	174
Sale of extra copies	24
Sale of binders	18
Total	$21,179
Total revenues	133,538
Expenses:	
American Association	94,123
Aera	34,755
Total expenditures	$128,878

EXPENSES TEN MONTHS ENDED AUG. 31, 1920

American Association:	
Salaries	$37,301
Rent	3,906
Postage	3,421
Office supplies and expenses	2,570
Express	137
Telephone and telegraph	3,010
Stationery and printing	7,431
Repairs to furniture and equipment	160
Traveling expenses of staff	2,141
General expense	3,540
Exchange	105
Miscellaneous pamphlets	1,925
Mid-year meeting	481
Mid-year dinner	5,486
Proceedings and advance paper	8,750
General convention expense (1919)	1,756
Convention entertainment expense (1919)	233
General convention expense (1920)	732
Convention exhibit expense (1920)	1 037
Hooper-Holmes Bureau	500
"Cost of Urban" Transportation	1,960
Washington office	7,533
Total expenses	$94,123
Aera:	
Salaries	11 291
Postage	341
Rent	565
Telephone and telegraph	470
Discount	172
Traveling expenses of staff	1 342
Magazine expense:	
Printing	14 750
Paper	4 372
Mailing	500
Cuts	950
Total	$34,755

STATEMENT OF COMPANY MEMBERSHIP SEPT. 30, 1920

	Railway	Mfg.	Total
Number of members Nov. 1, 1919	315	240	555
Number of members reinstated	20	4	24
Number new companies	21	18	39
	356	262	618
Resignations	18	24	42
Net total	338	238	576

STATEMENT OF INDIVIDUAL AND COMPANY SECTION MEMBERSHIP SEPT. 30, 1920

	Individual	Company Section
Members, Nov. 1, 1919	929	1 938
New members	38	42
	967	1 980
Resignations	78	71
Members, Sept. 30, 1920	889	1 909

company section membership showed a net loss of twenty-nine.

Considerable space was given to the report of the Bureau of Information and Service. Prior to 1918 this department handled about 500 inquiries annually. Last year showed an increase of 1,019, while the year just closing showed a total of 6,532. During the month of September 940 requests were answered. A list of the subjects of this information most in demand was given. More than 900 different companies made requests for information during the year, or an average of more than seven requests per company.

In conclusion, the secretary spoke of the loyalty of the office staff and made special reference to J. W. Welsh, the association's special engineer.

There are nine appendices giving detailed lists of the number of requests made for information on various subjects, special compilation prepared by the Bureau of Information and Service, questionnaires sent out, circular letters sent out, bulletins on the fare situation sent out, bulletins on the labor situation sent out, etc.

A summary of the report by the treasurer appears in the adjoining column.

COMPENSATION FOR CARRYING UNITED STATES MAIL

During the fall of 1919 the committee completed, with the assistance of special counsel S. S. Ashbaugh of Washington, the brief for presentation to the Interstate Commerce Commission and conducted the oral argument before the commission in Washington on Dec. 6. The commission did not hand down its decision until Aug. 7, and the decision was not communicated to the association until two or three weeks later. In the decision, copies of which have been sent to member companies, the effective date for the new rates was set as Dec. 6, 1920, just one year subsequent to the date of the final oral argument before the commission.

While the commission by the terms of its order has materially improved the existing situation concerning mail pay, nevertheless the committee feels that as a whole the decision is disappointing. It was hoped that as a result of the voluminous testimony and the earnest efforts made to present to the commission the injustices and impositions of the Post Office Department in the past it would adopt a more broad-minded and liberal attitude. In the judgment of the committee the commission signally failed to do this and did not give the railways the rates to which they were entitled.

Electric railway mail pay by this decision has been definitely put upon a space basis, although the definition of space is not as clear as it should be and it may be interpreted so as to inconvenience seriously mail carriers, particularly where mail is handled on passenger cars. The previous unfair and nebulous rates have been clarified to some extent in that the number of pouches to be carried for the minimum rate is limited to ten. This minimum rate has been increased 33⅓ per cent. When more than ten pouches are carried the order as indicated above is not clear, although there is provision for increased pay for each additional unit increment of 30 cu.ft. of space used. Further, there is a provision for tests to be made at least once in two years for determining the number of articles of mail that will fill the unit of 30 cu.ft. One significant provision of this portion of the order is the provision for conducting tests, "with the presence and assistance" of the railway officials, which is felt by the committee to be a recognition by the commission of the unfairness of the former practice of the Post Office Department in secretly handling and compiling all data relative to weights, space, etc., both on street railways and on steam railroads.

The rates laid down for independent cars and for railway Post Office cars are faulty, because they provide for no return on the value of the investment, the commission apparently having attempted merely to cover the operating costs for 1917. A new departure is the authorization of space on baggage and express cars, and here, too, it is felt the rate is too low.

Relief from side and terminal service has been provided, it being optional with the companies whether they will perform this work, except, of course, where directly contiguous to the right-of-way. A clear indication of the narrow-minded way the commission has treated the subject of compensation is shown in its allowing but 3 per cent over and above the actual cost of handling side and terminal service for supervision, accounting and general overhead expenses connected therewith.

While the situation has been somewhat clarified, the committee recommended that a committee on mail pay should be appointed for the ensuing year to continue work on this subject. The report was signed by V. S. Curtis, chairman; Charles L. Henry, G. K. Jeffries, P. J. Kealy, L. H. Palmer, Samuel Riddle, W. S. Rodger and C. L. S. Tingley.

Mr. Palmer, who read the report on United States mail, in the absence of the chairman, Mr. Curtis, added that Mr. Ashbaugh, the special counsel in this case, contends that this order is illegal and inconsistent with the decision of the Interstate Commerce Commission in the steam railroad mail pay case, docket 9,200. He thinks that the first duty of this association is to decide whether it wishes to file a motion to amend the order to make it conform to the law, as he believes it exists on the statute books. He also says that in his opinion under this decision no road need carry any mail until Dec. 6, 1920, when the order becomes effective, and that if this should be done it would most effectively bring the matter to the attention of the commission.

ELECTROLYSIS

The report of the committee on electrolysis was then presented by Calvert Townley, chairman. Mr. Townley's written report, which was very brief, simply stated that in accordance with the policy of the American committee on electrolysis the association committee had confined its activities to serving the delegates of the association, and that as there had been no calls upon it no meetings had been held. He recommended, however, that the association should continue the committee, so that it might be ready to act if necessary. In discussing his report he then explained more the purposes and functions of his committee, which he said was one of a series of similar committees from nine associations and also the Bureau of Standards, all forming the American Committee on Electrolysis. This committee was organized some ten years ago to unite the interests of the associations mentioned, which comprise all of the national associations representing corporations owning metallic structures in streets, the purpose being to study the electrolysis situation in a scientific manner. After about three years the committee produced a report which was confined largely to facts definitely determined and also to definitions compiled so that the various technical organizations forming the committee would talk the same language. During the war the committee was largely inactive. Recently there has been more activity. One of the arrangements which has been made by the American Electric Railway Association committee on electrolysis has been to appoint a representative to act with the Bureau of Standards in regard to any investigations which the bureau may conduct on the subject. This representative is L. P. Crecelius of Cleveland. Mr. Townley believes that from the work undertaken the number of disputes would be materially less, as the present plan provides a way by which the representatives of the interests affected can get together.

NATIONAL RELATIONS

Mr. Henry then read the report of the committee on national relations. An abstract follows:

The present organization of the committee on national affairs is practically a merging of the former committee on national relations and a subcommittee thereof known as the committee on national relations, and the committee was appointed at a time when Congress was considering the subject which afterward resulted in the passage of the transportation act of 1920. The committee found much to do before the passage of that act and was largely responsible for amendments proposed and accepted for the purpose of protecting interurban electric railways from being classed with steam railroads, where it was apparent that this would be injurious to the electric companies. Principal among the revisions urged by the electric railway companies and accepted was the provision that the issuing of securities by interurban electric railways should be under the control of the State public service commissions instead of the Interstate Commerce Commission; another that excluded them from the jurisdiction of the proposed United States Labor Commission; another that they should be excluded from the general provisions of that part of the act which provided for the grouping of railroads into districts, their appraisal and establishment of specific rates if they were not operated as a part or parts of a general steam railroad system or were not engaged in the general transportation of freight.

After the law was enacted many questions in connection with it developed. The first and principal one to call for the attention of the committee was the provision (Section 15-a) understood as an amendment to the interstate commerce act, which excluded the interurban electric railways, except where they "were operated as a part or parts of a general steam railroad system or engaged in the general transportation of freight." This called for a construction by the commission, so that any interurban electric railway might know whether it was or was not to be classed with steam railroads under this section. Finally the commission sent out questionnaires to various companies to get the facts on which they might base the construction of that clause. These questionnaires have quite generally been answered, but up to date the Interstate Commerce Commission has given no ruling in the matter. It is probable, indeed, that it will eventually be decided independently for each separate company.

Sections 300 and 301 of the transportation act deals with the appointments and duties of the United States Railroad Labor Board, and recently cases have been referred to that board concerning disputes between several electric interurban railways and their employees, and the board has to decide the question of jurisdiction. A hearing on this subject before the

Labor Board was set for Oct. 5, 1920, but nothing definite was determined. Several other cases are set for Oct. 18, and in the hearings on these the Labor Board is very likely to pass upon the question of jurisdiction where the cases relate to interurban electric railways.

The coal situation has received a great deal of attention at the hands of the committee and, co-operating with similar organizations from other utilities, the provisions in the service orders issued by the Interstate Commerce Commission for the benefit of electric railways and other public utilities were secured.

The chairman of the committee has been charged with oversight in management of the association's Washington office, which is at 950 Munsey Building. Paul W. McGovern is assistant secretary of the committee and personally in charge of the Washington office. He is there all the time to give attention to personal calls and inquiries and also calls by telegraph, telephone and mail for whatever information or assistance members of the association may require. With the reassembling of Congress there will be, undoubtedly, numerous matters of legislation which will claim the close attention not only of the committee but of the entire industry. In the meantime, the work before the Interstate Commerce Commission and the Labor Board and the various departments of government has presented many questions which the committee has been called upon to take care of.

At the conclusion of his written report Mr. Henry explained that under the rules of the Interstate Commerce Commission every road under its jurisdiction must have a representative in Washington upon whom notices can be served and to whom orders can be delivered. The Washington office of the association is in a position to assume this responsibility for any member company which desires such a service. In that case Mr. Henry explained that the companies should supply him with a power of attorney made out in his individual name. That will make further representation unnecessary.

PROBLEMS OF FUEL SUPPLY

A paper entitled "Problems of Fuel Supply" was then read by Eugene McAuliffe, president Union Colliery Company, St. Louis. An abstract is printed on another page.

James D. Mortimer had prepared a written discussion on Mr. McAuliffe's paper, but it was not read on account of the lateness of the hour. It will be included in the record, Mr. Mortimer being absent. In his discussion Mr. Mortimer summed up in a few words the various difficulties enumerated in the paper with which the coal industry has had to contend in recent years. He then commented that correction of the difficulties of the coal business must start at home, for he thought all progressive operators were ready to admit that there are internal problems requiring solution. He contended that assistance from coal customers is also required and that legislation would not be needed if all operators and all customers would work to a common end. Mr. Mortimer then spoke about the growing importance of the network of electric power transmission lines originating at more or less economical generating plants and the electrification of the railroads, in connection with the solution of the problems of fuel supply.

A. G. Gutheim, manager public relations committee, car service division, American Railway Association, Washington, and formerly with the Interstate Commerce Commission, appeared before the association at this time to discuss Mr. McAuliffe's paper on the problems of fuel supply. He said he wanted to emphasize two points made by Mr. McAuliffe, that the coal industry must get ready to carry a larger load and that the need for taking steps to bring about a uniform load on both the coal mines and railroads was paramount. He said that few people appreciate how miners must be content with but two or three days' work a week during a good share of the year. This is a primary cause of a great deal of the labor disturbances. Referring to the quotation from Herbert Hoover that the mines were more than 20 per cent overdeveloped in order to handle the peak load, he declared that he was of the opinion that the mines were overdeveloped 80 per cent, giving reasons for his conclusion. This matter of load factor is a very serious problem.

He then spoke of the impossibility of railroads conforming absolutely to an even distribution of a limited supply of cars among various mines. He also spoke of the Interstate Commerce Commission rule which had made it possible for the public utilities to go to a mine and contract for their daily requirements under a guarantee of adequate car supply to handle the order. This, he pointed out, was the very thing which the railroads were condemned for doing twelve years ago. The result of the order was that some of the mines did not get any cars at all for periods as long as two weeks. Upon investigation as to the reason for this, it was found that so many utility companies had gone into Kentucky, which was non-competitive on account of the fact that this coal was not shipped for export, to make their coal purchases that all available cars had been drawn into this territory under the I. C. C. ruling. Speaking of the reference in the paper to the fact that a 50 per cent car supply was all that had been secured, he declared that this 50 per cent was based not upon what the country needed in coal production but on the maximum potential output of all of the mines of 900,000,000 tons a year. It this 50 per cent were based upon the coal needed, it would be seen to be adequate to transport the normal supply.

Mr. Gutheim then spoke of the seasonal freight rate, and while he though it might help, he did not believe that legislation was the way to go about it. He considered that freight rates are too delicate a structure to be controlled by legislation. He thought also that zoning by a freight rate adjustment was not practical, although the object desired might be accomplished through legislation. In conclusion he made the statement that if there were any specter of which the coal industry has any fear today, it is that the government shall undertake to regulate it. He noted that in two or three states an attempt had been made along this line, and predicted that if this state regulation progresses it will result in controveries between states and national jurisdiction and will inevitably bring about a national commission. This, he said, he would not like to see come, but thought that the only way it could be avoided would be by the members of the industry itself adopting a more circumspect attitude than they have during the last few months.

"AERA" ADVISORY COMMITTEE

R. B. Stearns then read the report of the *Aera* advisory committee. An abstract follows:

Aera has demonstrated itself to be one of the most useful and essential features of the association's work for the industry, and a more progressive and constructive policy for its conduct has been planned and is being made effective. This policy, following the submission of a report by your committee, as heartily indorsed by the executive committee of the association, which, by resolution, called upon all members for support in the following words: "That the executive committee of the American Electric Railway Association urges upon railway manufacturer members and upon railway companies and manufacturers of railway apparatus and supplies generally that they lend their support to the *Aera* advisory committee in its plans for the betterment and improvement of *Aera*." With this policy clearly established by the executive committee, the *Aera* advisory committee has formulated the following plans, which it is believed will greatly enhance the value of the magazine to all association members and thereby provide ways and means for the publication to fulfill to the fullest measure the possibilities for good which lie in this field.

1. Securing constructive editorial discussion from the leading men of the industry.
2. Provision for general articles on timely and interesting topics by leading executives from all branches of the industry.
3. Arrangements have been made for technical articles from manufacturer members of the association of an educational character which will appeal not only to company section members but also to the rank and file of electric railway and manufacturing employees in general. These articles are for the purpose not only of interesting operating, repair and shop employees but also for the purpose of educating them in operating, construction, mechanical and electrical machinery problems of all kinds, which in turn will obviously tend toward lower maintenance cost and less abuse of equipment.
4. Provision for articles and discussions of interest to transportation and traffic managers and all other matters pertaining to this branch of the industry.
5. Articles and discussions by leaders of the maintenance of way, structures and other related problems.
6. Similar articles on power plants, substations, transmission and other problems embraced in this branch of the industry.
7. Special space to be devoted to specific problems confronted by companies in various cities such as those already published with respect to Detroit, Toledo and Bridgeport, an article on the latter being published in the October number, just issued.
8. Improvement and enlargement of the Question Box Section.
9. The great value to members of the association of the Bureau of Information and Service is becoming more and more apparent to the industry, as witnessed by its remarkable growth and extension of usefulness during the past year. It is planned, therefore, to give greater space and thereby more thoroughly inform members as to what this bureau is accomplishing so that all may avail themselves of its service.
10. It is planned to improve the mechanical features of the magazine for the benefit of advertisers.
11. It also is planned to work in closer co-operation in the future with the committee on membership and the committee on company sections, it being fully appreciated by your committee that the magazine can be of very great assistance in the work of both of these important committees.
12. Steps already have been taken to improve greatly the make-up and general appearance of the magazine as a whole. The August and September numbers appeared with a new cover design, which was part of the new plans. The August issue was designed to aid the committee on membership in its campaign for new members and at the same time indicate to the readers of *Aera* the new policy under which the committee expects to go forward and build an important and more valuable publication. It is recognized that a magazine, when properly conducted, is of immeasurable value in securing and holding membership in the association.

In general, it is the purpose of your committee to make improvements and changes and add new features which will give the readers of *Aera* a constantly improved magazine from every standpoint.

The present circulation of *Aera* is approximately 6,500 copies a month. This is far below what it should be considering the field it occupies as the official publication of the association, and your committee is firmly of the belief that this number can be greatly and rapidly increased if all executives and managers of both railway companies and manufacturer companies fully appreciated the great value to the industry as a whole and further realized the value of having their employees read the magazine regularly. Your committee believes that if serious and constructive efforts were carried out to secure additional subscribers the number could be increased several fold.

In planning to place this matter clearly before all members, your committee has divided its field of operations into eight regional districts and has appointed a committee to represent railway and manufacturer members in each district. The duties of these regional committees are to carry out the policy and plans of the *Aera* advisory committee, working in conjunction with the local committees on membership and conducting an active campaign to strengthen and build up this important branch of the association's work.

The entire plan for the betterment of *Aera* of course depends upon the support given your committee by the members of the association. A better magazine undoubtedly will bring steadily increasing circulation and this means better and more extensive understanding of the problems confronting the electric railway industry.

Aera now is a potent force for good, but it can be strengthened and made more valuable with every issue. The work must not be permitted to stand still. It must go forward, and to go forward it must have the active support of every member of the association. The committee bespeaks your co-operation and assistance. The report was submitted by R. B. Stearns, chairman; E. C. Faber, M. B. Lambert, I. A. May, C. C. Peirce, R. E. McDougall, A. M. Robinson and Martin Schreiber.

MR. GADSDEN GIVES VIEWS ON COMMISSION REPORT

Philip H. Gadsden, electric railway commissioner of the Federal Electric Railways Commission, was called to the floor by President Pardee to give some of his views and impressions of the work of the commission. Mr. Gadsden reviewed briefly how the industry had drifted into its present transportation methods from the horse car days and with only horse car experience to guide it. He pointed out how the resultant situation had become continually more difficult and had brought the industry constantly nearer to bankruptcy because of the uneconomic foundation upon which it was working. In referring to the final report of the commission he called particular attention to the fact that it formed the opinion of seven men, of whom five knew no more of the street railway industry than they did of 500 other industries when they began work. What they said in the report, therefore, represents what the people think. If railway operators feel that they cannot subscribe to some of the points made they should consider that the real question is whether or not these commissioners have reflected the real public mind. If so, then they must follow this dictation, for the future depends on whether we follow the code of ethics which the public has thus set up. He thought railway managers must give more and more thought to the consideration of the public.

Mr. Gadsden declared that one great value of the commission report was that for the first time men of the industry are able to cite the findings of an official body as to conditions in the industry. Whereas heretofore they have been under a continual handicap to make the public believe that taxes, paving charges, etc., were overcoming the industry, because the statement came from a biased person, this argument would no longer be necessary, for the railway men can cite an authority for the statement. Likewise, in the past, the exploitation of the railway treasury by the city officials was considered no crime, but when this official body has declared that of every carfare ½ cent goes to taxes, then it should not be long until the great mass of the people who must ride in the street cars will understand this and object to the payment of this sum for the benefit of the property owner who rides in his automobile. Likewise when the men of the industry have endeavored to tell the public that the industry was practically bankrupt, only to be disbelieved, they can now refer to this report, wherein a judicial determination of the real facts has been made.

Referring in a very complimentary way to the work of the Committee of 100, Mr. Gadsden said that the testimony and evidence presented was so complete and exhaustive that when the commission finally gathered to formulate its report there was not a single controversy on any facts regarding the industry. The commissioners were entirely of one mind on the facts, and there was surprisingly little difference of opinion on the conclusions to be drawn from these facts. What differences there were were largely on the importance to be attached to the various conclusions.

In its report the commission has sought, he said, to set up a complete theory for the reorganization of the electric railway industry, and in this connection he called attention to three or four basic things. Up to now, in the negotiations between company and city, each has tried to make the best trade possible, and in this procedure both parties have acted without regard to the considerations of the real party at interest, the public.

Another basic thought brought out in the report, which Mr. Gadsden said was the most valuable contribution of the commission, was the emphasis which had been laid on the restoration of the credit of the industry. Heretofore no one but executives of railways have considered this problem. There has been a popular notion that when money was needed all that was necessary was for the executive to go down to New York, spend a few days in Wall Street and come home with the money. Emphasis had never been laid on the right point, and it now appears that consideration has been given to the wrong people. The real parties in interest are the car riders on the one hand and the investors on the other—service and credit. Mr. Gadsden urged upon the members that they should go forth and preach this matter to the people generally, for the industry has been proved and declared essential and is giving a greater service than ever and yet is prostrate because of lack of credit. The question is, what are we going to do to revive the industry?

Mr. Gadsden endeavored to answer this by pointing out that it was no longer a question of what rate of fare will a city grant, or a supreme court ruling on what is a reasonable rate of fare. The real test of an adequate rate is not that which will produce a proper rate of return on the capital in the property now, but what it is necessary to pay for money from the man who has never put money in the industry before. Is he going to come in on a 6 per cent basis when he can get 10 per cent on securities of the highest rating in other industries? Mr. Gadsden insisted that the electric railway industry has got to be in a position to go into the money market to compete for the money so desperately needed. The proper rate must be that which will meet the demands of the investor, not the City Council.

Mr. Gadsden considered that the best route to follow in the effort to restore credit was by way of the service-at-cost plan or something along that line. He contended that the investor will not come back into the industry under the old conditions; he is not going to put his money into an industry which is subject to the control of some one outside of it. In all other businesses the management forecasts the future and adjusts the price of its commodities to conform to existing or expected conditions, while the electric railway industry has thus far never been able to secure a fare increase until it has proved that it was on the verge of bankruptcy.

In summing up, Mr. Gadsden said that the first step to be taken in working out the situation was to secure an accurate physical valuation of the property. He said there never was a more propitious time than the present to do this, for the appraisers are bound to be affected by present prices.

The second step to be taken was to make the capital value of the property conform to the physical valuation established.

Mr. Gadsden also laid stress upon the fact that harmonious relations with employees must be established in the industry because people are not going to put money into a business which is continually torn by strikes. He said that we must work out a plan which will guarantee continuous operation of the electric railway properties.

In concluding Mr. Gadsden referred again to the splendid work of the Committee of 100, saying that it was the most effective piece of work that had ever been done in any industry, not only in the preparation for the hearings, but in the manner in which publicity about the hearings was spread over the country. He thought that the work of this committee had only begun and that it should be continued by all means. As indicating how the benefit which may be expected to accrue from the report will continue, he said that only last week he attended a meeting of the board of directors of the United States Chamber of Commerce, at which the committee on public utilities of the Chamber filed a most excellent report on the public utility situation. This report was ordered to a referendum vote, so that during the next six weeks it will come before every local chamber of commerce and affiliated business organization, bringing attention to our industry through a very sympathetic report. He said that the electric railways ought to have a representative at every one of these local meetings.

President Pardee then appointed the following committees before adjournment:

Committee on resolutions: B. A. Hegeman, Jr., chairman; W. H. Sawyer, W. C. Ely, W. K. Archbold and E. S. Wilde.

Committee on recommendations in president's address: W. F. Ham, chairman; C. C. Peirce, C. D. Emmons, E. R. Hill and J. H. Drew.

Committee on nominations: Arthur W. Brady, chairman; W. A. Draper, L. S. Storrs, Thomas W. Casey, C. D. Cass, J. W. Perry, L. J. Drake, L. E. Gould and F. R. Coates.

Wednesday's Session

The second session convened in the Greek Temple on Wednesday morning, at which time reports of the committees on fare systems and company membership and publicity were presented. Abstracts of these reports are given below.

FARE SYSTEMS

The report of the committee on this subject is a continuation of the investigation conducted last year by the committee on zone systems. In a study of the results of flat fare increase, reports were received from forty-five representative electric railway companies.

In almost all cases when an increased fare was first put into effect there was a decrease in the number of revenue passengers carried. Due to the higher rate, however, this decrease was not sufficient to prevent an increase in revenue. As time went on and the patrons of the company became accustomed to the higher fare the volume of riding increased, and it is the opinion of many of the executives of the companies that they have gotten back practically all the riders lost in the beginning. Many properties have had more than one fare increase, and it has been the experience of a number of them that on the succeeding increases the revenue passengers carried showed no material losses. Where the public has been led to oppose fare increases, the gain in revenue has been limited, but in other cases, where the increase has been taken in a spirit of fairness and justice, the revenue has approached quite closely the theoretical limit. Only general deductions can be stated, because in a number of localities the economic and industrial readjustments occurring since the end of the war have made specific and accurate comparisons impossible.

One of the outstanding effects of the war so far as electric railways are concerned has been the destruction of the idea that a city street car ride should never cost more than 5 cents and the committee is of the opinion that the realization of this fact has been of great service in reconciling passengers to pay the higher fares, especially where more than one increase has been found necessary.

Hereafter, the greatest single factor in forcing still further fare increases will be the demands for higher wages, which are being continually and skillfully put forward by employees. It seems to the committee that it is becoming clearly understood by the public that increases in wages necessarily mean increased fares, and the granting of future demands of this sort will be largely dependent upon the attitude of the public.

MAXIMUM PRACTICABLE FLAT FARE

In the committee's investigations the direct question was asked as to what executives felt was the highest fare that could be charged on their own properties. The answers varied, being obviously influenced by existing local conditions, but the views expressed would seem to indicate that the price of a car ride must be determined by costs of labor, supplies, and commodities. If the country is facing still further increases in costs of living and higher wages, undoubtedly fares must be raised beyond 10 cents. Under existing conditions the large majority of the executives report that for their properties the charge should not be in excess of 10 cents. A considerable number of the executives placed the figure lower than 10 cents, and those placing the figure at 10 cents apparently had in mind the fact that 10 cents is a dime, a standard coin.

In Boston, Mass., where a flat 10-cent fare is in effect, some 5 cent non-transfer lines were provided in the built-up sections of the city in an effort to encourage short riding; but the results obtained were not particularly encouraging, due partly to the lack of transfer privilege, partly to slow operation through congested districts as compared with subways and elevated, and to some extent to lack of interest on the part of patrons in the possible saving.

In Portland, Maine, when the original increase in fares was established some 5-cent lines were put on to operate in the business district with a charge of 1 cent for transfers in case the latter were requested. These lines, which were the result of the suggestions of the Public Service Commission with the idea of encouraging short riders, were not successful from that standpoint, and when a further change in fare was made were abandond.

These two illustrations, while not conclusive, seem to discourage the idea that short-ride, low-fare car lines in congested centers of cities would be successful.

The fact is incontrovertible that costs of living, manufacturing and producing have increased over 100 per cent all over the country. While it is hard to make people acquiesce in the fact, it is inevitable that they must eventually pay proportionately as much more for transportation as they would have to for clothes, food, and other articles. Gradually the public mind is accepting the logic of this situation, and this is one of the psychological factors that are enabling the companies to obtain the theoretical increase when fares are raised, and is one of those underlying elements which are tending to restore the industry to some degree of prosperity.

The committee believes that the experience of the past year confirms the preference for the use of metal tickets expressed by the committee on collection and registration of fares. This has been especially demonstrated on certain systems where the use of the multiple fare paper tickets resulted in abuse by unscrupulous employees and patrons.

The experience of many companies now indicates that a substantial differential between a cash fare and a metal ticket is desirable in order to encourage the use of the metal ticket. There is, of course, ample justification for a higher cash fare because the transient and occasional riders who do not desire to purchase tickets should pay a higher fare for service which is always available for their use.

It is the conclusion of the committee with reference to the above matters:

1. That, for the large number of cities, a cash fare of 10 cents would not decrease the riding habit sufficiently to prevent the obtaining of needed increases in net revenue, and that in very many cities this 10-cent fare is absolutely necessary for adequate service and restored credit.
2. That if an average fare in excess of 7 cents is necessary to establish credit and allow proper service, it would recommend a 10-cent cash fare with such reduced rates, if any are desirable, preferably through metal tickets, as will produce the needed average fare.

JITNEYS IN FLAT-FARE CITIES

Up to even one year ago there was among many a general feeling that increases in fare, especially for short riders, would bring on very much more serious jitney competition. The results show that fear to have been unfounded in many cases, of but slight moment in others, and serious in some cases where the conditions were local unto themselves. Eighty per cent of the replies received to the questionnaire reported no stimulation to jitneys whatever, only 8 per cent reported an actual stimulation, while 12 per cent referred to it as slight or as lasting but a short while. Although the questionnaire did not directly ask for that information, one-third of the answers referred to the increased use of the privately owned automobiles. The general feeling seemed to be that the increase in fares was a negligible factor in the increase in the number of autos, though there was for a short time after an increase in rates of fare a growing practice on the part of auto owners to invite their friends to ride with them.

Sensible regulation has in many communities either eliminated the jitney entirely or confined its operations to streets or districts not adequately served by the railway lines. Although very substantial progress has been made by public authorities at different places in dealing with this question, there are still many localities where the problem has not been squarely faced.

While it is granted that, as summarized above, in many localities the jitney problem has been effectively met, the fact remains that there are still numerous communities in which jitney competition is most serious. The fundamental conditions in connection with this form of unbridled and usually unregulated competition have been stated and discussed on numerous occasions both before the association and in the technical press, but it seems to the committee that it is necessary again to draw attention to this problem. It is entirely possible that we shall, within the next few years, face a slackening of industry and business, and, if this occurs, the jitney menace may again assume more serious proportions.

The only way that a fair trial of the motor bus or jitney service can be made is for the authorities to insist that these vehicles give the same character of service as provided by the electric cars. This means they must furnish dependable and regular service during the early hours in the morning, during the mid-day period and after the evening rush peak, operating on schedule, whether the weather is pleasant or rainy, and going out to the ends of the unproductive or unprofitable routes. Just so long as jitneys and buses are permitted to skim the cream off of street railway traffic, they are working an injustice not only to the car company, but to the citizens and the communities themselves, because they are lessening the possibilities of the electric railroads performing adequately and completely the functions they are to render.

Certainly, the American Electric Railway Association should take the strongest possible ground against the uneconomic and short-sighted practice of some municipal officials in using jitneys as a means of reprisal against street railway companies. This industry of ours is governed by the same economic laws as other businesses, and, if these laws are violated to satisfy the grudges or prejudices of municipalities or politicians, not only the industry will suffer, but the citizens of the community in the long run will be the greater sufferers.

The conclusions of the committee with reference to the jitney situation are:

1. That the operation of jitneys should be confined to non-competitive and supplementary or auxiliary service.
2. That in a number of localities the handling of the jitney problem by public authorities has tended to decrease the operation of jitneys and affords an example to the remaining localities for an effective and far-sighted use and development of the urban transportation problem.
3. That this association should take strong ground against unfair motor vehicle competition and should urge its members to combat piratical competition in every way possible.

ANALYSIS OF THE EFFECT OF FLAT FARE INCREASES ON OPERATING REVENUES AND REVENUE PASSENGERS

The results of this study show that increases in carfares have not destroyed the street railway business. The street car is still the ordinary man's conveyance. Detailed information was obtained from a group of forty representative companies operating on a flat fare rate, and from the information furnished, the accompanying chart has been prepared which shows the passenger revenue, revenue passengers, and the average rate of fare by months from January, 1917, to May, 1920, inclusive. There was a consistent increase in operating revenue, amounting for the period in question to 56 per cent. Similiarly there was an increase in revenue passengers amounting to 12 per cent, and the committee's study shows that on the whole there has been a substantial gain and not a loss in revenue car riders.

The weighted average rate of fare was obtained by dividing for each month the passenger revenue by the number of revenue passengers for the entire group. This curve shows a consistent increase in the average rate of fare, from about 4.65 cents to 6.5 cents. Small fluctuations in the average rate of fare, particularly in the early months of 1920, are due largely to the variations in the relative traffic and revenue among the companies in the group, and to the effects of the severe winter weather in certain sections of the country. These curves are all compiled on a logarithmic chart and therefore show relatively, by the slope of the lines, the comparative increases in each of the plotted quantities. Attention is called to the fact that the lesser increase in revenue passengers than in passenger revenue and rate of fare does not indicate a reduction in the riding habit. Such a reduction could accurately be determined only by a comparison with an extended prior period in which no substantial fare changes occurred.

It is, of course, obvious that the bottom two curves on the chart, representing the passenger revenue and the revenue passengers, are parallel so long as the rate of fare is constant; and that the slope of the bottom curve, representing the passenger revenue, will increase in proportion to the algebraic sum of the slopes of the revenue passenger curve and the rate-of-fare curve.

It is significant, however, that during the final two years shown on the chart, in which the greater part of the fare increases have become effective, the growth in revenue passengers has been 12 per cent, as compared with fare increases of 36 per cent. This indicates that in the cities represented on the chart there has been no material interference with the normal growth in traffic as a whole. The yearly average increase in revenue passengers for the forty companies shown on the chart was therefore 6 per cent as compared with the average of 3.7 per cent for all electric railways of the United States as shown by the United States census between the years 1912 and 1917.

The committee believes that the conditions disclosed by this analysis confirm the opinions expressed above as to the transient character of traffic losses and the revenue possibilities of further increases in flat fares.

RESULTS TO DATE OF ZONE SYSTEMS

Two kinds of zone systems have been in operation in the United States. (1) The central area zone system, as used in Milwaukee, Portland (Maine), Providence, Springfield and Holyoke, and (2) the kind more nearly similar to the British system used on the Public Service Railway in New Jersey and the Connecticut Company.

Sufficient experience has been accumulated to show that the central area or fixed minimum zone systems can be successfully operated in American cities. Notwithstanding the fact also that after brief trials in New Jersey and Connecticut uniform rate zone systems have been abandoned, the committee feels that the experience gained has demonstrated that, if deemed desirable, it is practicable to introduce the uniform rate zone system in American communities of large population, but it is of the opinion that it should be done only with a fixed minimum charge.

Results to date have shown most definitely that the minimum fare should not be less than 5 cents. Speaking generally, where additional revenue is needed and the change from flat fare to a zone system is contemplated, the minimum fare for the zone system should not be less than the previous flat fare at least at the beginning. The increased number of passengers necessary to make up for revenue lost by reducing the fare to the short rider would, for the most part, ride on portions of routes already congested. Even if it were possible to obtain these riders by the reduced fare they could not be handled probably with present facilities in many communities.

In all cities using zone systems minimum fare riders constitute the larger percentage of revenue-producing passengers. On the Public Service Railway there was not a great increase in short riding when the fare was reduced from 5 cents to 3 cents, and, as a result, the company did not receive sufficient additional revenue from this source to make up for the loss from all of the riders who were able to avail themselves of a ride for a fare less than the previous flat rate of 7 cents.

It is true that the low fare zone system in use abroad has had no fair trial in this country, but experience thus far indicates plainly that under present conditions an initial rate under 5 cents would not bring a proportionate increase of short riders and would be ruinous, in that the fare of the long haul passenger would have to be increased to a prohibitive degree. Up to the present time, the zone system has been adopted because it was believed to be the preferable way, taking all needs into account, to secure the necessary additional revenue, and has in no case been tried out purely on its merits as being more equitable than the flat fare plan for producing the same revenue. There apparently has been no call on the part of the majority of the riding public in this country for a zone system except, knowing that increased fare had to be obtained, it was accepted as the less objectionable method. It is interesting to observe that, once having been tried out, it has remained in effect in all places where it has had a fair trial, and the prevailing opinion is that a large majority of the public, where such a system is used, would not change to a flat fare system producing equal revenue. The committee feels that in New Jersey and Connecticut the uniform rate zone system did not have a fair trial.

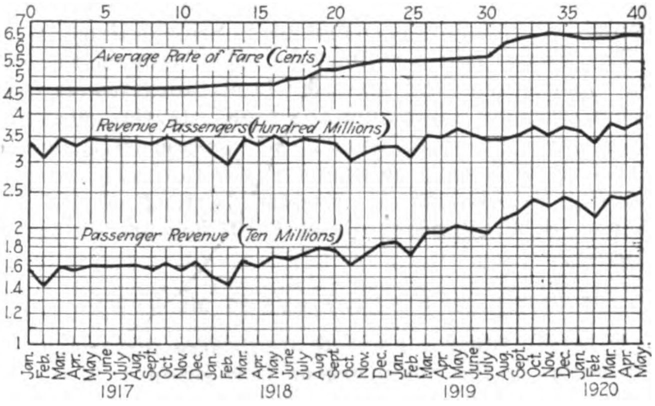


CHART SHOWING AVERAGE RATE OF FARE, REVENUE PASSENGERS AND PASSENGER REVENUE FROM GROUP OF FORTY COMPANIES, FORMING PART OF REPORT OF COMMITTEE ON FARES

All of the companies report practically no change as to congested areas or real estate values, due to the zone system. While true, this is not necessarily conclusive, because allowance must be made for the shortage in and unsettled conditions of housing facilities that have existed during the recent war adjustment period. The committee believes that this objection to a zone system has been very much magnified, and that it is not an important or valid one.

Against the protests made in the fare case at Springfield, Mass., by residents of suburban territory, that such territory had been built up under the flat fare system, and that the departure therefrom would be unjust and prejudicial to the inhabitants and especially to owners of real estate, the commission, in its decision, stated its belief that the zone plan would have no substantial influence on land values in the outlying districts. Even if it should, however, have such an effect, it was a fact that the electric railway lines had materially increased such values in the past; that the landowners profited by and enjoyed this unearned increment; and that, if they should be deprived of this in some slight measure by an attempt to apportion the mounting costs of electric railway service more nearly in accordance with the service furnished, there should be no complaint on this ground. The committee declares that this argument is logical and a fair answer to the protests of real estate promoters and suburban developers and landowners.

In some of the cities using a zone system no real jitney competition existed, but, in the majority of cases, jitney competition actually existing at that time, or fear of jitney competition with higher fares, was a very important feature in connection with the decision to introduce a zone system. Unquestionably the danger of jitney competition has been minimized by the adoption of a zone system instead of a corresponding increase in flat fares.

The managements now using zone systems investigated by the committee are practically unanimous that they prefer their present zone system to a flat fare system, and it is the opinion of the committee that in these places the companies are in a better position than they would have been under a flat fare system.

The committee has no changes to recommend in the terminology and definitions submitted in the report presented last year by the committee on zone systems.

The report also contained extended data on the results of the zone fare operation in certain cities as well as an appendix containing the replies to the questionnaire submitted by six companies. The report is signed by W. H. Sawyer, chairman; R. F. Carbutt, Thomas Conway, Jr., Robert M. Fuestel, L. R. Nash, L. H. Palmer, J. K. Punderford, A. S. Richey and C. L. S. Tingley.

DISCUSSION ON FARE SYSTEMS BY MR. MORTIMER

J. D. Mortimer submitted a prepared discussion on the report of the committee on fare systems, in which he stated that it was the consensus of experience that increases in flat rates of fare without change of fare points have pretty generally resulted in increases in revenue. If the area served for a single fare is large and the average ride long the increase in fare needed to compensate for increased costs has been larger than where the single fare area has been smaller and the length of average ride shorter. No one has yet been able to construct a demand curve for urban railway traffic. The relation between rates of fare and traffic is unknown. Attempts were made some years ago to show that the high riding habit in Cleveland was due to the 3-cent fare then obtaining, but investigation showed that the then high riding habit was accompanied by active business, disclosed by post office receipts, building permits and bank clearings. There was a much higher correlation between riding habit and business activity than there was between riding habit and rate of fare.

With the meager data available and the rough methods of reduction generally in use, it is impossible to say just what effect the rate of fare has on riding habit. It will probably vary in different localities; it will certainly vary during different seasons of the year, and it will vary with the industrial and commercial activity. Few cities during the last three and one-half years have possessed identical business characteristics. Some participated in war prosperity; others suffered because they had no war industry and temporarily lost population to the selective draft. If there is anything in the assumed relation between traffic and the rate of fare it is likely to appear more evident when war prosperity has become only a memory.

The diagram in the printed report shows that for the three years and five months the forty companies used in computing the comparative figures enjoyed an increase in traffic. The number of passengers during the first five months of 1920 was 1,843,000,000 compared with 1,667,000,000 during the first five months of 1917; this is an increase of 10.5 per cent. Just how much the traffic would have increased if there had been no fare increase no one will ever know. Neither will we know how much more traffic would have increased if the use of automobiles had remained constant during that period.

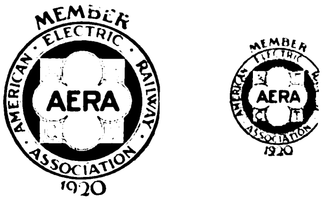
The fact that it became necessary to abandon the operation of the zone fare system on the lines of the Public Service Railway and the Connecticut Company is cause for great regret. Many people have been led to believe that these systems abandoned zone fares because they were impracticable; distance tariff plans thus received a setback. The central area zone system, devised in Milwaukee as early as 1911, but not placed in operation until January, 1914, appears to have given general satisfaction to both the company and the patrons. Needless to say, the central area zone scheme did not always produce the revenues which were expected; traffic reactions were indeterminate in quantity and accurate estimates difficult to make. In all the central area zone schemes except in Milwaukee zone fares were adopted for the purpose of increasing revenues at the time of adoption. In Milwaukee the plan was adopted to forestall an extension of the single fare area or central area in the near future and increase revenues in the more distant future. A look into the future was taken, and it was recognized that if expansion of the single fare area could be prevented, the problem of rising electric railway costs, then sensed, would be less difficult to meet. It was expected that the Milwaukee zone scheme would result in some reduction in revenues; an immediate small reduction was justified on the ground that in years to come the growth in revenues under this fare plan would far more than offset any temporary disturbance in income account.

That portion of the metropolitan system lying without the central area has never been remunerative; it has required support from the heavier traffic in the central area. But zone fares have not increased as rapidly as the increases in costs; the drag on the central area has increased. The commission and courts have held that the metropolitan system is to be considered as a whole and that the deficits on suburban lines are to be offset by larger returns in the central area. There remains much to be done in determining the best method of assessing the costs of service between the long and short haul rider. To require the long haul rider to pay all the costs of serving him will result in very high fares, fares so high as largely to reduce traffic. Probably only a general rule can be enunciated, *i.e.*, so to arrange the zone fares as to cause the minimum adverse reaction to traffic and support the deficit by the short haul traffic.

The problem is not greatly different from that of assessing income tax; ability to pay appears to be an important consideration. All the companies which have received increases in fares appear to be satisfied with the respective methods by which such increases were put into effect. The flat fare advocates are happy, and the zone fare proponents, who yet have their plans, seem satisfied with themselves. Probably most of us feel that revenues are still insufficient, and none of us, with possibly one exception, is very particular as to what scheme of fares gets us the money. If the railways are to run our motto must be, "Get the Money." Should industrial and commercial activity recede to the level where unemployment becomes noticeable and the depressed conditions of 1908 are approximated, then it will be instructive to watch the relative effect on earnings of the two general fare schemes discussed by the committee.

COMPANY MEMBERSHIP

The committee on company membership reported that its work this year had consisted of three parts: (1) The compilation of a list of possible members, based upon preliminary lists furnished by Secretary Burritt and revised according to data secured by correspondence and conference; (2) the enlisting of the active co-operation of railway men throughout the country in the endeavor to bring to the attention of companies which are outside the fold, as forcefully as possible, the advantages of membership in the association; (3) the use of all other possible means to secure the actual applications of possible members in time to have the names included in this report.



EMBLEMS RECOMMENDED BY COMPANY MEMBERSHIP COMMITTEE

The committee made several suggestions as to ways in which its work can be followed up. It submitted the accompanying design of an emblem for use of member companies on stationary, in catalogs and the like.

The committee reported a total of twenty-one new railway companies secured during the year.

The report was signed by F. R. Coates, chairman; Benjamin Adams, J. P. Barnes, H. F. Dicke, C. R. Ellicott, L. E. Gould, C. A. Hall, E. B. Moore, H. H. Norris, R. T. Sullivan, E. M. Walker, E. P. Waller and E. F. Wickwire.

PUBLICITY

The report on publicity explained that its instructions provided that the committee of publicity men, composed of local publicity men in the employ of a number of member companies, was to report to and work in close co-ordination with the committee on publicity. Such a co-ordination had been effected. The report mentioned the work done in disseminating the report of the Federal Electric Railways Commission and abstracts thereof and outlined a program for the coming year, including the preparation of car cards, the stimulation of utility managers to more consistent utilization of their employees as good will promoters, and the consideration of the publicity work of the various state associations, particularly that of the Illinois Committee on Public Utility Information, with a view of putting into effect such part of the work as can be adapted to the industry for use nationally.

OTHER PAPERS AND REPORTS

In the absence through illness of Gen. Guy E. Tripp, chairman of the Committee of One Hundred, President Pardee outlined the reasons for the formation of the committee, some of its accomplishments and stated that the executive committee of the association had voted for the future continuance of the committee for the purpose of further disseminating information pertaining to the industry.

The paper on possibilities of transporting other than passengers on interurban lines by Britton I. Budd, Chicago, was then read. It will be found on another page in this issue. Owing to the absence of Mr. Budd the paper was read by L. C. Carraway.

Martin Schreiber, Public Service Railway, Camden, N. J., then presented an address on the training of electric railway personnel. On account of the interest which this paper has to all branches of the electric railway industry its publication has been deferred to the next issue of this paper so that it can receive the wider circulation reached by the "mechanical issue" of this paper.

SETTLEMENT OF LABOR DISPUTES

At the conclusion of Mr. Schreiber's address President Pardee announced that Gov. Henry J. Allen of Kansas had arrived and would speak to the delegates on "Settlement of Labor Disputes in the Interest of the Public and its Influence on Fares."

A large audience had collected in the Greek Temple to hear Governor Allen, and eager listeners stood at the open windows. The Governor's address was devoted largely to an account of the working of the conciliation court in Kansas and the reasons which had led to its establishment. In the Governor's opinion a new principle in the settlement of labor disputes had been reached, beneficial alike to labor, capital and the public. His address was received with great applause. An abstract of it appears elsewhere in this week's issue. At its termination a vote of thanks was moved by Thomas N. McCarter and was unanimously carried by a standing vote.

Thursday's Session

The last session of the American Association was called to order about 10:30 a.m. Thursday, with President Pardee presiding. First in the order of business of the day was the report of the committee on valuation, which, in the absence of Chairman Kealy and Vice-Chairman Schreiber, was presented by Cecil F. Elmes, member of the committee. No action was taken on the report, an abstract of which follows:

VALUATION

The report of the committee on valuation was largely a reaffirmation of the principles outlined in the report of October, 1919, and an elaboration or a more specific definition of the significance of certain terms, such as "reproduction new," "present-day prices" and "going value."

The committee reported that it has spent its time in the study of important commission decisions and in the study and analysis of important papers which have been presented. It has also taken into consideration the fact that this is the fifth year of "abnormal prices" and that the general trend is still upward. It recommended the careful consideration of the reports of the committees on valuation and return of the Illinois State Electric Association, the Illinois Electric Railways Association and the Illinois Gas Association.

In making more clear what is meant by "cost of reproduction new" the committee says the following:

> It is one method used in making an appraisal and should not be confused with some other method.
>
> The "cost of reproduction new" of the physical plant, as we view it, means the estimated cost of reproducing a new property identical with the one under investigation, under

present conditions of labor and materials cost and methods of doing work without any deduction for loss of value due to age or other causes. The new property must be made up of the same number and kind of units as the existing property that is being reproduced, and all of the materials and labor that entered originally into the construction of these units must be considered in finding the reproduction cost of the new property.

As to present-day prices, the committee gave additional argument why unit prices of today must be used, for "in no way can the values of today be found by using unit prices of ten years ago, unless the dollar will purchase the same amount of material and labor today as it would have ten years ago. The company is clearly entitled to have the value of its property expressed in dollars having the same purchasing power as the dollars the public is paying for the service the company is compelled to give."

The committee also gave further argument with reference to "going value" and the reason for including it in a valuation. It states that "going value" is a fact just the same as the physical plant is a fact. Some of the more important items which take up "going value" are listed.

"Rate of return" is a subject directly collateral to that of valuation. The committee felt that it has not had time to give adequate attention to this question this year, but called attention to the paper on "Rate of Return" to be presented at the convention by C. F. Elmes, a member of the committee.

The report was signed by P. J. Kealy, chairman; Martin Schreiber, vice-chairman; H. C. Anderson, C. F. Elmes, Williston Fish, C. W. Gillespie, J. H. Hanna, W. J. Harvie, W. H. Sawyer and B. E. Tilton.

Following this report was the paper by Cecil F. Elmes of the firm of Sanderson & Porter on "Utility Regulation and Rate of Return," given in abstract in another part of this issue. On motion, the association gave a unanimous vote of thanks to Mr. Elmes for his paper.

MOTOR BUS PAPERS

Following Mr. Elmes's paper, three motor bus papers were presented. The first of these was "The Place of the Motor Bus in Urban Passenger Transportation" by George J. Shave, superintendent of maintenance, and Frank C. Pick, commercial manager, London General Omnibus Company, London, England. In the absence of both of the authors, the paper was read in abstract by Harold V. Bozell, editor ELECTRIC RAILWAY JOURNAL. It is printed in full in this issue of this paper. Considerable interest was expressed in favor of having this paper printed in full for the benefit of association members.

This paper was followed by one on "The Place of the Motor Bus as a Supplement to Electric Railways" by R. Gilman Smith, Milwaukee Electric Railway & Light Company, Milwaukee. This paper is abstracted elsewhere in this issue. A written discussion on this paper was submitted by J. D. Mortimer. It said, in part:

> We are prepared to admit the strong appeal of the pneumatic-tired vehicle operating at high speed with few stops. That some service can be rendered with a car seating four or six passengers needs no further proof. Whether such fares can be collected in competition with good street railway service as will make such business adequately remunerative has never been proved. The four and six passenger vehicle in "jitney" service does not seem to be permanent; the recession rate among operators suggests that something more than the usual monetary reward is necessary to keep an individual in such business. If there is any tendency, it is toward bus service seating sixteen to thirty or more passengers.
>
> The papers presented today deal with the larger type of vehicle. Mr. Smith, by a study of the comparative operating and investment costs, shows that both the motor bus and the electric car operating on rails have their respective places. The economical field of the motor bus is not nearly as extensive as the politicians and some of the bus operators have attempted to lead the public to believe.
>
> Probably the electric railway industry would be in better financial shape today if a reliable motor bus had made its appearance before the relatively large investment had been made in rail lines through sparsely settled urban and suburban districts. Then we probably would not be able to show how electric railways had built cities and increased taxable land values. But this heroic feeling is only satisfying for the time being. There is little permanent satisfaction in the knowledge that the sheriff is going to catch you sooner or later.
>
> Our cities are going to continue to grow. The same tendencies noted in all the recent census decades were recorded in the more rapid growth of the urban population during the period 1910 to 1920. Cities will continue to spread out and transportation facilities will be required to serve the new districts. Much growth will occur along lines of existing railways. But other territory will be built up requiring new facilities. Here is one place for the motor bus operated as an integral part of the city transportation plant. The motor bus will permit traffic to be developed to the point where the large investment in a rail line may be justified. The bus will thus conserve capital for more attractive uses.
>
> The cities that require motor buses as feeders or supplements to existing rail facilities are not numerous. Most cities are overbuilt with rail lines. Most cities could get better transportation if they had less track, and all cities could have better street car transportation if some of their track was in other places. Nevertheless, there are places where rail lines would ordinarily be built in response to "popular" demand, provided capital were available. In such locations the motor bus offers a solution of what may, for a time, be a pressing problem. The experience in Milwaukee and Kenosha will be watched with interest.
>
> If the motor bus has a part in the scheme of district transportation, then it is the duty of the railways to be the first to find its place and put it to beneficial use. Ill-advised competition may thus be anticipated and the better interests of the public more advantageously served.

Following this paper, George M. Graham, vice-president Pierce-Arrow Motor Car Company, Buffalo, N. Y., gave an address on "The Motor Vehicle—Competitor or Ally?" This address was most ably presented. By unanimous vote Mr. Graham was adjudged "Not Guilty." An abstract of Mr. Graham's remarks is given elsewhere in this issue.

There was no discussion on these papers except that Mr. Moser of the Fifth Avenue Coach Company, New York, said that he desired to correct a statement or impression given in Mr. Smith's paper, with reference to the experience of that company last winter. Mr. Moser said that at the time of the big storm his company, by means of a fleet of motor plows, opened the streets for normal operation by 6 a.m. of the day following the storm and that the chief difficulties encountered were caused by the snow thrown onto the streets from the sidewalks.

RECOMMENDATIONS OF THE PRESIDENT

This ended the program of the session and committee reports were next in order. The first was the report of the committee on recommendations in the president's address, presented by W. F. Ham, chairman. It indorsed the president's recommendations of an increase of the executive committee by the addition of six members, to be elected from the body at large, and the change in the membership class to provide for three additional classes of members, namely, (1) bankers, (2) investment organizations, and (3) consulting engineering firms. On motion the report was accepted and the administration was directed to take the steps necessary to put the recommendations into effect.

RESOLUTIONS PASSED

The next report was from the committee on resolutions and was presented by B. A. Hegeman, Jr. This report, given below, was unanimously accepted and approved.

Whereas a commission, appointed because in the opinion of the national government the crisis in the electric railway industry was seriously affecting the national interest, has reported to the President of the United States that electric railways constitute an "essential public utility," and that in their rehabilitation "the first essential is to restore credit," and

Whereas the present deplorable condition of the industry and its immediate restoration to full usefulness is a direct concern of the public, inasmuch as new capital in the amount of between $200,000,000 to $300,000,000 a year, not now obtainable, is required for extensions and betterments necessary to meeting urgent public requirements, and

Whereas such new capital will be forthcoming only if the reasonable requirements of the investor as to the safety of and return upon his investment be met, and

Whereas the readjustment in the relations between the public and the railways in order to effect this reassurance lies with the public authorities, state and local; therefore be it

Resolved, That the American Electric Railway Association, acting from a sense of public duty, calls to the attention of the nation the fact, as emphasized by the Federal Electric Railways Commission, that the restoration of electric railway credit is a requisite to the proper functioning of these utilities and urges with regulation of public utilities the application of such common sense economic and business principles as will restore credit and so enable electric railways to perform their full public service.

Whereas John H. Pardee has served this association as its president during the last two years, and under his wise direction it has increased to a remarkable degree in usefulness and value to its members and to the industry, generally, and

Whereas Mr. Pardee has devoted his time, energy and great talents to the association's interests and has placed all electric railways and all electric railway men under a not to be estimated obligation; therefore be it

Resolved, That the thanks of the association and its deep appreciation be extended to John H. Pardee, our retiring president.

Whereas since the association last met in annual convention death has claimed some of its most valuable and esteemed members; therefore be it

Resolved, That by this action the association expresses its sense of loss and its appreciation of the services rendered by its deceased members, both to the association and the industry.

Whereas the technical press has, as usual, been of great assistance to the association and has actively and effectively served the industry and the companies and individuals composing it; therefore be it

Resolved, That the thanks of this association be and hereby are extended to the ELECTRIC RAILWAY JOURNAL and to *Electric Traction.*

Whereas the officers, and especially the secretary, of the association have been indefatigable in their efforts in its behalf during the past year, and have done their work faithfully and well; therefore be it

Resolved, That the association hereby expresses its appreciation of their services and extends its thanks to them individually and collectively.

NOMINATIONS RECOMMENDED

The last report was from the committee on nominations, presented by Arthur W. Brady, president Union Traction Company of Indiana, chairman.

This report, in addition to making the usual nominations, made a recommendation as to a fixed nominating policy for the association and, itself, acted in accordance therewith. The report, which follows, was accepted and approved unanimously and the men who were nominated were unanimously elected to office for the ensuing year.

Your committee on nominations respectfully submits its report as follows:

For president for the ensuing year, Philip H. Gadsden, president Charleston Railway & Light Company.

In selecting Mr. Gadsden the committee was guided by its view that the principal work confronting the association during the coming year is of a very difficult and delicate nature. It is obvious from the developments of the war period, and is accentuated by the recent report of the Federal Electric Railways Commission, of which Mr. Gadsden was a member, that it is the immediate duty of the association to devote its efforts very largely to the cultivation of improved relations between the electric railway industry and the public. The committee regards Mr. Gadsden as eminently fitted for this task.

In this connection the committee takes occasion to recommend that in view of the great changes which, from year to year and almost from month to month, mark the critical period through which our industry is passing, it shall be regarded as the fixed policy of the association that, in the selection of all its officers, the association will be guided by the requirements at the time, unaffected by the choice of previous years.

Your committee nominates for vice-presidents the following:

First vice-president, Robert I. Todd, president Indianapolis Street Railway.

Second vice-president, P. J. Kealy, president Kansas City Railways.

Third vice-president, Britton I. Budd, president Metropolitan West Side Elevated Railway.

Fourth vice-president, C. D. Emmons, president United Railways & Electric Company of Baltimore.

The committee nominates as members of the executive committee representing manufacturer members the following:

D. B. Dean, sales manager J. G. Brill Company, Kuhlman plant.

B. A. Hegeman, Jr., president National Railway Appliance Company

J. R. Lovejoy, vice-president General Electric Company.

H. D. Shute, vice-president Westinghouse Electric & Manufacturing Company.

E. F. Wickwire, secretary Ohio Brass Company.

For members of the executive committee representing electric railway members, as authorized by action taken at this meeting, the committee recommends the following:

Frank R. Coates, president Toledo Railways & Light Company.

Frank Hedley, president Interborough Rapid Transit Company.

H. R. Mallison, assistant to president Montreal Tramways Company.

J. N. Shannahan, president Newport News & Hampton Railways, Gas & Electric Company.

W. H. Sawyer, president East St. Louis & Suburban Railway.

William Von Phul, president United Railroads of San Francisco.

As Mr. Gadsden had had to leave Wednesday evening, it was impossible to induct him into his new office, and the convention was pronounced adjourned by President Pardee.

Transportation & Traffic Association Proceedings

W. H. COLLINS
Retiring President

Six Topics Only Were Considered at the Atlantic City Convention, Namely, Collection and Registration of Fares, Traffic Principles, Safety Cars, Economics of Schedules, Freight and Express and Merchandising Transportation—R. P. Stevens Was Elected President

R. P. STEVENS
President-Elect

THE first session of the Transportation & Traffic Association was called to order by President Collins about 2:45 on Monday afternoon. The first order of business was the presentation of the president's address, of which an abstract follows:

PRESIDENT COLLINS ANALYZES YEAR'S WORK

"The electric railway industry is still facing a grave crisis. It has been confronted during the past year with more serious problems than ever before in its history. The conditions brought about by this situation have required the most intelligent and persistent efforts on the part of executives to meet and overcome. I believe, however, great progress is being made toward rehabilitating and stabilizing the industry, and I think we can now look toward the future with much greater confidence.

"Our association has accomplished much in the past, but I think it can be vastly more useful in the future if we can develop a greater spirit of enthusiasm and co-operation among the members, and I want to urge the importance of association work and the tremendous value it bears to the success of your properties.

"Last year a radical change was made from former practice in that instead of the presentation of a large number of subjects by standing and special committees only a few were covered, which gave ample time for a thorough discussion of each. This year the executive committee followed the same plan and six subjects were studied as follows: (1) Collection and Registration of Fares, (2) Code of Traffic Principles, (3) Safety Car Operation, (4) Economics and Schedules, (5) Express and Freight Traffic Facilities and Costs, (6) Merchandising Transportation.

"Of these subjects three were continued over from last year, namely, (1), (2) and (3).

"The problem of collecting and accounting for fares under a zone system has been the particular subject of one committee's investigation. The zone system is the object of general interest at the present time and offers the one best method thus far evolved of making the fare proportional to the distance traveled, and doubtless it would now be much more in vogue were it not for the difficulties of fare collection.

"After an extended and comprehensive study of the problem of traffic regulation in American cities a second committee has drafted a model form of traffic ordinance which it believes can be adapted, with some modifications to suit local peculiarities perhaps, to the requirements of any American city. The increasing congestion of traffic in city streets makes it of the first importance to us if we are to make any pretense of maintaining our schedules to see that the rights of the street car on city streets be carefully defined and strongly safeguarded.

"The committee on safety car operation in its study of this subject has prepared and sent out a comprehensive questionnaire covering practically every phase of safety car operation. The replies have been carefully analyzed by the committee and a summary of the conclusions derived from this analysis is incorporated in the report. The subject is of such timely interest just now that I am confident that the members of this association will derive considerable profit from a study of this committee's report.

"The study undertaken by the committee on economics of schedules gives promise of yielding a very valuable return. Among the subjects considered were: Analysis of schedules showing relation of dead time to live time, effect of increasing schedule speeds on platform expense, on investment, on traffic; methods of traffic checks to serve as basis of schedules. The traffic man and schedule maker, and the executive officer, too, for that matter, would find this report of immediate and practical value in his work.

"The possibilities of developing new sources of revenue by the transportation of express and freight is a subject which should command the interest of every operator who has the facilities for such business. Motor-truck operators have built up short haul business of this kind in the most unexpected places and there is no reason why the electric railways should not do the same. There can be no doubt that they can do the business much more cheaply than motor trucks. Just what it does cost the electric railways has been the object of this committee's investigation and its findings are given in its report. It is a subject which is very much to the point right now when the electric railways need to avail themselves of every possible source of income.

"Finally, merchandising transportation is a subject of the greatest timeliness. Every operating official knows that his business is not only to make transportation salable but also to sell it. The committee which has studied this subject this year has had the experience of the most efficiently operated properties in the country placed freely before it, and the committee has prepared in concise form a summary of the methods which experience has shown to be the most practical in developing the business of electric railways."

The reading of the report of the executive committee was omitted because it consisted principally of minutes of the meetings of the committee. The secretary's report was then read. It referred to the topics selected for discussion at the annual meeting and explained that the administrative expenses of the association were absorbed by the American Electric Railway Association.

President Collins then announced the appointment of the committee on resolutions: H. H. Norris, J. P. Barnes and G. K. Jeffries. The committee on nominations was then announced. It consisted of J. N. Shannahan, H. B. Flowers and F. W. Coen. At this point members of the Accountants' Association entered the hall to participate in the joint meeting to consider the report of the committee on collection and registration of fares.

COLLECTION AND REGISTRATION OF FARES

The joint committee of the Transportation & Traffic and Accountants' Associations on collection and registration of fares presented, first, names and definitions for the four types of zone systems (a, b, c and d) discussed in the 1919 report of the T. & T. Association and conforming with the practice of the zone committee of the American Association. These definitions, which were deemed necessary to avoid confusion in the questionnaire and to assist in standardizing nomenclature, follow:

(a) "Uniform Rate Zone System" is one in which the fare is directly proportional to the number of zones traveled in or through, that is, one in which the fare per zone is the same in each zone, including the first.

(b) "Initial Charge Zone System" is one in which the fare for the initial zone of any ride is greater than that for the succeeding zones.

(c) "Fixed Minimum Zone System" is one in which a certain rate per zone is charged, with a definite fixed minimum fare, which minimum disappears when the sum of the zone charges exceeds it.

(d) "Central Area Zone System" is one in which a flat fare or uniform charge, regardless of length of ride, within an established central area, is combined with zone charges on routes which extend beyond such central area.

A questionnaire was sent to thirty companies known to have given a trial to one of the four types of zone systems and eleven replies were received from companies which were able to speak from experience. These companies serve communities with populations varying from 20,000 to 1,250,000. The practice of several of these companies was described.

One company first discontinued transfers for crosstown riding and its revenues increased 2.7 per cent. It then established a zone area, 2.8 miles in radius, with a fare of 5 cents inside or outside for one zone ride and 8 cents for a ride to or from the center of the city beyond the zone limits. The operating revenue then increased 4.2 per cent over the previous year. Twelve days later the zone system was abandoned for a straight 7-cent fare, including crosstown riding and free transfers, and a 12 per cent increase was recorded. Another company is trying plan "d," and finds it successful, though it appears that as zone points are brought into the heavy traffic area the problem of passenger identification becomes more and more difficult. Another company speaks of the disadvantages of penny change and lack of a proper and simple method of fare collection, though it considers the zone system preferable to the single fare method if the latter is used with other than a 5-cent or a 10-cent fare. Another company has 5-cent zones, each divided into two sections to provide overlaps. It finds the system practicable even on open cars and with an overhead register. Another company has two zones with pay-as-you-enter inbound, those in the outer zones paying through receiving an identification check. When the zone limit is reached these checks are taken up. On the outbound trips the pay-as-you-leave system is used, the passengers who board the car in the outer zone receiving an identification check, so they do not have to pay the through fare when they leave the car.

The committee in its conclusions declares that under a zone plan identification checks are essential to prevent over-riding, but so far the committee has not been able to discover any satisfactory device for the issuance of such checks. Issue by the motorman or conductor is the only known method. The report concludes as follows:

"Analyzing all the reports received by your committee, we find that while several companies have been able to operate successfully under a zone system others have not been able to obtain satisfactory results with the type of zone system which they adopted and later the system was changed. Your committee is unable to say from the above analysis whether the difficulties experienced were due to local conditions solely or were inherent in the type of system applied. The principal difficulty appears to be that the details of application, so far as present zone systems are concerned, are burdensome both upon the public and the employee in carrying out the requirements without impairing the quality of service.

"It has been brought out that one of the chief advantages of a zone system is that it more nearly approaches the ideal condition for which all operating companies are striving, namely, that the fare collected be based on the transportation furnished the rider. Such a basis is of course fundamentally sound in principle and is equitable. All of the difficulties experienced and cited in the data furnished your committee are those of practical application, especially at points of congestion or heavy travel.

"In conclusion your committee desires to state that it is in full accord with the first above-mentioned fact and principle. With reference to the second condition stated above, your committee is forced to report, from the data available, that it is not able by analysis or otherwise to draw a constructive conclusion or to suggest a remedy for the practical difficulties which have developed.

"With respect to the application of a zone system to the one-man safety car, your committee recommends against its adoption except in small or sparsely settled communities, until some more simple system than any now in use is developed."

The report is signed by the committee, consisting of W. J. Harvie, chairman; M. W. Glover, co-chairman; R. D. Beatty, N. W. Bolen, L. D. Pellissier, E. C. Spring, C. W. Stocks, A. Swartz, W. A. Doty, John J. Duck, G. W. Kalweit, R. H. Stevenson and F. E. Webster.

Discussion on this report was not so complete or constructive as had been anticipated. Several points of interest were, however, touched on in the discussion which followed.

Ralph D. Hood, general manager Massachusetts Northeastern Street Railway, said he thought that the railway men were groping for light on this fare situation. Many systems had been tried and many discarded. He related the history of the Massachusetts Northeastern fare system, the advance from 5 cents to 6 cents, the change to shorter zones with a 5-cent unit, and subsequent change to 6 cents and then to 10 cents cash fare, with the present strip ticket selling at the rate of six for 50 cents. Mr. Hood said that this last system worked very well on his road: it has the advantage of a wholesale sale of rides; it makes the work in the first section somewhat harder for the conductor, but, on the other hand, the other zones are easier to handle. It is a good system where there are long rides and where there is extra riding from terminals. They have been able to find no specific case of resale of tickets. With respect to the effect of the increase in rates on riding, Mr. Hood said that while there was a 25 per cent reduction, he laid it entirely to the industrial condition of that section of the country over which the railway company of course had no control rather than to any change in fare. In reply to a question as to how he prevented conductors from substituting tickets for cash fares, Mr. Hood said that the amount of the cash fares was not more than 5 per cent of the total and that, frankly, he preferred to have the conductors get the advantage of the 1⅔ cents rather than to have them have the opportunity to take the entire 10 cents.

After Mr. Harvie had put a little catalyzer in the meeting, the discussion became a little more animated. John Benham of the International Fare Register Company said the manufacturers had always been trying to assist the railways to get all the nickels in the days of the 5-cent fare. When the fare system changed it became a serious problem to the manufacturer to make boxes which would register correctly and make it certain that the company was receiving all of the fares paid by passengers. It is not the mechanical or design difficulty, but rather the immense cost necessary to develop and change boxes to take care of changing fares. He related the history of reasons for locking up the pennies, such as the conductor substituting small nickels which would go through the penny register, thus making 4 cents per operation, and the subsequent development of the token, which immediately increased earnings beyond the rosiest expectations. While no longer in the fare box business, Mr. Benham commended the use of fare boxes and tokens as the one best method of assuring receipt of all money collected.

Mr. Benham also emphasized that city officials must help to make the fares simple. They are now agreeing that increased fares are necessary and they can be made to assist in making the fares simple and possible of collection. If zone fares are necessary, then Mr. Benham believes that plan No. 7 as reported by the committee is a desirable one. One of the most serious questions in this case or on the zone system in general is the question of over-riding, and that has by no means been solved. "Of course," said Mr. Benham, "I sell registers, but independent of that I believe that audible and visible registration of fares is necessary."

J. B. Stewart, Jr., general superintendent Youngstown (Ohio) Municipal Railway, said that under the service-at-cost franchise there the fare had been raised until finally on Jan. 1 it was 8 cents and on June 1 it was 9 cents. When the fare was 6 cents the conductors were substituting the smaller nickels through the penny register, but at 7 cents the tide turned and the public commenced to beat the conductor, particularly at heavy loading points. The first man of a large group, for instance, would board the car and ask for change for $1 and while the conductor was giving this change large numbers of others would go by and drop reduced fares or substitute tickets in the box. On May 1 the overhead register was installed and an immediate increase in revenue was noted. Pay-as-you-enter inbound and pay-as-you-leave outbound is the method of fare collection.

M. W. Glover, auditor West Penn Railways, called attention to the zone fare system section in the report of the Federal Electric Railways Commission, which, he said, he thought was very much to the point. Mr. Glover was a member of the joint committee, and in connection with the work of the committee said:

> One fact brought out by this report, in my opinion, is a question which may seriously affect the welfare of the American Electric Railway Association, namely, the apparent lack of interest shown by members of the association in replying to inquiries sent out by the association on subjects which vitally affect nearly every member company.
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> The members of this joint committee at considerable inconvenience to themselves held meetings and wrote numerous letters endeavoring to secure information to enable the committee to prepare a report which would be of some value to the associations. Forty-nine questionnaires were sent out and in addition letters were written several other companies asking for information on the subject of collection and registration of fares under the zone system and replies were received from only nineteen companies. Of these replies only eleven furnished information of such a nature as to be available for use. Upon taking the matter up with the secretary's office, I was surprised to learn that this percentage of replies received by this committee was above the average. It is indeed unfortunate that for some reason companies who take apparently an active interest in the welfare of the American Electric Railway Association are willing to ignore requests for information, yet the records of the secretary's office show that hundreds of requests for information are received at the association office from member companies on various subjects and some of the very companies which request information fail to reply to questionnaires sent out by the association.
>
> I think this is a most important matter and that the future success or failure of the American Association depends upon the value of the information secured by it, and in turn furnished to its members, and I hope the executive committee of the Accounting and Transportation & Traffic Associations will bring this matter to the attention of the executive committee of the American Association in the hope that future requests will be given better attention.

Mr. Glover then confirmed his agreement with the report of the committee and said:

> It is reasonably certain that some workable method will be devised which will meet the requirements of electric railways and it is the duty of all operating and accounting men to give this matter thought, and when they have found a solution communicate the fact to other members of the association, as it is only by co-operation that we can expect to evolve a system which will prove equitable to the companies as well as to the traveling public.

L. H. Palmer, United Railways & Electric Company, Baltimore, said that the report of the fare systems committee must be read in conjunction with the report of this joint committee. The two reports really form one subject. Mr. Palmer said that he understood that there were still considerable over-riding difficulties in England, where the zone system is in extended use. This difficulty must be overcome to make the zone fare system really 100 per cent.

A. Swartz, Toledo Railways & Light Company, Toledo, said he thought the zone system is really coming on American railways. The matter of getting the money is the important thing. He related the Toledo experience of how, when they were operating on a 6-cent fare, they decided to get fare boxes, but before the fare boxes arrived they had changed to the paper tickets, which, by the way, immediately lost some revenue. Then a later change in fare, coupled with the use of boxes, increased the revenue again. When the token was used the revenue went up in a jump, and, so far as Toledo is concerned, he believes tokens and fare boxes to be the answer. Even with decreased riding, income went up when tokens and fare boxes were used. Another point is that the accounting work was reduced so much that he personally was sometimes half ashamed to take his salary for the work the accounting department had to do.

John Benham, who had been through the fare changes in Toledo and tried to furnish boxes to collect various kinds of fare pieces, said: "If you fellows will only get something uniform in the method of fares and decide upon what you want the manufacturers will give you something which will do the work."

Carl W. Stocks, ELECTRIC RAILWAY JOURNAL, said he believed the railways will try to find some sort of a standard zone scheme to apply in this country. Formerly all operation was on a standard 5-cent fare basis and everybody knew what it was all over the country. Now the railways will have to get back to some similar uniformity under changed conditions. He thought there was no doubt the 6-cent and other higher unit fares eliminated the short haul, and that, as electric railways were incorporated to carry the people, this made it more difficult to do that, and unless they do carry all the people possible they are not doing their duty. Mr. Stocks believed in the next five years we will see more zone systems in this country; in fact, that zone systems will increase rapidly.

At this point the Claims Association entered the hall for the joint Claims, Traffic & Transportation session.

Chairman H. B. Flowers presented the report of the committee appointed to draft a code of traffic principles.

CODE OF TRAFFIC PRINCIPLES

The formal report of the committee on code of traffic principles was devoted almost entirely to the proposed model form of traffic ordinance, which had been drafted by the committee during the early part of the year and had been offered by it as a suggestion at the convention in San Francisco, Aug. 23-27, of the National Traffic Officers' Association. In the report of this convention, published on pages 494 and 495 of the ELECTRIC RAILWAY JOURNAL for Sept. 11, 1920, an extended abstract of this proposed ordinance was published. The remainder of the report of the committee gave the reasons for the draft of such an ordinance and the principles on which it is based. The report pointed out that the advent of the motor vehicle in various forms has so enormously increased the congestion in city streets that an entire revision of the traffic ordinances in all large cities has become imperative. Furthermore, the report pointed out that studies of the traffic in downtown New York and to a lesser extent the congested districts in other large cities during the peak hours show that before long main artery traffic must be dispatched under a system which would permit of a movement of several blocks without stopping, that foot passengers must be forced to move with vehicular traffic, that speed regulation must take the form of a minimum rather than a maximum limit, and that in many cases left-hand turns must be eliminated. Such a change will meet with opposition from the individual who claims the right to drive a slow-moving vehicle, to stop where he pleases and to reach his destination by the shortest and most direct route, so that public support for a properly drawn ordinance can be secured only by public education. Persons who have a right to the use of the highways were divided into six general classes: (a) Abutting property owners; (b) pedestrians; (c) users of slow moving or heavy vehicles; (d) users of fast or medium-moving vehicles; (e) users of public conveyances, such as street cars and public buses; (f) those demanding emergency service, such as fire apparatus, police patrol, etc. The streets are too narrow to permit all of these parties to exercise their full rights at the same time, so that each must lose something of its individual freedom, the convenience of the few yielding to the convenience of the many, and the normal use yielding to the emergency use.

The report was submitted by the committee, consisting of H. B. Flowers, chairman; W. H. Maltbie, Fielder Sanders and P. E. Wilson.

W. C. Culkins, City Railroad Commissioner, Cincinnati, stated that he started out with an ideal ordinance that provided only one-way streets, eliminated parking of all vehicles and prohibited left-hand turns in congested areas. It was not possible to promulgate the original ordinance, for one-way streets enlarged the terminal districts, caused passengers to be disgruntled because they had to walk several blocks in some cases to reach their connecting route. Merchants in the original terminal districts also opposed this change in rerouting, saying that the elimination of two-way streets would cut realty values and cause them severe losses. The ordinance now in effect cuts parking time to a minimum, limits standing time of street cars to three minutes, prohibits vehicles unloading on streets except when there is no alley available and gives street cars the right-of-way between cross streets. At present consideration is being given to multiple berthing of cars and the elimination of automobiles between cars at such berthing points. An attempt is also to be made to prohibit taxicabs from cruising up and down the streets by the establishment of fixed taxi stands. For infractions of traffic rules Mr. Culkins recommended the more extensive use of the tag system, for it required a smaller number of traffic officers properly to enforce the regulation. Mr. Culkins also urged very strongly that the committee be continued so that the points of contact already established by Mr. Maltbie with the National Association of Traffic Officers and other traffic associations be preserved.

W. H. Maltbie of the committee spoke in detail of the criticisms to the committee's code made by the Traffic Officers' Association, an abstract of which was printed in our issue of Sept. 11, 1920, page 424. Mr. Maltbie asked that any constructive criticisms be forwarded to the committee for use at the coming meeting of the traffic officers' drafting committee, which will meet in Cleveland some time in November or December.

J. L. Wickes, Public Service Commissioner, Bureau of Transportation, Baltimore, stated that the Public Service Commission was endeavoring to aid the street railways of that city in every way in solving the street traffic problems. Personally, he had made a suggestion that when there are parallel streets, each with double street car tracks, they both be made one-way streets and that express and local street car service be established thereon. This suggestion is at present frowned upon by the officials of the United Company, but nevertheless he believes it will in a large measure help solve some of the problems if put into effect. Mr. Wickes is much in favor of doing all that is possible to speed up the surface cars, and also advocates the elimination of parking in downtown districts and the wholesale unloading of vehicles backed up to the curb, especially during peak-hour travel.

Both H. D. Briggs and R. E. McDougall stated that the claims men were heartily in favor of standardized traffic ordinances.

C. M. Talbert, Director Department of Streets and Sewers, St. Louis, stated that in his city the state had supervision over street traffic and that at present several congested arteries had been turned into one-way streets with some measure of success. He urged that all parties working on traffic codes take the fundamentals that had been agreed upon, which represent at least 90 per cent of the rules, and have the United States Bureau of Standards promulgate a code. Such a code would carry considerable weight and be of benefit to all kinds of street traffic.

D. F. Fennell, superintendent of transportation Kansas City Railways, speaking from his experience, urged the use of loading platforms and safety zones to facilitate the handling of vehicular traffic. Mr. Flowers, however, believed that such requirements should not be included in a traffic code, but should be a matter of agreement between the railway company and the supervisor of city traffic.

On motion by T. C. Cherry the report was approved and referred to the executive committee of the American Association for further action.

C. M. Talbert, St. Louis, then presented a paper on "Automobile Hazards," an abstract of which appears elsewhere in this issue, and spoke particularly of the work that had been accomplished in St. Louis in reducing traffic accidents. Mr. Talbert's paper caused much favorable comment and a committee, consisting of Messrs. Palmer, MacDougall and Cherry, was appointed to confer with him as to what the street railways could do to help decrease traffic accidents and report to the ensuing executive committee.

Tuesday's Session

A joint meeting of the Transportation & Traffic and the Engineering Association was held on Tuesday afternoon for the presentation of the report of the committee on safety car operation. This was presented by C. W. Kellogg, chairman, and an abstract of the report appears below.

SAFETY CAR OPERATION

Statistics obtained by the committee on safety car operation show that the number of safety cars purchased in 1920, including those to be delivered up to Oct. 1, 1920, is 3,750, compared with 1,100 for the same period in 1919. The total number of companies using safety cars on Oct. 1, 1920, was 340, compared with 130 on the same date in the previous year. Data from sixty-five companies operating safety cars, obtained by a questionnaire, are given in the report.

As to population served, four of these companies reported population in excess of 250,000, twenty-four less than 100,000 and eleven from 100,000 to 250,000, six not answering. The average number of such cars used during rush hour was 23 per cent greater than normal service, indicating that the cars carried the base load rather than the rush hour service. The weight of the cars varied from 13,000 to 20,000 lb., or 48.5 per cent of that of all the other cars on the respective systems. One-half the companies report no change in specifications of the standard Birney safety car, while minor changes have been adopted by others. The more important of these changes have to do with more seating capacity and more heat-resisting body construction in places where severe winter weather is encountered, the standard car having been developed for climatic conditions prevailing in the South.

The average energy consumption was 1.20 kw.-hr. per car-mile at the car, with 0.10 to 0.50 kw.-hr. per car-mile for heating and other auxiliaries.

Only one company out of fifty-two definitely reported dissatisfaction by trainmen with the cars. The average differential paid to operators of one-man cars over other trainmen is 4.24 cents, or about 10 per cent increase. This differential makes the job attractive to the men in spite of the increased duties, and this feeling of satisfaction does not seem to wear away with time. Most companies recruit the operators from the existing staff. About half of the companies in answering gave the opinion that the same qualities in trainmen were needed for the safety and for the two-man cars. The others felt that in a general way the younger, more alert men with conductor's experience made the best safety car operators.

Only two of fifty-one companies experienced any public opposition in the establishment of safety car operation, and at present, according to the answers, not a single case of state or city commission ruling against safety car operation exists, although in several cases operation of one-man cars without safety features is not permitted.

Out of fifty companies reporting schedules, twenty-five have made no change in headway with the use of safety cars. The others have made increases in frequency of from 10 per cent to 100 per cent, the average being 40.5 per cent. Schedule speeds were increased by ten of the forty-five companies answering this question. Twelve companies supplement safety car service with larger two-man cars on the peak and thirty-four companies do not.

The averages of the companies which increased their schedules with safety cars show 40.5 per cent increase in car-mileage, with a decrease in gross earnings per car-mile of only 0.93 per cent. That is, the gross earnings with safety cars show substantially the same per cent increase as the car-miles operated.

The practice in flagging railroad crossings varies greatly. On ten roads the operator leaves the car to flag crossings, while on nineteen roads the operator flags the crossings from his position without leaving the car. In a few cases regular flagmen are employed on account of legal requirements.

The vote on bearings was thirty to eight in favor of friction as compared with ball bearings for journals. No snow-fighting equipment had been found necessary by any company over that previously used with two-man operation. Air-operating sanders in winter were considered desirable, and the majority of the companies used overhead registers in addition to the fare box, which is universal.

From a recent study of a group of companies under one management, representing approximately 5,000,000 car-miles per year of safety cars and 7,300,000 car-miles per year of other cars, a saving of 53 per cent in safety car maintenance per car-mile compared with that of other types was reported. The returns of the companies reporting to the committee indicate materially reduced accident expenses per car-mile from the safety car. Forty-seven companies replied that their experience with the safety car had been such as to lead them to favor expanding its use on their systems, and only two answered to the contrary. The answers as to suggestions for improvement in safety cars tended to making the car sturdier in certain respects, a plan which the committee says is already being followed by the manufacturers.

The report on safety cars was signed by C. W. Kellogg, chairman; S. W. Greenland, J. K. Punderford, J. M. Bosenbury, J. C. Thirlwall, C. H. Beck and Gardner F. Wells.

Following the presentation of the report J. K. Punderford, the Connecticut Company, said that his property now has in operation 130 safety cars and thirty remodeled one-man cars.

The differential paid by the Connecticut Company to safety car operators, Mr. Punderford believes, is money well spent, as it is possible to obtain a better class of men and more efficient operators. No boarding or alighting accidents have occurred with safety cars. The Connecticut Company uses fare boxes without double registration. The latter is favored, but it is believed that this would add too many duties.

H. B. Flowers, United Railways & Electric Company, Baltimore, said that his company has now in operation thirty-three safety cars and twelve converted one-man cars. The results of safety car operation have been a little disappointing, as the expected increase in traffic was not obtained. A differential of 5 cents in wages is paid, and the public took very well to the car. Mr. Flowers said that it was inadvisable to conduct an extensive publicity campaign prior to inauguration of safety car service, as this acted as an apology for the car.

D. L. Fennell, Kansas City Railways, stated that fifteen safety cars were placed in operation on that property in April, 1919. Due to the preceding strike all men had had not over two months of railway experience. The cars were put in service on a six-minute base and a three-minute rush headway. This has since been reduced to a five-minute base and a two-minute rush headway. Street collectors are used in congested districts and prove very helpful. This method of collection, however, was used prior to the inauguration of safety car service. Kansas City now has ninety-five safety cars in operation. Mention was made by J. M. Bosenbury, Illinois Traction System, of one property on which an increase of 25 per cent in car-miles had caused an increase of 33⅓ per cent in revenue. This resulted in a change from $1,000 deficit to $8,000 net revenue.

S. W. Greenland, Fort Wayne, Ind., said that his property did not have the standard Birney car, but that the average weight of his equipment was 18,500 lb. The operators receive 2 cents an hour higher wages than the interurban men. Fort Wayne has 100 per cent one-man service.

No safety cars have yet been placed in service in Chicago, said H. H. Adams of the Chicago Surface Lines, although ten standard cars have been ordered. Mr. Adams is making an extensive study of the safety car problem from a standpoint of car design for semi-congested service. This includes a study of the possibility of a separate exit and entrance and some method to safeguard the exit to make impossible its use in boarding. Mr. Adams believes that the present car is not quite ample in dimensions for outlying crosstown lines. Any large city has locations where the safety car can be used successfully. Mr. Adams asked that the railway operators present discuss any weaknesses which had developed in the car body and the necessity for the manufacturers to design a new motor. The present 25-hp. motor is not guaranteed for service on a car weighing over 16,000 lb., and the changes which Mr. Adams has in mind will increase this weight to 18,000 or 19,000 lb. It is believed that a car 8 ft. 4 in. or 8 ft. 6 in. in width and longer than the present car could be used. A proposed design gives an additional 16 in. in length and provides thirty-seven seats in place of the present thirty-two. It was pointed out that any decrease in maintenance resulting from the use of safety cars depends upon the age of the equipment replaced. The question of armature clearance was also raised.

R. B. Stearns, Eastern Massachusetts Street Railway, said that his company had purchased 250 new one-man cars and expected 100 more within a month. It is also remodeling the older cars at the rate of about forty per week for one-man operation. These are giving entire satisfaction. A couple of years ago the company had 2,345 passenger cars and of these 649 were scrapped last year and 738 this year. With the exception of about 100 cars, which are needed for train and other special operation, the property will soon be operated exclusively with one-man cars.

The company found that while under state supervision it is possible to raise fares, it is nevertheless necessary to save money, and one-man operation promised much in this direction. Mr. Stearns estimated a saving of about $3,000 per year per car on a 30,000-mile basis, with car-for-car replacement. The company had tried some experiments with single versus double folding doors and had decided on the former as better, although a door width somewhat greater than the minimum possible was preferred. Another experiment related to the lengthening of old single trucks, which was not found satisfactory. Their use showed the need of resilience.

As to maintenance of the one-man cars, Mr. Stearns felt that it is too early to reach a conclusion, but he felt that it might prove true that equipment and track maintenance varied somewhat with the weight of the car. His company is investing $4,000,000 in rolling-stock equipment to save $1,000,000 annually.

J. C. Thirlwall, General Electric Company, said that judging by recent results, one-man operation is going to be greatly extended both with standard and remodeled cars. It is quite possible to operate cars larger than standard by one man. Mr. Thirlwall quoted data secured in co-operation with the ELECTRIC RAILWAY JOURNAL showing operating results on a number of properties. From partial statistics it appears that the increase in gross earnings is about 90 per cent of the increase in service, while maintenance costs are cut roughly in two. Following Mr. Thirlwall, K. S. Schluss, Tacoma Railway & Power Company, said that, based on experience with thirty-two cars installed in 1917 and twenty-nine more installed in 1918, he considers the bodies amply strong, particularly in view of the war-time service to which they were subjected. For six months ended August, 1920, he had found about 1.3 cents per car-mile to be the average maintenance cost. E. M. Walker, Terre Haute Traction & Light Company, put in a plea for the standard car and said that the motor and compressor capacities of the cars used in his city are ample. The air equipment operates about 40 per cent of the time, and the motors have reserve capacity. The energy consumption for propulsion alone is less than 1 kw.-hr. per car-mile, the total being 1.1 kw.-hr. in summer and 1.5 kw.-hr. in winter. With 95 per cent of the rolling stock of the safety type, twenty months of operation to Aug. 1, 1920, showed that the safety cars produced 70 per cent of the gross income and 99½ per cent of the net income, while they are responsible for but 50 per cent of the operating costs.

The discussion was closed by C. H. Beck, Westinghouse Traction Brake Company, who called attention to the difference in the tenor of the discussion as compared with the 1919 meeting. Then it related to economics, now to details of design. Assuming that the safety car mileage in this country is 380,000 per day, the passengers carried total 2,000,000. At least $8,000,000 is saved per year by the safety cars. He urged managers not to forget why they put the safety cars in, but to extend their use to secure the maximum benefit.

Following Mr. Beck, H. B. Flowers moved that the report of the committee be accepted and the committee continued and this motion was passed. The meeting then adjourned, the engineers gathering in their own hall to discuss the subject of the keeping of stores.

Wednesday's Session

The session of the Transportation & Traffic Association on Wednesday afternoon was devoted to a discussion of the report of the committee on economics of schedules. An abstract of this report, which was read at the meeting by Alexander Jackson, follows:

ECONOMICS OF SCHEDULES

The subjects considered by the committee follow:

1. Analysis of schedules showing relation of dead time to live time.
2. Effect of increasing schedule speeds, on platform expense, on investment, on traffic.
3. Methods of traffic checks to serve as basis of schedules.

In connection with subject 1, the committee presented as a standard analysis of car-hours and crew-hours and for discussion the following division into the various factors now known to exist:

ANALYSIS OF CAR-HOURS

Revenue Passenger Cars.

1. Actual time operating to or from carhouse to starting point, known as "pull-in" or "pull-out" time, "run-on" or "run-off" time, dark or inactive hours, idle time or dead time.
2. Time operating between terminals including time allowed at stops; that is, running time.
3. Time allowed on the schedule for layover of car at terminals between trips, called allowed time, slack or layover time.
4. Time actually consumed out of No. 3 in operating between terminals, including time at stops; that is, running time plus delayed time.
5. Time consumed beyond time allowed in No. 3, commonly known as "set-back," "fill-in," "turn-back" time.

It is necessary to divide car-hours for revenue cars into the above various factors in order properly to define trip speed, schedule speed or actual speed.

It is understood that special or chartered cars, or funeral cars, or other passenger-paying cars will be included as revenue passenger cars.

Miscellaneous Revenue Cars.

The same method of computation would apply for sprinkler cars, mail cars, freight cars and express cars.

Non-Revenue Cars.

Non-revenue cars include supply cars, shifting cars, rail cars, wreck cars, pay cars, line cars, snowplows or sweepers, sand cars, sleet cars, dump cars, coal cars, bonding cars, slot scraper cars.

ANALYSIS OF CREW-HOURS

Revenue Passenger Cars.

1. "Reporting time" is time allowed in preparing car for service or putting car away after service.
2. "Platform time" is actual time operating trips including time between trips allowed on the schedule as layover time.
3. "Time allowance" is time in addition to platform time allowed to bring run to a prescribed number of hours.
4. "Spread allowance time" is time allowed because of length of spread or over-all time to work a given (scheduled) run.
5. "Minimum or guaranteed time" is the amount of time allowed to bring time of extra men up to a prescribed number of hours per day or per week.
6. "Over-time" is time worked by men in excess of their regular run.
7. "Continuous time" is time allowed between the completion of a regular run and time reporting for extra work. This also covers all swings for which crews are paid.

EFFECT OF INCREASING SCHEDULE SPEEDS

The committee assigned this subject to Alexander Jackson to formulate a brief statement showing the effect of increasing the schedule speed as requested to form the basis of a discussion. It is considered under three heads as follows, (a) On platform service. (b) On investment. (c) On traffic. An abstract of the discussion by Mr. Jackson, who is superintendent of timetables Public Service Railway Company, Newark, follows:

(a) The effect on platform expense is very pronounced. On a line operating a speed of 8 m.p.h. at a wage scale of 60 cents per hour per man, or $1.20 per hour per crew, the cost is 15 cents per car-mile.

If the schedule speed could be increased to 9 m.p.h. a saving of 1⅔ cents per car-mile could be made in platform cost, and if increased to 10 m.p.h. a saving of 3 cents per car-mile would result. If an increase in wages was made to trainmen making the rate 65 cents per hour per man, or $1.30 per hour per crew, it would only be necessary to raise the schedule speed to about 8.7 m.p.h. to absorb the increase and keep the car-mile rate constant.

(b) The effect on investment is so far reaching it is difficult to arrive at the exact amount. The following estimate on the amount required per car is thought conservative:

Cost of car	$15,000
Car house and shops	2,500
Power house investment	10,000
	$27,500
Yearly interest at 8 per cent	2,200

The power house figures are based on the following: Investment of generating station at $125 per kw.; transmission and substation at $75 per kw., total $200 per kw.; 50 kw. will be required per car *i.e.*, $200 multiplied by 50 kw. = $10,000 per car.

(c) Effect on traffic: The principal effect on traffic is that increasing speed reduces the number of cars in any given area at a given time, to give the same service. This reduces congestion, with a consequent increase in regularity. From the passenger's point of view, higher speed means a quicker trip, and speed is an important factor to be taken into consideration with jitney competition.

For example, assume a property operating 100,000 car-miles per day at a speed of 8.50 m.p.h. consuming 11,765 car-hours. The speed is increased 10 per cent to 9.35 m.h.p., then to operate 100,000 car-miles 10,695 car-hours would be used, making a daily saving of 1,070 car-hours.

If we assume the average car use per day as fourteen hours, under the old speed 840 cars would be used, while the new speed would require 764 cars, saving seventy-six cars. This may be summarized as above.

Estimated saving in investment 76 cars at $27,500 each	$2,090,000	
Saving in interest at 8 per cent		$167,200
Saving in platform expense at $1.20 per car-hour $1,284 per day—$1,284 by 350 average days		449,400
Saving per year		$616,600

METHODS OF TRAFFIC CHECKS TO SERVE AS BASIS OF SCHEDULE

The committee finds that in the past this subject has received very careful consideration and many data are now available. The following facts were contributed on this subject by Joseph A. Stoll, traffic manager United Railways & Electric Company of Baltimore, Md.

A traffic department that is alive and efficient will save many thousands of miles in a year that otherwise would be run needlessly and will anticipate and forestall complaints through close analysis of traffic checks and prompt adjustment of schedules. Proper statistics are indispensable to the intelligent handling of the many traffic problems that are constantly arising. Results depend, of course, more upon the quality than upon the quantity of statistics. Undoubtedly the most effectual results are obtained from simple records that faithfully and clearly portray actual traffic conditions.

A very satisfactory method to pursue in the acquisition of traffic data is as follows: After a list of checking points is selected, preferably at compulsory stops, and at points which should be agreed upon by the commission's representative or other regulatory authority, a checking schedule should be prepared in such a manner as to include all the lines of the system. The more important lines should be checked regularly and frequently and those of less importance as often as considered advisable. There should also be one or two extra men assigned to do special work, such as making running time tests, on and off characteristic curves, etc. Furthermore, there should be a supervisor of checkers.

The checking schedule should be arranged to cover a.m. and p.m. rush hours; mid-day and night rush-hours, and Saturdays and Sundays. Each checker should be supplied with a copy of his working schedule, a list of seating capacities of the cars, and such other general information as will aid him in his work. The checkers should be equipped with good watches and the watches should be synchronized with the official clock. A form similar to that submitted by the 1915 committee has proved very satisfactory. Upon this slip should be entered the train (or block) number, arriving time (nearest half minute) and total passengers. Where the checking is done at a transfer point the inclusion or exclusion of interchange traffic should be predetermined.

The slips should be added by the checkers, or observers as they are sometimes called, in half hour subdivisions. The checks should be turned in each day and after they are audited a typewritten record made of the half hourly results. This record presents clearly the service furnished and demanded during each period of the day and when compiled for a series of days will show adequacy of service and how closely the schedule was adhered to on the days checked.

Periodically there should be continuous all-day checks made and the results tabulated in half-hourly periods and charted. A series of such charts will reflect good or bad progress in the application of schedules.

The traffic department should also study the possibilities of short line service so as to obtain both maximum use of available equipment and better distribution of the passenger load. For this purpose it is desirable to have counts made of passengers boarding and alighting at all stops and the data so obtained for a number of trips under typical conditions reduced to a curve, generally known as a "characteristic" or "on and off" curve.

Proper running time must also be determined from observations and stop-watch tests made under the supervision of a competent transportation man. The United Railways of Baltimore has found it both feasible and advantageous to vary the running time in accordance with the degree of ease with which the cars may be "gotten through" at different hours of the day. Another very useful chart graphically depicts the loading of individual cars, average loading and spacing. The report was submitted by Edward Dana, chairman; James P. Barnes, H. F. Fritch, Herman E. Hicks, Alexander Jackson and J. A. Stoll

J. V. Sullivan, assistant to president, Chicago Surface Lines, in discussing the report, said he was impressed with the moderation of the committee in listing the kinds of times for which the company has to pay. He then read a list of some eleven times other than "running time," which are paid for in Chicago, and said that they aggregated 19 per cent of the entire time. He said the advantages of having definitions for different kinds of time would be great.

John J. Duck, general auditor of the same company, said that it would be desirable to have the records supplied to the management worked out on the basis of both platform time and total running time. In this way it would be possible to determine exactly what the cars were earning. J. E. Duffy, general superintendent, New York State Railways, Syracuse, also expressed pleasure over the outlook for accepted definitions of different kinds of time. He also pointed out that statistics on miles per hour would be confusing unless there was acceptance of such definitions. H. E. Hicks, superintendent of schedules, New York State Railways, Rochester, a member of the committee, explained that the definitions given in the report were not intended to be inclusive of all kinds of time and that with each new labor contract new kinds of time for which companies had to pay were possible.

H. B. Flowers, general manager United Railways & Electric Co., Baltimore, thought that schedule speed should be changed during the day more often than is frequently the case in order to increase the average speed. He thought a gain could especially be secured by increasing the schedule speed of the cars going in the opposite direction from the main flow of traffic.

D. L. Fennell, superintendent of transportation Kansas City Railways, suggested standardization of methods of schedule making, as for example, the method of figuring spreads.

N. W. Bolen, superintendent Public Service Railway, Newark, explained that that company kept separate records of its revenue and non-revenue car mileage. In connection with the point raised by Mr. Flowers, he asked whether it was better to have the car crews change their running time at a certain hour on the route or at terminals.

Herbert C. Moser, superintendent of transportation Fifth Avenue Coach Company, explained that that company changed its running time by the clock, that is to say, when a bus reached the next time point after the time at which the change was to be made. He believed that companies should have a much larger number of running times during the day. Some companies had only three, i.e., from 7 a.m. to 7 p.m., from 7 p.m. to midnight, and from midnight to 7 a.m. Inspectors and dispatchers do not like many changes in running time, as it is inconvenient to them, but it is a step in economy. Running times between time points should also be figured out in the timetable department rather than left to inspectors. He said there was danger also that absolute stops should be continued when the reasons for them had disappeared. A company should constantly be revising its absolute stop marks and making running time checks. It is sometimes helpful also to place the time points farther apart when a company is endeavoring to increase the scheduled speed. Timetables should not be put in the same class as dining room tables and expected to last for fifteen years. His suggestion was constantly to keep checking.

Discussion then turned upon the definition given in the report of the committee on "Analysis of Car-Hours" and "Analysis of Crew-Hours." In this connection William B. Wheeler, superintendent of timetables, Third Avenue Railway, suggested the elimination of the expression "dark hours" in the first definition, as he believes it an inheritance from the old cable cars in New York and not used to any extent outside of that city, and, in the same definition, C. E. Morgan, Brooklyn Surface Lines, said that the term "pull in" was generally used in connection with a defective car and was different from "run on" and "run off."

At this point F. G. Buffe, general manager Kansas City Railways, declared that there was a great call in this country for good schedule makers and that the companies would do well to instruct and break in new men for this kind of work.

Mr. Moser suggested that half a dozen proposed schedules be prepared and be presented for discussion and definite conclusions either at the meeting next year or at the mid-winter meeting. Mr. Jackson explained that the report was not a list of set definitions but was recorded for the purpose of bringing out criticism so as to arrive at a proper name for each item. Mr. Fennell suggested that the committee send out a questionnaire to the member companies for criticism as to the method of preparing the data. He emphasized the need for standardization of definitions. At the suggestion of Mr. Bolen it was voted to appoint a joint committee of the Accountants' and the Transportation & Traffic Associations to carry on the work on schedules.

Following the discussion of the report of the committee on "Economics of Schedules" the session was continued jointly with the Engineering Association and an address on the super-power plan was presented by W. S. Murray, chairman super-power survey, United States Geological Survey. This address which is abstracted elsewhere in this issue explained the work and plans of the survey and what it was expected to accomplish.

Before adjournment a three-reel motion picture showing track construction methods in Cleveland was presented by C. H. Clark, engineer maintenance of way of that property. This film illustrated the pavement plow in action tearing up 1,200 ft. of pavement in three minutes. Cutting rails with the acetylene torch, breaking pavement with a pile driver, and electric riveting and welding of joints were also illustrated. The film showed the electric crane, electric shovel and gantry crane in action.

Thursday's Session

President Collins presided at the final session of the Transportation & Traffic Association Thursday afternoon. The report of the committee on express and freight traffic was presented by T. H. Stoffel, in the absence of P. P. Crafts, chairman. This was followed by the report of the committee on merchandising transportation, which was read by F. G. Buffe, chairman. Abstracts of both of these reports appear on the following pages.

EXPRESS AND FREIGHT TRAFFIC FACILITIES AND COSTS

Information received from the questionnaire of the committee indicates that many electric railway companies do not segregate their costs of handling freight from their other operating expenses, and where the separation is made the methods of accounting vary considerably. General figures for the nine roads reporting are given in Table I. The larger gross earnings shown by the western roads reflect their greater development of the freight business and larger hauls. The greater revenue of the Western roads per car-mile is undoubtedly due to the heavier loading per car in the west.

In connection with Table II, Table III is also included, showing energy consumption and costs per car-mile for operating freight cars, both motor and trail, as determined by actual meter tests extending over distances of from 1,500 to 10,000 miles, the cost of power at the trolley being on basis of 2.92 cents per kilowatt-hour. The cars used varied in length from 38 to 50 feet and in capacity from 20 to 40 tons.

The increased power consumption indicated by these figures for the second and third trailers is undoubtedly due to the fact that the point of maximum efficiency of the motors used was past, or there may have been a reduction in line voltage due to the greater load. Generally speaking, however, trail cars in freight service require but 20 per cent of the power necessary to operate motor cars; in other words, a motor freight car with proper electrical equipment can haul five trailers at a power cost for operating two motor cars. This but emphasizes the economies to be secured through trailer operation in freight service.

TABLE I—GROSS EARNINGS AND REVENUE OF NINE ROADS

Road No.	Gross Earnings	Freight Car Miles Operated	Total Tons Handled	Tons per Car-Mile	Revenue per Ton	Revenue per Car Mile
Eastern Group:						
1	$99,681	266,755	65,000	0.244	$2.44	$0.37
2	649,967	678,877	373,073	0.550	1.74	.96
3	132,541	175,423	50,943	0.290	2.60	.76
4	264,681	400,836	110,036	0.276	2.40	.66
Average*	$286,718	380,473	149,763	0.340	$2.29	$0.69
Western Group:						
5	$265,842	311,352	48,060	0.155	$5.52	$0.85
6	1,514,238	1,323,925	299,363	0.227	4.97	1.14
7	100,476	82,000	17,112	0.209	5.78	1.23
8	428,184	†	116,455	†	3.68	†
9	511,162	900,841	113,039	0.114	4.52	0.52
Average*	$563,980	677,030	118,805	0.176	$4.89	$0.94

* Average not weighted. † Figures not available.

Expense of trainmen is the highest item in the cost of electric freight operation, and this also emphasizes the desirability of trains.

The next largest item is the labor cost of handling freight at stations and terminals, and where terminals are adequate in size and sufficient rolling stock is available this expense can be considerably reduced. Another help is the provision of adequate team trucks where carload and less than carload freight may be loaded directly from the trucks into freight cars. This may be done with many classes of freight which do not require weighing or where weight agreements are in effect. An expense of from 1 to 2 per cent of revenue for loss and damage is not excessive.

The average total expense for the group being made up of only a small number of roads, especially in the Western group, is probably not representative.

TABLE II—UNWEIGHTED AVERAGE EXPENSES OF SPECIFIED NUMBER OF EASTERN AND WESTERN GROUPS OF LINES

	Expense per Car-Mile		Expense per Ton	
	Four Eastern Roads	Three Western Roads	Four Eastern Roads	Four Western Roads
Maintenance of way	$0.0519	$0.0535	$0.162	$0.390
Maintenance of equipment	.0355	.0415	.112	.284
Power	.0518	.0490	.157	.401
Train labor	.1851	.1587	.575	.791
Station	.1332	.1604	.406	.839
Other station expenses	.0215	.0137	.195	.063
Loss and damages	.0105	.0286	.013	.167
Miscellaneous transportation expense	* .0094	* .0354	* .009	* .508
Traffic	.0049	.0119	.024	.039
General and miscellaneous	.0692	.0538	.145	.381
Total	$0.5680	$0.5928	$1.748	$3.462

* Averages of wo roads only.

TABLE III—ENERGY REQUIREMENTS AS STATED BY TESTS

	Average Kw.-Hr. per Car-Mile	Cost of Power per Car-Mile per Train	Separated Cost of Power per Car-Mile for Each Trailer
Single motor car	2.80	$.0819	....
Motor car and one trailer	3.40	.0994	For first trailer 0.0175.
Motor car and two trailers	4.12	.1205	For second trailer 0.0225
Motor car and three trailers	5.00	.1463	For third trailer 0.0244.

It is generally admitted that outside of the lack of equipment, the greatest need of electric lines engaged in freight handling is terminal facilities, and as a rule, far more business is being offered such lines daily than they are able to take care of, with the result that it becomes necessary to issue frequent embargoes, with consequent loss in revenue.

Studies of steam railroad less carload freight terminals indicate that where a terminal loads twenty cars of freight per day there should be track standing room for the same number of cars per day, and the average area required for one-story, single-deck freight terminals, including driveways, tracks and buildings, is approximately 2,000 sq.ft. per car. In many instances electric roads are loading daily two or three times the number of cars they have standing room for.

TABLE IV—PRINCIPAL TERMINAL FACILITIES

Road No.	Total Area in Square Feet	Area Occupied by Building	Cars Standing Capacity	Number of Cars Using Terminal per Day	Square Feet per Daily Car Standing Capacity	Square Feet per Cars Using Terminal Daily	Total Yearly Tonnage Inbound	Total Yearly Tonnage Outbound	Average Loading per Car in Tons Inbound	Average Loading per Car in Tons Outbound
1	16,890	7,425	5	18	3,630	938	20,000	45,000	4	8
2	*	*	*	*	*	*	*	*	*	*
3	3,781	*	10	7	378	540	31,22	10,312	3	8
4	92,597	10,080	10	11	9,260	8,418	142,91	23,111	5	8
5	44,584	23,640	20	22	2,229	2,027	289,50	41,884	18	29
6	150,880	44,440	67	100	2,252	1,509	†2751,85		7½	7½
7	8,850	3,600	4	6	2,213	1,308	31,32	6,836	1+	4+
8	196,150	12,030	32	20	6,129	9,807	134,44	60,098	*	*
9	*	4,000	10	12	*	*	11,40	1,502	10	10

* No figures received. † Includes both inbound and outbound.

The conclusions of the committee follow:

1. There is a great and profitable field for electric railways in handling freight.

2. To handle freight with a profit it is necessary to provide adequate facilities, including ample equipment and well planned terminals.

3. Every effort should be made to handle freight in trains consisting of a motor car or electric locomotive, depending on the class of business handled, and as many trailers as may be practicable, in order to reduce (a) investment in equipment, (b) trainmen's expense, (c) cost of power.

TABLE V—HANDLING COST PER TON AT PRINCIPAL TERMINAL FOR EIGHT ROADS

Road No.	Warehouse truckers	Warehouse foremen and checkers	Agent, cashier and clerical force	Station heating, lighting, etc.	Total	Wages Paid Warehousemen
1	....	.....	.....	.....	$0.27	$105 to $125 per month.
2	No data	.....	.....	.....	.....	
3	0.257	0.104	0. 56	0. 05	.622	42 and 43 cents per hour.
4	....	.....	.....		.....	41 cents per hour.
5	.73	0.11	.22	0.005	1.065	Foremen and checkers $125 to $140 per month; truckers 50 cents per hour.
6	.80	.....	.....	.....	.80	49 to 53 cents per hour.
7	....	0.48	0.48	.....	.96	50 to 55 cents per hour.
8	0.196	0.21	0.168	.....	.574	Truckers, 30 to 33 cents per hour; foremen $85 to $105 per month.
9	....	.....	.....	.....	.....	All on monthly basis, $85 to $100 per month

4. Every effort should be made tending to the heavier loading of cars.

5. It is evident that the accounting methods used on the majority of roads are not such at this time as to permit of definite determination of the cost of handling freight.

In conclusion, the committee recommended a thorough investigation of the cost of handling freight business similar to that worked out by F. W. Doolittle in 1916 for passenger traffic.

The report is signed by the committee, consisting of P. P. Crafts, chairman; T. H. Stoffel, vice-chairman; J. H. Crall, E. W. Fowler, R. B. Hull, F. D. Norviel, W. S. Rodger, C. E. Thompson and H. B. Titcomb.

MERCHANDISING TRANSPORTATION

An extended report was presented by the committee on this subject and was devoted to methods whereby the service to be sold could be made more attractive, to the education of employees in the capacity of salesmen, to advertising through different mediums to attract business, to the help possible from public and civic bodies, and to the advantages offered by the widespread use of tickets. The report pointed out that formerly the idea of using merchandising methods to dispose of rides never occurred to railway managers, but now salesmanship is necessary. Not only is there competition from privately owned and public automobiles, but increased fares have developed another very likely competitor, *i.e.*, the sidewalk, although it is a relief to know that the public is now beginning to think of rides in terms of service and cost and that in spite of higher fares riding has increased. The report was accompanied by reproductions of selected publicity. Several of these are reproduced. The following summary of the methods of merchandising transportation is from the report:

DIRECT METHODS OF MERCHANDISING TRANSPORTATION

Advertising: The electric transportation industry must advertise its service and use the copy plan to overcome the effects of competition and induce more car riding.

Of all the advertising mediums the daily newspaper is probably the best.

Another excellent medium is the space provided by the car itself, such as cards on dash, frames inside hangings from the car roof.

When advertising makes a sale it should also make a friend.

This direct advertising should enlarge on service changes.

A good feature to be emphasized is the cost of operating an automobile, for it has been demonstrated that no type of car can be operated for less than 10 cents a mile.

Another feature which can be utilized is the fact that the street railway in many communities is essential, and this being the case, every citizen should see that the local line is supported.

The moving picture theater should be a prospective field. Shops, power plant, carhouses, inspection force, track department, all should be brought to the notice of the public.

Publications circulated through boxes in the cars have proved to be effective.

Billboards offer a medium heretofore but little used.

Statements to employees and to the public should be easily understood.

Service: Service is the most important thing to be considered.

Service must start in the carhouses and shops.

Cars must be swept and kept cleaned.

Mechanical inspections must be rigid.

Rearrangement of stops in the downtown districts in some instances have increased speed 100 per cent.

Education of Employees: The greatest field ahead of street railway operators lies in the training of their transportation forces.

Such training involves courtesy, politeness and careful operation.

Company publications have proved valuable in obtaining the co-operation of the employees, which is a vital feature.

Care must be taken in the selection of men. Pleasing appearance and an understanding of the salesmanship features of his work are important.

Those types which are morose or easily irritated should not be hired.

A period of probation has, in some instances, seemed advisable.

The employment manager should be a specialist.

It should be a part of the trainman's job to be polite under all circumstances and he should be helped or penalized to overcome any other inclination.

Company meetings, lectures, service, codes, inspection reports, rigid enforcement of rules, and gradual elimination of those who cannot adapt themselves, must all be depended upon to maintain a proper standard of courtesy and service.

Shop committees have proved to great advantage, and even where a union force is maintained such committees can be formed. If union contracts prevent this being used as a medium for changing working conditions at least it should be used for the purpose of securing co-operation between the management and the employees.

Some form of disability or retirement plan should be seriously considered.

The job should be made as nearly fool proof as possible.

Ticket Fares: Tickets offer a more complete form of merchandising transportation because there is something concrete to merchandise.

Tickets do not have the same mental effect as money, and they have a widespread effect on the short hauls.

Sale of tickets should be pushed through agencies, advertising, street salesmen, and in some companies even a sales manager has been appointed to handle this department.

Jitney Competition: If street railways must compete with the jitney they should be allowed to do so on equal terms, and monopoly restrictions should be removed.

Jitney competition can be met and overcome only by closer economies of operation and a service which meets the public need.

The safety car seems to offer a near solution.

The Safety Car: Safety cars should be built not only from the standpoint of economy, but from the standpoint of merchandising transportation. Interiors should be pleasing; seats should be upholstered, and the ride made as comfortable as is consistent with the nature of the car.

The small safety car has proved to be one means of helping to meet jitney competition.

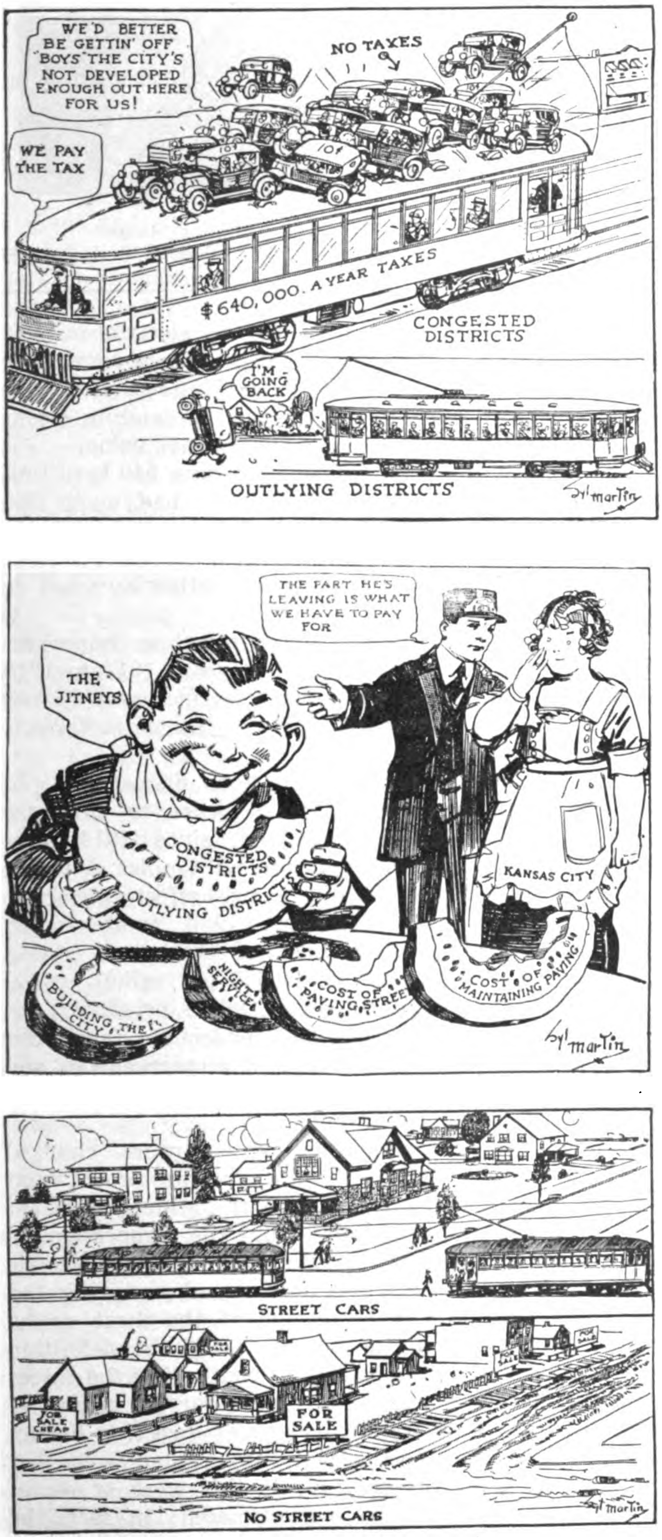
Some safety car operating figures show an increase in car-miles of 30 per cent, decrease in headways 30 to

37 per cent, and in actual saving of approximately $2,000 per year per car in power and platform costs.

The jitney competition will be met with the safety car through its frequency and regularity of service and high speed.

Safety features can be stressed in contrast with the conditions under which the jitney operates, as well as the fact that it promised superior comfort in all weathers and temperatures.

Public utility commissions and chambers of commerce can materially assist in keeping before the public the fact that prosperity to the railroad means better service to the public.


WE'D BETTER BE GETTIN' OFF BOYS THE CITY'S NOT DEVELOPED ENOUGH OUT HERE FOR US!
NO TAXES
WE PAY THE TAX
10¢
10¢
$640,000. A YEAR TAXES
CONGESTED DISTRICTS
I'M GOING BACK
OUTLYING DISTRICTS
Syl martin
THE PART HE'S LEAVING IS WHAT WE HAVE TO PAY FOR
THE JITNEYS
CONGESTED DISTRICTS
OUTLYING DISTRICTS
KANSAS CITY
BUILDING THE CITY
NIGHT SERVICE
COST OF PAVING STREETS
COST OF MAINTAINING PAVING
Syl martin
STREET CARS
FOR SALE CHEAP
FOR SALE
NO STREET CARS
Syl martin

TYPICAL CARTOONS PRESENTED BY THE COMMITTEE ON MERCHANDISING TRANSPORTATION

Company representatives should have membership in Kiwanis clubs, Rotary clubs, employers' organizations and business men's organizations.

Hotels, department stores and steam railroad stations can be utilized in various ways to merchandise transportation, a particularly effective method being the placing of pocket schedules in information booths or maps showing car routings.

The committee in conclusion expresses the belief that while it is probable that all of the recommendations cannot be carried out on all lines, some of the suggestions made are suitable to every railway system and that the sale of good service can be increased if a scientific effort is made along these lines. The committee which presented the report consisted of F. G. Buffe, chairman; W. J. Flickinger, W. H. Boyce, F. R. Coates, M. B. Lambert, A. Stuart Pratt, S. L. Vaughan, B. W. Frauenthal, A. L. Kempster and Joseph H. Alexander.

After the report on merchandising transportation was concluded, a motion-picture film, prepared by the Kansas City Railways under Mr. Buffe's direction, was shown to the meeting. The film had just been completed and this was its first exhibition. It was made for the purpose of informing the residents of Kansas City, Mo., and Kansas City, Kan., on the great plant and investment, with which the public has little knowledge, required to furnish transportation. The picture was well received by the delegates, many of whom gained therefrom a new idea of how the public can be approached in a manner both interesting to it and valuable to the utility.

L. H. Palmer, Baltimore, reported for the committee appointed to consider the suggestion made earlier in the convention for co-operation of this association with the Claims Association in appointing a joint committee to work with the National Safety Council. The committee recommended the appointment of such a committee and that the association become a member of the National Safety Council. These recommendations were adopted.

J. P. Barnes, chairman committee on resolutions, presented a resolution thanking the officers and committee members for efficient work performed by them during the past year.

OFFICERS FOR THE ENSUING YEAR

J. N. Shannahan then read the report of the nominating committee, which was as follows:

President, R. P. Stevens, president Republic Engineers, Inc., New York, N. Y.

First vice-president, L. H. Palmer, assistant to the president United Railways & Electric Company, Baltimore, Md.

Second vice-president, Garrett T. Seely, vice-president and general manager Pennsylvania-Ohio Electric Company, Youngstown, Ohio.

Third vice-president, J. K. Punderford, vice-president the Connecticut Company, New Haven, Conn.

Executive committee: G. H. Clifford, Fort Worth, Tex.; A. Gaboury, Montreal, Canada; T. C. Cherry, Syracuse, N. Y.; and J. V. Sullivan, Chicago.

President Collins expressed his sincere appreciation of the prompt and efficient co-operation given him by the members all the year. The meeting then adjourned *sine die.*

Engineering Association Proceedings

E. R. HILL
Retiring President

Outstanding Features of the Convention of the Engineers Were Addresses on the Proposed "Super-Power System," by W. S. Murray, and on the Problems of Heavy Electric Traction, by A. H. Armstrong. The Safety Car Was Considered Jointly with the Transportation Men. Committee Reports Were of High Quality

W. G. GOVE
President-Elect

THE Engineering Association opened its meeting on Oct. 11 with an address by President E. R. Hill, which was in part as follows:

"In some respects the past year has been uneventful, in that no sensational development either at home or abroad has occurred to disturb, broadly speaking, the normal activities of the country. The year, however, has been a very important one in the history of the country and of the electric railway industry, as it has marked the climax of many of the unhealthful influences which followed the war and were the direct result of it. Among these are low efficiency and high cost of labor in industry, resulting in high prices of materials and products, high cost of living and a tendency toward gross extravagance and waste on the part of a large proportion of the American people.

"To illustrate: Since 1914 the average advance in cost of building material has been 126 per cent, machinery 75 to 100 per cent, railway equipment such as cars and locomotives 87 per cent and foodstuffs 110 per cent. The advance in the cost of living has been estimated by responsible authorities at from 95 to 130 per cent, while wages of skilled and unskilled labor have advanced respectively 119 and 110 per cent. On top of all this, according to the testimony of large employers, the efficiency of labor has seriously declined, in some cases being put as low as 50 per cent.

"It has now become obvious, however, that the climax has at last been reached and that a decline in prices of materials and products has set in and will not stop until all costs, including the very important item of labor, have reached a reasonable, stable and thrifty level. Doubtless the decline will not bring us back to conditions prior to 1914, certainly not for a long time to come, but we shall presently reach a point where the value of the dollar, the rate of interest charged on loans and the efficiency of labor of all kinds will be such that business can be carried on in a normal, constructive and profitable manner.

"Specifically applying war and post-war conditions to the electric railway industry, it is worth our while to look for a moment away from purely engineering matters and to note some of the conditions that confront the properties in which we are interested. The following outstanding facts and figures are convincing:

"(a) As to the magnitude of the electric railway industry: At the beginning of the war there were some 963 electric railway companies in the United States, with a total trackage of 44,000 miles and outstanding stocks and bonds of more than $5,035,000,000 par value.

"(b) Fares on electric railways in some 540 localities, representing a population of 38,000,000, had, up to Oct. 1, 1920, been increased by 1 to 5 cents, the average increase being of the order of 40 per cent. Other lines serving perhaps an equally large population have had no increase in fares.

"(c) Operating revenues of twenty-three important electric railway systems in the five years 1914 to 1919 increased 27 per cent, while expenses increased 56 per cent in the same period and the net income suffered a decrease in 72 per cent.

"(d) Abandoned service and lines dismantled and junked, either of necessity or in order to minimize losses and keep afloat financially, since 1914 have occurred in 130 cases, aggregating 1,226 miles of track.

"(e) Receiverships and foreclosures affecting electric railway properties as of August, 1920, numbered 88 cases, representing 5,160 miles of track and stocks and bonds aggregating $759,162,625 par value.

"The situation indicated above, while primarily due to increased cost of service and inadequate fares, has also been affected by competition of motor vehicles and the general condition of the securities market and the prevailing high rates of interest.

"We are, as an association of engineers, charged chiefly with the solution of engineering problems; what can we accomplish either through our engineering talent or otherwise toward establishing the properties in which we are individually interested and the electric railway industry as a whole on a sound, enduring and profitable basis and make it one of the most useful public institutions in the country? If the definition that 'engineering is the science of controlling the forces and utilizing the materials of nature for the benefit of man and the art of organizing and of directing human activities in connection therewith' is accepted as correct, the importance of the engineer in this work of reconstruction can scarcely be overestimated; in fact, the scope of his work becomes vastly broader than most of us have usually been accustomed to think.

"Both as individual engineer and as an association I think we can do much to bring about this greatly desired result:

"1. We can offset by engineering skill some of the losses and high costs of operation by developing or applying more efficient and economical appliances and methods which will result in lower cost of service; for example, the reduction in the cost of electric power by adopting special fuels, the consolidation of power plants, the purchase of power in bulk and shutting down of obsolete plants, and the use of automatic machinery and devices; subjects of this character have been treated by our committees and will be reported on during the convention.

"2. We can employ improved types of construction materials and apparatus in connection with new work and can follow best established practices and adopt the highest standards. The work of our committees toward standardization is in line with this suggestion.

"3 We can adopt improved methods of maintenance of plant and equipment which will not only reduce the cost but will raise the standard of maintenance. To this end each committee this year has been assigned and will report on a subject dealing with maintenance methods and practices in its field.

"4. We can develop and recommend types of equipment, such as cars and stations, and methods of operation that conduce to public comfort and convenience, thus rendering the service more attractive, increasing the travel and adding to the revenue. The importance of pleasing the public is greater now than ever before in the history of the industry.

"5. We can be well balanced and comprehensive in our point of view and learn to weigh every question from all angles, thus striking a happy medium between progressiveness and conservatism; too much conservatism has hurt many a good property and too radical an attack has sometimes killed a good engineering project before its real merits were understood or appreciated.

"6. Lastly, we can be optimists. There is little use for a pessimist in any line of business. Some one has truly said, 'What the world needs is not more of us but a better brand of us,' and optimism improves the brand. If we can have the courage of our convictions, put product ahead of policy or politics and see the bright side of life and better times ahead, we will keep in condition to do our best work and accomplish the largest results.

"I feel that the Association is to be congratulated not only on its past achievements and the present excellent state of its affairs but especially on the broad field for activity that lies just before it and the as yet uncharted realm of opportunity that the future holds."

THE SECRETARY'S REPORT

Following the address by Mr. Hill, J. W. Welsh read the report of Secretary-Treasurer E. B. Burritt. The latter stated that as a result of the inclusion of manufacturers in the association a full personnel in all committees was provided. In view of the fact that reports must be in the hands of the standards committee early, it is desirable that the secretary have them by June 1, and to that end committees should be appointed immediately after the convention. As an indication of the scope of committee activities he stated that a total of eighteen days of committee meetings has been held, an average of three for each committee. Seven data sheets had been sent out for the following committees: Way, two; power generation, two; equipment, two; and buildings and structures, one. Further, President Hill had secured the approval of the executive committee for application for representation on the American engineering standards committee by one member at present, corresponding to annual dues of $500. During the year the subject of maintenance practices and life of wearing parts had been assigned for consideration by all committees. The prices of the Engineering Manual have also been increased from $2 to $3.50, complete, to members, and the binders, to all, from $1.50 to $2. To non-members the price remains $5 complete.

Early in the year a code of instruction was sent to all members of all committees. Later, in order to permit committee work to start early next year, a letter was sent to executives of member companies asking for suggestions and a large number were received. Early in July a nominating committee was appointed as follows: F. R. Phillips, J. H. Hanna, C. R. Harte, J. H. Libbey, and N. B. Trist. [This committee reported the following nominations as required by the constitution: For president, W. G. Gove; for first vice-president, C. L. Cadle; for second vice-president, C. S. Kimball; for third vice-president, C. F. Bedwell; for secretary-treasurer, E. B. Burritt; for members of executive committee, H. A. Johnson, L. C. Datz, E. H. Scofield, A. B. Stitzer.—EDS.] Finally Mr. Burritt reported the individual membership in the association as 544 and the company section membership as 769.

Next, President Hill appointed as a committee on resolutions C. W. Stocks, F. R. Phillips and J. C. Thirlwall. The report of the way committee was then presented by R. C. Cram. An abstract follows:

WAY MATTERS

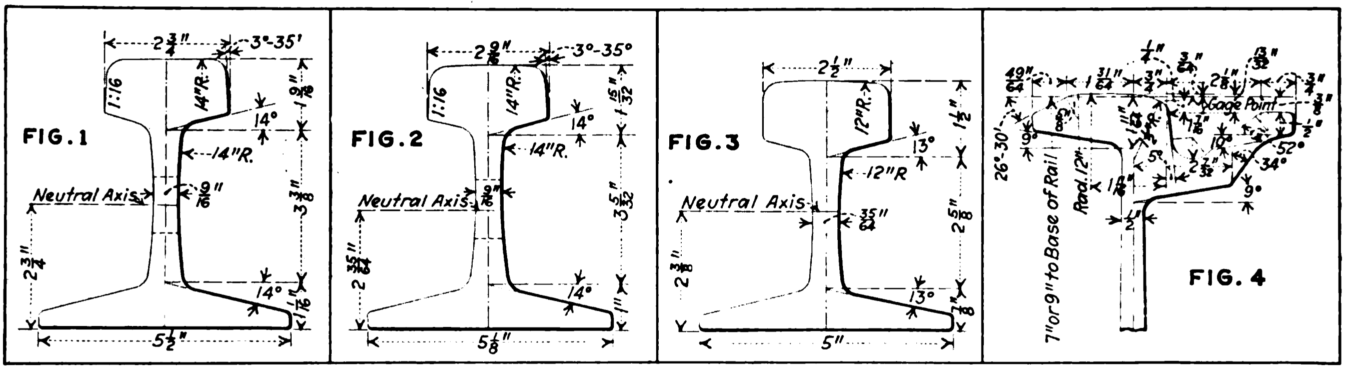
In presenting the report of the committee on way matters the chairman called attention to the increase in membership of the committee and to the size of the report which is due to the nature of the subjects and to the large number of revisions in Engineering Manual data proposed. The stoppage of committee work during the war has heretofore prevented presentation of the accumulation of revisions needed as time elapses and experience requires.

The most important two subjects covered are a recommended system of uniform track spirals and curved heads for the Association standard girder grooved rails. The report presented a uniform system of spirals for adoption, completing the work begun last year. It included all necessary engineering data, together with instructions for use. It is believed to be a big step forward in the Association's efforts to secure maintenance economies. A suggestion was made that the work be continued with the view to standardizing track-center distances and branch-off frogs as a means toward greater economies in costs of special trackwork.

A standard design of curved head placed upon existing association standard girder grooved rails was proposed. The design is one already in use and calls for no new rolls for the rails. This subject was treated exhaustively and illustrations given which help to explain the text. There are about 150 miles of single track in the United States laid with rails having curved heads. The committee inspected installations in several cities and the engineers visited all agreed that the curved head is of great benefit. The curved-head design has not prevented corrugation but has extended the time required for its formation. The committee on equipment concurs with the way committee in the design recommended.

The subject of progress made in rail joints was too broad to be covered in the time available. The committee believes that the association should undertake a test of all types of welded joints, working in co-operation with the United States Bureau of Standards. Unfortunately no funds are available for this kind of research work. The belief was expressed that the application of the arc-weld joint should not be taken up generally until more is known as to its performance in extended service.

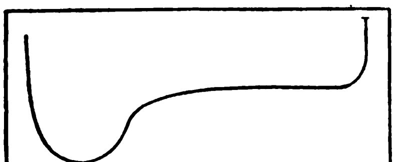
A revised specification for plain bolted special trackwork was submitted. Considerable existing matter was withdrawn and the revisions cover use of American Railway Engineering Association standards for split-switch design, fixtures and spring rail frogs. This should lead to a considerable saving through use of common standards.



FIGS. 1, 2 AND 3—STANDARD T-RAIL SECTIONS, 100 LB., 80 LB., 90 LB. FIG. 4—STANDARD DESIGN FOR HEAD OF 7-IN. AND 9-IN. GIRDER GROOVED RAIL

Conferences were had with representatives of the American Wood Preservers' Association in reference to specifications for wood-block paving but no conclusions were reached and the subject was suggested for continuation.

Under review of existing standards and recommendations, some nine subjects were discussed and important changes proposed. Among these are changes in titles of the specifications for girder grooved rails; specifications for special trackwork; specifications for splice bars; rules for government of way department employees, and designs of plain girder and standard section rails. Three different rails are proposed for the latter in substitution for existing designs. A study of the use of substitute ties for tracks in streets is proposed as a subject for the ensuing committee's attention.



AT TOP, COMPOSITE DRAWING OF AVERAGE WORN WHEEL. AT BOTTOM, DEVELOPMENT OF CURVED CONTOUR OF STEEL WHEEL

The committee presented an abstract from the report of the American Society for Testing Materials for 1919 covering the proposed substitution of the so-called impression test for the existing drop test in the specifications for girder grooved and high T-rails. The committee discussed this with the representatives of the A. S. T. M. and with manufacturers' representatives. It appears that the proposed test does not provide a test for brittleness, which is considered necessary with the testing of girder rails. The committee was not prepared to report favorably or unfavorably and recommended further investigating by the ensuing committee along lines suggested in its report, one of which calls for the addition of a test which will provide a test for brittleness which can be used as a substitute for the drop test.

The committee recommended the use of the term "special trackwork" instead of the term "special work" now generally used in referring to parts of special track construction and proposes a new definition of special trackwork. The new definition was believed to be more indicative of the nature of special trackwork.

The presentation of reliable data on safe limits of wear in rails and special trackwork and on life of track construction was practically impossible. Records are not available. An interesting monograph on life of special trackwork by Victor Angerer was included in the appendix to the report. The committee recommended that the subject be discontinued.

There were, all told, twenty-eight recommendations submitted by the committee, fourteen of which call for changes in the Engineering Manual.

Mr. Cram then gave the reasons for the recommendations in his report, pointing out that the changes in rail sections were designed primarily to provide standards which were more readily obtainable from the rail mills. He also urged the investigation by the association of substitute ties, declaring that in some respects the electric railways were in a better position to use such ties than steam railroads.

President Hill then suggested that the recommendations of the way committee should be taken up and that those which affected standards should first be considered. The first subject considered was the recommendation on a uniform system of track spirals, which was approved. Following this, approval was given to the other recommendations of the committee in connection with standard 7-in. and 9-in. girder rails, plain bolted special trackwork and standard section rails, as well as the recommended changes in wording contained in the "summary of recommendations" appearing at the conclusion of the report. In connection with these changes in standards, Mr. Cram explained that they had received the approval of the manufacturer members of the committee, and in the discussion Messrs. Angerer, Alden and Entwisle, speaking for the manufacturers, explained the benefit which would be derived from the proposed changes. At the conclusion of this portion of the discussion a vote of thanks was extended to the committee, H. H. Adams adding that in his opinion the work had been done in a very thorough manner and would be of great benefit to the association.

Charles H. Clark, Cleveland, expressed the opinion that it is impossible to go very far in standardization of crossing frogs, because it had been his experience that nearly every one needed had to be made special in order properly to meet the crossing angle requirements. But the body of delegates generally manifested a different opinion about this. The motion before the body to adopt the reinsuring recommendations of the committee was carried.

The report of the committee on buildings and structures was then presented by D. E. Crouse, chairman. The committee had made one definite recommendation as to the method of inspecting and maintaining bridges and making reports thereon, which had been placed before the standards committee for action. H. H. Adams reported for this committee that it recommended the association adopt the recommendation of the bridges and building committee as recommended practice. An abstract of the report follows:

BUILDINGS AND STRUCTURES

The committee on buildings and structures reported that bridge inspection and maintenance had been considered by it and as a result of its study and a digest of replies to a questionnaire the following outline was proposed: Bridges should be inspected by the track force daily, by a bridge foreman once a month and by the engineering department in conjunction with the bridge foreman semi-annually or annually. A suggested form for the monthly inspections formed a part of the report, and it was also recommended that the bridge foreman should make a monthly report summarizing the work done on structures. The committee recommended a continuation of the work on inspection and maintenance of buildings and structures.

The sub-committee on lag screws versus bolts in timber-decked structures attempted to find what the experience of steam roads had been in connection with the subject since 1918, but, due to the war, was unable to obtain many data and recommends a continuation of the work.

The sub-committee on fare collection at terminals obtained drawings and diagrams of all known methods. The post-payment method was found to have been discontinued. Three drawings were submitted showing forms of prepayment schemes now in use; turnstiles, change booth and coin box, and ticket booth and cancellation box. The turnstiles are in more general use, due to the requirement of only one attendant, but the other methods expedite the flow of traffic. The subcommittee proposed specific methods for the installation of a prepayment system and recommended such a system where the traffic density warrants its use. The suggestions submitted were as follows: When a prepayment scheme is to be designed for an industrial plant, an effort should be made to anticipate traffic and loading conditions by conferring with plant officials. An attempt should be made to concentrate the load at a minimum number of points, but sufficient track room should be available to reduce the loading time to a minimum. In all runways there should be sufficient reservoir capacity to permit an even flow of traffic. The plant employees should be utilized in handling gates and turnstiles during peak hours. Due consideration should also be given to the storage of cars, as often the prepayment loading point is the train terminal.

The committee report contained an appendix by D. W. Smith covering the use of lag screws in trestle construction, with drawings and data. The committee recommended that its work be continued.

The report was signed by D. E. Crouse, chairman; G. P. Legare, B. R. Brown, E. D. Smith, James Link, J. R. McKay, E. H. Berry, S. J. Steiner and R. C. Bird.

Martin Schreiber in discussing the committee report spoke of the economy of maintaining building structures, saying of the many different ways brought up as to how best to carry on this work that there was no plan which worked so well as to execute the small amount of maintenance work necessary each year. He believed that when the small repairs are deferred, the expense of doing it ultimately is far greater, for, once deterioration is started, it advances with great rapidity. He also expressed the thought that it would have been well for the committee to have carried this investigation a little further to include waiting rooms, shelters, etc., which are necessary as soon as a company begins the use of prepayment terminals. He suggested that next year's committee might take this up.

R. C. Cram called particular attention to the form of report included in the committee's work for use in reporting to state commissions and similar bodies. He thought that this was an important thing, for many public bodies are very particular about the form of reporting and insist on promptness as well. He urged railway men to be very particular to have all bridges used by them inspected by their own men whether the company was responsible for this inspection or not. He thought that it was well to do this to protect the company's interest with the public, for a bridge failure resulting in serious accident was very difficult to explain away even though some one other than the company was responsible.

The recommendation of the standards committee and the report of the committee on building and structures as a whole were adopted.

Tuesday's Session

The first part of the meeting of the Engineering Association Tuesday afternoon was taken up by a joint session with the Transportation & Traffic Association.

The engineers met at 4.30 Wednesday afternoon at the conclusion of the joint session of the Transportation & Traffic Association to hear a paper by E. P. F. McCall, storekeeper South Side Elevated Railroad, Chicago, but unfortunately neither Mr. McCall nor his paper was present, so this had to be postponed until Thursday.

The attention of the meeting was then directed by President Hill to the appointment of a standing committee on purchasing and storekeeping. This was discussed briefly by several delegates and was brought to a head by J. H. Hanna, who moved that a recommendation be made to the executive committee that such a standing committee be appointed. This motion was carried after a discussion in which it was brought out that there had been a movement heretofore to organize a separate association of purchasing agents and storekeepers, which was not wanted, but that the formation of such a standing committee was highly desirable. It was also brought out that the personnel of this committee should be composed of representatives of both small and large properties, for the practices used in the storekeeping departments of large properties are not applicable at all on small properties. The meeting then adjourned.

Wednesday's Session

At the third session of the Engineering Association held Wednesday afternoon reports of the committees on power distribution, power generation and the national electrical safety code were presented. The report of the committee on power distribution was read by Charles Rufus Harte, chairman. This was principally a report of progress and is abstracted below. The specifications and form of contract for electrical conduit construction which formed a part of this report were approved for publication in the Engineering Manual under miscellaneous practices.

POWER DISTRIBUTION

The committee on power distribution reported regarding seven subjects as follows: Revision of overhead line specifications, crossing specifications and specifications for catenary line construction, standard stranding of cables, standard threads on pins and insulators, electrical conduit construction and standard wires and cables.

The report stated that the sub-committee on overhead line material had continued the work begun in 1917 and recommended further study of the subject, and the sub-committee on overhead line crossings recommended that a joint committee of the Engineering Association, the American Railroad Association and the American Railway Engineering Association study this subject. The latter sub-committee presents fourteen points for the consideration of this joint committee in connection with the existing specifications.

No material was presented by the sub-committee on catenary line construction, but the sub-committee on standard stranding of cables submitted a very complete set of specifications and a complete stranding table which it recommended for acceptance as standard only after they are adopted by the American Institute of Electrical Engineers, which was largely instrumental in developing the subject.

The sub-committee on specifications for standard threads for pins and insulators found that there was a growing tendency toward the use of cemented metal pins, so that the importance of thread accuracy is decreasing. It found that no trouble was experienced with the pins and insulators furnished by reputable dealers. In view of these facts the committee recommended standards along general lines.

The sub-committee on conduit specifications and contract forms recommended the appointment of a joint committee representing the various associations to prepare standard contract forms and specifications. It presented some charts and drawings showing manhole and conduit construction.

The sub-committee on specifications for wires and cables reported that it had carried on the revision of the existing specifications in an attempt to treat the subject as a whole rather than in sections. Five of the seven items included have been recommended for adoption as standard.

The committee stated that it was unable to obtain satisfactory data on the subject of safe limit of wear on trolley wire, frogs, life of insulators, life of cable insulation, etc., and reported progress, with a recommendation that the work be continued.

TABLE I—PROPOSED STANDARD CABLES

Number and size *	Individual Strands Nominal Diameter Mils	Individual Strands Nominal Cross Section Circ. Mils	Total Nominal Cross Section Circ. Mils	Total Diameter Inches
127—No. 8	128.5	16,510	2,097,000	1.671
127—No. 9	114.4	13,090	1,662,000	1.487
91—No. 8	128.5	16,510	1,502,000	1.414
91—No. 9	114.4	13,090	1,191,000	1.258
61—No. 8	128.5	16,510	1,007,000	1.157
61—121 mils	121.0	14,641	893,100	1.089
61—No. 9	114.4	13,090	798,500	1.030
61—107 mils	107.0	11,449	698,400	.963
61—No. 10	101.9	10,380	633,200	.917
37—116 mils	116.0	13,456	497,900	.812
37—No. 10	101.9	10,380	384,100	.713
37—97 mils	97.0	9,409	348,100	.679
37—No. 11	90.74	8,234	304,700	.635
19—No. 9	114.4	13,090	248,700	.572
19—107 mils	107.0	11,449	217,500	.535
19—No. 11	90.74	8,234	156,400	.454
19—No. 12	80.81	6,530	124,100	.404
19—No. 13	71.96	5,178	98,380	.360
19—No. 14	64.08	4,107	78,030	.320
7—No. 10	101.9	10,380	72,660	.306
7—No. 11	90.74	8,234	57,640	.272
7—No. 12	80.81	6,530	45,710	.242
7—No. 14	64.08	4,107	28,750	.192
7—No. 16	50.82	2,583	18,080	.152
7—No. 18	40.30	1,624	11,370	.121
7—No. 20	31.96	1,022	7,154	.096
7—No. 22	25.35	642.4	4,497	.076
7—No. 24	20.10	404.0	2,828	.060

*—Sizes are expressed as A. W. G. gage numbers except where diameters are given in mils.

The report was signed by Charles Rufus Harte, chairman; C. C. Beck, J. H. Drew, R. W. Eaton, H. H. Febrey, C. J. Hixson, C. H. Jones, J. H. Libbey, F. McVittie, M. B. Rosevear, W. Schaake and A. Schlesinger.

POWER GENERATION

The report of the committee on power generation was presented by C. A. Greenidge, chief engineer J. G. White Management Corporation, in the absence of A. B. Stitzer, chairman of this committee.

TABLE III—PROPOSED STRANDING—FLEXIBLE CABLES

Nearest A. W. G. Size	Cross Section Circ. Mils.	Diameter of Cable Mils.	No. of Wires	Size of Each Wire A. W. G.	Size of Each Wire Diameter	Construction
....	2,039,000	1,885	703	15.5	53.9	37 x 19
....	1,816,000	1,779	703	16.0	50.8	37 x 19
....	1,617,000	1,679	703	16.5	48.0	37 x 19
....	1,440,000	1,584	703	17.0	45.3	37 x 19
....	1,284,000	1,496	703	17.5	42.7	37 x 19
....	1,103,000	1,372	427	16.0	50.8	61 x 7
....	874,600	1,222	427	17.0	45.3	61 x 7
....	693,600	1,088	427	18.0	40.3	61 x 7
....	550,000	969	427	19.0	35.9	61 x 7
....	436,200	863	427	20.0	32.0	61 x 7
....	345,900	768	427	21.0	28.5	61 x 7
....	274,300	684	427	22.0	25.3	61 x 7
....	264,600	671	259	20.0	32.0	37 x 7
0000	209,800	598	259	21.0	28.5	37 x 7
000	171,300	538	133	19.0	35.9	19 x 7
00	135,900	479	133	20.0	32.0	19 x 7
0	107,700	427	133	21.0	28.5	19 x 7
1	82,780	332	91	20.5	30.2	Concentric
2	65,650	295	91	21.5	26.9	Concentric
3	52,060	263	91	22.5	23.9	Concentric
4	39,190	228	61	22.0	25.3	Concentric
5	31,080	203	61	23.0	22.6	Concentric
6	24,650	181	61	24.0	20.1	Concentric
8	17,410	152	61	25.5	16.9	Concentric
10	10,560	118	37	25.5	16.9	Concentric
12	6,640	94	37	27.5	13.4	Concentric
14	4,176	74	37	29.5	10.6	Concentric
Smaller	......	......	To equal required size	30.0	....	Bunched

TABLE II—PROPOSED STRANDING—CONCENTRIC LAY CABLES

Size (See Note 1)		Number of Wires (See Note 2) A Bare Insulated or Weatherproof Cables for Aerial Use	B Insulated for Other Than Aerial Use
2.0 circular inches	1,013	91	127
1.5 circular inches	760	61	91
1.0 circular inches	507	61	61
0.6 circular inches	304	37	61
0.5 circular inches	253	37	37
0.4 circular inches	203	19	37
0000 A. W. G	107	19 or 7 (See note 3)	19
00 A. W. G	67.4	7	19
2 A. W. G	33.6	7	7
7 and smaller	10.5	....	7

NOTE 1.—For intermediate sizes use stranding for next larger size.

NOTE 2.—Conductors of 0000 A. W. G and smaller are often made solid and this table of stranding should not be interpreted as excluding this practice.

NOTE 3.—Class A cable sizes 0000 and 000 A. W. G. is usually made of seven strands when bare and nineteen strands when insulated or weatherproof.

The subjects considered by the committee on power generation this year were as follows: Form of power contract for the purchase of power, comparative cost of steam production in power plants using coal, oil, gas or other fuels, statistics of cost of power generated by member companies. These subjects were handled by sub-committees and the results were presented in detail by means of tables and charts.

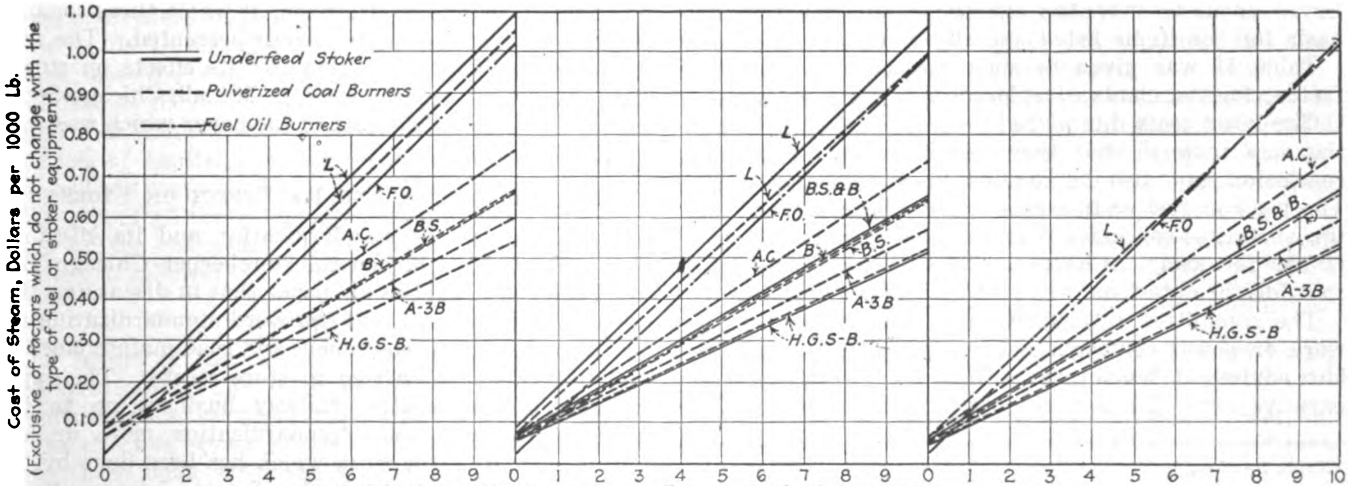
The form of power contract recommended covers the subject in detail and may be modified to suit particular conditions. The contract deals with demand and demand charges and also contains a clause which considers the effect of power factor on charges to be made. A coal clause is incorporated in the section covering the energy charge. The committee comments on each clause of the proposed contract and outlines its reasons for the wording of the clauses.

W. S. Finlay, Jr., submitted the main paper on the comparative costs of steam production in power plants using various fuels. In order to limit the scope of the subject to reasonable bounds, a medium-sized boiler plant was assumed, with equipment of known characteristics and operating under certain fixed conditions. The costs and comparisons were compiled from the results of a questionnaire sent to manufacturers and member companies. The sub-committee on that subject found that the status of chain grates and overfeed stokers was unchanged during recent years, but that the underfeed stoker had developed rapidly. The sub-committee maintains that the underfeed stoker holds the premier position in power service, but that modern developments and increased labor costs make it imperative that the stoker manufacturers develop the stoker as a system rather than as a mechanical unit, *i.e.*, coal-handling apparatus and methods must be included.

The committee discussed the use of pulverized fuel and incorporated written statements received from manufacturers. It appeared that there is no decided difference in the commercial success of a good stoker plant and a good pulverized-coal plant when all elements of cost are considered. The pulverized-fuel equipment cannot be used on an economic basis in small plants having a capacity of less than about 2,000 b.hp. From an operating standpoint the pulverized-fuel plant presents many advantages in regard to cleanliness, possibility of using low-grade fuel, standby savings and sanitation, but great care is required to avoid slagging troubles when high boiler ratings are desired. The pulverized fuel permits a higher combustion temperature, but it appears that a better adaptation of the boiler and furnace must be made to utilize fully this increased temperature and to avoid slagging.

The question as to the civic nuisance caused by ash dust from the stacks of plants using pulverized fuel was raised by the committee for discussion. It seemed to the committee undesirable to change a modern stoker plant to a pulverized-fuel plant, but pulverized fuel should be considered on its merits in remodeling an old plant or when installing a new plant.

In discussing oil Mr. Finlay stated that the situation today is that oil is a local fuel in so far as the general power situation is concerned. H. P. Bell stated that even in California the increasing price and decreasing production of oil is causing the development



PLANT DESIGNED FOR MAXIMUM BOILER RATING OF 100 PER CENT. YEARLY OUTPUT 1,022,000,000 LB. OF STEAM NET, LOAD FACTOR 50 PER CENT

PLANT DESIGNED FOR MAXIMUM BOILER RATING OF 200 PER CENT. YEARLY OUTPUT 2,044,000,000 LB. OF STEAM NET, LOAD FACTOR 50 PER CENT

PLANT DESIGNED FOR MAXIMUM BOILER RATING OF 300 PER CENT. YEARLY OUTPUT 3,066,000,000 LB. OF STEAM NET, LOAD FACTOR 50 PER CENT

DIAGRAMS FOR USE IN COMPARING COST OF STOKER EQUIPMENT AND FUEL

Boiler Equipment 12,600-hp., inclined header, longitudinal-drum, B. & W. boilers, 21 tubes wide and 14 tubes high, with no superheater; baffling, three vertical passes, steam pressure 200 lb. gage, feed-water temperature 200 deg. F.

Fuels: A 3 B, anthracite coal No. 3 buckwheat; A C, anthracite culm; L, lignite; B S, bituminous slack; H G S B, high grade semi-bituminous; B, bituminous; F O, fuel oil.

Cost Factors Included—The costs do not include factors which are the same for all classes of fuel and fuel-burning equipment, such as cost of boilers, buildings, etc. The cost of auxiliary power is included by assuming that 1 kw.-hr. requires 1.75 lb. of coal or 1.3 lb. of oil.

of hydro-electric power as a relief measure, and the trend is to use oil only on the peaks, in low-water periods and under emergency conditions.

The committee briefly discussed colloidal fuel and gas also, but considered them unavailable for general power purposes. The colloidal fuel promises good results, but gas is limited to auxiliary and emergency service.

The report contained statements from manufacturers which outline the developments made in stoker equipment, in pulverized-coal equipment and in oil-burning equipment.

In comparing costs, an assumed plant was considered with assumed conditions of operation. Twelve 600-hp. B. & W. boilers without superheaters, 200 lb. steam pressure, 200 deg. Fahr. feed-water temperature, 50 per cent load factor, a load curve and three maximum loads were features of the hypothetical plant. At 100, 200 and 300 per cent boiler rating the weights of steam produced per day were assumed to be 2,800,000, 5,600,000 and 8,400,000 lb. respectively.

A chart was prepared as a result of the comparisons, covering all items which would be taken into consideration when comparing various types of fuels and fuel-burning equipments. This is reproduced herewith.

In a summary the sub-committee drew only general conclusions, but stated that the graph will provide data that may be applied to a particular case.

Underfeed stokers, the committee reported, will hold their own where high-grade bituminous or semi-bituminous coal can be obtained and the pulverized-fuel burning equipment will yield a saving where low-grade fuels are available. They will become more and more important, due to the increasing scarcity of high-grade fuel.

The sub-committee on the analysis of power plant costs had available complete data from eleven plants operating under nearly the same conditions and ranging in size from 7,250 kw. to 50,000 kw. Operating expenses were considered on a five-year basis under the headings of labor, fuel, lubricants, water and miscellaneous power plant supplies and maintenance. Table I was given to show the average costs on a five-year basis for the items listed and the total operating cost.

Table II was given to show the outputs and load factors for the plants considered on a five-year basis.

The labor costs diminished only slightly in 1919 and the data indicate that they will increase. The same conclusion can also be applied to maintenance costs. The peak in fuel costs seems to have been reached and the committee concluded that the peak in operating costs is not far away. Charts and tables were submitted showing the data from which the tables are derived.

The committee recommended a continuation of the work on power contracts and statistics on power costs, but advised a temporary cessation of work on comparative costs of steam production using various fuels.

TABLE I—POWER GENERATION COST DATA OVER A FIVE-YEAR PERIOD

	1915	1916	1917	1918	1919
Labor:					
Cost per kilowatt-hour, cent	0.12	0.12	0.122	0.164	0.188
Relative cost compared to 1915, per cent	100	100	102	137	157
Fuel:					
Cost per kilowatt-hour, cent	0.375	0.375	0.573	0.672	0.675
Relative cost compared to 1915, per cent	100	100	153	179	180
Water, lubricants, etc.:					
Cost per kilowatt-hour, cent	0.28	0.28	0.28	0.26	0.31
Relative cost compared to 1915, per cent	100	100	100	93	111
Maintenance:					
Cost per kilowatt-hour, cent	0.049	0.044	0.061	0.096	0.104
Relative cost compared to 1915, per cent	100	90	125	196	212
Total operation:					
Cost per kilowatt-hour, cent	0.572	0.567	0.784	0.958	0.998
Relative cost compared to 1915, per cent	100	99	135	167	174

TABLE II—POWER-PLANT OUTPUTS AND LOAD FACTORS OVER A FIVE-YEAR PERIOD

	1915	1916	1917	1918	1919
Output in kilowatt-hour	52,500,000	61,700,000	70,200,000	74,000,000	79,000,000
Relative changes in outputs compared to 1915, per cent	100	118	134	141	150
Load factor, per cent	41.4	41.9	44.6	43.1	46

The report was signed by A. B. Stitzer, chairman; E. H. Scofield, C. W. DeForest, N. A. Carle, W. C. Slade, H. P. Bell, F. A. Scheffler, F. C. Hanker, A. H. Kruesi, W. S. Finlay, Jr., H. E. Davis and C. A. Greenidge.

In the discussion of this report N. A. Carle, chief engineer Public Service Electric Company, Newark, N. J., said in regard to the question of pulverized fuel that he is a firm believer in its use and he sees a largely increased field for it and believes that the burning of coal will in the future be as a pulverized substance. A. T. Perkins, manager for the receiver of the United Railways Company of St. Louis, said that he had a number of minor comments on the form of power contract which is a part of this report and these will be submitted in writing to the committee for their action. E. R. Hill, president of the Engineering Association, said that in regard to the time interval for demand readings that he suggested that a blank space be left in the form of contract so that this could be inserted by users as conditions warranted. The report was accepted and was referred to the committee for the ensuing year for further consideration and report.

C. A. Greenidge read the report of the committee on National Electrical Safety Code in the absence of J. H. Libbey, chairman. It was a brief progress report. The delegates then adjourned to meet in the Greek Temple and listen to an address on "Our Proposed National Power Policy," by W. S. Murray, chairman Super-power Survey U. S. Geological Survey. An abstract of this address is given in another part of this paper.

Thursday's Session

The closing session of the Engineering Association was held on Thursday afternoon, at which three committee reports and two papers were presented. The first paper was on standardization and its effects on stores. This paper was prepared by P. F. McCall, Chicago South Side Railroad. An abstract of the paper which was read by J. W. Welsh follows:

STANDARDIZATION AND ITS EFFECT ON STORES

On the subject of standardization and its effect on stores, P. F. McCall, general storekeeper Chicago Elevated Railroads, said in his paper that in discussing this topic he had assumed that the word standardization refers to such parts of equipment and road maintenance as applies to material carried in store stocks. The rapid progress of the electric railway business up to the present time has made standardization more or less difficult, but, with the work which has been done by the several associations, standards of materials are being given the attention they deserve.

Mr. McCall referred to the consolidation, some eight or nine years ago, of the properties with which he is connected. Upon acquiring the various stores he found a large assortment of similar rolling-stock materials, each of which had a slight difference which would not permit of exchange from one equipment to another. This was equally true with a certain amount of maintenance-of-way materials. It soon became evident that with certain changes a single standard covering all properties could be had on a great many items. Sometimes this necessitated a slight change in design, or merely a reduction or addition in measurement, and, as these items were brought to the attention of the engineering department, an attempt was made to standardize. Work along this line was soon reflected on the stores stocks, as where it was previously necessary, in some cases, to carry four items for certain equipment parts this stock was reduced to one standard.

In acquiring new equipment certain standards were maintained, and where this could be done the numbers of items to be carried in stock were reduced. It was found necessary to carry a larger supply of the same item, but multiplicity of parts carried were brought to a minimum.

Mr. McCall said, further, that it goes without saying that where the numbers of parts carried are reduced the amount of capital invested is likewise reduced. Standardization helps to improve the method of keeping stores, as it is much easier to maintain a stock of standardized materials than it is to maintain a large assortment of materials for which standards have not been arrived at. Facility of supply is greatly improved by the adoption and maintenance of standards by various manufacturers throughout the country. The whole effect of standardization on stores is one of economy of materials and effort, and the further standardization of materials can be carried in harmony with progress of the electric railway business the more evident will that economy become.

To bring about such economy however, the writer did not advocate obsolescence of good serviceable equipment, but said that in acquiring additional equipment attention must necessarily be paid to standards now in existence or to standards which could be used in connection with present property.

Departure from existing standards should be seriously considered by all engineers as to effect on stores stocks and should only be permitted when it has been demonstrated that such a step means a greater benefit to all concerned. Mr. McCall concluded thus: "As I view it, the 'Litany of the Storekeeper' should include: Blessed are the engineers who bring about lasting standards, as they very materially aid in the facility of supply, reduction of stocks carried, with a subsequent reduction of capital invested, and help bring about a more orderly method of stores handling."

The report of the committee on equipment was presented by the chairman, Daniel Durie. An abstract of this report follows:

EQUIPMENT

The report of the committee on equipment covered eight subjects. Four were reports of investigations on helical gears, standard cars, life of wearing parts and the effect of severe weather conditions on car equipment; three dealt with the standardization of equipment parts, and one involved co-operation with the way committee on rail heads.

Previous standard designs of brake heads, brake shoes and keys were adopted by the Association in 1907 and were revised in 1916. This year's committee submitted revisions from previous standards for three brake heads, shoes and keys, two additional designs for brake heads, shoes and keys, one revision in design of limit gages for brake-head and shoe design, and one new design of limit gage.

The subject of the standardization of motor parts was carried over from last year and much work was done by this year's committee in an endeavor to decide on some definite parts that would permit of standardization, but no definite progress was made. The investigation of the committee indicated that motor manufacturers seemed to have a certain reluctance to agree on standard parts which the operating companies seemed to consider as most desirable to have standardized.

The third subject consisted of a report on the development and use of helical gears and may be summarized as follows: Prior to 1914 there was an effort made to reduce the destructive effects of vibration from railway motor gearing on locomotives and heavy multiple-unit equipments by the use of flexible gears. These involved high first cost and when they were considered for small motors, additional problems were presented due to the space limitations and excessive weight. During the latter part of 1914 an investigation of the railway gearing situation in the United States indicated the desirability of obtaining some better type of gearing for railway motors; first, to produce longer life, and, second, to reduce the destructive effects resulting from gear vibration.

Early in 1915 one manufacturer started tests on helical gearing for use in interurban service. The results obtained indicated that more extensive tests and investigations were warranted, and to obtain information on the numerous variables, helical gears were placed in city, interurban and electrified steam-road service. Gears were installed having a helix angle varying all the way from 5 to 23 deg. Early in 1919, after an analysis of the results obtained, this company adopted a 7½-deg. helix angle as standard for its equipments. Another manufacturer is supplying helical gears with an 8-deg. helix angle on equipments. It appears desirable that an effort should be made to induce all manufacturers to decide on the same helix angle.

When helical gearing was first introduced it was thought that its use might necessitate some special provision to care for end thrust. Numerous tests of end thrust on the equipments now in service, however, show that the existing designs are adequate and that no additional provisions are necessary.

To obtain information regarding results obtained in service from helical gearing the committee addressed a questionnaire to a number of railways operating this type of gearing. As a result of the information thus obtained the following conclusions are of interest:

First—There appears to be a decided reduction in gear noise and a reduction of vibration in favor of helical gearing and even with a worn condition of the bearings or pinions there appears to be an absence of noise with helical gearing.

Second—There appears to be no appreciable difference in the wear on the axle and armature bearings due to end thrust from helical gearing.

Third—The life obtained from helical gearing will undoubtedly be somewhat greater than that now obtained from spur gearing.

Up to Aug. 1 approximately 16,000 7½-deg. helical gears and pinions have been purchased for railway service on approximately 170 railways.

There are possibilities of very great complication if helical gearing with a variety of angles and forms of teeth is used, and a standardization of the helix angle and tooth forms is extremely desirable.

An investigation was made as to the feasibility of adopting a standard car design and the committee reported that it is not feasible at this time to design or adopt a standard car. There was a feeling, however, that there is a wide field of usefulness for such a car, but in order to have it generally adopted it would be necessary for the operating companies to accept general types of construction instead of insisting upon the incorporation of their individual ideas in the cars which they purchased.

The committee reported that it had co-operated with the way committee in preparing and sending out a questionnaire on rail heads to obtain information in assisting to decide on a standard design of girder rail head.

A report on the life of wearing parts gave the line of investigation which had been used by this year's committee and a summary of conclusions. This work was directed along two lines, first toward the determination of the class of information that would be of most benefit, and, second, toward formulating methods for obtaining and recording the data.

The life obtained from car equipment wearing parts was shown to vary widely in different localities due to local operating conditions, service requirements, weather conditions, age of equipment, maintenance methods, etc. The number of variables involved is so great that this year's committee considered it advisable to concentrate its efforts on the more essential parts. An attempt was made to choose a few of the most important wearing parts and to formulate a questionnaire for obtaining information.

As the motor is the prime mover of car equipment the committee decided to obtain information on the life of five essential motor parts, armature bearings, axle bearings, gears, pinions and carbon brushes.

The questionnaire was sent out to 110 railways in the United States and Canada, those that operate one hundred or more cars. The replies received were tabulated and analyzed, and while the tabulations are not included in the report, a bulletin has been prepared which the Association will furnish upon request.

As a result the committee found as follows:

1. The replies to the questionnaire indicate the advisability of continuing the study of the life of wearing parts of car equipment.
2. The general opinion of the committee is that the replies received are rather inconsistent, and in many cases misleading and possibly useless as far as containing information for comparisons of different operating companies. The committee therefore feels that sufficiently accurate and reliable information cannot be obtained through the use of the questionnaire method.
3. The variation in the life given for the same part under similar service conditions as indicated by the answers was very great. For example, the figures given for the life of 40-hp. motor armature bearings varied from 5,800 to 200,000 car-miles in city service.
4. It is evident that the conditions existing on the different properties, such as service requirements, types of rolling stock, character of roadway, grades, curves, climate conditions, age of equipment and maintenance methods, are vital factors in the life of wearing parts. To permit the reaching of reliable conclusions these conditions must be known and their effect considered.
5. It appears that many roads are not keeping reliable records, so that it is impossible for them to give information of value. Some of the answers received give the life of wearing parts as the total number of parts used during the year 1919 divided by the car-mileage made during that year. Manifestly this is not the correct life. In regard to the limits of wear it appears that this subject should be properly studied in connection with the life obtained. From some of the answers received it appears that by using some parts after their useful life has been exceeded, the life of other parts is often reduced. A careful analysis and study of reliable operating data should decide the limits of useful wear and should prove of much benefit to operating companies.

The committee recommended that the subject of the life of wearing parts of electric car equipment be followed up and information collected by the Association so as to be available to the member companies, and that the work be carried on during 1920 and 1921 by at least two men reporting to the equipment committee who are either operators or men who have had operating experience. The report made should be based on about a three-month field survey, during which time the men would visit at least ten or twelve properties.

This year's committee made a careful study of the existing standards as adopted by the Association, together with proposed standards which were referred back to it by the committee on standards at the beginning of the year. As a result of this study the committee recommended revisions in the dimensions and designs as follows:

(a) Dimensions for A.E.R.E.A. steel-wheel designs.
(b) Standard tread and flange contours for steel wheels.
(c) Limit of wear gage for flange ⅞ in. in thickness.
(d) Association standard journal boxes and brasses.
(e) Journal box and contained parts for 3¼-in. x 6-in. journal.
(f) Gages for journal bearings and wedges.
(g) Standard specifications Et 12A—Specifications for solid wrought carbon steel wheels for electric railway service.

The eighth subject was a report on the effect of severe weather conditions on car equipment. This year's committee sent out a questionnaire on the subject. From the replies the following among other conclusions were drawn:

Few electric railways have a definite snow-removal program, but it is evident that those which have outlined such a program and adhere to it receive much benefit. The answers received indicate that these companies have fewer equipment troubles than others.

Very few companies have a continuous snow condition. The general method seems to be to clear to the pavement between tracks in city districts and a few remove the snow from the outside areas.

It appears that a majority of railways have definite obligations regarding snow removal specified by the city, but that the cities through which they operate assume no obligations themselves.

Most railways remove snow with their own crews and very few contract for snow removal by carts or other vehicles.

In a few cases sewer manholes have been used on main streets to good advantage, and the general opinion seems to be that it is very desirable to use sewers where they are of sufficient capacity and when the consent for their use can be obtained readily.

Difficulties with frost lifting of track or pavement are quite general and an apparently satisfactory method of reducing this appears to be through maintaining good drainage, cementing the pavement in where possible, and sealing the pavement to the rail to prevent water getting in.

Very few railways have taken any measures to keep traffic off the tracks in winter. In most sections this appears to be entirely impossible. There are a few places, however, where city ordinances prohibit vehicles running on the rails during snow periods, and in some sections troubles are reduced by urging co-operation with drivers of teams, automobiles, motor trucks, etc.

The use of salt seems to be quite general for keeping spring switches open, but with an accumulation of snow it is necessary to use broom and shovel in addition. Outside of the use of salt for switches it is used very sparingly at the other points.

The principal types of snow-fighting equipment used by electric railways consist of wing plows, spreader plows, machine plows, push plows, pilot plows, flangers, drags, ice cutters and snow sweepers.

Sweepers are used quite generally and to good advantage for light snow and for city work. Plows appear to have some advantage for deep snow and opening up suburban lines.

Very little attention has been given to developing apparatus for cutting ice from between rails. This appears to be a field of development to which considerable attention should be given as it is evident that a large amount of equipment trouble comes from high ice conditions between the rails. The clearances between the motors and roadbed are small at best and with an accumulation of ice it is difficult to obtain the necessary tractive effort, so that spinning of wheels takes place with serious results to the motor windings. Such troubles are particularly in evidence on equipments with small-diameter wheels. There seems to be a great need for some efficient equipment that will cut down and remove ice from between rails.

The principal equipment failures resulting from extreme winter conditions consist of water in motors, roasted armatures and fields, grounded rheostats and cables and general burn-outs to electrical wiring and equipment. Some trouble has been experienced due to breakage of resistors when they are suddenly cooled when splashed with cold water or slush. Most roads have provided shields to protect resistors.

It appears that ventilated motors have performed fully as well as closed motors during the extreme weather conditions. In this connection, however, the consensus of opinion seems to be that closed motors are much to be preferred for operating snow-removal equipment, as the advantages of a ventilated motor cannot be fully utilized in this service, and often in extreme conditions the equipment should be as fully protected as possible. On few roads the ventilating holes are covered during extreme conditions of snow and water, and no evil effect results from this procedure.

Considerable difficulty has been experienced due to collection of snow in motors and to the clogging of drain holes. Frequent inspection and cleaning out of these holes have produced good results.

A few roads report hot bearings as a result of the entry of water into housings, its freezing preventing proper lubrication. With the later equipments, however, no particular difficulty is reported.

Most of the railways which sent in information are dipping and baking armatures and fields. The opinion is general that less trouble is experienced with motors that have their armatures and fields dipped and baked than with those not so treated.

In general there appears to be a greater breakage of gears and pinions during severe winter weather, but these breakages are not excessive.

A few roads report damage to gear cases by high pavement and ice conditions between rails, but there appears to be nearly as much trouble from wearing through of gear cases at the sides due to neglect to keep the gear cases lined up properly. The damage to gear cases appears to be about equally divided between malleable iron and pressed-steel types.

Very few roads use any special methods for testing the equipment which has operated through water. A few dry out water-soaked equipment over heated pits, but the general practice seems to be to remove water-soaked fields and armatures and to bake them in an oven to prevent trouble.

DISCUSSION OF THE REPORT

The first subject opened for discussion was "Dimensions for Steel Wheels," which had been approved previously by the committee on standards. There was some discussion as to how railway companies would benefit by the adoption of these standards and how they would reduce costs and secure better deliveries. H. H. Adams stated it was not right for the association to set up standards so that the manufacturer can use them to the disadvantage of a company, and it did not seem right for member companies to be penalized for not using standards. R. H. Dalgleish said all had been led to believe that by adopting standards the ultimate costs to users would be reduced and also better deliveries could be obtained, as manufacturers could keep standardizd wheels in stock. He cited a case where a manufacturer had refused to make wheels other than standard unless an additional cost per wheel were added to the price. Mr. Dalgleish said it would be better not to adopt standards than to have these used by manufacturers to penalize the railways.

W. G. Gove said that there was no question that the adoption of standards would reduce costs to users, secure better deliveries and be of great advantage to all concerned, and that he was certain no manufacturer would increase the costs unnecessarily. On motion, the standard dimensions for steel wheels as recommended by the committee were approved.

The design of tread and flange contour for steel wheels as submitted by the committee was referred back for further consideration and study so as to see if any interference existed in connection with the standard rail sections, switches, mates and frogs of the association.

The next subjects discussed were: (1) The limit of wear gage for flange ⅞ in. in thickness, (2) revision of association standard journal boxes and brasses, (3) journal boxes and contained parts for 3¼-in. x 6-in. journal, and (4) gage for journal bearings and wedges. The recommendation of the standards committee for adoption of these reports was adopted without discussion.

On the subject of revision of specifications for solid wrought carbon steel wheels for electric railway service Norman Litchfield, American Car & Foundry Company, suggested that the proper action was to secure joint action between Engineering Association and the American Society for Testing Materials. It was decided to refer this report back to the equipment committee for the ensuing year. The same action was taken on the subject of gaging points and terms for wheel and track. The subject of brake shoes, brake shoe heads and brake shoe keys was also referred back to the committee. In the discussion of subject No. 4, "Investigate the feasibility of adopting standard cars," H. H. Adams, Chicago Surface Lines, emphasized the desirability of uniformity of car design. He suggested standards of varying length for cars (by one or more car windows) and of varying width to suit local track centers. Later it was moved and passed that the executive committee be requested to appoint a special committee composed of representatives of the Engineering Association and of the manufacturers to consider anticipatory standards, with special reference to cars and car equipment.

Concerning subject No. 3, "Report on helical gears," E. D. Priest, General Electric Company, stated that the last sentence recommending the adoption of a 7½-deg. helix angle was erroneously included, as the committee never acted upon this point. It was moved and passed to omit this sentence and the remainder of the report was accepted.

The report of the committee on heavy electric traction was briefly abstracted by Sidney Withington, New York, New Haven & Hartford Railroad, chairman.

HEAVY ELECTRIC TRACTION

The committee on heavy electric traction has this year reported on the following assigned subjects: Recent developments and progress in the design of motors and motor drives for heavy traction, both alternating current and direct current, with comparison of weight, space, efficiency, etc.; description and illustrations of recent types of electric locomotives and comparison of electric and steam switching engines in freight yards.

The first two subjects were treated in the form of a general discussion. As to gear drive the committee stated that the major limitations are as follows: Gear reduction, necessary clearance about motor and gearing, maximum safe locomotive speed and permissible dead weight on the axle. The length of the motor is limited by the space between the backs of the drivers, less the space required for the gear and gear case. The clearance between the bottom of the motor and gear cases and the rail should not be less than 5 in., which limits the motor diameter, gear diameter and number of teeth. The power limitations are fixed by the size of the motor and the gear ratio.

The quill drive, with spring supports between the motor and the wheels, was introduced to relieve the track distress due to heavy dead-axle loading, and has been successful for passenger, light freight and switching service. This type of mounting also affords opportunity to use larger motors than could be applied to axle mounting. The size is limited by the cab space occupied by the motor. The torque capacity is limited by the quill spring and the speed by the velocity of the armature, spring parts, gearings, journals or wheels.

In order to secure better weight efficiency the twin-motor quill drive has been developed; the pinions on each armature meshing into a common gear. The smaller armature diameter permits higher armature velocities, and by suitable gearing this secures higher horsepower rating per axle. The side-rod locomotive without gears permits axle loading similar to that of steam locomotive practice. This design necessitates the use of a few large motors and is economical for high-speed passenger service. It is not economical for low speeds, 15 to 20 m.p.h., because the speeds of driving wheels and armatures are the same and too low for the most economical design of motors. The geared side-rod locomotive has been developed for heavy freight service. It permits economy in motor design and also makes possible the driving of two or three axles from a pair of motors. The gearless motor has been successful in passenger service since 1906 and is economical in such service for reasons already outlined.

The single-phase commutator motor has been developed by stages for heavy traction service. Resistance leads were used in the early designs and gave trouble due to the use of improper materials in the construction. Monel metal is now used and most of the trouble has been eliminated. Another type has been developed, which starts as a repulsion motor and omits the use of resistance leads. The neutralization of the sparking voltage is secured by exciting the commutating winding in shunt with the main field and armature circuit. Commutation is improved by the use of interpoles and power-factor correction is obtained by means of an auxiliary winding distributed across the pole face. This motor, used on the Pennsylvania electrification out of Philadelphia, represents a 25 per cent increase in weight efficiency over previous designs of commutator motors.

An interesting design is the three-phase induction motor used on the Pennsylvania. This has wound secondaries, and the collectors are mounted on a shaft extension outside of the motor windings, which permits ready inspection. The leads to the collectors pass through a portion of the rotor spider and axially through the shaft and at the end of the shaft are connected to the collector rings by means of flexible copper connections. This design secures a maximum of active motor material between the side-frames of the locomotives.

The development of the 3,000-volt direct-current locomotive has carried with it every important development in direct-current motor design and important progress has been made in the use of insulation for this voltage.

The committee stated that it had found difficulty in obtaining exact data on steam and electric switching service. Where a considerable amount of switching is done, both passenger and freight, the electric switching offers several economies and advantages. Three electric switchers accomplish easily the work of five or six steam switchers. No relay engine is required and no time is lost for coaling, watering, cleaning fires, etc., as is the case with steam operation. The yard tracks are more intensively used, the yard capacity is increased and labor cost is decreased. Smoke is also eliminated by the use of the electric operation.

The use of electric switching offers more advantages in passenger service than in any other, particularly in the case of multiple-unit equipment. A chart introduced by the committee shows that the electric motive power tonnage per mile of track electrified has been nearly constant since 1905 in heavy electric traction.

In conclusion the committee advocated a "clearing house" for heavy electric traction study to avoid duplication of effort by the several organizations interested in the subject. The report was signed by Sidney Withington, chairman; L. S. Wells, C. H. Quereau, J. H. Davis, J. C. Davidson, R. C. Taylor, R. Beeuwkes, A. M. Eaton and J. V. B. Duer.

Following the heavy traction report A. H. Armstrong, General Electric Company, presented an address on "Electrification of Railroads," illustrated by lantern slides. An extended report of Mr. Armstrong's address will not be given here as this paper expects to report fully the address which he will give on the same subject at the joint meeting of the A. I. E. E. and A. S. M. E. in New York Oct. 22.

The committee on resolutions expressed the appreciation of the association to E. R. Hill, president; E. B. Burritt, secretary; James W. Welsh, special engineer, and other officers for their untiring work. The thanks of the association were given to the manufacturers for their earnest co-operation, to A. H. Armstrong and W. S. Murray for their interesting addresses, to the technical committees for their services and to the citizens of Atlantic City, who had helped to make the convention a success. Appreciation of the excellent attendance at the meetings was expressed and sympathy was extended to the families of deceased members.

OFFICERS ELECTED

The nominating committee announced the selection of officers for the ensuing year and the following were elected: president, W. G. Gove, superintendent of equipment Brooklyn (N. Y.) Rapid Transit Company; vice-president, C. H. Cadle, chief engineer New York State Railways, Rochester; second vice-president, C. S. Kimball, engineer way and structures Washington (D. C.) Railway & Electric Company; third vice-president, L. C. Datz, chief engineer American Cities Company, Birmingham, Ala.; executive committee, H. A. Johnson, superintendent shops and equipment Chicago (Ill.) Elevated Railways; E. H. Scofield, engineer power and equipment Twin City Rapid Transit Company, Minneapolis, Minn.; A. B. Stitzer, chief engineer Republic Engineers, Inc., New York, and C. H. Clark, engineer maintenance of way Cleveland (Ohio) Railways.

Upon the seating of the new president H. H. Adams moved a rising vote of thanks to Mr. Hill. Mr. Gove in accepting the chair said that he appreciated the handicaps under which he assumed the duties, first, by virtue of succeeding such a man as Mr. Hill and, second, due to the condition of the industry.

Accountants' Association Proceedings

I. A. MAY
Retiring President

How to Collect and Register Fares Under Present Conditions; Accounting and Its Relation to Stock Regulation; Cost-of-Service Accounting and Its Difficulties in Cleveland, and Some of the Financial and Accounting Problems of Utilities in These Tight-Money Days from the High Points of the Accountants' Discussions, Were the High Spots of This Meeting

J. J. LANDERS
President-Elect

THE Accountants' Association opened its session on Monday afternoon, Oct. 11, with the annual address of its president, I. A. May, comptroller the Connecticut Company, New Haven, Conn.

ADDRESS OF PRESIDENT MAY

In his presidential address Mr. May spoke of the past year as having been pre-eminently one of readjustment. The great World War, he said, has brought changes in all lines of business, and especially in the railway business. It has been a hard year for all operators, and of course this has reacted upon the accounting department and brought demands upon it that have been hard to meet. Mr. May, at this point, paid a tribute to the self-sacrifice of the committee members and all those who have spent time in contributing to the work of the association, in view of the pressure of work upon them in the corporations with which they are connected.

He said that he looked forward with great hopes for the future and believes that the opportunities to do more constructive work for the association were greater even than ever before. It seemed to him that this work for the immediate future would be centered largely upon what might perhaps be termed "cost accounting." The method of business control of electric railways, he said, is entirely different from that followed a few years ago. The companies are now being asked the cost of operating a certain line, or the cost of operating a particular type of car, and under these conditions there will be plenty of material for the accountants to work on during the coming year.

He recommended that the three joint committees as well as the two standing committees of the association be continued, and to illustrate the kind of work he had in mind for committee activities he referred to the committee on accounting-engineering. He believed good work could be done if this committee could work out some method whereby more detailed cost of operation could be furnished to the engineers and other operating officials. For example, in the first group of operating accounts, namely, way and structures, he believed that the accountants and the engineers could work out some simple method of accounting that would furnish the maintenance engineer with prompt and accurate detailed cost data; that is, the cost of maintaining a particular piece of track and the cost of maintaining different types of track in any one system.

Again, in the next group of accounts, maintenance of equipment, unit costs are wanted by the engineers and officers in charge of equipment. Unit shop costs have been developed in the manufacturing plant, and the cost to operate certain machines is definitely known. Similar data should be compiled for the railways so that the management might know, for example, whether to manufacture trolley wheels or to buy them. The same remarks in a general way apply to energy accounts, such as power stations, certain costs of the transportation department, and even in the general and miscellaneous groups.

Cost accounting, Mr. May said, has been developed in the large manufacturing industries to a fine art, and his message to the association was that it should develop cost accounting in the railway industry in advance of requests that are bound to come to the department for this kind of information.

After Mr. May's address the report of the executive committee was read, the principal feature of which was the committee's effort to encourage joint committee work with other affiliated associations. The report covered two meetings of the executive committee, one in Cleveland Jan. 8, 1920, and one in Atlantic City, Oct. 11, 1910. The first meeting was largely devoted to assignment of subjects to committees and the assignment of subjects for papers to be presented. The most important act of the second meeting was the appointment of a permanent committee to represent the Accountants' Association at the annual conventions of the National Association of Railway & Utility Commissioners. This committee consists of C. S. Mitchell, comptroller Pittsburgh Railways; B. W. Fernald, auditor San Francisco-Oakland Terminal Railways, and John M. G. Horn, comptroller Illinois Traction System, Champaign, Ill. The executive committee reports as follows with reference to this action: "In the past these annual conventions of the National Association of Railway & Utility Commissioners have been held during November, and at our annual convention in October it has been the practice hurriedly to appoint a committee of three members with short notice for these members to arrange their affairs to permit of their attendance at the National Association of Railway & Utility Commissioners' meeting. By adopting the permanent committee idea the former practice will be eliminated."

The plan outlined for the permanent committee provides:

"That it will not meet during the year; that not more than one of the members will attend the annual convention of the above-named association, and the committee member located nearest to the city selected for the annual convention will be the accountant and association representative in attendance."

COMMITTEES FOR 1921

With two or three slight changes in committee membership, which have taken place during the year, the following committees were continued for the ensuing term: Joint committee on claims accounting—H. J. Davies, co-chairman, Cleveland; George B. Cade, Asbury Park, N. J., and Walter Shroyer, Anderson, Ind. Joint committee on engineering accounting—W. E. Jones, co-chairman, Providence, R. I.; B. E. Bramble, Champaign, Ill.; Charles H. Lahr, Akron, Ohio; J. C. Collins, Rochester, N. Y., and F. H. Sillick, co-chairman, New York City. Joint Transportation & Accountants' Associations committee on collection and registration of fares—M. W. Glover, co-chairman, Pittsburgh, Pa.; R. H. Stevenson, New Haven, Conn.; W. A. Doty, Denver, Col.; John J. Duck, Chicago, Ill.; F. E. Webster, Haverhill, Mass.; G. G. Kalweit, Milwaukee, Wis. Standing committee on standard classification of accounts—H. L. Wilson, chairman, Boston, Mass.; W. F. Ham, Washington, D. C.; W. H. Forse, Jr., Anderson, Ind.; R. N. Wallis, Fitchburg, Mass., and P. S. Young, Newark, N. J.

The annual report of the secretary-treasurer, Frank J. Davis, was then submitted and showed a growth of membership from sixty-one to sixty-two individual members and from 165 to 168 company members.

The Accountants' Association then adjourned to attend the joint meeting with the Transportation & Traffic Association on the subject of registration and collection of fares. The discussion at this meeting is reported under the proceedings of that association.

Tuesday's Session

At the opening of the second session President May announced the membership of the convention committees. He named as members of the committee on resolutions T. P. Kilfoyle, J. J. Duck and D. J. Strouse. As members of the committee on nominations M. W. Glover, W. E. Jones, H. L. Sanders, W. K. Zinsmeister and A. M. Curtiss.

The chairmen of the committees on claims accounting and engineering accounting stated they had nothing to report.

STANDARD CLASSIFICATION OF ACCOUNTS

The report of the committee on a standard classification of accounts was read by Secretary Davis in the absence of the chairman. The report stated that during the past year the committee had received either through the Interstate Commerce Commission or direct some thirty communications, some of which embodied several questions asking for decisions. With the exception of two cases, which are now pending, they have all been given attention.

Accounting Bulletin No. 14, the last issued by the Interstate Commerce Commission, was effective on May 1, 1917, and the committee some time ago suggested to Alexander Wylie, director of the Bureau of Accounts, that it would be advisable to publish a new bulletin embodying all decisions that had been made to date, but unfortunately, owing to the pressure of work upon his bureau in connection with the duties imposed by the transportation act of 1920, Mr. Wylie said it was necessary to defer such publication.

The committee also believed that the Standard System of Accounts, the text of which was prepared previous to 1914, had proved fairly satisfactory, but that time and experience had shown that there were portions, owing to changed conditions, that might be revised. This matter was also taken up with Mr. Wylie and for the same reason he believed a new edition could not be issued for some time. The committee is to keep these two matters in mind and is prepared to take up the work at the earliest date agreeable to Mr. Wylie.

It was a source of no little pride, said the committee, that the classification of accounts had been adopted so generally by the different state commissions and that bankers and others interested had shown confidence in the financial statements made in accordance with the rules laid down. It is beyond question that its general use has been of great help in improving public relations and has materially assisted in the proper presentation and consideration of the numerous rate cases that have been under investigation during the recent period of abnormal conditions affecting the electric railway industry.

STORE ACCOUNTING

A paper on store accounting as a means of stock regulation was presented by R. A. Weston of New Haven. The plans outlined followed to a large extent the recommendations of the Association of Railway Storekeepers. An abstract of this paper appears elsewhere in this issue.

B. J. Yungbluth, Philadelphia, in discussing the report stated that a similar system based very largely on this plan had been used for some years by the Pittsburgh Railways and had recently been established by the Public Service Company. The Philadelphia Rapid Transit Company is now installing a similar system. Good results had been obtained through the use of this system, and in some instances the amount of stock necessary to be carried had been materially reduced. Mr. Yungbluth also urged that the suggested plan be used to a greater extent by the electric railways, as it allows accounting officers to keep any records they choose, but absolutely puts it up to the storekeeper to know what he has on his shelves without any guesswork.

Mr. Weston in answer to several questions stated that this plan should not take the place of the regular inventory, which should generally be taken at least once a year.

On motion of T. P. Kilfoyle a committee of five is to be appointed by the incoming president to study and report on the subject of stores accounting.

COST-OF-SERVICE ACCOUNTING

The second paper presented was by H. J. Davies, Cleveland, on "Some of the Imperfections in the Cleveland Franchise," an abstract of which is also printed elsewhere in this issue. In answer to questions Mr. Davies stated that the property written off on retirement from service was not at the original investment figure but at reproduction new prices. This plan, he stated, was satisfactory only so long as prices for reproduction are in excess of the original cost. With falling prices, and he believes they are at hand, this plan of retirement of property will make the value of new additions less than the capital invested and the result will be overcapitalization.

Mr. Davies also outlined in detail the various steps in the attempt made by the company to secure a higher rate of return at the time the increase in wages of employees was granted, the final result being that the voters in referendum had refused by a vote of 35,000 to 10,000 to approve the action taken by the City Council in allowing a 7 per cent return. As a result of this the company is no longer able to float any stock at par for needed extensions and bonds cannot be sold at a discount unless the total interest and discount is kept within the 6 per cent requirement of the franchise.

Wednesday's Session

The closing session of the Accountants' Association was held on Wednesday afternoon. Two papers were read, the first of which was by Harry G. Mendes of Cleveland on financial problems confronting public utilities during the period of reconstruction. An abstract of this paper appears elsewhere in this issue.

The second paper was presented by George L. Vannais of Hartford on the accounting profession. An abstract of this paper is also printed elsewhere in this issue.

The committee on nominations next reported and on motion its selection for officers was voted. The officers elected were: President, J. J. Landers, auditor York (Pa.) Railways; first vice-president, F. E. Webster, vice-president and treasurer Massachusetts Northeastern Street Railway, Haverhill; second vice-president, W. G. Nicholson, secretary and auditor Omaha (Neb.) & Council Bluffs Street Railway; third vice-president, W. A. Doty, auditor Denver (Colo.) & Intermountain Railroad; secretary-treasurer, F. J. Davis, auditor's department Public Service Railway. P. L. King, auditor San Antonio (Tex.) Public Service Company; L. T. Hixon, Terre Haute, Indianapolis (Ind.), and Eastern Traction Company, and R. H. Stevenson assistant to comptroller the Connecticut Company, New Haven, were elected as members of the executive committee.

After the installation of officers the meeting adjourned, *sine die.*

Entertainments at the Convention

ALL the entertainments at the convention this year were at the pier with the exception of the ladies' obstacle golf tournament which was held on the lawn of the Marlborough-Blenheim Hotel. The evening entertainments consisted of the annual reception Monday night, informal dancing Tuesday night, the "County Fair" Wednesday night and the annual ball Thursday night. Of these, the most unique was Wednesday evening's entertainment, which was staged under the direction of R. C. Cram. Besides the main exhibition there were many side shows and opportunities for those so inclined to hit the African dodger, knock the cats from the fence or ring a cane. Only "bolshevik" money, with which the guests were freely supplied, passed current.

The ladies were entertained in the afternoon by a bridge tournament on Tuesday, with Mrs. W. F. Ham as hostess, an obstacle golf tournament on Wednesday with Mrs. Frank Donohoe as hostess and a tea Thursday afternoon with Mrs. John H. Pardee as hostess.

Meeting of Committee of 100

AT A meeting of the members in Atlantic City of the Committee of 100, held Tuesday afternoon at 4:30 in the Greek Temple, it was resolved to continue to function and that the work of the committee will be largely in the direction of the dissemination of information, as suggested by President Pardee in his address at the meeting of the association on Tuesday morning.

President Pardee presided at the meeting Tuesday afternoon, in the absence of General Tripp, who was detained by illness. H. G. Bradlee and B. C. Cobb were among those who advocated the plan adopted.

Public Representatives of Urban Transit

W. C. CULKINS

THE former American Association of City Representatives of Electric Railways met at the Traymore Hotel in Atlantic City on Oct. 13. The name of the organization was changed to Public Representatives of Urban Transit, as being more inclusive than the former name.

The officers elected for the coming year were: W. C. Culkins, Cincinnati, Ohio, president; Judge Fielder Sanders, Cleveland, Ohio, first vice-president; Carl D. Jackson, New York City, second vice-president; J. S. Goodwin, Detroit, Mich., third vice-president; delegates-at-large, W. S. Twining, Philadelphia, Pa.; Col. J. L. Wickes, Baltimore, Md., and M. M. O'Shaughnessy, San Francisco, Cal.; secretary-treasurer, C. R. Barnes, Rochester, N. Y. Messrs. Twining, Barnes and Sanders were appointed as a committee on constitution and by-laws. Robert P. Woods, formerly city member of the Kansas City Board of Control, now consulting engineer and also general manager of the Kansas City, Clay County & St. Joseph Electric Railway, was elected as the first honorary member. Following organization work the members had an instructive and animated discussion on their experiences in the operation of their local traction agreements. Plans were also started for a mid-winter meeting.

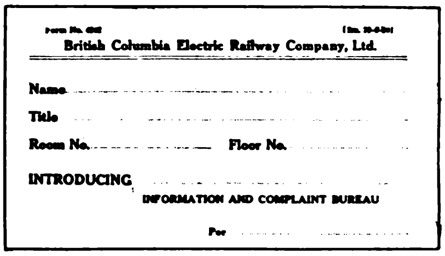
Celluloid tokens will shortly replace tickets on certain lines of the Glasgow Corporation Tramways. It was originally intended to make the change at the time of the recent increase in fares, but the manufacturers could not supply a sufficient number of the tokens at that time. The tokens will be accepted as payment for the two-stage fares. So far as is known this is the first occasion on which celluloid tokens have been placed in general circulation by a British tramway. They have been used previously by special classes of riders.

Vancouver Solves Information and Complaint Problem

Patrons of the British Columbia Electric Railway Show Increasing Appreciation of the Facilities Afforded Them

A DEPARTMENT of the British Columbia Electric Railway which has proved itself worth while during the past few months is the Bureau of Information and Complaint. This is located in a large booth at the Terminal Building. The accompanying illustration shows the bureau in action, but gives no idea of the volume of business transacted by it.

An actual count was made recently on an average day, after the bureau had been in operation for about two months, to determine the number of inquiries and complaints which were being handled and their nature. On this day there were 783 inquiries, an average of more than one a minute during the working hours between 8:30 a.m. and 8:30 p.m. These were answered by the bureau staff, consisting of two men. The questions were distributed thus: Regarding railway matters, 229; light and power, twenty-eight; gas six; miscellaneous, fifty-eight; referred to office upstairs (the company office being located in the terminal), twenty-three; calls on the two telephones, 428. The complaints regarding railway service numbered one; light and power, five, and, gas five.



Form No. [illegible] [illegible]

British Columbia Electric Railway Company, Ltd.

Name ....

Title ....

Room No. .... Floor No. ....

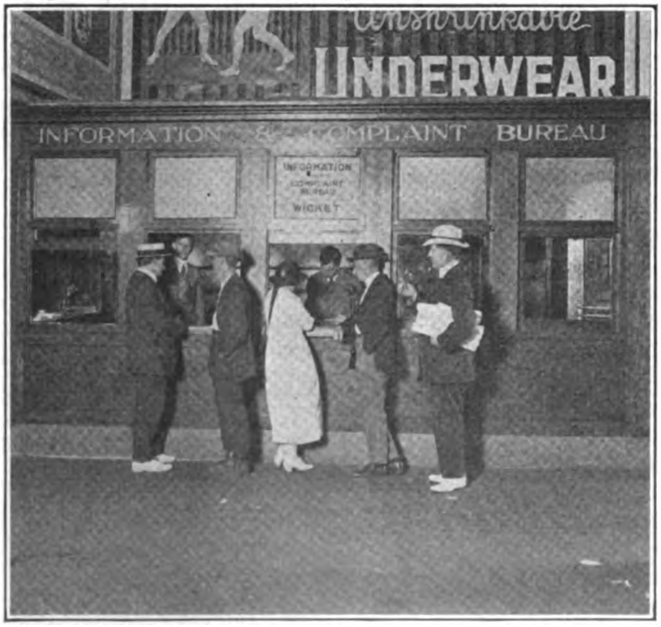
INTRODUCING ....

INFORMATION AND COMPLAINT BUREAU

Per ....

CARD USED IN INTRODUCING PATRONS TO COMPANY OFFICERS

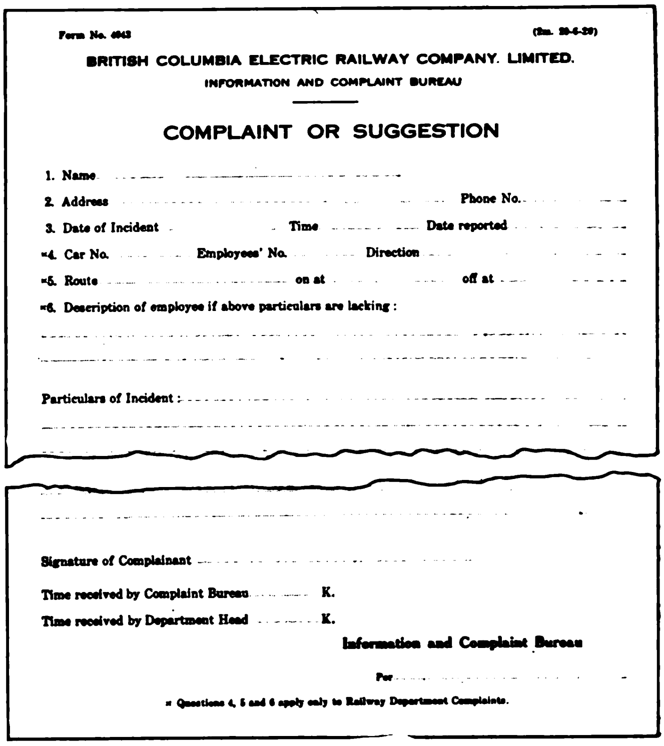
Many of the queries and requests made of the bureau are amusing and serve to add interest to the work of the men connected with it. The following questions chosen at random will serve to indicate the nature of these requests: "When does the Chilli-wack train leave?" "What is the fare to Abbotsford?" "Where is Wall Street and how can I reach the 2500 block?" "When does the Victoria boat get in?" "Why is my light bill higher than my neighbor's?" "How often do the trains leave Victoria on the Saanich Line?" "How can I get to Ladner?" "Where is the best place to go fishing?" "When does the last ferry leave for North Vancouver?" "When does 'Teddy Lyon' (conductor of the company's sightseeing car) leave Robson and Granville?" "How is a good way to spend the evening?" "I've lost my daughter; she left here two hours ago on a Robson car; can you help me find her?"


Unshrinkable
UNDERWEAR
INFORMATION & COMPLAINT BUREAU
INFORMATION COMPLAINT BUREAU WICKET

PATRONS OF THE BRITISH COLUMBIA ELECTRIC RAILWAY, VANCOUVER, UTILIZING THE NEW INFORMATION AND COMPLAINT BUREAU

Entrance to waiting room at left and entrance to company offices at right.

One effect of the new bureau which the company officials noted is the increase in the number of complaints regarding service. This is due to the fact that the place where such complaints may be lodged is much more readily accessible than before. To illustrate, in June Assistant General Manager W. G. Murrin received sixty-seven railway department complaints as against forty-two in May. This was considered a very satisfactory result for the reason that, had the patrons not been able to lodge their complaints easily they would have nursed any resentment they had against the company, whereas a brief explanation might have cleared up the difficulty in almost every case.



Form No. 4043 (2m. 20-6-20)

BRITISH COLUMBIA ELECTRIC RAILWAY COMPANY. LIMITED.

INFORMATION AND COMPLAINT BUREAU

COMPLAINT OR SUGGESTION

1. Name ....
2. Address .... Phone No. ....
3. Date of Incident .... Time .... Date reported ....
*4. Car No. .... Employees' No. .... Direction ....
*5. Route .... on at .... off at ....
*6. Description of employee if above particulars are lacking:

Particulars of Incident: ....

Signature of Complainant ....

Time received by Complaint Bureau .... K.

Time received by Department Head .... K.

Information and Complaint Bureau

Per ....

* Questions 4, 5 and 6 apply only to Railway Department Complaints.

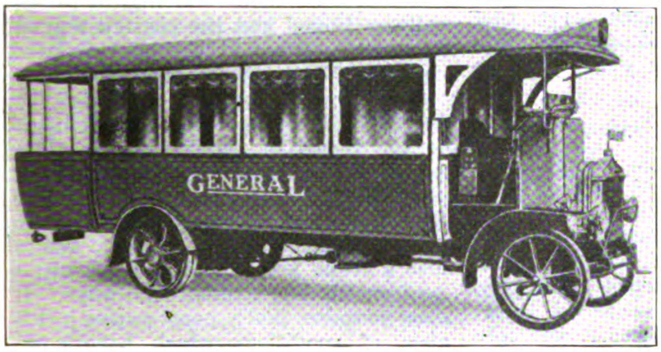
FORM USED FOR FILING COMPLAINTS AND SUGGESTIONS

The bureau also exerts a wholesome influence upon the departments affected by the complaints received. While many small misunderstandings which might never have come to light but for the convenience and accessibility of the bureau are satisfactorily cleared up at the wicket, a full report of all complaints is made to the management, and they are then directed to the officials affected, enabling them to determine and remedy the causes for complaint. Incidentally this acts as a check upon the efficiency of the departments concerned, for where a cause of misunderstanding or dissatisfaction has been thus brought to the attention of the official responsible, he cannot do otherwise than see that it is remedied and its recurrence prevented.

The Information and Complaint Bureau is well supplied with time-tables and other literature for distribution. In handling inquiries and complaints a few simple printed forms are used, of which two are reproduced. One is a 3 x 5-in. slip used in referring a complainant or inquirer to the proper company official when the matter cannot be handled by the bureau itself. The other is a letter sized form for filing complaints or suggestions in a rather formal manner.

A Camel-Back Motor Bus

THE Associated Equipment Company, designers and builders of the London General Motor Company's omnibuses, had a unique and new design of single-deck two-man bus on exhibition at the Antwerp Exposition.



A UNIQUE MOTOR BUS AT THE ANTWERP EXPOSITION

The driver is placed at the side of the engine, instead of behind, which increases the loading platform by 3 ft. 6 in. without adding to the over-all length of the bus. It also gives a more uniform distribution of weight between the front and rear axles and decreases the overhang of the body on the rear. A special spring is used which produces a very comfortable riding vehicle. The height of the top frame from the ground is 2 ft. 5 in. The chassis weighs about 3,000 lb. and will carry a total load of 7,000 lb., including the body, on the frame.

Another feature of the bus is the rear platform, which permits of twelve standees. The bus proper seats twenty-five, so there is a total capacity of thirty-seven. The roomy rear platform, the low step and the seating arrangement expedite loading and unloading passengers and the camel-back design permits the elimination of a bulkhead and a great reduction in weight, to say nothing of placing the driver closer to the traffic and eliminating a great deal of waste space found in earlier designs.

Steam Versus Electric Locomotives

AT A JOINT meeting of the New York section of the American Institute of Electrical Engineers and the metropolitan and railroad sections of the American Society of Mechanical Engineers at the Engineering Societies Building on Oct. 22 a number of prominent engineers will discuss the relative advantages of modern steam and electric locomotives.

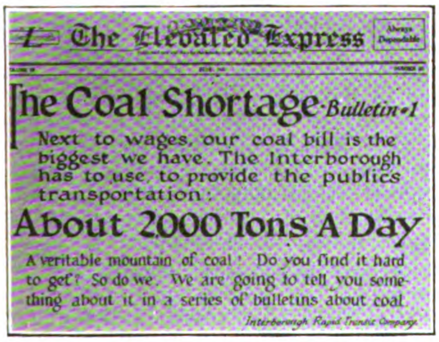
The subject will be introduced by Frank J. Sprague, consulting engineer. The advantages of electric locomotives will be presented by A. H. Armstrong, chairman electrification committee, General Electric Company, and F. H. Shepard, director of heavy traction Westinghouse Electric & Manufacturing Company, and the advantages of steam locomotives by John E. Muhlfeld, of the Railway and Industrial Engineers, Inc., and another speaker to be announced at the meeting.

The electric point of view will be discussed by C. H. Quinn, chief electrical engineer Norfolk & Western Railway Company; A. L. Ralston, mechanical superintendent New York, New Haven & Hartford Railroad; R. Beeuwkes, electrical engineer Chicago, Milwaukee & St. Paul Railway, and E. B. Katté, chief engineer electric traction New York Central Railroad, and the steam point of view by W. L. Bean, assistant general mechanical superintendent New York, New Haven & Hartford Railroad; A. W. Gibbs, chief mechanical engineer Pennsylvania System; F. H. Hardin, chief engineer of motive power New York Central Railroad and W. F. Kiesel, Jr., mechanical engineer Pennsylvania Railroad.

The discussion will be closed by George Gibbs, consulting engineer Pennsylvania Railroad.

Coal Story Told by Interborough

The Interborough Rapid Transit Company has been telling the story of coal scarcity to the people of New York through a series of bulletins carried in the subway and elevated railway cars of its system. The series began with No. 26 of the "Subway Sun" and "Elevated Express" published during June, and ran through five issues of these bulletins. The entire series is reproduced for the benefit of other railway companies which may want to present the facts in regard to their coal supply to the public.



L The Elevated Express Always Dependable

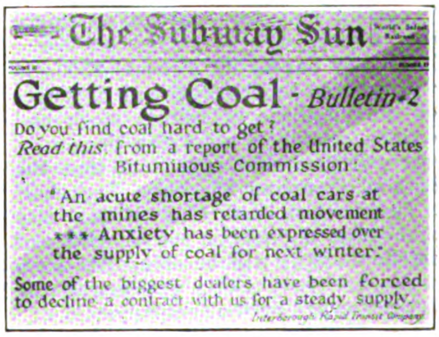
The Coal Shortage · Bulletin · 1

Next to wages, our coal bill is the biggest we have. The Interborough has to use, to provide the publics transportation:

About 2000 Tons A Day

A veritable mountain of coal! Do you find it hard to get? So do we. We are going to tell you something about it in a series of bulletins about coal.

Interborough Rapid Transit Company.



The Subway Sun

Getting Coal · *Bulletin · 2*

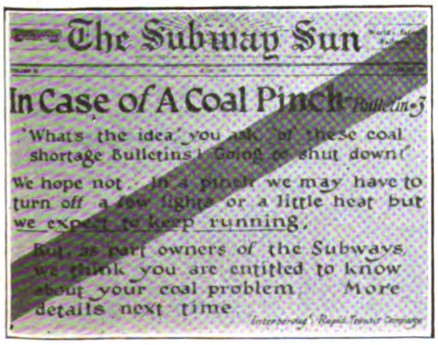
Do you find coal hard to get?

Read this, from a report of the United States Bituminous Commission:

"An acute shortage of coal cars at the mines has retarded movement *** Anxiety has been expressed over the supply of coal for next winter."

Some of the biggest dealers have been forced to decline a contract with us for a steady supply.

Interborough Rapid Transit Company



The Subway Sun

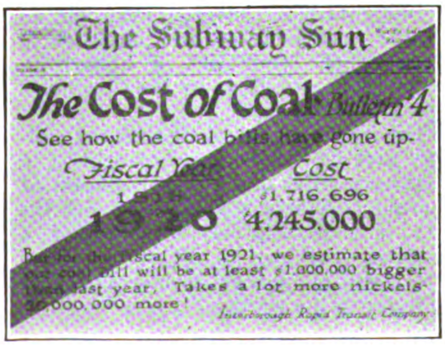
In Case of A Coal Pinch [redacted] 3

"What's the idea," you [redacted] coal shortage Bulletins [redacted] shut down?"

We hope not. [redacted] we may have to turn off [redacted] or a little heat but we [redacted] running.

[redacted] owners of the Subways, [redacted] you are entitled to know [redacted] your coal problem. More details next time.

Interborough Rapid Transit Company



The Subway Sun

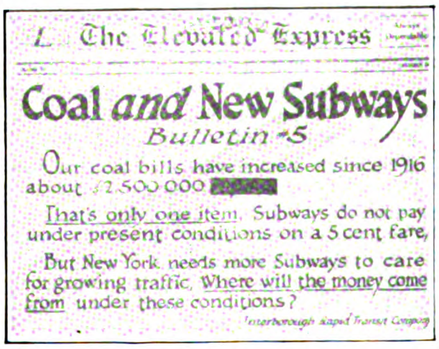
The Cost of Coal [redacted] 4

See how the coal [redacted] gone up-

Fiscal [redacted]	Cost
[redacted]	$1,716,696
[redacted]	$4,245,000

[redacted] scal year 1921, we estimate that [redacted] will be at least $1,000,000 bigger [redacted] ast year. Takes a lot more nickels- [redacted],000,000 more!

Interborough Rapid Transit Company



L The Elevated Express Always Dependable

Coal *and* New Subways

Bulletin · 5

Our coal bills have increased since 1916 about $2,500,000 [redacted]

That's only one item. Subways do not pay under present conditions on a 5 cent fare,

But New York needs more Subways to care for growing traffic, Where will the money come from under these conditions?

Interborough Rapid Transit Company

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

City Will Run Lines

Plans to Take Over Staten Island Midland for One Year—Will Charge Nickel Fare

Mayor John F. Hylan of New York City will shortly be given an opportunity to try out his theories of municipal ownership. An agreement has been reached by Grover A. Whalen, Commissioner of Plant and Structures, and Jacob Brenner, receiver of the Staten Island Midland Railway, Richmond Borough, under which the city will take over the company's lines and will operate them beginning about Dec. 1. A 5-cent fare will be charged.

The plan provides in brief for taking over the property for one year. During the first six months the profits, if any, will go to the city, which will also have to make up for probable deficits. During the second six months the profits, if any, are to be divided evenly between the city and the company. A clause in the agreement provides that the Richmond Light & Railroad Company, which has been supplying electric current to the road, shall continue doing so at cost, which is to be fixed by an expert for the city and another for the company. If these two experts fail to agree Federal Judge Chatfield will decide the question.

City to Furnish Equipment

The city agrees to operate the cars on the schedules in force prior to the cessation of operation last January and to provide the necessary rolling stock and equipment to make this possible. It is also provided that either party to the agreement may terminate it on thirty days' notice.

The city has at its disposal $300,000 appropriated by the Board of Estimate for the purchase of rolling stock and equipment and to start the lines running. It was said on Oct. 9 that the Midland Company has only about half a dozen cars, and that if the city intended to operate on the schedules of last January it will be obliged to have at least twenty cars, which was the number owned by the company.

The Midland company, on the plea that it could not pay expenses with a 5-cent fare, ceased operating last January. This action followed much agitation on the part of the company, the Public Service Commission, the Staten Island public, the Board of Estimate and the various civic organizations. When Mr. Brenner was appointed receiver he tried to take possession of the company's property, but found very little of it. When he was urged to set the cars running he retorted that he could not find any cars.

The Board of Estimate ordered the company to resume operation, and its failure to obey the order resulted in a resolution passed by the board declaring the company's franchise forfeited. At the expiration of the ninety days required before such an order could become effective, action was delayed by the fact that the property was in the possession of the Federal court, that the company was bankrupt and that nothing could be done with it unless the court consented.

Service Resumption Called "Bluff"

Late in September the company resumed operation, but charged an extra 3 cents for passengers to and from St. George, because it operated for a short distance over the tracks of the Richmond Light & Railroad Company. Staten Island citizens objected strenuously to this and declared it was only a trick to save the franchise of the company from being forfeited and to enable it to obtain an 8-cent fare, which the Richmond company is charging by virtue of an order by the Public Service Commission. It was also charged that the receivers of the two railroads were acting as one and were in a plan to mulct the public.

Sixty Cents for Covington Men

After several weeks of investigation the board of arbitration which has been considering the demands of the employees of the Cincinnati, Newport & Covington Railway, Covington, Ky., for an increase in wages, has filed its report granting a 20 per cent advance in the wages of motormen, conductors, shopmen and power house men employed by the company. The report fixes the schedule at 56 cents an hour for the first three months; 57.6 cents an hour for the next nine months and 60 cents an hour thereafter. This is 1 cent an hour more than was recently granted by the Cincinnati Traction Company to its men. The board is composed of Judge John M. Lassing, representing the company; John M. Corbin, representing the carmen, and William L. Glazier, for the public.

Judge Lassing favored granting an 18 per cent increase and objected to granting the employees a higher increase than was given by the Cincinnati Traction Company.

The report recommends that the railway give up its perpetual franchises in Kentucky cities and that the officers of the company seek a conference with the city officials relative to obtaining a uniform franchise in all of the cities which will allow them to increase fares to improve the service.

Would Cost $97,000,000

Rapid Transit System for St. Louis Urged by City Plan Commission—Many Lines Needed

Recommendations for a system of rapid transit for St. Louis, Mo., which call for the utilization of the present Washington Avenue and Eighth Street railway tunnel and the construction of a subway system at a total estimated cost of $97,000,000 are contained in a report which has been submitted by the City Plan Commission of St. Louis to the Board of Public Service. The report, which is the result of a year and a half of study, is a comprehensive digest of the transportation problem confronting the city at present, and is also a frank analysis of the difficulties confronting the United Railways. It also contains much constructive criticism of conditions which have combined to bring about what the commission regards as an unsatisfactory system of transportation.

Would Abandon Some Lines

The plan calls for a gradual development of the local transportation system to meet the city's growth in the next ten to twenty-five years and also suggests a supplementary plan for a rapid transit system of subways and elevated tracks after the reorganized surface lines have been outgrown.

It is recommended that existing surface lines be rerouted, that some lines be abandoned and that new ones be built. These changes are discussed in detail. The construction program would be undertaken in three sections. It is suggested that the plan be carried out slowly for economic and physical reasons. The plan is somewhat similar to the plan submitted to the Department of Public Utilities recently by C. E. Smith, consulting engineer for the city. The cost, however, is estimated at $97,000,000, while the cost of executing Mr. Smith's plan would be approximately $200,000,000.

Many Districts Lack Service

At present 1 per cent of the city's area is more than one-quarter of a mile from a car line. Under the plan proposed this area would be reduced to less than 3 per cent. To accomplish this result many miles of single and double track would have to be constructed and 21 miles of single track and 23 miles of double track would have to be abandoned.

The report touches only briefly on finances. It opposes a uniform fare and points out that there is a tendency toward municipal credit and control in the operation of electric railways.

Seattle Mayor Asks Re-Deal

Demands Revision or Cancellation of Original Contract for Purchase of Lines—Sees $90,000 Monthly Loss to City

Mayor Hugh M. Caldwell of Seattle, Wash., in a recent public address went into details in regard to the municipal railway situation in Seattle and explained the city's peculiar position in operating a railway system in which it has not now, and will not have when the system is paid for, "one dollar invested." Mayor Caldwell stated that the contract entered into with the Puget Sound Traction, Light & Power Company was virtually written in its entirety by the attorney for the company, and was so written as to "protect the vendor." The Mayor expressed himself as in favor of rewriting or canceling the contract, but he would not make any definite statement as to the possibility of this being successfully done until he had completed his inquiry into the transaction. He declined to take the initiative in offering any suggestions to the City Council as to a change in the policy of the city in regard to the operation of the local transportation system.

THE Mayor said that Seattle is trying to do what no other municipal corporation ever attempted and what no public service commission would allow a privately-owned corporation to do, namely, make its patrons (the patrons of its electric railways) pay for the entire system, including depreciation charges, interest on investment and the capital invested.

MAYOR ASSAILS CONTRACT

Startling figures throwing light on what the street railway system would cost Seattle were given by Mayor Caldwell in support of his statement. He began with the capital investment of $17,215,000, made up, he said, of $775,000 of general bonds voted by the people, and of $16,440,000 in utility bonds which are a lien on the lines, and payable solely out of the receipts of the railway lines. A monthly depreciation charge of $56,415 has to be made against the lines by the State Bureau of Accountants, he said, which in the eighteen years required to pay off the principal will amount to a total of $12,185,776. This depreciation charge, according to City Comptroller Carroll and Mayor Caldwell, really does not exist. "No money has been paid in the depreciation fund," said Mayor Caldwell. In explaining this situation the Mayor said:

> In conferring with representatives of the State Bureau of Accountants I attempted to learn what should be done with this money, if any was in the fund. The bureau's suggestion was that the money be invested in income securities, a course I consider doubtful when the system is paying interest on its own bonds.

SEES $90,000 MONTHLY LOSS

At the rate of present expenditures by the city for upkeep and maintenance of the city lines, the Mayor said that at the end of the eighteen-year period the city will have put back into the lines in upkeep a total of $21,886,552. In discussing the item of depreciation, the Mayor used figures for August. In that month, the city spent approximately $100,000 for upkeep of the lines, but to this figure would have to be added the $56,000 monthly depreciation charge demanded by the State. As a result, August would show a net loss of $26,538. If the same plan is followed, he said, and adding the $64,000 a month which must be set aside beginning Jan. 1 next as payment on the principal, the city will be something like $90,000 "in the red" every month.

The Mayor arraigned the present agreement as follows:

> The present scheme is to have the car riders pay all operation, upkeep, maintenance, depreciation, dividends on capital investment, and retire the entire capital investment in eighteen years, at which time the car patrons will not own the lines, but they will belong to the corporation of the city of Seattle, which will at that time, under the present plan, not have invested a dollar therein. Even if we concede that those who ride upon the street cars are the only ones interested therein and that the merchants and property owners of the city find it of no financial benefit to them to have a going street car system, for which they would be willing to pay nothing, it is still a human impossibility successfully to navigate the fatuous course that we are now embarked upon. Shall we continue to raise the street car fares during the next eighteen years, until they reach a point where an insufficient number will ride on the street cars to make their operation worth while, or shall we give the Stone & Webster people a better contract than they made by making an entrance into the general fund in order to keep the system going?

Vacations for employees, a 5 per cent return on the capital—greater than the former owners of the line said they made—and other factors underlying the present situation were scored by the Mayor as contributing to the city's dilemma. The city, to date, according to the Mayor, has not had to pay any of the principal due on the bond issues. It is at the present time, however, paying out of its railway revenue all operating and maintenance expenses and is paying dividends of $72,138 a month on the capital valuation of $17,215,000. These dividends are being paid in the form of interest on bonds, that on the general bonds being 4½ per cent and 4¾ per cent; on all of the utility bonds except $100,000, 5 per cent; and on this $100,000 issue, 6 per cent. The Mayor said:

> These dividends, amounting to $865,658 plus per annum, are certainly much greater than were paid by the Puget Sound Traction, Light & Power Company before we took over its system. In addition to the dividends we are paying operating expenses, which for the eight months ending Sept. 1 amounted to $3,772,255. Included in this amount was the expense incurred in maintenance of track and structure, $308,507, and in the maintenance and upkeep of equipment, $502,105. In other words the amount that was set aside and used monthly for the upkeep of track and equipment averaged for the first eight months of this year, $101,325.

Mayor Caldwell called attention to the fact that under the contract of purchase of the lines the city agreed to pay all operating expenses and charges, including interest, out of the receipts and, moreover, agreed to pay the $15,000,000 out of the receipts at the rate of $833,000 a year, beginning March 1, 1921. Under these terms, he pointed out, the payment of the principal is made a first lien upon the gross receipts. The city is thus confronted with this situation:

> The depreciation charge which the State Bureau insists upon amounts to $676,987 a year; the principal to be paid the bondholders for the Puget Sound Traction system amounts to $833,000, exclusive of the interest, which is now $750,000 a year, but which will decrease in proportion to the number of annual payments on the principal. During the eighteen years that will be required to pay the principal the city will have charged as depreciation a total of $12,185,776. These figures indicate that the city will, during the eighteen years in question, have charged off the entire value of the lines, and will have put back into the system the sum of $21,886,552 for upkeep and maintenance, besides having retired the entire capital stock of $17,215,000.

The Mayor pointed out that the lines are being operated this year under a general wage increase of 11.38 per cent over the scale of August, 1919. The item of vacation expense was also referred to, the Mayor stating that the vacation expense for next year for the employees, giving them a vacation with full pay, will amount to about $100,000.

"DIVIDEND" OF 5 PER CENT

Mayor Caldwell referred several times to the fact that the private company, according to its own statements, at no time paid anything like 5 per cent on the capital invested. He stated that the company claimed that at no time during the last few years was it able to pay more than 3 per cent plus on the money invested. Also, under the system of charging depreciation by the private company, the charge was only a small amount compared to the $56,000 advised by the State Bureau of Accounts.

Mayor Caldwell pointed out that the number of passengers carried has fallen off, the figures for the month of August showing that 2,000,000 fewer persons were carried than during August, 1919. Notwithstanding this fact, the gross revenue for the month showed a net increase of $31,741. More than $16,000 of this amount was consumed in vacations, which were not a charge in 1919.

In referring to the jitney situation Mayor Caldwell stated that since thousands of people depend upon this form of transportation the city should not, in his opinion, abolish jitneys unless it can offer some other form of satisfactory and rapid transportation, merely to increase the revenues of the railway lines.

Calvin H. Hagan, financial expert, has written a letter to Mayor Caldwell in which he supports the stand taken by the Mayor. Mr. Hagan suggests the adoption of an amortization plan under which the city would be able to make the required payments for the railway lines and which he believes would be satisfactory to the Stone & Webster interests. No formal action will be taken by the Mayor until the completion of his investigation into the purchase of the property.

Utility Board Ousted

Governor Removes New Jersey Commissioners for Neglect of Duty—General Incompetency Charged

Gov. Edward I. Edwards of New Jersey on Oct. 14 removed from office upon charges of misconduct and neglect of duty the four members of the State Board of Public Utility Commissioners. At the same time the Governor appointed three members of a new commission and called a session of the State Senate for Oct. 19 to act upon his nominations. The three new commissioners are Col. Walter F. Whittemore, Republican, an engineer and a member of the State Highway Commission; Representative James A. Hamill, Democrat, a lawyer; and Arthur A. Quinn, Democrat, president of the State Federation of Labor.

The four commissioners removed from office are President John W. Slocum, George F. Wright, Harry L. Knight and Andrew Gaul, Jr., of Ridgefield. In announcing his decision, Governor Edwards sent the following letter to each of the ousted commissioners:

> You will please take notice that I have found and determined that you are guilty of neglect of duty and misconduct in office as a member of the Board of Public Utility Commissioners of this state and for this reason have and do now remove you from such office. A copy of the conclusions as reached by me is inclosed.

CHARGES BROUGHT BY CITY

The ousted commissioners were appointed by ex-Gov. Walter E. Edge. The board has long been under criticism. The complaint is that it has favored the Public Service Corporation as against the public interest. A year ago the town of Montclair preferred charges against the commission. Acting Governor Runyon heard those charges, but dismissed them. Then last spring Jersey City preferred other and more serious charges and it is on the basis of these that the Governor acted.

Summarizing his findings, Governor Edwards made the following statement:

> The facts disclosed in this case, upon which I have arrived at my conclusion, show not only that these men (the ousted commissioners) have been guilty of neglect of duty and misconduct in office, but they explain clearly why these men have lost the confidence of the public. The powers intrusted to this commission are extensive and affect not only the rights of the public, but the immense investments that have been made in the construction of these properties.
>
> The delays and vacillations of these commissioners have created a serious condition of doubt as to the safety of existing and future investments. It is as important to the capitalists who invest money in the construction of a public utility, and to the financial institutions which lend money upon the securities of public utilities, that there should be a definite rule of law and procedure, promptly and impartially applied, at all times, for the protection of these investments, as that there should be protection for the public against exactions of capital.

Among the outstanding charges sustained by Governor Edwards as cause for the removal of the commissioners were failure to require setting aside of adequate depreciation accounts; favoritism and bias toward subsidiary companies of the Public Service Corporation; delay in valuing the property of the Public Service Railway and the Public Service Electric companies; fixing increased retroactive rates for the Public Service Electric Company; establishing seven rates on Public Service Railway lines in one year without sufficient reason; failure to recommend changes in the utilities law shown to be necessary by experience; permitting diversion of proceeds of bond issues to the account of working capital; establishing unnecessarily long and extensive processes; retention of experts biased toward corporate interests, and discrimination in granting promptly applications of public service companies and delaying decisions in other cases.

Governor Edwards began his conclusions by meeting the arguments of counsel for the commissioners that he lacked power to remove them from office. He took the position that if such action on his part was an invasion of judicial powers vested in the courts, it would be equally an assumption of judicial power for him to hold the public utilities act unconstitutional. On this point the Governor said:

> The first answer to the objection is that the statute establishing the Board of Public Utility Commissioners provides that the Governor may remove any commissioner for neglect of duty or misconduct in office, giving to him a copy of the charges against him and an opportunity of being publicly heard in person or by counsel in his own defense upon not less than ten days' notice. The legislative intent, therefore, is clear, and that is not questioned by the counsel for the accused commissioners.
>
> If I decline to consider charges against these commissioners, or if I find them guilty and neglect to remove them, it is plain that I am violating a duty laid upon me by the Legislature. I am unwilling in this case to take the responsibility of declaring this provision of the public utility act unconstitutional.

Receivers Denied Increased Compensation

An application by the three receivers of the Rhode Island Company, Providence, R. I., for increased compensation on account, has been denied by Judge Chester W. Barrows in Superior Court. The receivers, Frank H. Swan, Theodore Francis Green and Zenas W. Bliss, presented the petition asking for an increase of $450 each a month, through their attorney, Clifford Whipple.

The receivers of the Rhode Island Company were each allowed $12,000 on account for the first year of the receivership when the matter came before Presiding Justice Tanner for a hearing, no one having presented any objections to the sum fixed by the court. In their petition presented to Judge Barrows recently, the receivers asked for an allowance of $1,450 each a month on account, for the period of seven months which has elapsed since the last settlement was made.

In arguing for increased compensation, Mr. Clifford reminded the court that at the time the receivership was established prospects for an early reorganization of the railway was very bright, but that with the present uncertainty of the situation the receivers should be allowed compensation more nearly approaching the sum that would finally be requested.

Eight Cents in New Orleans

Advance in Fare Adopted as Means of Averting Threatened Strike—Wage Award Met

Beginning Oct. 21, the people of New Orleans, La., will be charged 8 cents for car fare. This decision was reached by the Commission Council, at the instance of a committee appointed by the board of directors of the Association of Commerce, after a long drawn out conference with Assistant Attorney General Hall, Major Behrman and Receiver O'Keefe, of the New Orleans Railway & Light Company, as the only alternative to prevent another strike of trainmen.

Mayor Behrman was unwilling to give the men the award made by the Special Masters, awarded by Federal Judge Foster, before giving the public a hearing in the matter, being undecided in his mind whether a strike or an 8-cent fare would be more expensive to the Community.

EIGHT-CENT FARES FOR SIX MONTHS

The representative of the men and attorneys alleged, however, that the men were insistent on the carrying out of the award made to them by the Special Masters and that unless the matter was decided forthwith and the award executed, they could not be restrained in their determination to abandon work. It was hinted their course would be followed by the employees of the gas light company, a contingency which would make the strike all the more trying and vexatious, since it would curtail one of the city's chief sources of power, heat and light.

The agreement provides that an 8-cent fare shall be charged from Oct. 21, for a period of six months, leaving to the incoming administration the solution of the service-at-cost plan, the valuation of the property and other controvers in question.

Accidents Decreased in Seattle

In a report by D. W. Henderson, general superintendent of the Seattle (Wash.) Municipal Railway, marked reduction is shown in the number of accidents on Seattle's railway lines. In the first eight months of 1920, accidents were cut down from 3 to 53 per cent in all classes. The effects of weekly conferences for instruction and caution conducted by Mr. Henderson are reflected in the report. The percentage of claims against the gross earnings for accidents are said to be considerably less in Seattle than in other cities of the country of the same class, with one or two exceptions, and these in cities where railways are operated on level streets. The report gives the following table covering eight months of 1919 and 1920:

	1920	1919	Reduction Per Cent
Car collisions	172	368	53
Auto collisions	2016	2446	17
Pedestrians	136	210	35
Accidents on cars	204	312	35
Step accidents	341	342	3
Derailments	166	205	19
Ejectments	70	82	15

Men Accept Five-Cent Advance

The 800 employees of the Middlesex & Boston Street Railway, Newtonville, Mass., have accepted the company's offer of a wage increase of 5 cents an hour. The old agreement under which the men have been receiving 45, 50 and 55 cents per hour, according to term of service, expired on June 30. The men then submitted demands for 75, 80 and 85 cents. It is understood that the increase will be retroactive. The company announced that an increase of 5 cents an hour will not necessitate a fare increase. Pitt F. Dred, president of the company, in a statement regarding the acceptance of the increase, said:

> I am very glad to learn that the men have voted to accept the increase offered by the company. I have always had a strong conviction that the great majority of the men on our system are intelligent, level-headed and reasonable, men ready to do what they believe to be right and fair when they are in possession of all the facts. For this reason I refused to make an offer to their committee unless they would send an accountant to examine our books and report the facts to the men.
>
> The cost to the company is more than should be paid from a business standpoint and I believe the men realized it. On the other hand they, no doubt, felt that they too were making a sacrifice. It is this spirit of fairness and co-operation on the part of the men that gives me courage.
>
> We have been passing through very hard times for the management and for the men, to say nothing about the patient and unfortunate stockholder. The men agreed with me that it would be unfortunate to have a raise in fares and certainly no general increase will be asked for until we have made every reasonable effort to work the proposition out on the present basis.

News Notes

Demand That Service Be Restored.—An ordinance requiring the Atchison Railway, Light & Power Company, Atchison, Kan., to resume service on its lines or to pay a forfeit of $500 a day has been passed by the City Council. The road has recently been tied up by a strike.

Begin Work on Vehicular Tube.—Ground was broken on Oct. 12 for the vehicular tube under the Hudson River which is to connect Manhattan Island, New York City, with the state of New Jersey. Gov. Edward I. Edwards of New Jersey and Lieut.-Gov. Harry C. Walker of New York attended the ceremony. The cost of the project is estimated at $28,000,000.

Labor Shortage Halts Improvements.—A shortage of labor in Dallas, Tex., is seriously interfering with the improvement work being carried on by the Dallas Street Railway. Richard Meriwether, vice-president and general manager, recently stated that, in spite of the fact that the company was paying 40 cents an hour to common laborers, sufficient help of this class could not be obtained. Work on various betterments is therefore being delayed.

Interurban Tie-up Ends.—A strike which tied up the lines of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, operating interurban trains between Toledo and Marblehead, Ohio, ended on Oct. 8 when trainmen returned to work, adjustments having been perfected on a new time schedule which caused the trouble. Trainmen brought from Cleveland to operate the cars have returned. The strike began on Oct. 3.

Towns Would Take Over Line.—The towns and villages served by the Exeter, Hampton & Amherstburg Street Railway, Hampton, Mass., have opened negotiations with the company with a view to taking over its system for joint municipal operation. The company some time ago announced its intention of closing its lines and removing the tracks because of lack of funds. The State Department of Public Utilities has fixed $105,000 as fair value of the property.

City Ownership Favored. — Acquisition of the property of the Ottawa (Ont.) Electric Railway by the city of Ottawa is proposed in a report recently submitted to the City Council by the Board of Control. The board recommends that the rate-payers pass upon the question of the city's taking over the system at a referendum election to be held in January. If the voters should approve the proposition, the Council would have the power to ask the Provincial Legislature to grant permission for the city to borrow the necessary funds without a second appeal to the rate-payers.

Service Not Quite Normal.—Complaints from the officers of civic organizations, churches and schools in Brooklyn, N. Y., that as a result of the recent strike the Brooklyn Rapid Transit Company is still withholding surface cars from a number of important lines have been filed with the Public Service Commission for the First District. During a hearing on the complaints the company produced a letter from Federal Judge Julius M. Mayer, addressed to W. S. Menden, general manager of the B. R. T., which showed that the Federal Court was not only cognizant of the lack of street-car service, but had authorized it.

Big Toledo Vote Forecast.—W. L. Milner, author of the new service-at-cost franchise for the Toledo Railways & Light Company, which is to be submitted to the voters of the city at the general election on Nov. 2, is leading a campaign for the passage of the measure. He has addressed several public meetings, among them a rally at the Women's Building, which was largely attended by women. So far registrations have indicated that there will be a vote of more than 75,000 on the ordinance and on the twin bond measures for municipal ownership, as compared with a total of little more than 20,000 at the last election. The Toledo Railways & Light Company is taking no active part in the campaign in behalf of the service-at-cost measure.

Program of Meeting

National Association of Railway & Utility Commissioners to Hold Convention Nov. 9

The thirty-second annual convention of the National Association of Railway & Utilities Commissioners will be held at Washington, in the rooms of the Interstate Commerce Commission, on November 9, 1920, at 10 o'clock. The convention will last four days.

The address of welcome will be delivered by Edgar E. Clark, chairman of the Interstate Commerce Commission. Other addresses will be delivered by President Shaw, Clyde B. Aitchison of the Interstate Commerce Commission and George W. Anderson, a former member of that commission and now Judge of the United States Court in Massachusetts.

DISCUSSION OF PUBLIC OWNERSHIP

Among the subjects to be treated are: Public ownership and operation, safety of railroad operation, safety of operation of public utility companies, railroad service, accommodations and claims, railroad rates, public utility rates, car service and demurrage, express companies, statistics and accounts, grade crossings, capitalization and state and federal legislation. When these reports are presented they will be discussed upon the floor of the convention, and commissioners from various states will exchange views.

As a departure from the usual program, the convention this year will devote the afternoon sessions on Nov. 10 and 11 to informal or round-table discussions of a number of topics, among them "Local Street Railway and Interurban Transportation." The chairman of this meeting will be Charles E. Elmquist, of Minnesota, who headed the Federal commission which investigated the street railway situation early in the year. Among the speakers will be E. O. Edgerton, of the California Commission, and Noah W. Simpson, of the Missouri Commission.

WOULD SAFEGUARD POWERS

Attention is called to the efforts to minimize the influence of the state commissions, and the movement by certain interests to seek freedom from state control. On this subject the call says:

> This association has not and never can have any quarrel with Federal regulation in the field of Federal jurisdiction. It has repeatedly placed itself on record as in favor of the closest co-operation between the states and the Interstate Commerce Commission. But it resents the efforts of those who seek to curtail the rightful powers of the sovereign states over strictly intrastate matters.
>
> Against attempts to disarm the states this association must be constantly on its guard. It is only fair to state that the Interstate Commerce Commission itself has not shown any disposition to encroach upon the state field, and its chairmen frequently have urged closer co-operation between Federal and state commissions. In the recent advanced rate case three state commissioners selected by this association at the invitation of the Federal commission sat with it. The association is earnestly desirous of continuing these harmonious relations, but will stand firm, in the future as in the past, for the right of each state to control in matters of purely local regulation.

Financial and Corporate

Income Drops 200 per Cent

Railways in New York City Report Decline from Profit of $5,000,000 to Deficit of $5,000,000

For the year ended June 30, 1919, the provisional report issued by the Public Service Commission for the First District, covering the railways in New York City taken as a whole, shows that the net corporate income changed more than $11,000,000. The net income for 1918 was $5,780,958 as compared with a deficit of $5,583 820 for 1919, o: a decrease of very nearly 200 per cent. The large decrease is due to the increased cost of materials and operations with no increase in fares. The operating revenues increased only about $7,000,000, or 6.5 per cent over 1918. At the same time the total operating expenses increased twice as much as did the revenue.

This increase was more than $15,000,000, or 25.2 per cent over 1918. This allowed the net operating income to fall approximately $8,000,000 short of the same item in 1918. The taxes were decreased slightly and the non-operating income remained the same, so the gross income was decreased $8,500,000 over 1918. Deductions from the gross income increased approximately by $3,000,000, thereby making the total difference in the net corporate income for the two years was very close to $11,000,000.

In 1919, 77,811,385 more passengers were carried than in 1918, an increase of 3.4 per cent. At the same time the car miles increased about 12,000,000, or 3.6 per cent over 1918.

TRAFFIC AND MISCELLANEOUS STATISTICS OF NEW YORK CITY COMPANIES

Year Ended June 30:	1919	1918	Percentage Change
Miles of track, exclusive of storage and yard track	1,793.21	1,733.82	3.4
Average daily maximum number cars operated (June)	8,480	8,013	5.8
Passenger car-miles (active)	334,938,289	322,957,219	3.7
Car seat-miles	16,823,199,459	15,889,141,428	5.9
Total revenue car-miles	341,342,293	329,538,712	3.6
Passenger car-hours	28,591,562	28,939,839	— 1.2
Ratio C.M. to C.H. (speed M.P.H.)	11.7	11.2	45
Revenue passengers	2,079,754,393	1,975,511,690	5.3
Transfer passengers	293,988,420	320,419,738	— 8.3
Total number passengers	2,373,742,813	2,295,931,428	3.4
Operating ratio	69.0	58.5	10.5
Statistics per car-mile	11.7	11.2	
Operating revenue (cents)	32.3	31.5	2.5
Operating expenses (cents)	22.3	18.4	28.1
Net income (cents)	1.64	1.76	— 6.8
Number of passengers (total)	7.0	7.0	.....
Car-miles per revenue passenger	164.0	166.7	— 1.6
Statistics per car-hour:			
Operating revenue	$3.85	$3.58	7.5
Operating expenses	$2.65	$2.09	26.8
Net income (cents)	19.5	20.0	— 2.5
Number of passengers (total)	83.1	79.4	4.7

EARNINGS OF NEW YORK CITY COMPANIES

Year Ended June 30 (Provisional):	1919	1918	Percentage Change
Passenger revenue	$103,199,657	$97,394,225	6.0
Other transportation revenue	710,594	545,943	30.2
Total revenue from transportation	$103,910,251	$97,940,168	6.1
Other railway operating revenue	6,281,431	5,560,021	13.0
Total railway operating revenue	$110,191,682	$103,500,189	6.5
Operating expenses:			
Maintenance expended	$20,898,872	$16,007,110	30.6
Depreciation reserve	Cr. 2,112,793	96,617	—2279.0
Operation of power plant	14,590,859	11,195,756	30.4
Operation of cars	34,507,458	26,209,281	31.6
Injuries and damages	4,340,019	3,751,412	15.7
Traffic and general expenses	3,721,297	3,346,362	11.2
Total operating expenses	$75,945,712	$60,606,539	25.2
Net operating income	$34,245,970	$42,893,650	—20.2
Street railway taxes	7,909,679	8,232,322	— 3.9
Operating income	$26,336,291	$34,661,328	—24.0
Non-operating income	4,247,358	4,498,531	— 5.6
Gross income	$30,583,649	$39,159,859	—21.9
Deductions from gross income:			
Interest	$18,317,105	$16,902,067	8.4
Rents	16,097,054	15,802,682	1.9
Miscellaneous	1,753,310	674,152	160.0
Total deductions from gross income	$36,167,469	$33,378,901	8.4
Net corporate income	*5,583,820	5,780,958	—196.4

* Deficit

Ticket Ratio Declines

Chicago "L" Reports Results of 10-Cent Fare—32 per Cent of Riders Now Pay Cash

The figures for the first month's operation of the Chicago Elevated Railways under the 10-cent cash fare, with four tickets for 35 cents, which went into effect on Aug. 4, are now available. During August of this year 15,025,599 passengers were carried, with a resulting revenue of $1,370,864.

SMALL FALLING OFF IN PASSENGERS

This compares favorably with the month of August, 1919, the rate of fare then being 8 cents, when 13,578,959 passengers were carried, producing a revenue of $1,063,068. In July, 1920, when the rate of fare was 8 cents cash with two tickets for 15 cents, the number of passengers carried was 17,024,667, the passenger revenue amounting to $1,319,677.

During July, 1920, 4,204,932 passengers, or 25 per cent of the total number carried, paid the cash fare of 8 cents. During August, 1920, 4,826,697 passengers, or 32 per cent of the total, paid the cash fare of 10 cents.

While the number of passengers carried in August was practically 2,000,000 less than the number carried in July, the falling off is attributed more to the fact that July was an abnormal month than to the increased rate of fare. The number of passengers carried in June, 1920, which was 15,659,350, would probably be a better figure with which to compare the number carried in August, 1920.

REASON FOR DECREASE

This would show a reduction of about 600,000 passengers, which might be reasonably attributed to the higher rate of fare, as this many might easily be driven to the steam road suburban service and the surface lines, the latter having an 8-cent cash fare.

Scranton Valuation Fixed

A report has been filed with the Pennsylvania Public Service Commission fixing the physical valuation of the Scranton Railway. The valuation figures were determined by Drum & Company, Chicago, engineers, who represented the railway, and Dr. F. Herbert Snow, engineer for the commission. These figures, as submitted to the commission, are: Valuation on Nov. 1, 1919, $9,049,264; average for 1914 to 1912, $6,876,891; for year of 1914, $5,543,216. The historical valuation is placed at $11,319,156.

Attempts were made by complainants in the case to show that the high price area has passed and prices are dropping, and that there is considerable inflation in the country today.

The valuation of the property of the Scranton Railway was ordered by the commission in April, 1919, when it authorized the company to charge a 7-cent fare. It recently refused the petition for a 10-cent fare.

St. Louis Deficit Decreased

United Railways, in Receivership, Decreases Its Deficit From $400,000 in 1918 to $265,800 in 1919.

The results of the operation of the United Railways, St. Louis, Mo., in the hands of a receiver, show some improvefor the year ended Dec. 31, 1919. The revenue from passenger traffic increased by nearly $3,000,000, or 21.8 per cent over 1918. The improved showing was due largely to an increase of 32,024,602 in passengers carried, bringing the total of 376,985,727 passengers in 1918 up to 409,010,329 in 1919, or 8.5 per cent more.

Operating expenses were $16,592,680, an increase of 26.4 per cent over 1918. Taxes increased 30 per cent. Gross inccme increased $277,424 and deductions from the gross income increased $142,905. The net income transferred to profit and loss increased $134,519. The net income for 1918 was $400,299. The deficit for the year 1919 was only $265,780.

The Public Service Commission awarded, effective Sept. 20, 1919, cash fares of 8 cents for adults and 4 cents for children, with the sale of adult tickets at two for 15 cents, seven for 50 cents, and fifty for $3.50, and children's tickets at the rate of two for 7 cents. It was found impossible to secure the necessary number of metal tickets (over 4,000,000 being needed) on Sept. 20, 1919, and a flat rate of 7 cents was charged from that date until Oct. 31, 1919. On Nov. 1, 1919, bronze tickets, two for 15 cents, were sold on the cars only, and alloyed-silver tickets, in greater quantities, were sold at some 800 different stations. The result was that fares gradually settled down to a basis of approximately 3 per cent cash fares, 35 per cent 7-cent tickets sold off the cars, and 62 per cent of 7½ cent tickets sold on the cars. For the first few weeks traffic fell off on account of the increase in fares, but this was more than offset by the increased proportion of fares turned into the treasury and by increased business activity.

INCOME STATEMENT—UNITED RAILWAYS OF ST. LOUIS

Year Ended Dec. 31:	1919	1918	Percentage Change
Revenue from transportation	$16,497,932	$13,551,542	+21.7
Revenue from other railway operations	94,748	88,077	+ 7.6
Total railway operating revenue	$16,592,680	$13,639,619	+21.7
Current operating expenses	11,533,460	9,126,513	+26.4
Net operating revenue	$5,059,220	$4,513,106	+12.1
Taxes assignable to railway operations	1,110,911	852,476	+30.3
Operating income	$3,948,309	$3,660,630	+ 7.9
Non-operating income	106,442	116,697	— 8.8
Gross income	$4,054,751	$3,777,327	+ 7.4
Deductions from gross income:			
Interest and miscellaneous charges	2,661,263	2,540,872	+ 4.7
Depreciation reserve	1,659,268	1,636,754	+ 1.4
Total deductions from gross income	$4,320,531	$4,177,626	+ 3.4
Net income transferred to profit and loss	*$265,780	*$400,299	+33.6

* Deficit.

STATISTICAL INFORMATION—UNITED RAILWAYS OF ST. LOUIS

Year Ended Dec 31:	1919	1918	Percentage Change
Revenue passengers	263,221,899	245,876,910	+ 7.1
Transfer passengers	145,788,430	131,108,817	+11.2
Total passengers	409,010,329	376,985,727	+ 8.5
Percentage of revenue passengers using transfers	55.39	53.32	+ 3.9
Passenger revenue	$16,463,312	$13,516,790	+21.8
Average fare per revenue passenger (cents)	6.25	5.50	+13.6
Total miles of single track	461.57	460.90	+ 0.1
Amount track reconstruction, renewal and extension	25.01	15.80	+58.3
Total kilowatt-hours	179,011,395	174,686,259	+ 2.5
Number passenger cars owned	1,460	1,480	— 1.4
Average number passenger cars operated daily	1,132	1,107	+ 2.3
Number of employees	5,605	5,295	+ 5.9

Interest Payment Authorized

An order for the payment of interest by the receiver of the United Railways, St. Louis, Mo., on bonds of the St. Louis Transit Company and the St. Louis & Suburban Railway, amounting to $357,250, has been issued by Judge C. B. Faris in the United States District Court at St. Louis. The bonds bear 5 per cent interest which fell due on Oct. 1. St. Louis Transit Company bonds total $9,790,000 and the St. Louis & Suburban Railway bonds amount to $4,500,000.

Judge Faris also issued an order granting the receiver an extension of time in which to annul or adopt contracts of the United Railways. The orders were issued as a result of petitions asking six months' extension for the United Railways, the Florissant Construction & Investment Company, the Merchants' Express Company, and the Missouri Electric Company, all of which are in the hands of Rolla Wells, as receiver.

The United Railways was granted the right to enter into a contract with the Union Electric Light & Power Company for steam-generated current. The contract which the company now holds expires on Dec. 31, and the new contract will begin Jan. 1 and run for three years. Through the terms of the contract the United Railways will pay $15 per kilowatt per annum plus the energy charge of 89 cents per kilowatt hour. The energy charge is subject to change under the contract.

New Haven's Trolley Ventures Costly

The sale at auction of the New York, New Haven & Hartford Railroad's 96,855 shares of the Rhode Island Company, carried at a book value of over $24,000,000, for $2,200 marks a final chapter in the New Haven's venture in New England trolleys. The Boston *News Bureau* explains as follows:

It has for some time been apparent to the New Haven people that practically a total loss would have to be sustained on the Rhode Island street railway investment. The trolley situation there has gone from bad to worse. The outcome is not a surprise but it is sad commentary on the status of street railways in some parts of New England.

In additional to the original investment which was carried at slightly over $251 per share the New Haven had advanced the Rhode Island Company $3,746,037 in loans and held notes for that amount so that the total investment was above $28,000,000, as shown below:

	Par value	Book value
Stock	$9,685,500	$24,352,336
Notes	...	3,746,037
Total	...	$28,098,373

The Rhode Island Company was incorporated by special act of the Rhode Island Legislature in April, 1902, to consolidate all the street railway, gas and electric light properties of Providence and vicinity. It operated over 354 miles of street railway and 8.41 miles of steam railroad lines. Of the total mileage 39.93 miles were owned and 322.64 operated under lease.

Under the government dissolution decree for the New Haven the stock and obligations of the Rhode Island Company were put in the hands of trustees who were to exercise their best efforts to complete the sale of the securities before July 1, 1919. in March, 1919, however, Federal Judge Mayer extended the period during which the trustees might dispose of the securities to July 1, 1921.

New Haven's other big trolley investment —the Connecticut Company—should work out considerably better than the Rhode Island venture. It carries the 400,000 shares of stock of the Connecticut Company at $40,000,000 book value and holds over $3,000,000 notes and debentures of that company.

It is obvious that it will have to take a large loss on this valuation but should be able to salvage a portion of its investment here. Trolley conditions in Connecticut are not entirely satisfactory but a great deal has been done toward establishing street railways on a paying basis.

The New Haven's total investment in trolley, electric light and properties of similar character aggregates about $106,000,000. On a portion of this it will undoubtedly be able to realize to substantial degree, but even assuming that the whole amount had to be written off, the New York, New Haven & Hartford Railroad could show, on the basis of cost of reproduction and bare original cost of land, an equity above all obligations equal to $132 per share on the $157,000,000 stock.

Power Bonds Offered

William A. Read & Company and Spencer, Trask & Company, New York, N. Y., are offering for subscription at 99 and interest $5,000,000 of Wisconsin Electric Power Company first mortgage 7½ per cent sinking fund gold bonds, Series A, dated Oct. 15, 1920, and due Oct. 15, 1945, principal and interest guaranteed by indorsement by the Milwaukee Electric Railway & Light Company.

All Bids Rejected

Court Refuses Tenders for Buffalo & Lake Erie Property—Road to Quit Nov. 30

Upon the recommendation of George Bullock, as receiver for the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., Supreme Court Justice Louis W. Marcus has rejected all of the bids for the purchase of the property of the company. The court has authorized the receiver to continue the operation of the line until midnight of Nov. 30, 1920.

Justice Marcus reserves final disposition of the application of the receiver of the road to dismantle the property. Included in the order of the court is a provision authorizing the receiver to operate over the lines of the company after Nov. 30, such cars or trains as will be necessary for the purpose of disposing of freight then on hand and of closing up the stations and of collecting property belonging to the railway.

Further advertisements for bids will not be postponed, but the receiver is authorized to conduct such further negotiations looking to the sale of the property as he may deem desirable and to report to the court the result of the negotiations.

The proceedings were brought originally by the New York Trust Company, New York City, against the Buffalo & Lake Erie Traction Company, Buffalo; the Erie Electric Motor Company, Erie, Pa.; the Erie City Passenger Railway, Erie, Pa.; the Erie, Reed Park & Lakeside Street Railway and the Buffalo & Lackawanna Traction Company.

Would Rehabilitate Binghamton Lines

It is reported that persons interested in the receivership of the Binghamton (N. Y.) Railway are attempting to secure funds to be used in the rehabilitation of the system, and that their efforts promise to be successful. The proposed refinancing will carry with it the raising of sufficient funds to pay in full bonds aggregating $500,000 due in 1923. Receiver Phelps has announced that he expects to pay the interest on the company's consolidated mortgage bonds, due Nov. 1, amounting to $40,000. Federal Judge George W. Ray in an order issued several months ago directed that in the period ending Oct. 30 the receiver should pay off certain debts of the company. This order also provided for the ultimate discharge of the receiver.

Interborough Deficit Decreased

The Interbourough Rapid Transit Company, New York, N. Y., for the month of August, 1920, shows a deficit for its net corporate income of $658,482 against a deficit of $632,976 for the corresponding month of last year. For the two months ended Aug. 31, 1920, there was a deficit of $1,201,908. This was a decrease of 15 6 per cent over the same period last year. For the month of August, 1920, the number of passengers carried increased more than 10,000,000, or 17 per cent over the number carried in the same month of 1919. For the two months' period ending Aug. 31, 1920, the revenue passengers per car mile increased from 131,350,416 to 150,587,186, or 14.6 per cent.

SUMMARY OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY

Month ended Aug. 31, 1920	1920	1919	Percentage Change Over 1919
Total operating revenue	$4,032,388	$3,482,685	15.8
Total operating expenses	2,812,625	2,285,582	23.0
Net operating revenue	1,219,763	1,197,103	1.9
Total taxes	215,752	211,114	2.2
Operating income	1,004,012	985,989	1.8
Non-operating income	51,940	45,046	15.3
Gross income	1,055,952	1,031,034	2.4
Interest, rentals, etc., including Manhattan guarantee	1,714,434	1,664,010	3.0
Net income	*$658,482	*$632,976	4.1
Operating ratio (per cent)	69.75	65.63	6.2
Revenue passengers carried	74,797,650	63,988,828	17.0

Two months ended Aug. 31, 1920	1920	1919	Percentage Change Over 1919
Total operating revenue	$8,116,013	$7,122,071	13.9
Total operating expenses	5,576,796	4,518,990	23.5
Net operating revenue	2,539,218	2,603,081	2.5
Total taxes	435,769	427,073	2.0
Operating income	2,103,448	2,176,008	3.4
Non-operating income	104,478	91,961	13.7
Gross income	2,207,927	2,267,969	2.6
Interest, rentals, etc., including Mahnattan guarantee	3,409,834	3,307,453	3.1
Net income	*$1,201,907	*$1,039,485	15.6
Operating ratio (per cent)	68.71	63.45	8.2
Revenue passengers carried	150,587,186	131,350,416	14.6

*Deficit.

Suburban Line Suspends

The Providence & Danielson Railroad, Providence, R. I., on Oct. 3 discontinued service on its Providence-Danielson and its Chepatchet lines. The owners of the property have been experimenting with it since Sept. 7, when it was turned over to them in the hope of continuing operation. Negotiations have been opened with the representatives of the towns interested, looking toward their operating the line.

Financial News Notes

Branch Tram Line Sold.—The Montmorency branch of the Quebec Railway, Light, Heat & Power Company, Quebec, Que., is said to have been sold to an English syndicate for a price estimated at $2,500,000.

Municipal Lines Show Gain.—Receipts of the Toronto (Ont.) Civic Railway for the month of September were $46,558, an increase over the same month of 1919. During September, 1920, the municipal lines carried 2,775,708 passengers, as compared with 2,332,674 during September of last year.

Railway Sold at Auction.—The property of the South Morgantown (W. Va.) Traction Company was sold at auction on Oct. 2 to James H. McGrew, D. H. Courtney and Aaron J. Carlow, all of Morgantown. The price paid was $40,100. The property disposed of comprised 4 miles of track, two interurban cars, an amusement park of 16.5 acres and the buildings and fixtures, a carhouse and miscellaneous equipment. The railway has been operating for about a year under direction of A. J. Carlow, receiver, and in that period has paid all running expenses, taken up several obligations and has considerable cash to its credit. The new owners will continue to operate the line.

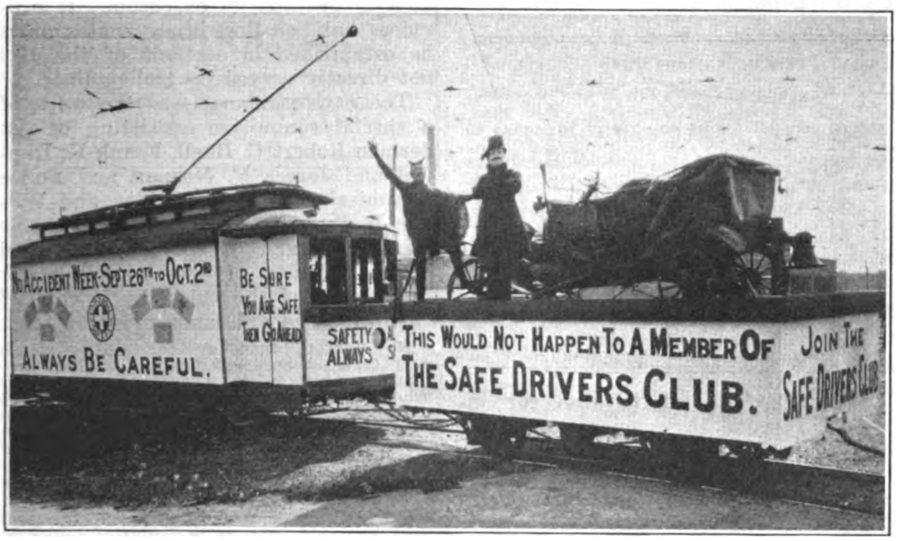
Bondholders Urged to Accept.—Bondholders of the St. Louis (Mo.) Railroad (Broadway Line) are urged in a second circular issued by Rolla Wells, receiver for the United Railways, St. Louis, to accept his offer to retire the $1,900,000 outstanding 4½ per cent bond issue of the St. Louis Railroad by turning over to the bondholders an equivalent par value of the three-year 7 per cent receiver's certificates. The date for the expiration of the bonds was May 1 of this year, but by agreement they were extended for six months. Under the provisions of this extension they would become due Nov. 1, but in his circular Mr. Wells says that a written demand for payment of principal was not served until June 14, 1920. In consequence an action for the foreclosure on account of default in payment of the principal could not be maintained until Dec. 1, 1920. According to the opinion of Charles W. Bates, attorney for the receiver 4½ per cent is the rate of interest that the bonds will legally bear from May 1, 1920, until they are paid. It is known that some of the bondholders have objected to the acceptance of the receiver's offer on the ground that they believe the bonds should bear interest at the rate of 6 per cent during the time of the six months' extension. Other phases of the company's finances are referred to on page 845.

Traffic and Transportation

Boosting for Safety

Railway Takes Active Part in "No Accident" Week in Milwaukee—Autoists More Careful

In connection with the Ninth Annual Congress of the National Safety Council, held in Milwaukee, Wis., from Sept. 26 to Oct. 2, there was conducted in the city a "No Accident Week" campaign. Among those organizations participating in the campaign was the Milwaukee Electric Railway & Light Company. The city cars of the company carried on the bumpers large posters reading as follows: "No Accident Week—Help Make Our City Safe From Accidents." The 1,700 trainmen of the company were furnished with celluloid buttons 2.5 in. in diameter with the same slogan inscribed upon them, the buttons being mounted on ribbon badges.


No Accident Week-Sept. 26th to Oct. 2nd
Always Be Careful.
Be Sure You Are Safe Then Go Ahead
Safety Always
This Would Not Happen To A Member Of The Safe Drivers Club.
Join The Safe Drivers Club

SAFETY EXHIBIT OF MILWAUKEE COMPANY

During the week the company also operated a two-car train especially designed to teach a lesson of safety. The motor-car of the train bore upon its sides large banners with the standard safety motto in the center and such safety slogans as, "Don't Kid With Safety—You May Be The Goat." The trailer was a flat car with a built-up platform on which was placed a wrecked automobile, in the driver's seat of which was an employee of the Company dressed to represent the devil, while in the tonneau was another employee dressed to represent an undertaker. The trailer was equipped with a large bell and a fire siren which were operated to attract the attention of the public to the exhibit. It bore on its sides two banners, one reading: "This gentleman is not a member of the Safe Drivers' Club," while the other read: "This accident would not have happened to a member of the Safe Drivers' Club."

The Safe Drivers' Club is a local organization of automobile owners and chauffeurs who have pledged themselves to observe fundamental safety rules in the operation of their cars. This organization was founded and is being conducted under the auspices of the local Association of Commerce.

The company's safety exhibit was operated in residential districts during non-rush hours and in the downtown district during the rush hours. It attracted a great deal of attention and is believed to have taught a useful lesson. The exhibit was prepared under the direction of P. A. O'Keefe, chief safety inspector for the company.

The company has a permanent safety organization known as the Central Safety Committee. This was started about six years ago. It is composed of the heads of various departments and meets from time to time for the discussion and initiation of such safety measures in connection with the company's varied activities as may be needed. The chief safety inspector is its secretary. He is also the executive head of the safety enforcement committee, which was organized in January 1920, and whose duties are to enforce the safety rules promulgated from time to time for the benefit of the system's employes. It is on a military basis and the organization is such that there is always at least one safety representative of the safety enforcement committee present at the execution of any construction work that is being done by the Company. This representative is responsible for the observance of safety regulations.

Favors One-Man Cars

Tri-City Railway Proposes to Change Equipment as Means of Saving—Seeks Higher Rate

Installation of one-man cars on the Illinois lines of the Tri-City Railway & Light Company, Davenport, Iowa, was proposed at a hearing on Sept. 28 before the Illinois Public Utilities Commission. The hearing had been called by the commission to consider the company's petition for authority to charge a permanent fare of 10 cents in Illinois. Company officials declared that the use of "safeties" would help to solve the railway's financial difficulties.

It was estimated by officials of the company that such a system of operation would save the company $100,000 annually on its Illinois lines and $200,000 in Davenport over the same period. Cost of new safety car equipment makes the purchase of new cars out of the question, but cars in present use could be converted for one-man operation at an approximate cost of only $40,000. Two-man car operation in Illinois would be necessary during peak hours, it was stated. In Iowa this continuation of the present system would be unnecessary because of lighter traffic, it is estimated.

To test the accuracy of the estimate of savings under one-man operation, four cars will be put in service on the Prospect Park line in Moline if the Illinois commission recommends the experiment. It is understood that the city of Moline will welcome the test.

CARMEN FILE PROTEST

Illinois trainmen, representing the viewpoint of organized labor on one-man car operation, have filed a protest with the Illinois commission against this system of operation. The petitioners call it dangerous to the public and also state their belief that many men would lose their jobs if the new plan were put into force.

On July 20 an 8-cent fare was placed in effect in Moline and Rock Island as a temporary relief measure. Since that time the scale of trainmen's wages has been increased from 60 to 70 cents an hour. This increased labor cost has eaten up the additional income derived from the 8-cent rate. To such an extent have net revenues decreased that the company withdrew its application for a clause by which three tickets could be sold for 25 cents and made its plea for a straight 10-cent fare. In Davenport the fare is now 9 cents, three tickets for a quarter.

Seven Cents in Colorado Springs

The Colorado Springs & Interurban Railway, Colorado Springs, Col., has been authorized by the City Council of Colorado Springs to raise its fare to 7 cents cash. The company has been ordered to sell eight adults' tickets for 50 cents and eight children's tickets for 25 cents. Before taking effect new rates must be approved by the State Public Utilities Commission.

Eight per Cent Return Allowed

Georgia Commission Authorizes General Increase in Rates—Seven-Cent Cash Fare in Atlanta—Orders Service Improved

Holding that the Georgia Railway & Power Company, Atlanta, is entitled to a return of 8 per cent upon a total valuation of $41,000,000, the Georgia Railroad Commission on Sept. 22 authorized the company to charge a 7-cent cash fare on its railway lines in Atlanta. The company was directed to sell fifteen tokens or tickets for $1. The company has been charging a 6-cent fare since April, 1919. The commission also authorized an 8-cent cash fare with thirteen tickets for $1 on the company's lines in Gainesville. Free transfers were ordered continued. Charges for electric power and for gas were also substantially increased. The new rates took effect on Oct. 1. Fares on the lines in Decatur and College Park remain at 5 cents, since contracts between the company and the municipalities prevent any increases in these cities.

BY THE terms of the commission's order, the company is directed to place in service on its city and suburban routes, during the morning and afternoon rush hour periods as now established, additional seating capacity equal to 20 per cent of that now provided. This increased service is to be furnished at as early a date as practicable and, if the necessary equipment can be secured, within six months from Oct. 1, 1920. Commenting upon this stipulation, Walter T. Colquitt, counsel for the company, said:

> Under a provision allowing only a 7-cent carfare and providing for large improvements of service, the Georgia Railway & Power Company would be far better off without the rate increase and without having to make the service increases. It would take a carfare of 20 cents for the company to make ends meet on an order requiring the company to make 20 per cent service increases and other improvements the commission considered. The company stands to lose close to $400,000 a year under such provisions.
>
> We recognize that some of the lines ought to be improved and they will be improved, but there are other lines where decreases in service are imperative.

$41,000,000 VALUATION

The company had applied for an 8-cent cash fare and for increases in power and gas rates amounting to approximately 33⅓ per cent. The commission, after an exhaustive inquiry, fixed the sum of $41,000,000 as a fair value of the combined properties owned, leased and devoted to the public use on April 30, 1920. Two years ago the commission estimated the fair value of the properties at $35,000,000 and the necessary working capital at $666,000, making a total of $35,666,000 upon which the company was at that time entitled to a reasonable return. Between Dec. 31, 1917, and April 30, 1920, the corporation's capital was augmented by the sum of $4,337,815. The working capital required to care for the properties under the new valuation is placed at $850,000. The commission found that for the year 1919, the company's net income amounted to approximately 6.2 per cent, and for the six months period ending June 30, 1920, to approximately 6.5 per cent on the $41,000,000 valuation. The smallest percentage of returns occurred in the railway department and in the outside electric department.

WAGE SCALES, GEORGIA RAILWAY & POWER COMPANY

	Wage Scales in Effect July 1					
	1915		1918		1920	
Inspectors, per month		$95.00		$125.00	$172.50 to $185.00	
Motormen, per hour	1st 3 mos.	.17	1st yr.	.25	1st 3 mos.	.42
and	2nd 3 mos.	.18	2nd yr.	.27	next 9 mos.	.44
Conductors, per hour	2nd 6 mos.	.19	3rd yr.	.29	thereafter	46
	2nd yr.	.21	4th yr.	.30		
	3rd yr.	.23	5th yr.	.31		
	4th yr.	.24	6th yr.	.32		
	5th yr.	.25				
Linemen, per hour	$0.30 $0.31	$0.36½	$0.31 to	$0.40	$0.57 to	$0.63½
Common labor, per hour			.20	.21½	....	.35
Machinists, per hour	.39 to	.44	....	.50	.83	.85
Carpenters, per hour	.27	.32	.42	.45	.70	.80
Painters, per hour	.18	.39	.25	.48	.63	.80
Car cleaners, per hour		....	....	.20	....	.35

In support of its petition for increased revenue, the company submitted comprehensive data regarding increases in operating costs. The commission summarized the results of its study in the accompanying tables.

UNIT COSTS—GEORGIA RAILWAY & POWER COMPANY

Commodities and Materials f.o.b. Atlanta

	July 1st		
	1915	1918	1920
Coal, per ton	$2.56	$5.01	$11.80
Copper, per lb.	0.23¼	0.27½	0.24½
Steel wire, per lb.	0.024	0.037	0.039
Standard poles, each, set	10.50	14.00	20.00
Cross arms and brackets	0.58	0.94	1.67
Y. P. lumber, per 1,000 ft	16.00	34.00	55.00
Insulators	0.95	2.24	2.80
Creosoted ties, each	0.69	1.07	2.02
Cement, per bbl.	1.25	2.18	4.50
Steel rails, standard wt., per ton	31.43	74.00	70.00
Steel rails, girder, per ton	42.60	none bought	76.40
Spikes, per keg	4.00	7.80	12.00
Ballast, crushed stone	1.00	1.80	3.13
Paving Brick	22.00	none bought	42.00
1 Standard suburban car — complete	5,200.00	7,176.00	13,559.00
1 Standard PAYE Car — complete	4,201.00	5,819.00	11,937.00
1 Standard Trailer car — complete	2,120.00	2,995.00	6,063.00
1 Spl. work 2 piece crossing	1,496.00	2,540.00	2,540.00

Regarding the matter of return, the commission's order said:

> A public utility with rates providing only a 5 or 6 per cent return cannot secure new capital in competition with a private business earning an 8 or 10 per cent return. It should be further borne in mind that the cause of the decreased purchasing power of the dollar, a return of 8 per cent now is not the equivalent of a 6 per cent return prior to the war. * * *
>
> This commission is of the opinion, after mature consideration, that a return on the fare value of the property and capital employed by applicant of 8 per cent is reasonable and really needed to enable it to render to the public, under existing conditions, efficient and adequate service, and the schedule of rates established in connection herewith is intended to provide approximately this return. Out of this percentage of net income applicants must meet its fixed charges, such as bond interest, sinking fund requirements, rentals, on leased properties, etc.

Jitneys Ruled Off Hartford Streets

The Board of Aldermen of Hartford, Conn., on Oct. 11 adopted an ordinance barring motor buses from the streets used by the Connecticut Company and from the congested business areas of the city. The measure will go into effect on Nov. 1 unless court action is brought by the jitney men to prevent its execution. It provides that belt-line jitney routes must be established in sections of the city not directly served by trolley lines.

The new ordinance was the work of a special committee consisting of Aldermen Robert C. Buell, Frank K. Daniels and James F. Noonan and Police Commissioners Morris Older and Wilbur Walker of the commission's traffic committee and Corporation Counsel Walter Schultz. It was passed under suspension of the rules, by a vote of 15 to 3. The ordinance provides that:

> No person, firm or corporation shall operate a public service motor vehicle popularly termed a jitney, as such, along any other streets or parts of streets than those established and fixed in this ordinance as traffic routes. Any person, firm or corporation violating any of the provisions of this ordinance shall upon conviction be fined $50 for each offense. This ordinance shall take effect Nov. 1, 1920.

"Mass Honesty" Test Successful

Square-dealing is a characteristic of the citizens of Pittsburgh, Pa. That is the opinion of Charles A. Fagan, W. D. George and S. L. Tone, receivers of the Pittsburgh Railways. They base their contention that Pittsburghers are fundamentally honest upon an experiment which they conducted in connection with the recent increase in token fare from 7½ cents to 8⅓ cents.

To save unnecessary expense the receivers decided to make no change in the form of token in use. They issued a statement to the public explaining their position and pointing out that, while tokens purchased prior to the increase in price would be accepted when the new rate took effect, car riders could aid the railway by refraining from "stocking up" on the metal discs prior to the advance. Receiver Fagan commented upon the results of this experiment as follows:

> A great deal of fun has been poked at the receivers for taking the public into their confidence, under the impression that the public would take advantage of the situation to load up with the metal discs. This possibility was taken into account in the calculations made by the receivers of the extent to which the sales would in-

crease, and we are gratified to say that the sales did not reach our expectations. We felt that in deference to the consideration the public has shown in this unavoidable increase in street car fares, the public was entitled to know in advance that the type of metal token tickets in use were not to be changed. In obviating the confusion of a change in the kind of tickets in use, the irritation of refunds involving a few cents, and ill temper and delays, the experiment was a complete success. We would do it all over.

The returns from the sales of tokens in the two days preceding the increase were upwards of 1,000,000 tokens in excess of the normal number for two days. The so-called bargain-counter rush would not have required us to limit the sales of tokens, as originally intended, if the type of ticket in use had been of the paper kind, as such tickets are used only once and then destroyed. The supply of metal tokens, however, is limited and inasmuch as they are used repeatedly, there necessarily must be some tokens each day in the hands of the conductors for handling the next day's business and also some in the fare boxes.

Approximately 20 per cent of the car riders took advantage of the opportunity to get more than their usual supply of tickets, and thereby caused parts of the system to be without tokens to sell to those who required them and thus created a necessity for limiting the number of tokens to be sold to one person to two at one time.

Transportation News Notes

Eight Cents in Berlin.—The New Hampshire Public Service Commission has authorized the Berlin Street Railway to raise its cash fare from 5 cents to 8 cents. Five tickets will be sold for 35 cents.

Upholds Eight-Cent Fare.—The Pennsylvania Public Service Commission has dismissed complaints of the city of Wilkes-Barre and various boroughs, townships and individuals of Luzerne County against the 8-cent fare charged by the Wilkes-Barre Railway. The commission authorized the company to raise its fare to 8 cents cash two years ago. Four tickets are sold for 30 cents.

Rejects Seven-Cent Fare.—The City Council of Clinton, Iowa, has refused a petition presented by the Clinton Street Railway for authority to raise its fare to 7 cents. The company sought the elimination of workingmen's tickets, which have been sold at the rate of forty for $1. Representatives of local labor unions opposed a higher fare.

Will Vote on Fare Increase.—The voters of Kalamazoo, Mich., will decide at the general election on Nov. 2 the question of granting the Michigan Railway an increase in fare from 7 cents to 10 cents. At a former referendum the rate advance was refused. The City Commission has authorized the company to put the 10-cent fare in effect temporarily.

Municipal Line Raises Fare.—The board of directors of the municipally-owned Norton, Taunton & Attleboro Street Railway, Norton, Mass., has voted to discontinue the sale of sixteen tickets for $1 and to charge a straight 10-cent fare in each zone. The railway's employees are asking for an increase in wages to a maximum of 75 cents an hour.

Tokens in Buffalo.—The International Railway, Buffalo, N. Y., has begun the use of metal tokens. These replace the paper tickets which have been in use since the 7-cent fare went into effect. The tokens are slightly smaller in size than a dime and are sold at the rate of four for 25 cents, the same as the tickets. The company's fare boxes have been rearranged so that the tokens register on a separate dial from the cash fares.

Bus Permit Revoked.—The City Commission of Newark, N. J. has directed City Counsel Congleton to prepare an ordinance rescinding the franchise of the General Omnibus Company. The company was given permission in January, 1919, to operate a number of buses in Newark. Under the terms of the agreement it was to begin service before July 1 last. Failure to comply with this condition led to a demand that the franchise be revoked.

Ten Cents in Waterloo.—A 10-cent cash fare took effect on the lines of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, on Sept. 15. The fare was formerly 5 cents. The advance was authorized by the board of arbitration which recently awarded the company's employees an increase in wages. Thirteen workmen's tickets or twenty children's tickets are sold for $1, good during designated hours. A similar schedule of rates is in effect on the company's lines in Cedar Falls.

Eight Cents Asked in Johnstown.—The Johnstown (Pa.) Traction Company has petitioned the State Public Service Commission for authority to charge an 8-cent cash fare and to sell four tickets for 30 cents on its Johnstown city lines. The present fare is 7 cents cash with four tickets for 25 cents. The company on Oct. 1 raised the wages of its carmen from 50, 52.5 and 55 cents an hour to 55, 57.5 and 60 cents an hour.

Front-Exit Cars in Twin Cities.—Front-exit cars will soon be operating through the streets of Minneapolis and St. Paul, Minn. Three hundred cars of the old type are being remodeled by the Twin City Rapid Transit Company. Of the reconstructed cars, 175 will be placed in service on the Minneapolis lines and 125 on the St. Paul lines. The equipping of the cars has been delayed by the difficulty of obtaining castings. These are now being received at the company's Snelling shops.

Four Cents a Mile Allowed.—The Southwestern Traction Company, Temple, Texas, which operates an interurban line from Temple to Belton, Texas, a distance of twelve miles, has been granted authority by the Texas Railroad Commission to increase its passenger fares between the two towns from 35 cents to 49 cents, and to make proportionate increases for intermediate stations. The company contended that 35 cents was confiscatory.

Rate Dispute Settled.—The Kentucky Railroad Commission on Oct. 7 entered an order approving the new schedule of interurban rates of the Louisville & Interurban Railroad, Louisville. The commission also rescinded the order requiring the Attorney General and Commonwealth's attorneys in the counties affected to bring an action against the company. Under the new schedule cash passenger fares will be collected on all trips beyond the city limits on a 3-cents-a-mile basis.

More Trains on Subway.—Under an order issued on Sept. 29 by the Public Service Commission for the First District the Interborough Rapid Transit Company, New York, N. Y., has resumed the operation of trains on practically rush hour schedules during nearly the entire day. The order for the improved service was issued last April but was suspended during the past few months. It provides for the maximum of service in all hours except the middle of the day and late at night.

Wants More in New Castle.—The Pennsylvania-Ohio Electric Company, Youngstown, Ohio, has filed with the Pennsylvania Public Service Commission a new schedule of rates, under which it proposes to raise its fare on its lines in New Castle, Pa., from 7 cents to 10 cents. The company contends that the 7-cent fare is insufficient to meet operating expenses and to pay a fair return on the investment. The city authorities have announced that they will oppose any increase in fare.

Busmen May Unite.—An attempt is being made to form one central organization embracing all the large and small jitney buses in Hartford, Conn. The Hartford Public Service Operatives' Protective Association is back of this movement. An association to be known as the Hartford Bus Corporation is being formed. The capitalization will be $50,000. The officers of the corporation are: Harry A. Cohen, president; D. S. Wells, secretary; C. J. Miller, financial secretary, and Joseph M. Namourn, treasurer.

One-Man Cars in Houston. — The Houston (Tex.) Electric Company has received its first consignment of twelve one-man safety cars. Additional cars have been ordered and will be put into service in Houston as rapidly as they are received. The company is still operating at a 7-cent fare under the court decree holding the 5-cent rate to be confiscatory and declaring that the company is entitled to earn 8 per cent on its investment after 4½ per cent has been charged off for depreciation. Efforts so far to negotiate a new franchise have so far failed.

"Safeties" Approved, Fare Reduced.—A 1-cent reduction has been made in the fare charged by the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, as the result of the introduction of one-man safety cars. The company recently raised its fare from 6 cents to

8 cents. It subsequently applied to the City Council for permission to use "safeties." The Council consented, the company agreeing to reduce the fare. The carmen objected to this scheme and went out on strike on Sept. 24. They returned to work on Sept. 27. On that date the one-man cars and the 7-cent fare were placed in operation.

May Abandon San Diego Lines.—Service may have to be abandoned on a numer of lines of the San Diego (Cal.) Electric Railway in the near future, according to a statement made by William Clayton, vice-president and managing director of the company, at a recent hearing before the San Diego City Council. Mr. Clayton declared that the railway was willing to make track improvements in so far as it was financially able, but that it was unable to undertake the street paving as requested by the council. It is proposed to abandon the Market Street line between Fifth and Sixteenth and the Spruce Street line because of insufficient patronage.

City May Run Lines.—Operation of the Lowell Division of the Eastern Massachusetts Street Railway by the city of Lowell, Mass., was suggested by Homer Loring, chairman of the public trustees of the company, at a recent conference with municipal officials and the members of the local Chamber of Commerce. Mr. Loring proposed that the city undertake to operate the Lowell lines for a period of three months. The city, in addition to meeting operating expenses, would be required to pay interest at the rate of 6 per cent annually on the value of the railway property. The proposition may be submitted to the voters at the general election on Nov. 2.

Increase Asked in Sacramento.—Asking that the State Railroad Commission investigate the cost of operation of its lines in Sacramento, the Pacific Gas & Electric Company has filed a petition with the commission looking toward an increased fare. The application asks that the commission make an order establishing such rates as will provide a reasonable return upon the property investment. The company gives the value of its railway holdings in Sacramento, exclusive of franchise or going concern value, as $2,449,285. For the fiscal year ended June 30, 1920, it is stated the gross revenue totaled $727,647, and the operating expenses $586,073, leaving a total of $131,574 available for depreciation and returns. The fare is now 5 cents.

Motor Buses as Election Issue.—Establishment by the city of Winnipeg, Man., of municipal motor bus lines is demanded by the Winnipeg labor party, which is making the question an election issue. The labor unions are supporting the candidacy of Councilmen pledged to work for the installation of a motor bus system to be owned by the city and to give service at a fare below that charged by the Winnipeg Electric Railway. They also demand that the railway be compelled to abide by the provisions of its original agreement with the city, limiting the fare to 5 cents, or that it surrender its franchise. A 7-cent cash fare took effect in Winnipeg on Sept. 1, the rate having been 6 cents for the past year. The increase in fare was strongly opposed at the time by the labor element.

Five Cents a Mile Asked.—The Southern New York Power & Railway Corporation, Cooperstown, N. Y., has asked the Public Service Commission, Second District, for permission to increase its interurban passenger rate from 4 to 5 cents a mile and to discontinue the sale of mileage books. The company's petition states that its line is paralleled by improved state highways and that there is competition from auto buses and freight truck lines, and that grades render operation of cars expensive. The company alleges, in support of its application, increases in the costs of materials and labor, stating that subsequent to June 1 there had been wage increases approximating 23 per cent in the operating department and 12 per cent in other departments. Arbitration of the strike in July, in states, added $25,000 to the payroll.

Seven Cents in Pine Bluff.—The Pine Bluff Company, operating the electric railway system in Pine Bluff, Ark., raised its fares from 6 cents to 7 cents on Sept. 21. The increase had been approved by the City Council and the State Corporation Commission. Fifty tickets are sold for $3 at the railway's offices. The company voluntarily reduced the rate for school children by putting on sale fifty tickets for $2.50 good at any hour between 8 a.m. and 5 p.m. There has been no material reduction in the number of passengers since the new rates took effect. In preparation for the increase the management carried on a campaign of education by means of a series of advertisements in the Pine Bluff newspapers. A. G. Whidden, advertising manager of the company, was in charge of this publicity work.

Jersey Busmen Answer Railway.—Thirty-one owners of jitney buses operating in Newark, Paterson, Jersey City and other cities of New Jersey, have filed their answer in the Court of Chancery to a complaint made by the Public Service Railway, Newark, alleging the competition of the buses to be illegal. Several months ago the railway started legal proceedings to have the jitneys ousted from the streets in which it has tracks. In their answer, the busmen disclaim all responsibility for the company's failure to earn a profitable revenue, and throw the blame for such failure upon the corporation. They contend that for the court to restrain the operation of the defendents' buses would not only deprive the defendents of their right to make a livelihood, but would also deprive the public of means of transportation to which it is entitled.

Street Collection Speeds Up Service.—The Chicago (Ill.) Surface Lines has begun the use of front-end street collections at various congested points as a means of speeding up the loading of cars, filling up the front end, and in general improving schedules. Points of heavy transfer where a line stub-ends, such as at Adams and State Streets, Van Buren and State Streets, and Twelfth Street and Wabash Avenue, were the first locations at which auxiliary collectors were provided. The plan will be extended to other heavy transfer points and to industrial plants such as the Western Electric Company, and Sears, Roebuck & Company, where large numbers of employees must be handled in the rush hours. Adoption of this plan was recommended by John A. Beeler, consulting engineer, New York, who is making an extensive study of conditions in Chicago. The collectors are equipped with the usual small portable register, transfers, etc.

Intrastate Rate Powers Argued.—Conflicting opinions as to the authority of the Interstate Commerce Commission to prescribe intrastate rates were presented to the commission on Oct. 12 by representatives of the railroads and state commissions at the hearings on application of the roads of New York and Illinois for an order increasing intrastate passenger fares to the level of the 20 per cent advance granted for interstate traffic. Spokesmen for the railroads contended that the transportation act made the whole rate structure of the country a matter for the consideration of the Interstate Commerce Commission, and that the Federal authority no longer was confined solely to the regulation of interstate traffic. State commissioners, however, argued that the commission was without authority to make blanket increases in the traffic charges within the boundaries of a state and that Congress in passing the new law did not broaden the power of the commission over intrastate regulation.

May Raise Reading Fares.—Reading Transit & Light Company, Reading, Pa., has filed with the Pennsylvania Public Service Commission a new schedule of fares for its entire system, comprising the lines of Reading, Norristown and Lebanon and the suburbs, to go into effect on Oct. 27. The new schedule provides for an increase from 7 cents to 8 cents on thirty lines in Reading and Lebanon, and an advance from 8 cents to 9 cents in Norristown and on all suburban lines of the system. Under the new schedules monthly commutation books and excursion tickets will be discontinued, but there will be no curtailment of the practically universal transfer privileges or other features of the service. Constantly increasing cost of operating the system is given by the company as the reason of the advance. Experts engaged by the city to make a survey of the property of the company have placed the total valuation of the lines between Norristown and Lebanon at approximately $4,600,000. The company's experts are said to have placed the value of its property at $6,500,000.

Personal Mention

General Manager Named for Toronto Commission

H. H. Couzens, general manager of the Civic Hydro-Electric Commission, of Toronto, Ont., was on Sept. 28 appointed general manager of the Toronto Transportation Commission, which is to take over and manage the system of the Toronto Railway at the expiration of the latter's franchise in September, 1921.

The commission also appointed R. C. Harris, Commissioner of Works for the city; E. L. Cousins, general manager of the Harbor Commission, and F. A. Gaby, chief engineer of the Hydro-Electric Power Commission, as a committee to serve in a consulting capacity with a view to co-ordinating the interests represented by them and obtaining the benefit of their advice on the problems arising in connection with the taking over of the railway lines.

One of these problems involves the altering of the gage of the Toronto Railway and the Toronto Civic Railway lines now operating in St. Clair, Danforth and Gerrard Avenues, which were constructed in 1912 and 1914. The gage on both the privately owned and the civic lines is 4 ft. 11 in., in comparison with the standard of 4 ft. 8½ in. The importance of this question will be understood when considered in connection with the Ontario hydro-radial project. If the gage is not changed to conform to the standard gage, the Toronto system will be unable to take advantage of the night haul of radial express and freight cars into the city, and much revenue will be lost.

E. C. Brister has resigned as general manager of the Alexandria (La.) Municipal Street Railway. Mr. Brister has accepted a position as manager of the Alexandria municipal power station.

Dean McLaughlin, superintendent of the Michigan Railroad, Kalamazoo, Mich., has resigned to join the organization of the Ohio Brass Company, Mansfield, Ohio. Mr. McLaughlin has been connected with the Michigan Railroad and with its predecessor, the Michigan United Traction Company, for the past eight years. Prior to that time he served with the Toledo Railways & Light Company, Toledo, Ohio.

Robert J. Dunham has resigned as vice-president of Armour & Company, Chicago, Ill., and will sever all connection with the Armour interests. Mr. Dunham was receiver of the Kansas City (Mo.) Railways on the occasion of its former receivership, ended in 1914. Subsequently he served as chairman of the board of the Kansas City Railways until his resignation in June of this year. He is now president of the Sioux City Service Company, Sioux City, Iowa, a property controlled by the Armours, but will resign this position in the near future.

Steam Operator Chosen

Ernest Stenger, New President of the Denver Tramway, Long with Union Pacific System

Steam railroading has lost an able executive to the electric railway field in the person of Ernest Stenger, the newly elected president of the Denver (Col.) Tramway. Mr. Stenger has already achieved a reputation for "getting things done" as superintendent of the Southern Division of the Union Pacific Railroad. The experience which he has thus gained will stand him in good stead in taking up for the first time the management of a traction property.

ERNEST STENGER

Mr. Stenger, as announced in last week's issue, has already entered upon his new duties. The office of president has been vacant since 1913, the direction of the affairs of the company having been largely in the hands of Charles Boettcher, chairman of the board of directors. In addition to serving as president, Mr. Stenger will perform the functions of general manager, Vice-President F. W. Hild having submitted his resignation to take effect as soon as the operating force has been reorganized. Mr. Stenger has announced that he will adhere to the present policies of the tramway, and that he contemplates no changes in the executive personnel.

Like most steam railroad executives, Mr. Stenger gained much of his experience in the school of hard knocks. A civil engineer by training, he has a broad understanding of the fundamentals of the transportation industry, which has not only made possible the rise to a position of responsibility with the Union Pacific, but which will enable him to visualize the problems of the Denver system. He is well acquainted with the West, his entire railroad career having been passed west of the Mississippi River.

Mr. Stenger was born in 1865 at Colmar, Alsace. Coming at an early age to the United States he was graduated from the University of Michigan in 1886. In the same year he entered the railway service as a rodman with the Burlington & Missouri River Railroad in Nebraska. After two years of this work he was appointed a draftsman with the Atchison, Topeka & Sante Fè Railway, resigning in 1890 to become assistant engineer with the Missouri Pacific Railway.

After serving with the Missouri Pacific for ten years, Mr. Stenger resigned to join the Union Pacific System. His first position with that road was that of division engineer. He later served as assistant superintendent and as division superintendent. In 1907 he was made general superintendent of the Rio Grande Western Railway, continuing in that capacity until March, 1911. He then became general manager of the St. Joseph & Grand Island Railway, with headquarters at St. Joseph, Mo. He subsequently returned to the Union Pacific as superintendent of the Southern Division, making his headquarters at Kansas City.

During the war Mr. Stenger served with the American Expeditionary Forces in France as lieutenant-colonel of the 31st Engineers, directing the transportation of supplies to the battle front.

W. W. Nielsen, assistant secretary of the Springfield (Mo.) Traction Company, has resigned. Mr. Nielsen has accepted a position with the International Coal & Products Company, a Virginia corporation. He has been connected with the Springfield Traction Company since May, 1919.

Robert W. Hewins, who recently submitted his resignation as superintendent of the Norton, Taunton & Attleboro Street Railway, Norton, Mass., has reconsidered his action at the request of the board of directors and has announced that he will continue with the road indefinitely.

Frederick W. Heffernan has been appointed superintendent of transportation of the Augusta Division of the Androscoggin & Kennebec Railway, Lewiston, Maine. Mr. Heffernan succeeds George W. Bowie, resigned. He has been connected with the company for a number of years.

Louis A. Pease, division superintendent of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., with headquarters at Erie, Pa., has resigned. Mr. Pease was appointed superintendent of the western division of the railway four years ago. He was formerly a conductor with the same system.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Large Turbo-Generators in Strong Demand

Westinghouse Orders Amount to More Than 500,000 Hp. in the Last Three Months

The Westinghouse Electric & Manufacturing Company announces that it has received within the past three months orders from electric light and power companies for more than 500,000 hp. of turbo-generators. Among these are:

Cheswick Power Company, Pittsburgh, Pa., one compound unit of 60,000 kw., which will be one of the largest engines ever built.

Narragansett Electric Lighting Company, Providence, R. I, one compound unit of 45,000 kw.

United Electric Light & Power Company, New York, two compound units of 35,000 kw. each.

Brooklyn (N. Y.) Edison Company, two single units of 25,000 kw. each.

United Electric Company, Springfield, Mass., a single unit of 25,000 kw.

Commonwealth Edison Company, Chicago, one compound unit of 35,000 kw.

Havana (Cuba) Electric Railway Company, two single units of 25,000 kw. each.

Commenting on the sale of these large steam turbines, E. H. Sniffin, manager of the power department, Westinghouse Electric & Manufacturing Company, pointed out that the business in large turbine units was about equally divided, as to number, between units of over 30,000 kw. and units of under 30,000 kw. rating. Owing to the reliability of the multi-cylinder type, he stated, it is believed that it eliminates many problems of design which would occur, owing to the physical dimensions, with the single cylinder in these very large sizes. From the present knowledge of design it appears, according to Mr. Sniffin, that this will continue to be the case for some time to come, but, of course, definite prediction cannot be made on account of the rapid development in the industry.

British Purchase American Rails

The question of ordering American rails again came before the Town Council of Glasgow on Sept. 1. It may be recalled that a recommendation by the tramways committee to give an order to the United States Steel Products Company for 10,000 tons of steel rails and fishplates had been referred back to the committee. The latter reconsidered the subject and renewed its recommendation, which was again brought forward. In the interval, owing to the necessity of getting rails as soon as possible, the general manager, with the concurrence of the chairman of the tramways committee, accepted the contract and gave the order. The labor members of the council again made the allegation that the steel workers in America had to work excessive hours and that in this way the American prices for rails were lower than the British. This was met by the statement that the president of the American rail manufacturing company gave a personal guarantee that the rails were being produced under fair conditions. The proposal of the committee was carried by forty-two votes against eighteen. The American price is £23, 10s. per ton, while the only British tender received was £28 per ton.

Special Coal Permits for Emergency Needs

General Privilege of Assigned Cars to Utilities Rescinded—Committee of Three Hears Cases

While service order 21, issued October 8 by the Interstate Commerce Commission, takes away the privilege of assigned cars to public utilities generally, the new order makes the securing of emergency coal more certain. It provides a sort of super-rating for cars needed to supply utilities in distress. Because the old order had been abused to an important extent the commission decided that the need for emergency coal would have to be established in each individual case. It therefore has appointed a committee which is to pass on all applications for emergency coal. The committee is constituted as follows: W. L. Barnes, American Railroad Association; D. B. Wentz, president of the National Coal Association, and G. W. Elliott of the National Committee on Gas and Electric Service.

With the operators and the railroads represented on this committee it is believed that most applications can be taken care of without resort to the commission's order. The operators see that utilities are kept in coal.

All applications by utilities for relief in the matter of coal supply should be addressed to the National Committee on Gas and Electric Service, Munsey Building, Washington, D. C. As a result of the better understanding which has followed the conferences which preceded the issuance of the new orders it is believed that the crisis in the coal situation has passed. With the issuance of Order 21 the commission also curtailed all outstanding permits for the use of open-top equipment for other than coal-carrying purposes.

Railway Motor Manufacturers Optimistic

Demand Light at Present, but Manufacturing Conditions Are Improved, with Heavier Sales Expected

Demand for railway motors at present is light, according to leading manufacturers. Electric traction companies are said to be buying new rolling stock only when absolutely necessary. The trend of demand has been more and more toward safety cars, so that now the number of motors bought for heavy car service is small compared with the safety car types. One result of this tendency has been an improvement in delivery conditions, since in the safety car motor certain material such as gears can be more or less standardized. One of the largest motor manufacturers in the country is optimistic regarding future business on the ground that the attitude of the public toward electric railways is improving in respect to higher fares and increased transportation facilities. Virtually all of the lines are badly in need of additional equipment, this company states. Heretofore, more cars at old rates of fare in many cases meant greater loss in operation, however, and the money with which to make extensions has been lacking. Demand, as a result, has not been as great as it would have been if the railway companies could finance new equipment. This condition is said to be gradually improving.

Manufacturing conditions are fairly favorable at present. Raw material is causing little trouble. The shortage of gears and of insulating material that prevailed during the summer has been relieved. Furthermore, producers are anticipating their needs well in advance, keeping a good running stock of material on hand at the factory. A reserve supply of motors is also maintained with each of the car builders, it is stated. Reasonable shipments can be made. One manufacturer quotes deliveries of from forty-five to sixty days. No cancellations have been reported.

Small hope of any immediate reduction in prices is held out by one of the leading interests, until there is a reduction in wages paid the men who build the equipments. This view holds that the high level attained by railway motor prices since prior to the war has been very largely caused by the tremendous demands of labor all along the line, from the ore in the ground to the finished product. Another producer, however, thinks that if any change comes about it will be in the direction of lower prices, provided the cost of raw material lessens.

Cement Market Greatly Undersupplied

Stocks Are Low and Deliveries Long In the Face of Heavy Demand—Prices Steady

Demand for cement holds up so strongly that manufacturers are still far from catching up with the volume of orders. In spite of the curtailment of the building industry in many sections of the country, the market for cement remains greatly undersupplied. Electric railways have not been heavy buyers, however, but according to one of the leading interests the outlook is bright for good business to develop from that quarter as well as from steam roads next year. According to an article recently appearing in the New York *Times*, there are orders hanging over the market for 15,000,000 barrels of cement at present that the industry cannot hope to catch up with for the next three or four months. The same source of information states that today there is no more than a national ten days' supply of this commodity in the country. The probable entire production for 1920 is placed at 95,000,000 barrels, provided the present approximate output of 70 per cent of capacity is maintained. Of this total, railroad needs are expected to account for 6.63 per cent of the supply.

Producers are so heavily booked ahead with orders that new business is not accepted for shipment earlier than about Dec. 1 in several representative cases. Mill stocks of cement are generally depleted. According to the *Times* report, there were about 5,000,000 barrels on hand on Oct. 1, compared with 10,000,000 barrels last year at that time. The raw material supply is reported favorable except in respect to coal.

Representative manufacturers express the view that the downward trend of prices in other lines will not affect the cement market. Some producers are covered by contracts for quite a while yet, and this circumstance, together with the present scarcity of the finished product and the prevailing high prices of coal and labor, is expected to operate against any immediate lowering of prices. Optimism is the keynote of the view which cement manufacturers take of the trade. In spite of excellent sales this year, 1921 should show even better results it is said. Many construction products which have long been postponed pending more favorable conditions, are expected to get under way, not only in the railway field, but in constructing highways, buildings, etc.

Street Car Plant Undamaged at St. Louis Car Fire

Fire which was discovered at midnight of Oct. 11 in the steel erection plant of the St. Louis Car Company at St. Louis, Mo., partially destroyed the plant and caused a loss which is estimated by fire department officials to exceed $500,000. The electric railway car assembly plant was not damaged, however. This was largely due to its being separated from the fire by a 100-ft. areaway. The phonograph assembling plant and the former aircraft building were also saved.

An explosion in an acetylene tank is said to have started the fire, which gained rapid headway because of the wind and the inflammable nature of the material stored at the plant. The buildings destroyed included the pneumatic tool, steel car, wheel and axle and truck departments, as well as the machine shop, power house, planing mill, pattern and storage warehouses and steel forgings plant. Most of these were new buildings. About 1,200 people are employed at the plant and it is expected that many of these will be thrown out of work. Besides street cars the company manufactures freight cars and passenger coaches, automobiles and cabinet phonographs.

At the date of going to press encouraging word has been received. Edwin B. Meissner, vice-president and general manager of the company, is quoted as saying that normal operation should be resumed by Nov. 10. The entire West Works and the main car-building section of the plant, as well as the lumber stock and dry kilns, remain intact, Mr. Meissner states. The destroyed wood mill and machine shop of the East Works can be taken care of by their counterpart in the West Works, it is stated.

Rolling Stock

The Northern Ohio Traction & Light Company, Akron, Ohio, noted in the Aug. 14 issue as having received authority to purchase twenty interurban cars in addition to the fifty-six city cars mentioned last week, has specified the following equipment on the interurban cars:

Number of cars ordered	20
Builder	The G. C. Kuhlman Car Company
Type	Interurban—Single End
Seating capacity	58
Weight, total	71,980 lb.
Bolster centers, length	32 ft. 6 in.
Length over all	55 ft. 11 in.
Truck wheelbase	0 ft. 84 in.
Width over all	8 ft. 6 in.
Height	12 ft. 9½ in.
Body	Steel
Interior trim	Mahogany
Headlining	Agasote—Buff
Roof	Arch
Air brakes	Westinghouse AMM
Axles	Penna. R.R. Standard
Bumpers	Hedley Anti-Climbers
Signal system	Westinghouse 8-T Signal System; Ohio Brass Company Marker Lamps and Signal System.
Control	G. E. MK
Couplers	Ohio Brass
Curtain fixtures	Curtain Supply Company
Curtain material	Pantasote
Designation signs	Hunter
Fenders or wheelguards	N. O. T. & L. Co. Std. Pilot
Hand brakes	American Brake Company
Heaters	Peter Smith Heater Company, Hot Water
Headlights	Crouse-Hinds LHH Luminous
Lightning arresters	G. E.
Motors	G.E.-240-B-4
Registers	Ohmer Fare Register Company
Sanders	Nichols-Lintern Company
Seats	Brill
Seating material	Fabrikoid
Trolley catchers or retrievers	Trolley Supply Company
Trolley wheels	More-Jones Brass & Metal Company
Trucks	Brill 27 MCB-2
Ventilators	Nichols-Lintern Company
Wheels	Forged Steel Wheel Company, 36 in.

Track and Roadway

Carolina Power & Light Company, Raleigh, N. C.—This company has been authorized by the Raleigh City Commission to double-track its line in Hillsboro Street from Park Road to Groveland Avenue.

Virginia Railway & Power Company, Richmond, Va.—The Church Street Improvement League will petition the City Manager and the Council against the removal of tracks from Church Street between Eighteenth and Twenty-sixth Streets, and to the re-routing of cars through Granby Street between these points, as turning business into Granby from Church Street. This property belongs to the Virginia Railway & Power Company operating in Norfolk.

Ohio Valley Electric Railway, Huntington, W. Va.—The city of Huntington, W. Va., has power by indirection to compel the Ohio Valley Electric Railway to double-track its Third Avenue line. That was the substance of a formal report on the problem filed with the commissioners on Aug. 2 by City Attorney O. J. Deegan. The matter was carried over until a later date in order that the commissioners might confer on the construction of the overhead crossing in front of the American Car & Foundry Company's plant. The two propositions are akin and the commissioners hope to handle both at the same time.

Monongahela Valley Traction Company, Fairmont, W. Va.—The probability of extending the lines of the Monongahela Valley Traction Company from Fairmont to Morgantown within the next twelve months is considered to be very strong by Morgantown business men in touch with the officials of the concern at Fairmont. The company right now has plans for such an extension under consideration and its start is predicted as soon as construction costs swing a little back toward normal. At the present time, the Monongahela Valley company operates cars as far north along the river as Riversville and has a graded right-of-way for some distance below Riversville toward Arnettsville. The distance between this terminal and Morgantown is about 12 miles. A survey which has been made for the proposed route is said to be most favorable for rapid construction, the grade being very light. It is known that several routes are being considered for the line.

Virginia Railway & Power Company, Richmond, Va.—The port terminals' committee of the Chamber of Commerce has framed a resolution calling on the Virginia Railway & Power Company to make an extension of its Pine Beach line to the Army Supply Base. This additional transportation service would materially aid about 1,500 employees of the U. S. Army who have to walk about one mile from the car line to the army base every day. This project before it can be considered must have the approval of the government.

St. Catharines, Ont.—The Welland Board of Trade will ask the Grand Trunk Railway to electrify the Welland division of the road from Port Dalhousie to Port Colbaine.

Hydro-Electric Power Commission of Ontario, Toronto, Ont.—The double-tracking of West London Street, Windsor, which will begin shortly, has been a long-promised improvement to the border street railway system. The delay has been caused by the difficulty in purchasing the equipment and the condition of the rolling stock taken over from the Detroit United some months ago.

Hydro-Electric Commission, Ontario, Canada.—H. G. Dickinson, superintendent of the Niagara Railway Arch Bridge Company, Niagara Falls, announces that Sir Adam Beck, chairman of the Ontario Hydro-Electric Commission of Canada, is seeking permission to run electric cars over the bridge to connect the Toronto and Rochester interurban lines. Charles E. Foster of New York, consulting engineer of the bridge company, has been called into conference regarding the plans. The proposed Toronto-Rochester interurban line has been under consideration for some time.

Trade Notes

General Railway Signal Company, Rochester, N. Y., has issued an addition to its direct current catalog volume I. The addition is dated September, 1920, and covers section J, Nos. 21-29.

F. M. Richards, formerly chief engineer of the Atlantic Shore Railway, Kennebunk, Me., has joined the forces of the Transit Equipment Company, New York City, in the capacity of chief engineer, it is announced.

The Greenfield Tap & Die Corporation, Greenfield, Mass., is offering $2,255,000 8 per cent cumulative preferred stock through bankers, which is part of a $5,000,000 authorized issue, the par value of which is $100.

Blaw-Knox Company, Pittsburgh, Pa., manufacturer of transmission towers, steel buildings, etc., on Oct. 1 opened a district office in Birmingham, Ala., in charge of Prescott V. Kelly. The company now has eight district offices.

Ohmer Fare Register Company, Dayton, Ohio, has just completed the addition of one story to its main building, making it a five-story structure. The change was necessary to take care of new types of machines and to increase present production.

Edward Casey has joined the Duff Manufacuring Company as the sales representative of the forge department in the East, with offices at 50 Church Street, New York City, it is announced. Mr. Casey was formerly associated with Kraerter & Company and the Bethlehem Steel Company.

Sattley Company, Detroit, Mich., manufacturer of machines for sorting, counting, and wrapping coins, announces that it has moved into its new factory at 812 East Woodbridge Street. The new building comprises 16,000 sq.ft. of floor space and is expected greatly to increase the capacity of the company.

J. L. Galef, 75 Chambers Street, New York City, has taken over the exclusive sales agency of the McGill high-speed changer, manufactured by the McGill Metal Products Company, Chicago. The selling of the utility ticket punches will be continued by the manufacturer as heretofore.

Dwight P. Robinson & Company, Inc., New York City, with which Westinghouse, Church, Kerr & Company, Inc., is consolidated, devotes the current number of its publication, the *D. P. R. News*, to a railroad issue, emphasizing the importance of improving terminal facilities, roundhouses, shops, etc.

Sam W. Smith, formerly sales manager of the Uehling Instrument Company and at one time equipment engineer of the Southern New England Telephone Company, has joined the Smith Engineering & Supply Company, Boston, Mass., which represents the Uehling Instrument Company and the Adriance-Bate Company in New England.

M. A. Kretchmar, formerly chief lubricating engineer of the Sinclair Refining Company, has become associated with the Horrocks Desk Co., Herkimer, N. Y., it is announced, as supervising engineer and chief of sales. Mr. Kretchmar will devote his attention to promoting the Danight Wick Oiler for lubricating car axles, armature brasses, etc., which the company manufactures.

The Locomotive Superheater Company, New York, through its industrial department, has issued what is called a "Data Book for Engineers." This is a book with flexible covers containing sixty-four pages of data of everyday interest to the steam-plant engineer. Besides an abbreviated steam table, it contains a table of the various coals of the United States arranged by states and giving an approximate analysis.

The Habirshaw Electric Cable Company, 10 East Forty-third Street, New York City, has issued a combined statement of the earnings of the Habirshaw Electric Cable Company, Inc., the Electric Cable Company and the Bare Wire Company, for the five months ended May 31, 1920, as follows: Sales (not including Bare Wire Company), $4,846,807; profit in trading, $412,617, from which $163,767 was deducted for interest, discount and bonuses, leaving a net income of $248,850.

J. J. Edwards, secretary and treasurer of O. M. Edwards Company, Syracuse, N. Y., manufacturer of window fixtures, platform trap-doors, etc., announces that he has given up his duties at Syracuse and will devote his whole attention to the sales field throughout the entire country, with the object of getting into close touch with both steam and electric railways.

American Steam Conveyor Corporation, Chicago, Ill., announces a change in its corporate name to the "Conveyors Corporation of America." The company manufactures steam jet conveyors for handling ashes, etc., trolley conveyors, oil-bearing sheaves, and other conveyor supplies. A completely equipped machine shop, to which foundry facilities will be added, has been acquired at South Bend, Ind. No change either in personnel or business policy will be made, it is stated.

The United Railways Company of St. Louis and a number of street railway supply manufacturers will take part in a railway exposition which is to be given at the Railway Y. M. C. A., St. Louis, for one week starting Oct. 25. The exposition will be given under the auspices of the St. Louis Railway Club. The first and second floors of the Y. M. C. A. building and the grounds surrounding the building will be filled with steam and electric railway equipment, showing the progress that has been made in efficiency and labor-saving devices in the past ten years.

New Advertising Literature

Arc Welding.—The Ohio Brass Company, Mansfield, Ohio, has issued a booklet covering equipment and instructions for electric arc welding.

Automatic Arc Welder—The General Electric Company, Schenectady, N. Y., has issued booklet No. B-3575, covering automatic arc welders.

Used Material.—Transit Equipment Company, New York City, has issued bulletin No. 271, listing its second-hand railway motors, armatures, controllers, trucks, resistances and couplers.

Carbon Electrodes.—The National Carbon Company, 30 East Forty-second Street, New York, has distributed an instructive eighteen-page booklet on carbon electrodes for electric furnaces.

Water Screens.—The Link Belt Company, Chicago, Ill., has recently published a twenty-four page illustrated book covering its traveling water screens. Copies may be had on request.

Equipment.—Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a fifteen-page special publication, No. 1636, covering its exhibit at the A. E. R. A. convention in Atlantic City.

Price Lists of Car Equipments.—The General Electric Company, Schenectady, N. Y., has issued bulletin No. 44,001-P, to supersede No. 44,001-O, of prices on renewal parts and supplies for car equipments, mine locomotives and railway and mine line material.

Electric Tools.—The Van Dorn Electric Tool Company, Cleveland, Ohio, is circulating a letter with typewritten pages attached, describing the growth and the products of the company. The company employs about 400 people and it has reached its fifteenth anniversary.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative GEORGE BUSHFIELD, Editorial Representative G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Sell More Transportation on Its Quality

WE HEARD an official of an automobile manufacturing company say the other day that he never went to his office in his auto in the morning, "for," he said, "I think too much of my morning newspaper; I go on the street car." Here is a man who enjoys his breakfast with his wife and family without a newspaper barricade to separate them and then takes advantage of one of the good features of street car riding to learn the morning's news. It's an old story to electric railway men, but how much are we doing to tell such stories to the public to whom we want to sell our rides? Why not sell more goods on their quality?

If a grocer or other local merchant wants to maintain his trade in the face of new competition, mail order inroads and of individuals supplying their own needs in various ways, he brushes up his wares and tells the public why he is still prepared to give them the best service and what the good qualities of his wares are.

Of course, we admit your rejoinder that the electric railway is a public utility and on a different basis. But there are many features of other businesses which can well be put to greater use in the electric railway business, and selling rides on quality is one of them. The little newspaper story above is an example of one advantage of electric railway rides which cannot be enjoyed in the average jitney or motor bus or private automobile.

The Significance of Electrification

LAST June the JOURNAL published an article by E. G. Buckland, vice-president of the New York, New Haven & Hartford Railroad, under the above title. This week we publish abstracts of some of the principal addresses scheduled to be presented at the joint meeting of Mechanical and Electrical Engineers in New York on Friday, Oct. 22, as announced in detail last week. It is both interesting and instructive to note that in the article by the railroad executive and in the papers by mechanical and electrical engineers the leading theme is not the mechanism which is to be used to haul trains or produce train-miles so much as it is the comparative effectiveness of the service to be performed by the two agencies. What the public is interested in, and therefore what the railroads are interested in providing, is transportation service. Broadly considered, the public is interested in coal conservation as such, but most concretely is the public interested in the transportation service rendered and the cost of the service. As pointed out by Mr. Buckland, the terminal advantages in large cities are a part of both the service rendered and of economy.

But here, with engineers discussing the steam versus the electric locomotive, while each advocate of his own agency is proud of and dwells upon the efficiency and power consumption, the weights, the tracking qualities, the speeds, etc., they all rest their case and their own decision on the service ultimately rendered by the entire system. That the electric locomotive as such has reached a stage of most practical development is not disputed. That the steam locomotive has increased its dependability and efficiency and is, as a machine, almost perfection is also evident, and this fact should be recognized by the proponents of its electric rival. But certainly, under many modern transportation conditions, the electric locomotive shows a necessary field for itself in which the steam locomotive is already a hopeless competitor, and must soon be displaced entirely. As a result of the consideration of this subject in the joint meetings there should be developed a much clearer conception of the fields of the two systems under present conditions and also what factors will determine, under future conditions, when the electric locomotive is to displace the steam.

An Idea, and a Personality

THOSE who were fortunate enough to hear Martin Schreiber, chief engineer of the Public Service Railway of New Jersey and manager of its Southern Division, give his address on training electric railway personnel at Atlantic City could not help catching the enthusiasm of the speaker for his subject and his evident desire and ability to put his ideas into practice. The JOURNAL is printing an extended abstract of his address this week, but printed words are somewhat dead. Some will say, as some have said, that these ideas are not new, that they, the speakers, have been practicing along such lines for some time. Maybe so—maybe they think so, at least, but mere plans or ideas are one thing and success in using them is another.

The industry is always on the hunt for new ways of solving problems, but it cannot guarantee that a method successful in one place will make good somewhere else. As regards mechanical matters, such as the babbitting of a bearing, a strict following of the procedure of the successful pioneer is likely to be successful. Unfortunately this is not true where the human element is involved. One railway achieves a commendable result with a wage or a merit or a co-operative system, but another, hastening to adopt it, fails to attain similar success. The practice of both railways being alike in all externals and the human nature of the employees being much the same everywhere, shall we not look for the answer in the personalities of the different managers and their aides?

The successful man succeeded only because he believed in his plan so thoroughly that he made all his staff believe in it, too, so that they in turn carried the message to the rank and file. It succeeded because everybody soon learned that the Boss meant just what he said and would not be turned from his purpose. The plan did not succeed on the second property because the manager gave a smoker to the boys, made a sympathetic address and then left the working out to a lot of "unsold" petty officials.

In other words what is needed for accomplishment is an idea *plus* a personality, a plan coupled with the enthusiasm and ability to put the plan into operation.

No one can have heard Mr. Schreiber without being convinced that he has both these attributes. He also has, clearly formulated, the constructive ideas with reference to railway personnel which should do much to maintain an effective organization with the necessary co-operation between men and management, all of which is needed for the successful operation of a railway property. He makes no claim that these are all new and admits that he learned much of what he now sets forth from the present Lord Ashfield. Certainly every one hopes that Mr. Schreiber will have the fullest opportunity to put these ideas into effective practice at Camden. But, more, it is to be hoped that others in a position to profit by them will see in his ideas and plans suggestions which they can apply, coupled with their own personalities. The industry needs more of such ideas and men.

The Call for Increased Effort All Along the Line

RENEWED energy and a determination to work out their problems to a successful issue should be one of the results of the Atlantic City convention. No one could have attended the meetings there without being strongly impressed with the essential nature of the industry and the solidity of its future. Hard work will be required to solve all the problems, but hard work is no deterrent to a man of courage where there is hope of ultimate success, and in the railway industry there is not only hope now, but the final triumph is practically in sight.

The same resolution to do better work should extend all along the line in every railway organization. In fact, efforts toward higher efficiency and greater production are the order of the day in all industries in this country, and the electric railway field should be no exception. During the war the fall in manufacturing output per man employed was a common complaint, but there were many reasons to account for the demoralization and high turnover which characterized the operating forces of that time. Many employers declared that they could afford the higher wages which they had to pay if only labor would increase its rate of production.

Now the desired increase in efficiency seems to be evident. In a recent inquiry made by the Federal Reserve Bank in New York of thirty-one of the largest corporations in the country, all except nine report improvements in this regard. None of the concerns reported any decrease in efficiency, five reported that there was no change one way or the other and four were unable to draw conclusions from any data at hand. Others quote definite increases, such as one of the large steel corporations quoting 6 per cent, two clothing factories 7 to 8 per cent and other large concerns from 10 to 17 per cent as compared with a year ago. With these figures the turnover of employees is said to be decidedly less than formerly, and more men are looking for work.

Such an increase in efficiency will be one solution and the most satisfactory all-around solution for the present high wages paid to electric railway employees. For example, if the shop man will do more work in the same time he may extend the period during which the company is warranted in paying war wages in spite of reduced living costs. If the motorman can operate his car so carefully and skillfully as to warrant the management in increasing the schedule speed of the road and if the conductor will co-operate in this effort and stimulate traffic by merchandising methods they will justify the increases which they have received during the past five years.

This is a time when all departments should make a special effort to pull together. There is every reason and every inspiration for such a movement now. Let this be the spirit to animate the entire organization of every electric railway company during the coming year.

Making the Interurban a "Real Railroad"

A CENTRAL station manager, unversed in electric railway matters, was recently invited by the writer to return to Chicago from Milwaukee by way of the North Shore Line instead of the steam road. With some hesitancy at the thought of a 100-mile interurban ride, he was finally persuaded. On the way down, while enjoying an excellent dinner in the dining car, the last of a four-car train, and traveling at 80 miles per hour, he exclaimed: "Why, this isn't an interurban! This is a steam road, but run by electricity."

And so it is. Great things have been done to make the North Shore Line a "real railroad," and it may now be said that it is one of the leading show lines of the country in general physical condition, equipment, service rendered and morale of employees. Its earnings are also satisfactory and improving rapidly, and the people along the line are actually talking about it and boosting it to their friends. This did not happen by chance. It has come from a lot of hard work and the practicing of the principles which were set forth in an article in the Oct. 2 issue by Britton I. Budd. It means that a very unfavorable public reaction toward the road only a few years back has been turned into indorsement through the pursuit of a single purpose—to give good service, with all that that embodies.

The courtesy of the trainmen and their open interest in the road and the punctuality, speed and comfort of the service are things that impress one as he makes a trip over the line. Indeed, it is an inspiration to any one interested in the electric railway industry to take this trip to Milwaukee and return from Chicago over this electric railroad constructed and operated according to heavy traction practice.

The article by Mr. Budd referred to contains numerous suggestions about operating practices that will develop interurban lines into popular railroads. As written, it gives only the meat of a wealth of experience, omitting all the background or substantiating evidence for the conclusions drawn. Yet we know that none of these conclusions is without the backing of proved practice. While Mr. Budd doesn't say so, out of modesty in his accomplishments, all of the things recommended in his article have been done on the line which he directs, and that is why we are glad to give this special emphasis to his contribution solicited for the convention issue.

Way Standards Adopted Last Week an Important Step

ONE of the most far-reaching acts taken by any of the associations last week at Atlantic City was the acceptance by the Engineering Association, among the other recommendations made by the way committee, of its proposed uniform track spirals and curved heads for girder grooved rails. Both of these subjects have been treated extensively in this paper in the past, and action along these lines taken by the Engineering Association last week has been urged in editorials published in previous issues of this paper.

The adoption of a uniform system of track spirals should lead to many economies in the manufacture and maintenance of special trackwork, and the spiral system as presented by the way committee has the advantages of simplicity and adaptability for use in connection with partial renewals. The report emphasized the latter by illustrating the method of adapting the new spiral system to the renewal of a part of an old layout. We feel that the committee is to be congratulated upon its successful efforts to reconcile differences of opinion in regard to this subject which have so long prevailed among manufacturers and railway men. Having adopted the uniform spiral, it now remains for the engineers to see that its use is put into effect as promptly as possible.

The incorporation of a curved head or tread contour upon the standard girder grooved rails is another step in advance which should have a far-reaching effect in securing maintenance economies. The report of the committee treated the subject from every angle, and it will be noted that the committee recommended the adoption of designs for which rolls have already been provided. Meanwhile, it was unnecessary to change any other dimensions of the existing standard girder grooved rails.

The substitution of designs for standard section rails which have a greater demand than those now in the Engineering Manual is another step which is to be commended, and the committee has shown businesslike acumen in recommending the adoption of sections which may be obtained readily from the mills. The advantage of having manufacturers represented upon the committee is clearly shown in the treatment of this subject by the committee.

The committee reported upon an important subject in its discussion of the so-called impression test for girder rails. In line with comments which we have heretofore made, the committee expressed the belief that the impression test does not properly provide a test for brittleness and recommended further investigation with the view of developing some adequate test for brittleness which can be made as readily as the impression test. The matter is important, and we are pleased to note that the committee is alive to that fact. It is to be hoped that this year's committee, in co-operation with the manufacturers, can devise a test which will meet the requirements.

In recommending the new subject of the use of substitute ties, the committee recognizes the fact that such ties are being used to an increasing extent, and we are of the opinion that the 1921 way committee can lead the way in developing information as to the value of existing designs and at the same time it may consider the matter of the design of such ties as engineering structures. There seems to be a distinct field for substitute ties in street railway tracks and the introduction of the subject is considered very timely.

For those who think that the life of railway physical property is readily determined, we recommend the study of the monograph by Victor Angerer attached to the report as Appendix H. Mr. Angerer gives an able exposition of the many variables which prevent the compilation of data which have any value and covering the life or limits of wear in special trackwork. The committee is fortunate in being able to present such an able treatment of a very difficult subject.

The thoroughness with which the report as a whole was compiled attracted much favorable comment both on the floor at the convention and on the side. In fact, and without any disparagement of any of the many other excellent reports presented at Atlantic City, it is proper to say that this report is a good example of what a convention report should be.

Philadelphia Goes to Seven Cents

ONE cannot avoid recognizing that the industry will attach more than ordinary importance to the latest fare change in Philadelphia, reported in the news columns of this issue. Philadelphia is the one large city in which a private electric railway management has acted on the policy of trying to maintain 5 cents as the initial unit fare. Because the management, under the conditions obtaining in Philadelphia, has been able to retain the 5-cent base for so long and has preached the policy as a good one elsewhere, there has been criticism from other managements which have had Philadelphia "flung in their faces" by their own communities when seeking fare advances to meet ever increasing costs.

Now that Philadelphia is to have a 7-cent fare, with reduced-fare tickets and a continuation of 3-cent exchange tickets, it is only fair that a correct interpretation be placed upon this move. As facts appear, the management, that is, largely, Mr. Mitten, has not abandoned the idea that the retention of the 5-cent minimum fare is still the best policy. The company asked for a 5-cent fare with no transfers whatsoever in the belief that the advantages of the 5-cent fare to the average rider and in attracting the short-haul passenger more than offset the disadvantages to the patron who has to use more than one car. There was no avoiding the fact that in Philadelphia, as elsewhere, costs of operation have risen. When the case came before the Public Service Commission, however, that body differed with the management and decided that with the traffic flow and conditions such as they are the retention of transfer privileges, even with a charge at some points, was more important than the retention of the 5-cent base fare. The arrangement is a temporary one, pending valuation and a final fare adjustment, and of course and rightly, when the final fare system is devised the voice of the management will probably have much influence in connection with the adoption of a permanent system.

What is apparent in the entire case, however, is that electric railway operating costs have gone up and income must go up in proportion. The question in Philadelphia has been as to the best way to increase the income. This has been decided by the Public Service Commission of Pennsylvania to be, for at least the present, a flat increase in the existing fare.

Training of Electric Railway Personnel*

General Principles to Be Followed in Dividing and Deputizing Executive Duties—Application of These Principles on Public Service Railway Property at Camden, N. J.

BY MARTIN SCHREIBER
Chief Engineer Public Service Railway and Manager
Southern Division, Camden, N. J.

MARTIN SCHREIBER

BEFORE taking up the main line of thought which I wish to lay before the delegates to the Atlantic City convention of the American Electric Railway Association, I wish to tell a story which illustrates the principles to be stated afterward. I live in East Orange, N. J., and to the right and left of me live neighbors each blessed, among other good fortunes, with a fine son of athletic tendencies. My right-hand neighbor wished to break his son of over-devotion to athletics and began by assigning for a certain Saturday the task of cutting the grass on the lawn. The purpose of this was to keep him off the baseball field on that day. The boy went to the field and explained the circumstances to his comrades, telling them not to wait for him after a certain hour. The task had been so planned by the father that it was out of the question for the boy to play, and he lost his game. Incidentally the team failed to win the game.

My left-hand neighbor tried somewhat the same tactics but with a different result. His son had the job of cleaning up the leaves, but instead of spending the time raking he brought his football team over to the yard and hurried the job through before the game was called. He explained to his father afterward that even if this had not been possible he had arranged for a substitute.

I tell this story because it seems to me that the second boy showed attributes which are necessary in any individual who is to carry executive responsibility. He did the task assigned to him, but he secured the co-operation of others and they were glad to co-operate with him because it was to their interest to do so. Take another illustration, from the experience of E. H. Harriman. When he reorganized the Southern Pacific it was his ambition to build up the greatest of transportation systems. For this purpose he sought out men who had the power of reflection, of initiative and of growth. He had difficulty in locating such a personnel, but afterward said that he could find in the subsidiary offices of the various companies that had been consolidated many men who were human machines but few that were any more. The story is told of him that, when seeking out people for his organization, he would go through the various offices and when he found a man surrounded with books and papers, too busy to notice what was going on, he would not stop; but when he found a man in a reasonably well-conducted office, apparently in thought, perhaps with his feet on the table, he was sure to give that man most serious consideration.

Why is it difficult to find the ideal supervising employee? Simply because industry has not developed him. We have spent millions of dollars and much time in developing specifications for material, but little money or time in developing men. Lord Ashfield, or Albert Stanley as we knew him here, is considered one of the biggest transportation men of our time. At fifteen he was working as a switch-boy in the streets of Detroit; at twenty-five he was superintendent of the Detroit United Railway; at twenty-nine he was general superintendent of the Public Service Railway; at thirty-three he was manager and director of the London Underground Lines. Today, Mr. Stanley, barely forty-six years of age, is not only chairman of the board and managing director of the underground lines of London, but is a member of the British House of Lords. In a recent interview published in *System*, he says that "the secret of how to find big men, who I am sure are growing up to fill the big new jobs of the new century, is opportunity, opportunity and again opportunity; opportunity must be thrown at them—opportunity to educate and train themselves." From my observation, there are many officials in industry, including those in the electric railway business, who are engaged in suppressing the powers of reflection, of initiative and of growth in employees. Moreover, many officials think that before a man can become an executive, with responsibilities involving several departments, it is necessary for him to have a long specialized training in each department. By applying ordinary arithmetic it can be seen that following this procedure a man would have to be as old as Methuselah before he gets the executive job. By this time he is so old that he has lost all his enthusiasm.

The truth is that when a man has shown ability to excel in handling one department of the electric railway this is a good sign that he could be an executive for several departments. At least he should be in line for such opportunity. It is not necessary to maintain a man in an executive position because he has been tried out in it, but if a company never tries a man out it will never have available competent men to fill the bigger jobs. Some of us seem to forget that we who have been placed in executive positions had, ourselves, to begin at one time.

LEAVES FROM DAVISON'S EXPERIENCE

H. P. Davison, of the great banking house of J. P. Morgan & Company, was asked what plans and methods he had followed in accomplishing the large undertakings he performed in connection with his firm. His reply was: "If I had any definite plan, the first was I would try and do my job and the work assigned to me a little better than any one else; second, I always groomed some one else for my job; third, I always studied and trained myself for the duties of the man in the position above me." These are very simple declarations, but they carry with them principles of tremendous importance. How many railways are there that have men groomed and ready to step into any of the supervisory positions in case of vacancies. No doubt in a large percentage of the companies if the manager or a department head or two should drop out there would be something of a panic in the "front office." Now, this should not be the case, but rather the reverse. If the manager or any of the department heads or any man in the employ of the company should leave, this ought to give the other fellows a chance and thereby introduce new blood and enthusiasm into the organization.

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*Abstract of paper read at annual convention of American Electric Railway Association, Atlantic City, N. J., Oct. 13, 1920.

An organization that is stagnant and without enthusiasm is defeated at the outset; the whole organization gets into a rut and the men are, more or less, the machines that Mr. Harriman found. Certainly an unenthusiastic organization will never accomplish what Mr. Davison set out to do, to give service a little better than the other fellow. Emerson said in effect that if you manufacture only a mousetrap and make it better than any one else, even though you have a house in the woods, you will always have a trodden path leading to your door.

THE "SERVICE COMMITTEE" IS PROMISING

One of the bugaboos in connection with the railway organization is the securing of teamwork or proper co-ordination. There is much overlap of departments and a tendency for one department to shift responsibility on another. Besides, even where there is loyalty, criticism of the management is often heard. One of the best ways to overcome this difficulty is to insist that the department head take an active part in the management.

On the southern division of the Public Service Railway, at Camden, N. J., we are trying out a new organization plan. Every Friday all department heads gather to lay out the operating policies and work of the railway for the ensuing week. They discuss all questions man-fashion. When anything is decided, every member of this "Service Committee," as it is called, is back of the decision and he is responsible for the outcome. The department heads not only carry out instructions given them, but they help to make the orders. This develops the traits that Mr. Harriman was looking for to run his great transportation system.

RESPONSIBILITY OF DEPARTMENT HEADS

We also insist that every department head be a "real boss" as far as his department is concerned, and he is strictly responsible for the work coming under his jurisdiction. At the same time he thoroughly understands that as a whole the railway is more important than any one department. Besides, he is expected to break in a man under him to assume his position in case of necessity. His cardinal duties are to do his job as well as he can, to train a subordinate to fill his position and to study for advancement. For example, it is up to the manager to "groom" department heads for the position of manager; to the superintendent of equipment to train an assistant for his job, and so on down the line. The ultimate goal of this committee is to produce the best service we can and to sell it to the public. We want the public to be a willing and pleased purchaser. We hope to have our business relations with our patrons exactly on the same basis as those of the high-class department stores with their patrons. In the last analysis the public must be the final judge of what constitutes a satisfactory service.

PASSING SERVICE DOWN THE LINE

Now the service committee idea is not going to stop at department heads. Each department head is going to inject it into his own department. We believe that this system will produce a different grade of employee from that which we have at present and put a personal touch into transportation business that cannot be had in any other way. For instance, the operating department will be run largely by consultations of the superintendent of transportation, the assistant superintendents, the road officers, the inspectors, the carhouse men and so on. Their meetings will be so arranged that the ordinary routine of business will not be interfered with and all the men that have any supervising work, that is those who have charge of other men, will have an opportunity to take part in these consultations at least once a month. We expect to go further. One of the inspectors on each line will be responsible for that line and he will know its daily receipts and costs. Few facts will be withheld from him and his business will be to make suggestions for improving the service and pleasing the public as well as to do his daily routine work. We shall expect this inspector or road officer to consult with other inspectors, if there are any others on the line, and also to discuss the run receipts and costs with the particular crews involved, seeking from them new ideas for bettering the service and pleasing the patrons. In doing this we shall be developing those important qualities that every employee possesses to greater or less degree and that will keep the enthusiasm of the organization keyed up to the highest pitch. Besides we are selling our service first to the employees before we sell it to the public.

ANOTHER COMPANY SECTION TO BE FORMED

Besides the official education and development of the men which I have described, we propose to institute another company section of the American Electric Railway Association at Camden. Some semi-official organization seems necessary for the rank and file of the organizations, in the meetings of which the entire railway situation can be discussed in open forum. The position of the electric railway business requires that the most accurate and complete information be given to the public in order to secure co-operation between the car riders and the company. Public opinion of the railway in a general way is obtained by the public through contact with the company's employees. Besides this local consideration, the company section has the advantage on account of its affiliation with the national association. Thus the employees secure an idea of what is going on on properties other than the one with which they are identified. Often the employees' attention may be called to some improvement of practice elsewhere, which by slight modification can be adapted to conditions on the local property.

The company section has many other advantages that have been brought out frequently. It has always been a conundrum to me why the usual electric railway manager has not taken more interest in the company section. I have argued with electric railway officials who cannot see where they are going to get back the money, time and energy that would be required to institute and maintain a section. Almost in the next breath they would complain of poor public relations. How a railway expects to improve public relations without beginning at home and talking to its own men about proper public relations and the real facts about the railway is beyond my comprehension.

THE "RANK AND FILE" OF THE ORGANIZATION

The attitude of the company and its supervisory officials toward the rank and file is one of the most important problems with which we have had to deal. This body of men today is not what it was even five years ago. The requirements of the men are becoming more and more complex. The other day I saw a poster of the United States Army recruiting service. The poster said: "Get a free education; select any one of six countries; select any one of fourteen branches." Many believe that all the men want is more money; this may appear so on the surface, but I do not believe it. Of course, we should pay a living and a reasonable wage, based on what is being paid in like industries elsewhere, but modified to suit local conditions. Our greatest difficulty lies in the fact that many officials entrusted with the charge of men are unfitted for the job.

I believe that proper negotiations with men must in the final analysis be based on one and only one rule, the Golden Rule or the fair deal. To the employer I would say that you will seldom if ever make a mistake in handling a man if you will make an earnest and conscientious effort to find out all the particulars in his case and then put yourself in his place before you make a decision. If you find a dissatisfied man in your organization, do not turn your back on him. Call him in and endeavor to find out the trouble. Probably a personal matter has discouraged the man; in that case try to make a constructive suggestion. The employee may be dissatisfied with his job. Then it is your duty to try and get him other work, maybe in another department. If he is dissatisfied with his pay try to get him more money. This does not necessarily mean an increase in the rate but it may be possible to place him in different work where he will receive more remuneration. It may be necessary to suggest that he do some overtime work, or work on the outside, or again you may have to send him to one of your friends. Do not be afraid to make it a practice to say to every man leaving the service of the company who has not been dishonorably discharged, "If you ever want to come back, we will be glad to do everything we can to place you," for remember that man, even if he is not an employee of the company, may still be a patron of its lines.

True, you may not be able to get a man any more money, but you will find that he has appreciated your efforts and he will make a better and more loyal employee. One of the greatest compliments I ever knew one man to pay another was that of a crook working in a construction gang while I was in Paterson, N. J. After the crook had robbed all of his fellow employees he was apprehended by the police. He admitted he had robbed nearly every one except a certain foreman. That particular foreman, he claimed, he could have robbed many times, but he was the only one in the railway, in his opinion, who had given him, a stranger in a strange land, a square deal when he most needed it. He said he had worked harder for that foreman than he ever worked in his life and he never would regret it and would have starved rather than take a single cent from him.

CHARLES M. SCHWAB IS A REAL LEADER

One afternoon during the war I had occasion to visit the Submarine Boat Company in Newark, about the time Charles M. Schwab took charge of the Emergency Fleet Corporation. He came into the yard that afternoon and the first thing he did was to remove his coat and roll up his sleeves. He took one of the workmen by the arm and walked up to the platform with him. It just took about a minute for a person to realize that Mr. Schwab was a real leader. He spoke briefly to the men and when he finished there was tremendous applause from the brawny-armed workmen, with nods and smiles of approval from the officers of the boat company. It was evident that they were for him to a man; in short, he had won their confidence.

AN OFFICER OF PERSONNEL

In connection with the Camden organization, we propose to have one man in our organization who will be in charge of employment. He will hire every man who will be required to run the railway, in no matter what department. Before the employee is passed along for instruction or investigation, this superintendent of employment will interview him.

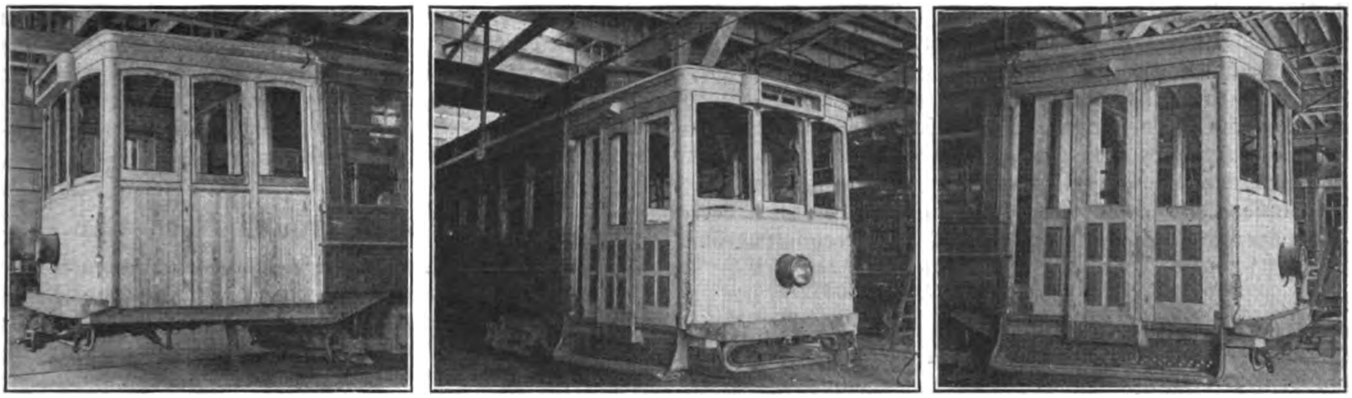
Many employees are ruined when first they apply for work. The first impression that the new man gets of the company is of great importance. The very fact that he is looking for a job indicates that he is not in the best kind of circumstances, hence a sympathetic attitude on the part of the company officials at that time may reach him and may win his favor and loyalty forever. On the other hand, a too critical attitude on the part of the company's representative, which, I fear, is not unusual, may cut him deeply. He accepts employment because of necessity for work.

It will be the business of our superintendent of employment not only to hire, train and follow the employee from the production standpoint, but it will also be his duty to keep in touch with him from a personal standpoint through his career with the company.

Welding Experts Active

THE American Welding Society is doing very effective work through its sectional and general activities. The Chicago section, for example, has just issued a booklet entitled "Keep the Guesswork Out of Welding." Copies of this may be had by addressing the American Welding Society, 608 South Dearborn Street, Chicago, Ill.

The society announces that members of the welding trade in Cleveland are making arrangements to form a section in that city. A meeting to consider the organization of a New York section was held in the Engineering Societies' Building, New York City, on Oct. 14. At this meeting it was decided to organize a New York or metropolitan section, and a nominating committee, a rules committee and a committee on membership and organization were appointed. The next meeting for the formation of this section will be held on Monday, Oct. 25, at 4 p.m.. Every one interested in the various processes of welding is urged to attend.



FRONT VESTIBULE OF CAR RECONSTRUCTED FOR ONE-MAN OPERATION IN SHOPS OF WASHINGTON WATER POWER COMPANY, SPOKANE, WASH.

Shop and Park Notes from Spokane

Washington Water Power Company Operates One-Man Double-Truck Cars Successfully—Also Has Natatorium Park, Which Is One of the Few Parks in the Country That Pays

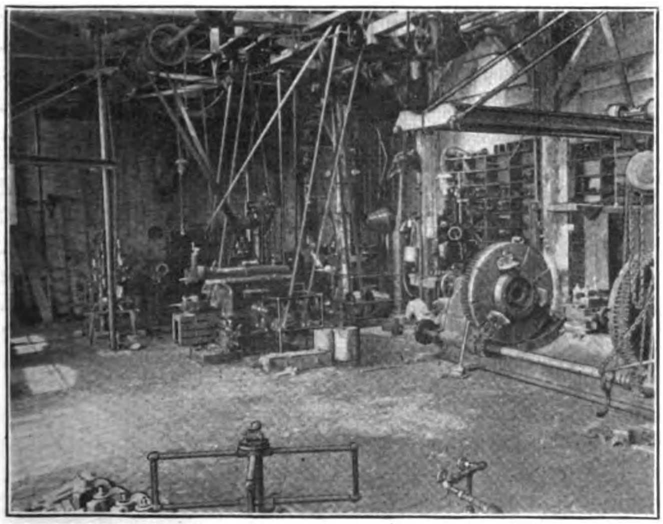
SPOKANE, WASH. (pronounced Spo-kan′, if you please), is a city well supplied with urban and suburban transportation facilities. The larger part of the urban service is furnished by the Washington Water Power Company, while most of the outlying lines belong to the Spokane & Eastern Railway & Power Company. The latter is part of the "Inland Empire System," which will be discussed in another article. The writer recently had an opportunity to look over the Water Power Company's lines in company with R. A. Willson, general superintendent, and in doing so noted a number of points of interest.

Although the city fare in Spokane is limited to 6 cents, which is entirely inadequate, both of the companies are keeping up an excellent schedule. By the use of one-man cars, rigid economy all along the line, ingenious shop methods, etc., they are able to keep their heads above water. To be sure the Inland Empire has recently passed through a receivership, but as Kipling says, "that is another story."

The logic of the local situation demands a unified system for the city lines, and as the larger of the two companies, as far as city mileage and cars are concerned, the Water Power Company will presumably operate it. Plans to this end have been under way for years (see ELECTRIC RAILWAY JOURNAL, April 26, 1919, page 839), and are still under way. The proposed merger involves many financial and physical difficulties, but these are gradually being overcome. The recent reorganization of the Inland Empire System has made a new plan necessary.

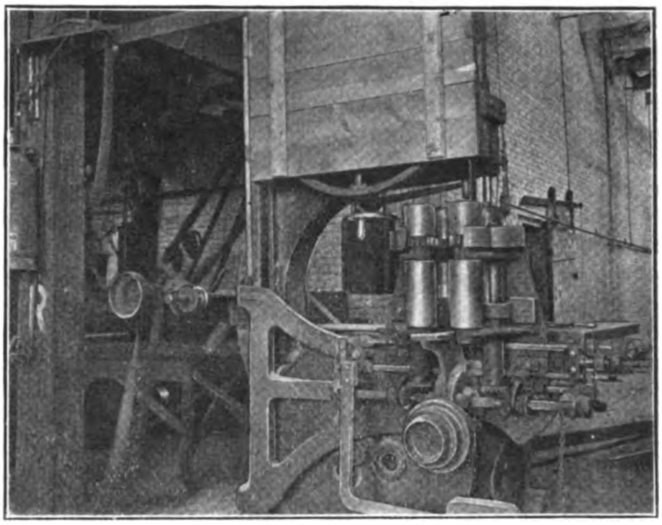
There is a strong local tendency in Spokane to standardization of equipment and methods and the managements show a spirit of active co-operation. For example, at present the Water Power Company is remodeling in its shops a part of the rolling-stock of the Spokane & Eastern, changing over double-truck cars for one-man operation.

The Water Power Company has about 111 miles of single-track, 142 motor passenger cars, ten passenger trailers, three express motor cars, twelve freight and eleven other cars. As the nature of the equipment



CORNER OF MACHINE SHOP, WASHINGTON WATER POWER COMPANY

Note floor paved with sawed-off sections of wood poles.



RE-SAW ATTACHMENT FOR BAND SAW USED IN WOOD MILL OF WASHINGTON WATER POWER COMPANY indicates, its business is radically different from that of its neighbor. It has an excellent shop, in which, as mentioned above, it is remodeling a number of city cars for the other company. These cars, like those remodeled by the power company for its own lines, are double-truck cars which have been turned end for end, the principal work being the substitution of new front vestibules for the old ones. Several pictures have been reproduced to show the details of this reconstruction.

HOW EQUIPMENT MAINTENANCE COST IS KEPT DOWN

In the company's shops particular attention has been paid to the equipment required for economical maintenance. The machine tool equipment in the company's machine shop is of particular interest. A part of this is shown in an illustration. The several tools are served by means of small gib cranes mounted on pipe standards, so that there is little manual labor required in handling the work. The floor of this shop, by the way, is paved with blocks made by sawing up old transmission line poles. While not as smooth as a floor made of regulation creosoted wood paving blocks, this floor answers its purpose and is very durable.

Another illustration shows a "resaw" attachment to a band saw which has proved to be a wonderfully useful tool. It consists of a set of rolls surrounding the saw and driven by gearing. The rolls are readily adjustable for different thicknesses of material to be split and the tool has been found invaluable during the car-remodeling régime, which still continues.

LEST WE FORGET NATATORIUM PARK

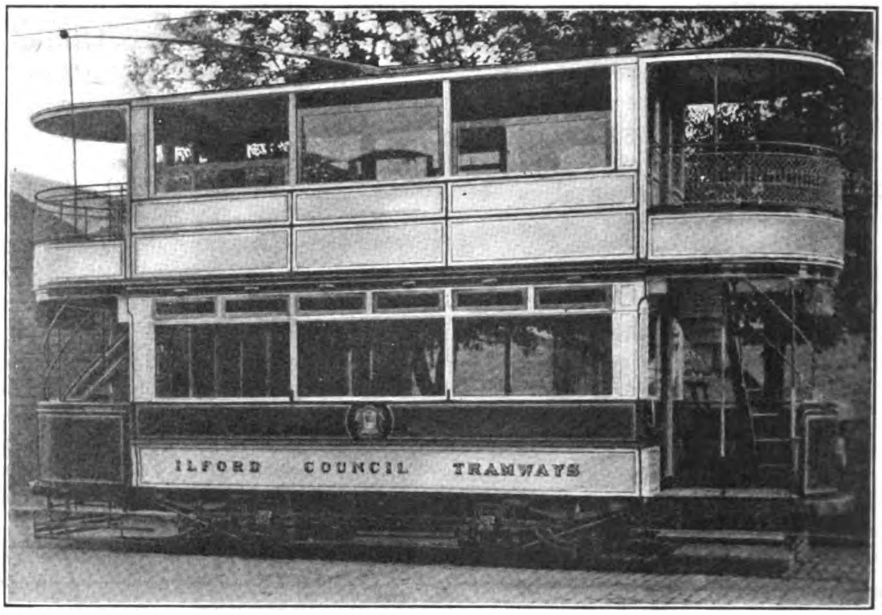
The Washington Water Power Company is one of the few in the country that is making a park pay. Circumstances are such locally that the public depends largely upon the company's Natatorium Park for its diversion. The park is conducted upon the principle that the numerous amusement features must each bring in a satisfactory return. They are operated either by the railway department or by concessionnaires, depending upon the character of the feature. For example, the company operates the "shoot the chutes," the flying swing (the cars of which are provided with motor-driven propellers to simulate airplanes), the natatorium, the dance hall, etc. It lets out the roller coaster concession (the coaster, a new one, being one of the largest in the country), the refreshment sale privilege and some others.

The piece of woodland in which the park is located is in itself a thing of beauty and the company has enhanced its attractiveness by judicious planting. A state fish hatchery is no small attraction in itself. Mr. Willson takes a personal interest in the details of Natatorium Park and spends much of his spare time therein.

The transportation end of the park proposition has presented some interesting problems. Cars from the city loop at the park in a prepayment area, those bringing patrons to the park discharging their load at the side of the loop remote from the entrance gates. The patrons then enter the park through a subway which passes under the prepayment area. Those leaving the park do so through prepayment gates, the approach to which is up a rather steep incline. This natural feature is utilized to slow down the loading, thus effectively preventing crowding at the gates.

Latest Type of Double-Deck Car

THE English have had a great deal of success with double-deck street car operation and the Ilford Council Tramways has just placed in service a late design of double-deck car. The cost of the car is given as about $10,000 and the car has a seating capacity of sixty-four, the lower saloon accommodating twenty-six, the upper thirty and the canopies eight. The car is 30 ft. 6 in. over all in length, 16 ft. 6 in. over all in height and is mounted on a single truck with 8-ft. wheelbase. Ceilings are of aluminum and are arranged in three panels. A patent type of seat is used which folds back against the side of the car when desired, permitting free passage and speeding up car cleaning.



A SIXTY-FOUR PASSENGER DOUBLE-DECKED CAR

The trucks are of the pendulum type, with the rigging that supports the side frames on the axle boxes consisting of independent longitudinal supporting frames, suspended flexibly from the truck by U-shaped saddles. This has the effect of increasing the wheelbase by 2 ft. and permits the wheels and axles to move laterally, independent of the side frames. The cars are equipped with 35-hp. motors and with Thomson-Houston K-10 controllers. The gears and pinions are of tool steel.

The cars are painted sage green and cream, are fitted with curtains and are finished in mahogany inside. They have illuminated destination indicators in each canopy and are very neat and attractive in appearance, as shown by the photograph.

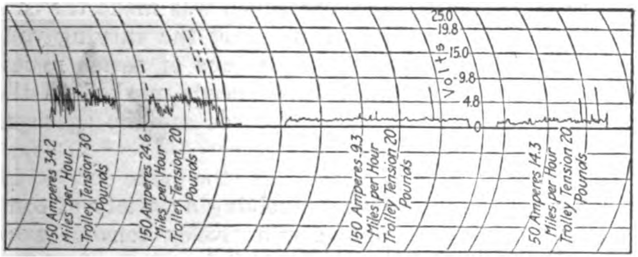
An appropriation of $85,000 has just been authorized to the Bureau of Standards for the investigation of standards of practice and methods of measurements of public utilities, such as gas, electric light, electric power, water, telephone, central station heating and electric railway service.

What Happens at the Trolley Contact?

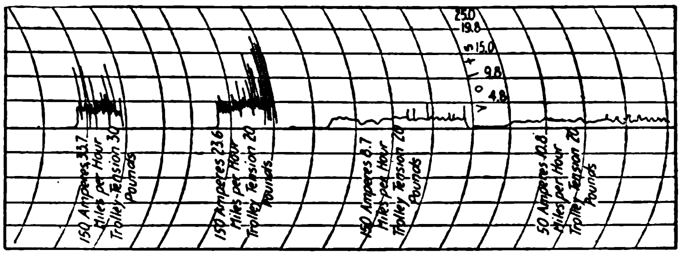
Results of Numerous Tests Under Various Operating Conditions Are Given—Average Power Loss with 5-in. Wheel Was Nearly ½ Kw.

By D. D. EWING
Professor of Electric Railway Engineering Purdue University,
Lafayette, Ind.

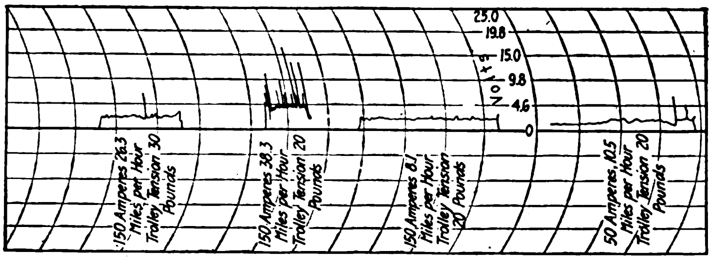
VIEWED from the standpoint of mechanical performance, the device that collects the propulsion current for an electric car has a hard job. "It must work in fair weather and in foul, particularly in foul weather," says the riding public. It must not interrupt the power circuit, and, therefore, it must keep in close touch with the contact line, which to the collecting device seems to have a chronic habit of continually bobbing up and down. On an interurban car it may be required to gather up a hundred or so amperes with the car traveling 60 or 70 miles per hour. We would like to have it do all of these things without losing any of the energy collected and without wearing either the device itself or the line with which we desire it to maintain such close contact. Also, economic considerations require that the device be cheap both in first cost and in maintenance.



CONTACT VOLTAGE GRAPHS FOR A 5-IN. V-GROOVE WHEEL



CONTACT VOLTAGE GRAPHS FOR A 5-IN. U-GROOVE WHEEL



CONTACT VOLTAGE GRAPHS FOR SLIDING SHOE TROLLEY

The several requirements are more or less incompatible and an ideal device is one of the impossibilities. Any practical design necessarily involves compromises. In America the wheel trolley has given such good account of itself in the street and interurban railway fields that it has more than held its own against all comers. The tendency has been to develop this device to the point of greatest utility rather than spend time and money on other possibilities. But the wheel trolley is not a long-lived device and it does cause considerable wear on the trolley line. Because of these things railway operators, in their attempts to cut down maintenance expense, recently have been giving some thought to other contact devices. In this article some data on the electrical performance of the wheel and sliding shoe trolleys are presented.

In 1907 some experiments on trolley contact phenomena were made at Purdue University by G. M. Laird in connection with his graduation thesis. These experiments were performed in the laboratory, actual operating conditions being simulated as closely as possible. A standard 6-in. trolley wheel with pole and base was used, but instead of having the pole move with reference to the wire the wire was moved with reference to the pole. The voltage drops between wheel and trolley wire and between wheel and harp were measured for a number of different speeds, currents and trolley tensions. From the experimental data thus obtained, the several resistances and losses were calculated. The mechanical loss, that is the frictional loss, due to the rotation of the wheel and the contact between wheel and wire, was also measured. The several losses and resistances for 30-lb. trolley tension at different speeds and currents are shown in accompanying curves. It will be noted that the electrical loss at the wheel-wire contact for 150 amp. and 20 m.p.h. is 130 watts, while the mechanical loss is only 36 watts.

Briefly summarized the conclusions drawn from these tests are:

Both of the contact resistances decrease with increased current and trolley tension and increase with increased speed.

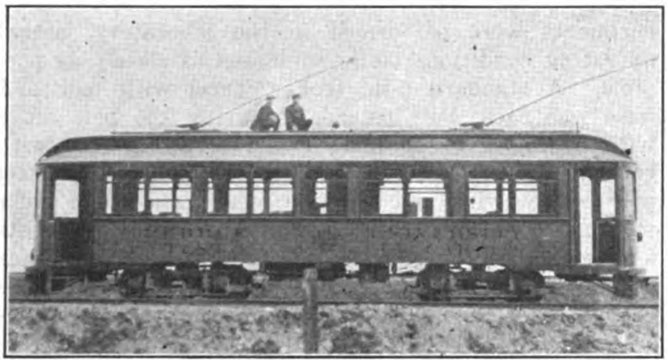
The voltage drops across these resistances increase with the speed and increase (slightly) with the current.

All of the losses increase very rapidly with increase in the speed.

The voltage drop between the wheel and the wire is the larger of the two voltage drops.

ARCS AT WIRE SUPPORTS USE MUCH POWER

In 1915, while making a series of tests on interurban cars, the writer made a number of measurements of the voltage drop between the trolley wire and the trolley base. In these tests the front trolley was used as a voltmeter contact on the trolley wire. The data show that for speeds between 37 and 45 m.p.h. and for currents between 190 and 225 amp. the average voltage drop with the wheel running on smooth wire between span supports was 3 volts. At the points of trolley wire support voltmeter "throws" ranging from 5 volts to "off scale" on a 75-volt range meter were recorded. On the assumption that two-thirds of the voltage drop under smooth running conditions was chargeable to the wheel-wire contact the voltage drop at this contact would be 2 volts, and the watt loss at 200 amp. would range from 400 watts for smooth running to over 15 kilowatts for the arcs which caused the large voltmeter deflections.


PURDUE TEST CAR AND TROLLEY ARRANGEMENT

COMPARATIVE TESTS ON WHEELS AND SHOE

Last year, C. P. Boggs, A. C. Clinger and W. V. Stockton, then seniors at Purdue University, working under the writer's direction, made some further investigations of trolley contact phenomena.

Tests were made on four wheels and one sliding shoe. Three of the wheels were manufactured by the Star Brass Works and are listed by the manufacturer as numbers 1, 2 and 20 respectively. The other wheel was manufactured by Vaile & Kimes. The principal physical features of the wheels and shoe are as follows:

Wheel	Kind of Groove	Throat Diameter, Inches	Weight, Pound (Including Harp)
No. 1	V	5	7
No. 2	U	5	7
No. 20	U	10	15
V. & K.	V	4½	6½
Miller Shoe	U	..	5¾

The tests were run on the Battle Ground Line of the Fort Wayne & Northern Indiana Traction Company. This is a stub end line whose overhead distribution system consists of a No. 0, B. & S. round copper trolley wire tapped to a paralleling feeder every quarter mile. The poles were spaced 100 ft. apart. In most of the tests the test car was the only car operating near the stub end. The test track was practically level and contained only one curve, which was short and of long radius. The Purdue Test Car with the trolleys arranged as shown in the accompanying illustration was used in making the tests. Car speed, contact voltage drop and current were measured. The front trolley was used as one voltmeter lead contact and the other lead was connected to the collecting trolley base. The voltage drop measured, therefore, consisted of the drop in the trolley wire between the two wheels, the drop across the wheel-wire contact, and the drop between the wheel and trolley base. The latter drop, as measured with the car standing still, was 0.6 volt per 100 amp. As the distance between the trolley wheels was 21 ft., the drop in the trolley wire was due to the resistance of that length of No. 0 wire or 0.2 volt per 100 amp. All of the runs were made with the car moving toward the stub end of the line, but on account of the feeder system, the trolley wheel was, of course, fed from both directions. On the assumption that 50 per cent of the current passed through the trolley wire in front of the collecting wheel the voltage drop in the trolley wire was 0.1 volt per 100 amp. of car current and the total voltage drop, exclusive of the contact drop, was 0.7 volt per 100 amp.

In order to protect the low range voltmeter from excessive voltages such as would occur in case the collecting trolley left the wire, the connections used were those diagrammed in the accompanying reproduction. The circuit breaker was of the type used for protecting telephone circuits from stray power currents and proved itself to be a very satisfactory protective device.

In making the tests it was of course desirable to hold both current and speed constant. As the variation in line voltage made such a procedure impossible, the current being most easily controlled was made the constant quantity. Adjustment to meet the varying voltage conditions was effected by means of series resistances and the car brakes. The speeds marked on the accompanying graphic meter records are the averages for the respective runs.

The paper chart traveled at the rate of 1 in. in 1.15 minutes. Test runs involving a variety of combinations of speed, current and trolley tension were made, the charts here reproduced being for a few representative runs.

The charts are of especial interest as they show clearly what happens at the trolley contact. The ripples in the graphs are due to the trolley wire hangers and joints. With the wheel trolleys it is almost possible to count the wire imperfections, particularly in the low speed graphs. At higher speeds the ripples are greatly magnified. Each ripple represents the voltage drop over a small arc.

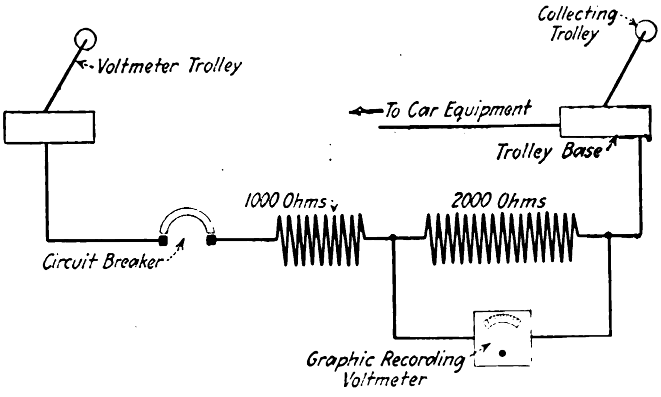


DIAGRAM OF THE CONNECTIONS USED IN MAKING VOLTAGE MEASUREMENTS

The arcs cause pitting both of the collecting device and the wire. The pitting of the wheels is affected in a marked manner by the shape of the groove as is indicated in the following comparisons:

Location	U-Groove	V-Groove
Bottom of groove	Small uniformly distributed pits	No pits
Sides of flange	Few small pits	Many large pits
Edge of flange	Many large pits	Few small pits

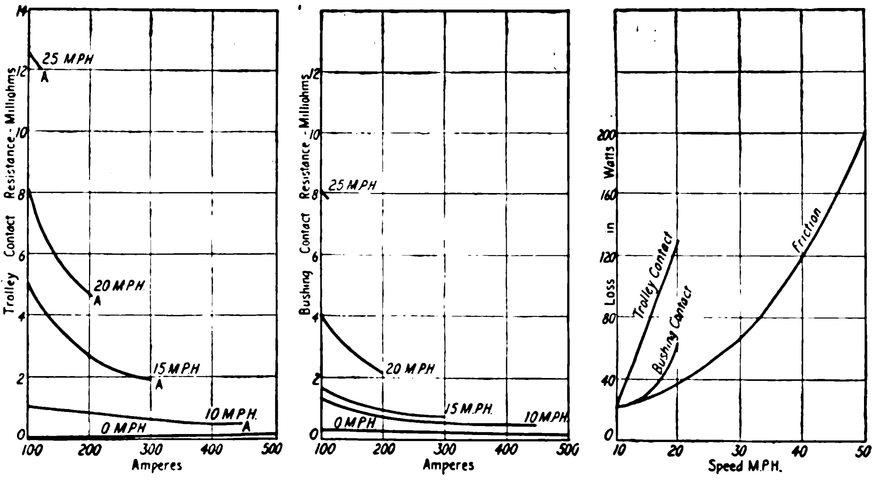
Owing to its great weight the 10 in. wheel did not prove satisfactory. Its inertia prevented it from following the wire as it should and the arcing was excessive except at very low car speeds.

CONCLUSIONS DRAWN FROM TESTS

The general conclusions drawn from the test data and from an inspection of the collecting devices after the tests were finished may be briefly summarized as follows:

The average voltage drop increases slightly with an increase in current and markedly with an increase in speed.

Increase in speed affects the character of the ripples in the voltage graph. At low voltages the ripples represent a voltage change of only a fraction of a volt, while at higher speeds the amplitude of the ripples or "throws" indicates serious arcing.



Relation between trolley contact resistance, speed and current, trolley tension 30 lb.

Relation between bushing contact resistance, speed and current, trolley tension 30 lb.

Current of trolley wheel losses, trolley tension 30 lb., current collected 150 amp.

CHARACTERISTIC CURVES OF TROLLEY WHEEL CONTACT LOSSES

The voltage ripples were less pronounced with the higher trolley tensions than with the lower ones.

Of the two types of wheels the arcing was far less serious with the V-grooves than with the U-grooves.

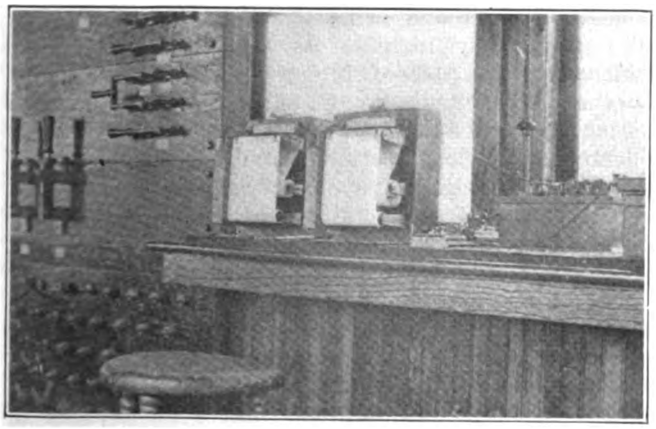
There was far less arcing with the sliding shoe than with the wheel trolleys.

A calculation of the power loss at the trolley contact is of interest. For example, the average contact drop for the 5-in. V-groove wheel when collecting 150 amp. at 24.6 m.p.h., trolley tension 20 lb., is 4.3 volts. Correcting this for the voltage drops in the other part of the circuit at the rate of 0.7 volt per 100 amp. gives a contact drop of 3.3 volts. This voltage multiplied by the current, 150 amp., gives 495 watts.

Now an energy consumption of 500 watts is not at all alarming as far as the energy consumption of the car is concerned. At 25 miles an hour such a loss would amount to only 20 watt-hours on a car-mile basis. The important thing about it is that this energy loss must be dissipated in the form of heat at the very small area of contact between wire and wheel. Inasmuch as there is not time for the heat to be conducted away, the heating is highly localized. The momentary arcs indicated by the larger "throws" are quite destructive and cause the larger pits so often observed on trolley wheels and the contact wire.

As the wear on any device is dependent on the work done on the device, the energy expended in heat on the various parts of the device should be a pretty good measure of the wear. The investigations detailed here indicate that the electrical energy losses at the contact exceed by a very considerable amount the mechanical energy expended in overcoming friction.

The above data are not presented with the thought that they answer the question "What Causes Trolley Wire Wear?" but they are presented with the thought that the electrical losses at the wheel-wire contact have an important bearing on the subject.



CATCHING THE "THROWS" WITH GRAPHIC RECORDERS

Irrigation Limits Water-Power Development

A UNIQUE condition exists in connection with many projected water-power developments in the West which has been met very largely by water wheel manufacturers. Irrigation is the primary object in water storage developments and the electric power is only incidental. This requires a water wheel or turbine which must act under variable head and flow conditions and also requires a large capacity in auxiliary steam plants or ample provision for interconnection to render available a constant supply of electric power.

At Fontana, Cal., in connection with an irrigation project a total gross head of 725 ft. was made available by a pipe line 6 miles long, but irrigation requirements caused a variation in head and flow ranging from 58 sec.-ft. with 505 ft. head to 10 sec.-ft. and 657 ft. head. Under these conditions flexibility and efficiency were essential elements of the impulse wheels to be installed. Two 1,350-hp. Pelton double-overhung, two-runner, impulse turbines equipped with electrically operated needle nozzles and governor-operated jet deflectors were installed. These wheels show an efficiency at the lowest operating point only 3 per cent less than the maximum developed under most favorable conditions. As the quantity of water flowing is the governing factor and not the load, the governing apparatus was designed to operate by water flow variation, which is a radical departure from practice where load demand and not water flow is the controlling factor. It is gratifying to the railway industry to know that these conditions have been met in prime mover design, as the new water-power law will expedite many combined irrigation and water-power developments in the near future.

The Modern Steam Locomotive*

The Author Shows How the Steam Locomotive Has Been Improved and Compares the Modern Machine with the Electric Locomotive from Several Standpoints

BY JOHN E. MUHLFELD
Railway & Industrial Engineers, Inc., New York City

IN MAKING comparisons of the relative values of steam and electric railway power some electrical engineers have frequently given out such an attractive and confident line of loose figures that railway managers and their engineers have often been misled into making recommendations that have later resulted in embarrassment. Comparisons have been made between the operations of new, up-to-date electric and of obsolete steam installations, of costs of repairs per locomotive-mile for electric and steam locomotives of different dates built new and of different average ages, and of fuel rates at the substations of modern central power stations with fuel rates of obsolete steam locomotives, per horsepower-hour. Also, assumptions have been made of extraordinary steam locomotive standby fuel losses, inclusion of steam locomotive tender, but exclusive of electric locomotive non-adhesive weight as non-revenue train tonnage, and of like erroneous factors. It is just as misleading to compare the most efficient electric locomotive operation on the St. Paul with that of its saturated steam locomotives of 1910 as it would be to compare the most efficient superheated steam locomotive performance on the Baltimore & Ohio with that of its electric locomotives.

In line with the foregoing several years ago a report was made on the advisability of electrifying about 275 miles, or a division, of one of the more prominent Western lines, and an erroneous comparison was made, first, between the existing antiquated and uneconomical steam and an up-to-date electric operation, and, second, by omitting the investment required to bring the steam operation up to date. When all involved factors were properly adjusted the net capital expenditure of $4,000,000 required for electrification compared with $1,000,000 as needed for modernizing the steam equipment, and the estimated annual operating saving of approximately $750,000 from electrification was wiped out and replaced by a saving of $250,000 from a continuation of the improved steam operation.

When we discuss or recommend the further electrification of the whole or any part of the 260,000 miles of steam-operated railroad system in the United States, which is now making use of about 65,000 steam and 375 electric locomotives for its passenger, freight and terminal service, the most important item involved is a comparison of the most up-to-date steam with similar electric operations, after which come the important factors of financing and legislation.

While there is much existing steam road trackage that can and should receive first consideration as regards electrification for the purpose of eliminating gases from underground terminals and tunnels and to give relief to terminal or line traffic congestion in the vicinity of large commercial and industrial centers, it would be financial suicide to electrify immediately adjacent connecting and intermediate mileage, particularly in view of the improvements that can be made in both existing and new steam locomotives in the matter of reducing smoke, sparks, cinders and noise and in increasing general efficiency and economy.

With the decreased value of gold and purchasing power of the dollar has come an increase of from 4 and 5 to 7 and 8 per cent in the cost of money, which in combination with the 100 to 150 per cent increase in the cost for labor and material makes the procurement today of the most pressing railroad capital needs almost prohibitive. Therefore, when engineers and politicians propose reckless super-power plans for the electrifying even of such belts of steam roads as lie in the densely populated district between Washington, D. C., and Boston, at a new capital cost approximating $1,000,000,000, and in addition mark off the books the principal value of existing steam locomotives, passenger cars, shops and terminal and intermediate facilities that would be unsuitable for the electrified service, they are planning either a new road to railroad bankruptcy or a further burden in traveling and shipping costs, or in taxes, which would be representative of criminal waste instead of increased earning capacity by means of more efficient and economical operation.

Therefore, before the electric locomotive can be made permissible for general application the electrical engineer must reduce his first costs, promote interchangeability, provide a motor which will efficiently, economically and flexibly cover a wide range of speeds and not break down or deteriorate from overloading and heating, reduce complication, wear and corrosion in transmission and contact line apparatus and substantially reduce the current losses between the point of power production and the locomotive drawbar. Likewise the steam railway mechanical engineers, locomotive builders and specialty manufacturers, if they are to guard the steam locomotive and continue it in its present field of usefulness, must become more active in modernization and bring about improvements that will substantially increase its capacity and thermal efficiency by the use of higher steam pressures and superheat, compounding, more efficient methods of combustion, utilization of waste exhaust steam and products of combustion heat, better distribution and use of live steam, reduction of dynamic weights, greater percentage of adhesive to total weight and a lower factor of adhesion and by a substantial reduction in standby.

As both steam and electric locomotives should have a useful life of from twenty-five to fifty years from the date built these policies should be inaugurated now in order that the least artificial age will be capitalized in all new built motive power.

In order to determine the relative advantages of modern steam and electric locomotives the items discussed hereinafter may be stated as important items for consideration.

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*Abstract of paper read at joint meeting of A. S. M. E. and A. I. E. E. sections, New York City, Oct. 22, 1920.

1. *Legislation.*—This may be of such varied character that any assumptions for analysis purposes are out of the question.

2. *Financing.*—The electrification of the steam roads in the United States since 1895 now embraces about 1,250 road-miles on eighteen different lines and 375 electric locomotives, of which total about 375 road-miles on nine different lines and 230 locomotives (as well as 1,000 motor cars) are located in the territory between Washington, D. C., and Boston.

In view of past experience probably little if any financing of steam road electrification projects in the United States can be undertaken, particularly at present interest on money and labor and material prices, unless the returns are more adequately and fully guaranteed. In fact, few if any existing steam roads can justify or stand the additional capital investment required per mile of road for electrification, except for short distances under very special conditions such as prevailed on the Norfolk & Western, where the ventilation and 1.5 per cent grade line features of a ⅝-mile single-track tunnel restricted the train movements to a 6-mile-per-hour basis on a congested traffic section of the main line, and even then only providing the fixed charges and operating expenses are not too excessive.

The immediate requirements of new money for the more urgent steam equipment and facilities needed to provide adequate, safe and expeditious rather than luxurious service in the regeneration of the railroads is the obvious reason for the continued utilization of the over-all more economical steam operation, and only after the possibilities in this direction have been realized can any serious financial consideration be given to the proposed radical change to super-electrification.

3. *Adaptability to Existing Trackage and Facilities.*—First and foremost in the advantage of a continuation of the existing improved steam locomotive for all purposes for which it is permissible is its flexibility and adaptability to existing railroad trackage and terminal and operating facilities and the relatively low first cost at which it can be purchased per unit of power developed for the movement of traffic. Being a self-contained mobile power plant, it is possible quickly to transfer needed or surplus power from one part of the line to another and to concentrate it when and where necessary.

4. *Effectiveness in Increasing Track Capacity.*—Without a doubt electrification increases the capacity of a terminal, and this is fully evidenced by the intensified traffic movements at Grand Central Station, in New York, and at Broad Street Station, in Philadelphia; but an analysis of the situation on the New York Central shows that this is not due to decreasing locomotive movements through the use of multiple units as is usually stated. Special line conditions, as on the Norfolk & Western, may make electrification advisable for short distances, but neither the results on that road nor at the New York terminals justify the frequent reference by electrical engineers to the weakness of steam locomotive haulage during the unprecedented cold weather and volume of traffic conditions during the winter of 1917-18, in that electrification would not have obviated the difficulty. Furthermore, in the handling of heavy tonnage trains by the unlimited combining of electric locomotive units the factors of peak load, transmission lines and power plant capacity must all be considered with the probability that permissible modern steam locomotive train units can be more economically handled over dense traffic lines than the electric multiple-unit super-trains.

5. *Train Speeds.*—The average freight car is in main line movement only about 10 per cent of its life. The balance of its time can be distributed 55 per cent in the hands of the railroads on account of interchanges, yard and loading and unloading track movements, surplus cars, repair tracks and road delays, and 35 per cent in the hands of the shipper and consignee, due to loading and unloading reconsignment and Sundays and holidays. Therefore, increasing train speeds beyond established economic limits at the sacrifice of tonnage, and with an increase in fuel, track and equipment upkeep and danger of operation, is not the solution of the freight traffic problem. As the electric locomotive is a constant-speed proposition, whether going up or down grade, and is unable to utilize its rated capacity and effectiveness through the same range of speed and tractive power variations as the more flexible steam locomotive, the latter can therefore be more efficiently operated over the continually changing up and down grades, levels, curves and tangents traversed by the average freight train in this country. With respect to passenger train service, where speed is more of a factor, the steam locomotive performance is equally satisfactory.

6. *Fuel Consumption.*—Great economy in fuel consumption and cost is the principal claim for electrification. Eminent electrical engineers have recently arrived at the startling conclusion that had the railroads of the United States, using 63,000 steam locomotives, been completely electrified in 1918 along lines fully tried out and proved successful today, they would have required, without the use of any water or other power, only 53,500,000, instead of 176,000,000, tons of coal or its equivalent, thereby effecting a modest saving of more than two-thirds, or 122,500,000 tons.

The basis for arriving at these comparative figures is for the steam operation a coal rate of 12.75 lb. per kilowatt-hour of useful work done, as measured at the driving wheel treads, or 7 lb. (including transmission and conversion losses inherent to electrical operation) as measured at a central power station. These data were obtained from some tests made in 1910 on the St. Paul on some probably long since antiquated types of saturated steam locomotives. For the electrical operation a modernized central power station coal rate of 2½ lb. per kilowatt-hour, in combination with a 40-watt hour rate at the point of delivery of the power to the railroad system for moving a gross ton-mile of passenger and freight train, was used, which would produce a movement of 1,000 average gross ton-miles for 100 lb. of coal of about 12,000 B.t.u. value per pound as fired. In arriving at these data apparently factors were overlooked or disregarded such as gradient and curvature, drifting train-mileage, human element, the necessity for hauling one-third of the freight car-miles without lading and its effect on train resistance, the use of 15,000 locomotives in switching and transfer service, the existence of 25,000 steam locomotives equipped with superheaters and of 35,000 equipped with firebrick baffle walls, the past ten years' improvement in steam locomotive boilers and machinery, that electrification will not eliminate the rail haulage of company coal or of dead weight on locomotive leading and trailing truck wheels, that large central power stations will only show a fuel saving when operated somewhere near their rated capacity without peak load conditions, that the interconnecting of electrification systems will result in prohibitive conversion and transmission losses, that electric motors must operate at predetermined loads to produce maximum efficiency, that central power stations cannot be regulated to a basis of 50 per cent average load factor, and many others.

However, accepting the assertion that the proposed electrification will produce 1,000 gross ton-miles for an average of 40 kw.-hr., or 100 lb., of 12,000-B.t.u. coal, as stated and generally approved by electrical engineers, what can the modern steam locomotive do to justify its existence? The results of some dynamometer-car tests made during 1918 may be of interest. The steam locomotives tested were of the ordinary superheated Mikado freight type, weighing 110 tons. One locomotive was fitted for hand firing and burning coal on grates, while another was equipped with the "Lopulco" system for burning powdered coal in suspension, and the tests were made in tonnage freight service handling from 2,400 to 2,600 tons eastbound and from 1,850 to 2,250 tons westbound on the Santa Fé main line between Fort Madison, Iowa, and Marceline, Mo. (the profile consisting of 0.8 per cent ruling grades), a distance of 112.7 miles, during March and April, 1918. The comparative average results show a coal consumption of 3.74 lb. and 4.99 lb. per boiler and superheater horsepower-hour for the two engines respectively.

As the coal supplied to the grates of the hand-fired locomotive was considerably lower in heat value than that specified in the electrification project, and as the tests were run during March and April, it can be assumed from the foregoing that the average yearly performance will approximate 100 lb. of 12,000 B.t.u. coal per 1,000 gross ton-miles, or equivalent to what we are promised by electrification.

7. *Efficiency of Locomotive Operation.*—The offsetting fuel and energy losses, due to standby in the steam operation, and decrease in efficiency on account of fluctuating loads in the electric operation must not be lost sight of. Neither should those incident to the transforming transmission and conversion of electric current and like factors be neglected.

While the electrical engineers and manufacturers in this country deserve great credit for the progress made in the development of the electric locomotive, they have as yet been unable to design one which can operate at maximum efficiency throughout its range of load.

Furthermore, to produce electric current at various hydro-electric or steam power plants, to raise the voltage to a high value, transmit the power through transmission lines to switching substations, to step down the voltage and then convert the power into direct current at, say, 3,000 volts for locomotive use, all involve expensive lines, plants and equipment, as well as tremendous losses from the generator at the central power station to the bus bar on the direct current side of the transformer, where the current is usually metered for billing. Also the secondary system is responsible for further losses. After allowing for, say, 10 per cent regeneration, the actual dead loss in power from the central power station to the electric locomotive drawbar will be not less than 50 per cent.

The number of factors entering into an analysis of the net thermal efficiency of the electric locomotive, in terms of drawbar pull, are so many as to make it impossible with the lack of dynamometer-car and laboratory test data to arrive at a figure which is not based on a number of assumptions, but as a matter of interest, assuming that *all of the factors are affected equally* in the electric locomotive, the net thermal efficiency at the drawbar, when taking into consideration the boiler, engine, generator, step-up transformer, alternating-current transmission, step-down transformer, a.c.-d.c. converter, direct-current transmission, motors and machine efficiencies, may, as representative of average existing practice, be illustrated as in Table I.

TABLE I—ESTIMATED EFFICIENCIES IN ELECTRIC TRACTION

Equipment	Net Thermal, Per Cent	Load Rating, Per Cent 100	75	50
Boiler	Factor	....	....	....
	Efficiency	76.7	76	72
Engine	Factor	18.25	18.29	19.17
	Efficiency	14	13.9	13.8
Generator	Factor	90	89.5	86
	Efficiency	12.6	12.44	11.88
Transformer, step-up	Factor	98	96	90
	Efficiency	12.34	11.93	10.67
Transmission, alternating current	Factor	90	95	97
	Efficiency	11.10	11.32	10.34
Transformer, step-down	Factor	98	96	90
	Efficiency	10.87	10.85	9.30
Converter, alternating to direct current	Factor	80	75	63
	Efficiency	8.69	8.13	3.85
Distribution, direct current	Factor	90	95	97
	Efficiency	7.82	7.71	5.66
Motors, direct current	Factor	91.5	90.8	89.5
	Efficiency	7.15	7.00	5.05
Machine efficiency	Factor	81	85	90
	Efficiency	5.79	5.95	4.54

Likewise the net thermal efficiency of existing representative steam locomotives, in terms of drawbar pull, may be illustrated as in Table II.

TABLE II—ESTIMATED EFFICIENCIES IN THE STEAM LOCOMOTIVE

Equipment	Superheated or Saturated	Net Thermal, Per Cent	Load Rating, Per Cent 100	75	50
Boiler	Superheated	Factor	....	....	....
		Efficiency	42.7	54.9	65.9
	Saturated	Factor	....	....	....
		Efficiency	45.0	57.4	70.0
	Superheated	Factor	11.9	11.0	10.5
		Efficiency	5.08	6.04	6.92
Cylinders	Saturated	Factor	7.8	8.4	7.8
		Efficiency	3.51	4.82	5.46
	Superheated	Factor	75	80	85
		Efficiency	3.85	4.83	5.88
Machine	Saturated	Factor	77	80	82
		Efficiency	2.70	3.86	4.47

Comparing the electric and steam locomotive figures as illustrated, the relative percentage of power delivered at the track rails to 100 per cent B.t.u. in the coal would be as in Table III.

TABLE III—COMPARISON OF EFFICIENCIES OF STEAM AND ELECTRIC TRACTION

Kind of locomotive	Net Thermal Efficiency at Load Ratings of 100 Per Cent	75 Per Cen	50 Per Cent
Electric	5.79	5.95	4.54
Steam, superheated	3.85	4.83	5.88
Steam, saturated	2.70	3.86	4.47

As 100 per cent load rating conditions would, in practice, occur only momentarily and as the majority of the drawbar load represents from 30 to 60 per cent of the locomotive maximum drawbar capacity, comparison should properly be made only of the net thermal efficiencies at 50 per cent load ratings.

At speeds of from 15 to 75 m.p.h. the existing superheated steam locomotive thermal efficiency actually ranges from 5.3 to 8.1 per cent as compared with the calculated figures of from 4.83 and 5.38 per cent for 75 and 50 per cent load ratings, respectively. Adding to this an increase of from 15 to 50 per cent in net thermal efficiency that may be produced from developments now under way and the steam locomotive of the future will be quite a respectable assembly of engineering efficiency.

8. *Cost for Enginemen.*—When the use of the electric locomotive was contemplated it was thought that a single motorman could be substituted for the steam locomotive engineer and fireman. Under existing conditions this is neither permissible nor practicable, and as each electric locomotive must carry a man comparable to but who does not function as a fireman, his wage is an added expense without economic return and must be charged to the cost of firing the central power station boilers or otherwise distributed.

9. *Cost of Maintenance.*—In determining the maintenance cost of the electric locomotive a true comparison can only be made by including all corresponding elements as found in the self-contained steam locomotive which goes back to the upkeep of all facilities having to do with the utilization of the fuel or water power, including the central power station buildings, boilers, engines, conversion, transmission, distribution and contact line systems, substations, track rail bonding and insulation, electric disturbance cut-outs or neutralizers, extra expense in upkeep of the electric zone trackage and like auxiliaries, and finally the electric locomotive itself.

10. *Peak-Load Conditions in Relation to Traffic Requirements.*—With the steam locomotive the traffic requirements are met by the distribution and utilization of the necessary number of self-contained motive power units as required, regardless as to the capacity of one or more central power stations or of any limitation in quantity, or in price, of the total available power output. The operation of one or of 500 steam locomotives at their maximum capacity at any given, or for any duration of, time on a single division is of no concern. However, in order to meet the ideal conditions for electrification, the traffic should be uniformly spread or scattered over the twenty-four-hour period, whereas in the majority of cases train movement is based on traveling and shipping conditions and cannot be advanced or delayed in order to eliminate peak-load conditions.

11. *Ease of Starting Trains.*—Due to the uniform torque as developed by the electric locomotive, its adherents have laid great stress on its ability to start a heavier train than a steam locomotive of relatively the same tractive power and factor of adhesion. In steam railroad service the locomotive is seldom required to start "the train," but what it does is to start each car in the train, successively, and which nullifies this theoretical advantage of the electric locomotive. In fact, with steam locomotives of the Mallet and other types having cylinders equipped with properly designed simpling devices the starting power is increased about 20 per cent as compared with electric locomotives of equivalent road rating.

12. *Rate of Acceleration.*—In order that the desired running speeds can be reached in the minimum of time after the starting of trains, the ability of a locomotive to rapidly accelerate its load is of considerable importance, and in this respect the electric power has had the advantage. The steam locomotive engineer has, however, not lost sight of this fact and improvements already made in boiler and cylinder horsepower ratios, as well as developments now under way for the utilization of existing non-productive adhesive weight and to increase the coefficient of friction between the propelling wheels and the track rails, will enable the steam locomotive to duplicate the performance of its electric competitor in this regard.

13. *Train Braking.*—Since the development of regenerative braking with the electric locomotive, great emphasis has been laid on the increased security of operation over heavy grade lines due to the ability of the locomotive to hold the train under complete and positive control on the down grade without brakes, by temporarily converting the main motors into generators to produce electricity, which is returned to the line for use by some other locomotive in pulling a train. Considerable attention has also been directed to the saving brought about through the elimination of the ordinary air braking on such down grades. The Baltimore & Ohio has, with steam locomotives, successfully and safely handled its heavy tonnage and dense traffic on the Cumberland and Connellsville divisions for many years, and this tonnage descends a grade averaging approximately 2.2 per cent for 17 miles, at an average speed of from 15 to 20 miles per hour for freight and from 25 to 30 miles per hour for passenger trains, without slow-downs or stops. This performance is comparable with that on the worst grade conditions in the St. Paul electrified zone.

14. *Effect of Weather Conditions.*—Even though the full steaming capacity, horsepower and drawbar pull of a modern steam locomotive can be developed during cold weather conditions, there are the factors of radiation and freezing to be reckoned with, which gives the electric locomotive the advantage in winter, particularly as its effectiveness is greater on account of the lesser tendency for the motors to overheat. This winter advantage, however, is largely overbalanced during the summer, when the main motors heat, especially under overloads, and require cooling at terminals or otherwise overheat and result in insulation break-downs or burn-outs, or other troubles.

15. *Road Delays and Tie-Up.*—While the electric locomotive has the advantage of not being required to take on fuel and water, except for the operation of steam-heating equipment for passenger trains, with the increased capacity of the modern steam locomotive tenders and the lower water and fuel rates per drawbar horsepower developed, the delays due to taking on these supplies have been greatly reduced and need not be serious. Barring collisions, wrecks and like accidents not due to the system of motive power in use, steam operation is not susceptible to complete tie-ups as is the case with electrification.

16. *Terminal Delays.*—There is no doubt but that the electric has an advantage over the steam locomotive as regards time required for periodical boiler work, fire cleaning and rebuilding, fueling and watering except where fuel oil is used, but where terminal delays occur due to waiting for trains, such as the foregoing statement set forth, the time required for such work does not become an expensive determining factor in the daily average miles to be obtained per locomotive. Also the fact that the electric locomotive cannot, without terminal rest periods or without the consumption of power to operate auxiliaries, operate at its maximum capacity must not be overlooked. Furthermore, many improvements in the fuel and ash handling and combustion equipment of the steam locomotive using coal are now in process and terminal delays due to these causes are annually being reduced by improved means and methods.

17. *Hazards.*—With the establishing of more scientific and careful methods of designing, testing and inspection, and the more extended use of safety appli-

ances, the failures of steam locomotive boilers and machinery, particularly those resulting in personal injury, are relatively low as compared with the work performed. It is therefore doubtful if there is any greater proportion of risk from the steam locomotive in that regard than from electrocution and other attendant dangers from high-voltage electrification.

Transportation Possibilities with Electric Locomotives*

Summary of Savings Secured by Electrification of Steam Roads—Co-operation Between Electric and Steam Locomotive Designers Urged

By F. H. Shepard
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THE steam locomotive is a marvelous machine, representing to a wonderful degree the combination of designers' skill and years of experience. The electric locomotive, on the other hand, while a notable machine, should, in its present service, be taken as indicative only of what may be accomplished in the future. The transportation problem is about the most serious one which now confronts the American people. For a number of reasons, for only part of which the railroads are responsible, provision for the movement of railroad traffic has fallen far behind the productive capacity and needs of the country today. At the same time, the demand for traffic movement will undoubtedly be doubled in about twelve years. So the question arises, What are we going to do, and how are we going to do it?

The limit to physical expansion of railroad line and terminals has been about reached in many cases, on account of both the prohibitive cost and the inefficiency of terminals of unworkable size. A large measure of relief can still be secured by line and terminal revisions and improvements, but when the inevitable increase in the demand for traffic movement of the future is considered these expedients to secure relief are seen to be only temporary and very limited in extent.

The great need of the country is the free and expeditious movement of traffic. The way to move traffic is to *move it* and to keep it moving. The yearly average of 22 miles per day for a freight car for the whole country, with monthly averages of as low as 5 miles on some of our most congested railroads for a single month, emphasizes the fact that this is a problem that some how, some way, we must solve. The solution lies, to a large extent, in the electrification of railroads.

With the present standards of train make-up, classification and terminal handling, electrification will double the capacity of any railroad. With the better equipment we can expect in the future, together with the evolution of improved methods of operation contingent on electric power, this capacity should be doubled again, thus securing four times the present capacity.

The electric locomotive has generally, thus far, been a mere substitute for the steam locomotive, although in some cases, due to the greater power of electric locomotive, there has been a modification of the handling of traffic. Two conspicuous examples are the Norfolk & Western and the Chicago, Milwaukee & St. Paul.

In the case of the Norfolk & Western, two electrics handle the same train as was formerly handled by three Mallet engines, but at twice the speed. In this operation, owing to the great increase in hours of road service as well, one electric locomotive is the practical equivalent of four of the Mallet engines replaced.

On the Milwaukee the notable change has been the elimination of intermediate terminals on the 440-mile electrified section between Harlowtown, Mont., and Avery, Idaho. There is at present a single intermediate engine terminal, but the latest passenger locomotives are detached from trains at this terminal for inspection and work only, which takes place about once in eight or ten trips. On regular schedule those engines make a run of 440 miles each day, being taken off for inspection at Deer Lodge after a mileage varying from 3,000 to 5,000. On occasion, when due to a schedule derangement engines have been maintained in continuous road service for thirty hours or more, for a full day of twenty-four hours records up to 766 miles in this mountain service have been established.

The advantages of electric power are its great flexibility and mobility. The difference between steam and electric locomotives is fundamental. The steam locomotive carries its own power plant, while the electric locomotive, on the other hand, is simply a transformer of power. The design of the steam locomotive is circumscribed by the necessity of tying up the rest of the machine to a steam boiler. On the other hand, the electric locomotive assembly can differ amazingly as to type, length, axle loading and driving connections. A group of small motors does not differ materially from a single large motor in efficiency. The speed and power, therefore, of an electric locomotive is limited only by conditions of track and construction, and of car equipment. It is entirely practicable to build an electric locomotive to take any train which will hold together, over any profile whatever and at any desired speed. Therefore, it should easily be practicable greatly to increase the speeds of freight trains so that they could all run at a common speed not very different from that at which the superior trains are operated.

Again, with the retirement of the lighter and weaker car equipments, a material increase in the weights of trains will be realized. Without the limitation in train speed commonly accepted as a handicap to operation of tonnage trains, who can say what the limit to train load will be with electric power? Every other industry that has been electrified has experienced a revolution in methods and service due to electrification. This should be equally true in the case of the movement of our railroad traffic.

Our present methods have been built up entirely under the necessities and limitations of the steam locomotive. This is evidenced by the existence of intermediate terminals at the ends of all the so-called engine districts, where all traffic halts. Again, the steam locomotive requires attention en route, needs supplies of water and coal, and, because of its slow movement when hauling our present tonnage trains, it is frequently sidetracked for superior trains, and thus there are more and still more halts to traffic.

Car inspection now takes place at the terminus of each engine district. If, under condition of electric operation, the engine district can be increased to 200, 400 or even 500 miles, is there any good reason why car inspection should not be eliminated at the present intermediate terminals? In fact, is not the general standard of maintenance of equipment of doubtful value on the present basis of inspection at each 100-mile interval? Cars in subway service, which is certainly full of potential hazard, are economically and reliably maintained through inspection at intervals of 1,000 to 3,000 miles. The elimination of these intermediate terminals, with the resultant necessity of keeping the trains moving on the main line, would secure an enormous increase in miles per car with a corresponding saving in equipment.

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*Abstract of paper read at joint meeting of A. S. M. E. and A. I. E. E. sections, New York City, Oct. 22, 1920.

Furthermore, with the dispatch obtained in handling trains, movement could be so marshaled and scheduled that the necessity of storing goods at terminals to protect exports and local consumption would be largely eliminated, and terminals would then become in fact, as in fiction, gateways open instead of closed.

Coming now to the comparative performance of steam and electric locomotives, it is important to bear in mind that one is a generator and the other a transformer of power. The generation of power in central stations is surrounded with many refinements, and in the consumption of coal there is every opportunity for skillful handling and supervision, so that the thermal efficiency of a modern central station is relatively high and is continuously maintained at a high value. With the steam locomotive, on the other hand, the thermal efficiency is dependent not alone upon the design of the locomotive but the manner in which it is worked, its condition, which differs widely from the best, and finally by the skill in firing. The electric locomotive, on the other hand, consumes power only when in service and works at any load at its designed efficiency. The average performance, in the case of the electric, approximates the maximum in efficiency, while the steam, on average performance, will differ widely therefrom. There is further economy due to the lesser work performed, because the electric locomotive does not have to trail supplies of fuel and water, nor is there need for the hauling of coal to points of local supply, which will always be greater than hauling to electric central stations.

There are a considerable number of different designs of electric locomotives all in successful operation, and each possessing certain advantageous features. The great latitude with which electric locomotives can be designed, while fundamentally most desirable, is in itself at the present time somewhat of a handicap. This is now the subject of intensive analysis and this study is undoubtedly developing as well a better knowledge of the running characteristics of the steam locomotive.

To state the case briefly, we are all interested in the transportation problem. Electrification is bound to be the most potent factor for its relief. We should, therefore, secure the closest possible co-operation with the engineering and mechanical skill which has been so productive in the steam locomotive field.

The Electric Locomotive in Heavy Traction[*]

The Several Factors in Its Application Are Stated and Illustrated by References to Data from Operating and Test Records

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A COMPARISON of the modern steam and electric locomotive leads immediately to a discussion of the relative fitness of the two types of motive power to meet service conditions. At present railway practice has closely followed steam engine development, but are we not justified in looking at the transportation problem from the broader standpoint of a more powerful and adaptable type of motive power?

A locomotive is primarily a hauling machine. Its design is defined by recognized limits such as maximum degree of track curvature, coefficient of adhesion between driving wheels and rail, gross weight and dead weight per axle, tracking qualities at high speed, etc. Furthermore, the locomotive should be simple in construction, reliable and adaptable in operation and capable of being maintained in condition for a reasonable percentage of its cost.

Accepting the Mikado and Mallet as the highest developments of steam-road and helper engines for freight service, the general comparison of Table II, shown on page 872, is drawn with an entirely practicable electric locomotive that can be built without in any respect going beyond the experience embodied in locomotives now operating successfully.

The above analysis brings out the fact that to equal the hourly ton-mile performance of one electric locomotive it would require three and four engine crews respectively for the Mallet and Mikado types.

The electric locomotive has demonstrated its very great advantages in relieving congestion on single-track mountain-grade divisions. Due to the increase in number of meeting points through its higher speed, and on account of the independence of climatic conditions of the electric locomotive and other time-saving factors, it is safe to say that the daily tonnage capacity of single-track mountain-grade divisions will be increased fully 50 per cent over possible steam-engine performance by the adoption of the electric locomotive.

TABLE I—COMMONLY ACCEPTED CONSTANTS IN HEAVY TRACTION

Limiting gross weight per axle, lb	60,000
Limiting dead weight per axle, lb	18,000
Limiting coefficient adhesion running, per cent	18
Limiting coefficient adhesion starting, per cent	25
Ruling gradient, per cent	2
Maximum curvature, deg	10
Maximum rigid wheelbase, ft	18
Maximum speed on level, passenger, m.p.h	65-70
Maximum speed on level, freight, m.p.h	25-30
Maximum drawbar pull, lb	150,000

REGENERATIVE BRAKING IS A UNIQUE ELEMENT

The hazard of mountain operation is greatest on down grades, although the perfection of automatic air

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[*] Abstract of paper read at joint meeting of A. S. M. E. and A. I. E. E. sections, New York City, Oct. 22, 1920.

TABLE II—COMPARISON OF STEAM AND ELECTRIC LOCOMOTIVES

	Mikado	Mallet	Electric
Type	2-8-2	2-8-8-2	6-8-8-6
Weight per driving axle, lb	60,000	60,000	60,000
Number of driving axles	4	8	12
Total weight on drivers, lb	240,000	480,000	720,000
Total weight locomotive and tender, lb	480,000	800,000	780,000
Traction effort at 18 per cent coefficient	43,200	86,400	129,600
Gross tons, 2 per cent grade	940	1,880	2,820
Trailing tons, 2 per cent grade	693	1,495	2,430
Speed on 2 per cent grade, m.p.h.	14	9	16
Horsepower at driver rims	1,620	2,080	5,570
Indicated horsepower at 80 per cent efficiency	2,030	2,600	......
Trailing ton-miles per hour on 2 per cent gradient	9,700	13,500	38,800

TABLE III—ELECTRIC LOCOMOTIVE MAINTENANCE DATA FOR 1919

	N. Y. C.	C., M. & St. P.	B., A. & P.
Number of locomotives owned	73	45	28
Locomotive weight, tons	118	290	84
Annual mileage	1,946,879	2,321,148	566,977
Cost of repairs per mile, cents	6.39	14.65	6.48

brakes has done much to modify its dangers. It is left to electricity, however, to add the completing touch to the safe control of descending trains by supplying regenerative electric braking. Aside from the power returned from this source (14 per cent of the total on the Chicago, Milwaukee & St. Paul Railway) the chief advantage of electric braking lies in its assurance of greater safety and higher speeds permitted on down grades.

The electric locomotive shows great advantage over the steam engine in cost of maintenance. Special importance attaches to this item of expense in these days of high labor and material costs. In order to draw a fair comparison, however, there should be included in steam-engine repairs all expenses of roundhouses, turntables, ashpits, coal and water stations, in fact the many items contributing to rendering necessary steam-engine service, as most of these charges are eliminated by the adoption of the electric locomotive. Spare parts can be substituted so quickly that, excepting wrecks, there is no need of the back shop for electric locomotives, unless turning tires and painting can be considered heavy repairs. Electric locomotives are now being operated 3,000 miles between inspections on at least two electrified railways and the data that are given in Table III show recent costs.

On the basis of pre-war prices, maintenance costs were approximately 60 per cent of the figures given in Table II. In contrast, it can be stated that the present cost of maintaining a type 2-8-8-2 Mallet may be taken at 60 cents per engine-mile, without including many miscellaneous charges not shared by the electric locomotive. Possibly more direct comparison may be better drawn by expressing maintenance in terms of driver weight, as in Table IV.

TABLE IV—STEAM AND ELECTRIC REPAIRS ON WEIGHT BASIS

	Steam Mallet	C., M. & St. P. Elec.
Cost of repairs per mile, cents	60	14.65
Weight on drivers, tons	240	225
Cost of repairs per 100 tons locomotive weight on drivers, cents	25	6.52

TABLE V—FUEL COMPARISON, SHOWING STANDBY LOSSES

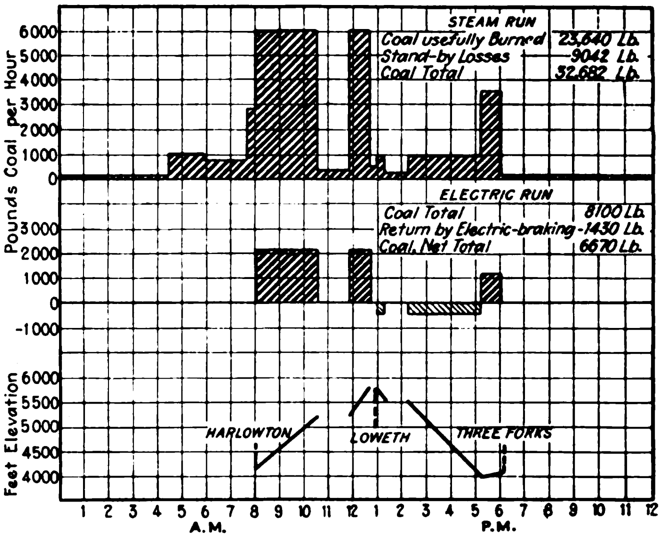
		Steam	Electric
Doing useful work, lb		23,640	8,100
Making up fire, lb	1,535		
Delay at Harlowton, lb	2,270		
Held up at Lennep, lb	394		
Held up at Loweth, lb	128		
Held up at Dorsay, lb	230		
Fire, banked 9 hr., lb	1,425		
Coasting down grade, lb	3,060		
Total standby losses, lb		9,042	
Regenerative braking, lb		.....	1,430
Total net coal, lb		32,682	6,670

Including all engine service charges, the facts available give foundation for the claim that electric locomotives of the largest type can be maintained for 25 per cent to 30 per cent of the upkeep cost of steam engines operating in similar service.

FUEL SAVING AS PROMISED BY ELECTRIFICATION

As to fuel saving effected by steam railway electrification, estimates of electric engineers have been called extravagant by steam engine advocates. Fuel economy figured prominently among the reasons leading up to the replacement of the steam engine on the Chicago, Milwaukee & St. Paul Railway as brought out by a careful analysis of the performance of the steam engines then in service.

The following runs are chosen for illustration as bringing out most strikingly the inherent disadvantages of operating a steam engine over a single-track mountain-grade division and handicapped by the usual delays attending freight train service under such conditions: The run of 111.1 miles from Harlowton, elevation 4,162 ft., to Three Forks, elevation 4,066 ft., over the Belt Mountain divide at Loweth, elevation 5,789 ft., was made by steam with 871 tons trailing load in twenty-six cars and by electric locomotive hauling sixty-four cars weighing 2,762 tons. The accompanying diagram shows the results reduced to a common basis of 1,000 gross tons moved, including the locomotive and tender weight. The running speed of the electric train was but slightly higher than the steam and the additional correction in the power demand rate of the former is made proportional to the lower speed. Both runs are therefore shown as made in identical time on the basis of 1,000 total gross tons moved in each instance. The fuel furnishing power to the steam train was 11,793-B.t.u. coal. Electric power was furnished by water and hence no direct coal equivalent is provided by the test result. To afford a common basis of comparison, however, a rate of 2½ lb. of coal per kilowatt-hour is taken as representative of fair electric power station practice. Coal burned under the steam engine boiler was determined by weighing at the end of the run and by detailed record of scoops en route. Power input to the electric locomotive was obtained by means of carefully calibrated recording watt-hour meters as well as curve-drawing volt and



COAL CONSUMPTION COMPARISON ON IDENTICAL RUNS ampere meters. These values of locomotive input were raised to the value of three-phase power purchased, in the ratio given by R. Beeuwkes in his A. I. E. E. paper of July 15, 1920,* and the kilowatt-hours so obtained were reduced to coal equivalent in the ratio of 2½ lb. of coal per kilowatt-hour.

While the electric locomotive demands power only when in motion, the steam engine requires coal during twenty-four hours, whether doing useful work, standing idle or coasting down grade. In fact, the standby losses were such a large percentage of the total coal consumed that a careful record was kept of their several amounts, as may be seen by referring to Table V.

The run of a more modern steam engine would have effected a material reduction in the 23,640 lb. of coal burned in doing useful work, but the amount of coal wasted in standby losses (9,042 lb.) might have been duplicated or even possibly increased with larger grate area. As standby losses constitute so large a proportion of the total coal burned (27½ per cent in this instance) it is apparent that enormous economies over the simple engine tested must be realized in the modern superheater and other improvements since introduced to offset in part the high inherent efficiency of the electric locomotive.

The commonly used unit measurement of pounds of coal per 1,000 ton-miles is at best a very rough and unstable comparison of steam engine runs over different profiles, variable quality of fuel and operating conditions. For example, the data given in Table VI show that pounds of coal per gross 1,000 ton-miles may vary from 650 to 50.5, according to gradient, with no standby losses included. The boiler must always be kept hot, however, and fully 33 per cent can safely be added to the above figures to include the inevitable standby losses inherent to steam engine operation. Except over very long runs with terminals at the same elevation it seems hardly possible therefore accurately to compare engine performance over different profiles by such a variable unit as pounds of coal per 1,000 ton-miles.

A truer understanding of what takes place under the engine boiler may be shown by continuous records of coal burned, tons moved, profile, delays, etc., all reduced to pounds of coal burned per useful horsepower-hour of work done at the driver rims with segregation of the many standby losses, as in Table VII.

Under the same conditions a modern engine would undoubtedly have consumed much less than 9.02 lb. of 11,793-B.t.u. coal while doing work measured at the driver rims. The addition of superheaters gives greater output and economy, while mechanical stokers add output only and, it is claimed, at some expense in economy over good hand firing. However efficient the power plant on wheels may reasonably be developed without too seriously interfering with the sole purpose of the steam engine, the hauling of trains, it can never approach the fuel economies of modern turbine generating stations. Whatever transmission and conversion losses are interposed between power house and electric locomotive are more than compensated for by the improvement in the load factor resulting from averaging the very fluctuating demands of many individual locomotives.

TABLE VI—POUNDS OF COAL PER 1,000 TON-MILES

	2 per Cent Grade	Level Track
Horsepower-hours at driver rims	123	18.8
Indicated horsepower-hours at 80 per cent efficiency	154	23.5
Pounds water per indicated horsepower hour	20	16.0
Pounds water per pound of coal	6	8
Pounds coal per indicated horsepower-hour	3.33	2.0
Pounds coal per 1,000 ton-miles	513	47
Pounds coal per 1,000 ton-miles trailing	650	50.5

TABLE VII—ANALYSIS OF STEAM AND ELECTRIC RUNS HARLOWTON TO THREE FORKS, IN UNITS PER 1,000 TONS MOVED

	Steam	Electric
Kilowatt-hours at driver rims	2,038	2,038
Horsepower-hours at driver rims	2,625	2,625
Coal per horsepower-hour at driver rims, lb	9.02	*3.09
Credited regenerative braking, lb	.....	0.55
Standby losses, 27½ per cent, lb	2.47	.....
Total coal per rim horsepower-hour, lb	11.49	2.54

*Measured at power house; includes locomotive losses and 32 per cent transmission and conversion loss.

It would be a simple matter to carry through a series of runs over the electrified zones of the Milwaukee with a modern Mikado equipped with up-to-the-minute fuel-saving devices and thus provide the necessary data to draw direct comparisons with the electric locomotive. Such tests with modern steam equipment would undoubtedly discredit the above comparison based upon the economies of six years ago and might lead to something approximating the blend of fact and theory shown in table VIII.

The above table is based upon actual electric locomotive performance, Harlowton to Three Forks, coal taken at 2½ lb. per kilowatt-hour at assumed steam power station. Steam engine values are based upon the known working efficiency of a Mikado equipped with superheaters but penalized with the same standby losses actually determined with a simple engine tested Harlowton to Three Forks. A test run from Harlowton to Three Forks with a modern Mikado engine hauling 1,420 tons may possibly show a lower average fuel rate than 3 lb. per indicated horsepower-hour at drivers less standby waste than 9,042 lb. of coal, but the average annual performance of many such engines would be most excellent if it reached the net figure arrived at of 5.9 lb. of coal per actual horsepower-hour of work performed at drivers. The electric run, however, is being duplicated daily, as to relation between kilowatt-hours and ton-miles, and it is just this reliability of electric operation that may at times give rise to misunderstanding in the comparison of steam and electric data.

In view of all the facts a broad statement may be made that the general adoption of the electric locomotive would probably result in saving fully two-thirds the fuel now burned on present steam engines and possibly one-half the amount of fuel necessary to steam engines of the most modern construction.

TABLE VIII—THEORETICAL COMPARISON OF MODERN STEAM AND ELECTRIC LOCOMOTIVES, HARLOWTON TO THREE FORKS

	Mikado	Electric
Type	2-8-2	4-4-4-4-4-4
Weight on drivers, lb	240,000	450,000
Weight engine and tender, lb	480,000	568,000
Tractive effort, 18 per cent coefficient, lb	43,200	81,000
Trailing tons, 1 per cent grade	1,420	2,836
Horsepower-hours at driver rims	4,360	8,200
Coal per indicated horsepower-hour, lb	3	....
Coal per driver, horsepower-hour, lb	3.75	....
Standby loss, test result, lb	9,042	....
Standby loss, per horsepower-hour, lb	2.15	....
Total coal per driver, horsepower-hour, lb	5.90	....
Coal at power house, per kilowatt-hour, lb	....	2.5
Coal at power house, per horsepower-hour, lb	....	1.86
Coal at locomotive driver, per horsepower-hour, lb	....	3.09
Coal credit due regeneration, lb	....	0.55
Net coal at driver per horsepower-hour, lb	5.90	2.54
Total net coal, lb	24,800	20,900
1,000 trailing ton-miles	157,500	314,000
Coal per 1,000 ton-miles, lb	158	66.7
Ratio coal burned	2.37	1

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*See issue of ELECTRIC RAILWAY JOURNAL for July 31, 1920, page 227.

The superior operating advantages of the electric locomotive are admitted by many who believe the first cost to be prohibitive, largely due to the necessary trolley construction, copper feeders, substations, transmission lines, etc. Such auxiliaries do add an amount that may equal the electric locomotive expense and the task of proving the electric case is not made easier by the fact that steam engine facilities are already installed and may have little or no salvage value to offset new capital charge for electrification.

Comparing the cost of equivalent steam and electric motive power, it is apparent that on the basis of the same unit prices for labor and material the first cost is approximately the same. While electric locomotives cost possibly 50 per cent more than steam for equal driver weight, the smaller number required to haul equal tonnage may quite offset this handicap, especially with quantity production of electric locomotives of standard design.

The steam engine also demands a formidable array of facilities peculiar to itself, as shown by expenditures made on fourteen railways included in the Northwestern group from 1907 to 1919. This expense covers fuel and water stations, shops and engine houses, shop machinery, turntables, ashpits, etc., and amounted to $42,200,000 as compared with expenditures of $68,000,000 for engines. Proper facilities for rendering adequate steam engine service apparently add some 62 per cent to the cost of the latter.

One of the advantages of electric locomotives rests in the longer engine divisions which they make possible. Considered as a problem of construction only, electrification of a new road may, in some instances, compare quite favorably with the complete first cost of steam engines and all facilities incident thereto. The general problem, however, is one of replacing steam engines now running so that the economic advantages of electrification are rather individual to the particular railway under consideration. The operating economies effected under favorable conditions have been found sufficient to show an attractive return upon the additional capital charge incurred besides providing the improved service which was the main objective in view in replacing the steam engine.

No discussion of electric railway economies would be complete without comment upon the increased value of real estate brought about by terminal electrification. Not only is neighboring real estate benefited thereby, but the "air rights" over the electrified tracks may become so valuable as to largely pay the cost of the change from steam. With the work but partly finished the Grand Central Terminal district is already a remarkable example of the indirect benefits derived from electrification.

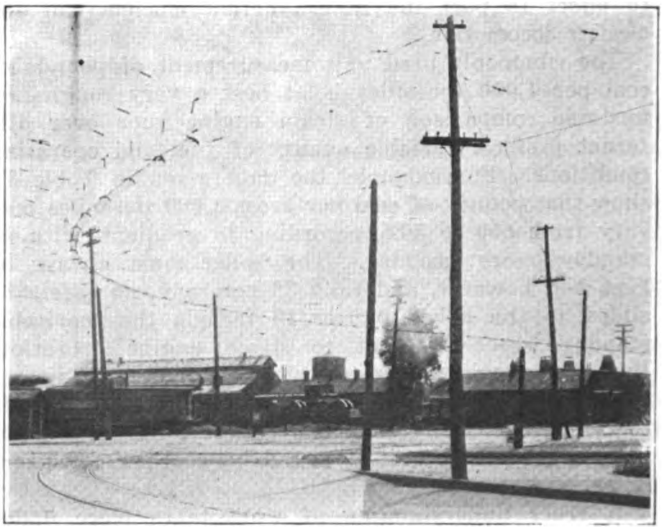
A SUMMARY OF THE WHOLE MATTER

Some of the principal advantages claimed for the electric as compared to the steam locomotive may be briefly stated as follows:

1. No structural limits restricting tractive effort and speed of electric locomotive that can be handled by one operator.
2. Practical elimination of ruling grades by reason of the enormously powerful electric locomotives available.
3. Reduction of down grade dangers by using regenerative electric braking.
4. Very large reduction in cost of locomotive maintenance.
5. Very large saving of fuel, estimated as two-thirds the total now burned on steam engines in operation.
6. Conservation of our natural resources by utilizing water power where available.
7. Material reduction in engine and train crew expense by reason of higher speeds and greater hauling capacity.
8. Increased valuation of terminal real estate following electrification.
9. Increased reliability of operation.
10. Material reduction in operating expense due to elimination of steam engine tenders and most of the company coal movement, the two together expressed in ton miles approximating nearly 20 per cent of present gross revenue ton-mileage.
11. Large reduction in effect of climatic conditions upon train operation.
12. Postponement of immediate necessity for constructing additional tracks on congested divisions.
13. Attractive return on cost of electrification by reason of direct and indirect operating savings effected.
14. Far-reaching improvements in operation that may revolutionize present methods of steam railroading.

Unusual Trolley Guard Installation

ON ONE of the Council Bluffs, Iowa, lines of the Omaha (Neb.) & Council Bluffs Street Railway the track crosses at grade a group of thirteen steam railroad tracks, including main-line tracks of two railroads, and at the same time curves through an arc of about 75 deg. The difficulty of holding the trolley wheels on the wire while traversing this curved crossing may be readily appreciated, likewise the necessity to resort to every means available to keep the trolley wheel on the wire. If the car were to lose power at any point of the crossing it would be practically certain to be stranded and consequently would be in a dangerous predicament.



A 507-FT. TROLLEY GUARD INSTALLED ON A CONTINUOUS CURVE OVER THIRTEEN STEAM ROAD TRACKS

In coping with this situation, the Omaha company installed an unusually long stretch of Ohio brass overhead trolley guard. It is 507 ft. long and none of it is tangent. Its installation was a difficult piece of work. Not only was there very heavy traffic on the several steam lines to contend with but the linemen found it difficult to bend the trolley guard sideways and still retain the V-shape. This was done by using bending clamps, which were kept in place while the guard was worked sideways. A $\frac{5}{8}$-in. backbone messenger cable was first installed and the trolley guard supported from this, with double pull-offs to hold messenger and trolley wire in proper position over the tracks.

W. O. Jacobi, superintendent of electric lines, reports that this installation is of great assistance.

Responsibilities of Foremen with Reference to Safety*

Good Will and Expression Thereof Must Supplement Rules and Printed Matter in Promoting the Safety Movement Among Employees

By John H. Mallon
Superintendent of Transportation Metropolitan West Side Elevated Railway, Chicago, Ill.

THE importance of the position of the foreman in connection with safety work can hardly be overestimated. Unless the men in positions of authority show an interest in the work we cannot hope to attain the desired end.

When I began railroad work, accidents were looked upon as an inevitable accompaniment of the calling. If a collision occurred and an employee was killed there might be an investigation, but that was usually the end. Little attention was given to changing operating methods, to taking steps to guard against the recurrence of the accident. The workmen became callous and careless, assuming that, according to an old superstition, when one accident occurred two more would surely follow. Happily, however, managers of railways or other properties no longer think that accidents are necessary and inevitable; they have been "sold" on the safety movement in a general way, but I doubt whether all of them realize their responsibility in this field fully.

While my subject has to do with the responsibilities of the foreman, we might go further and point out that the higher officials are responsible for the selection of foremen, and this is a great responsibility. Foremen are often selected because they are competent workmen or because they have been long connected with an organization, without due regard to their qualifications for dealing with the men under them.

The workmen in any organization cannot be better than the foremen under whom they work. They get their ideas of the managment from the foremen. It is highly important, therefore, that the foremen should know the policies of the management with reference to safety work as they must educate the men under them.

It has been my experience that the character of the man at the head of a company is reflected in all of his subordinates down the line. If he is an enthusiast on accident prevention, the organization as a whole will adopt safe practices. While I fully appreciate the splendid work that has been accomplished by safety committees during the past few years, I feel that we can never attain the best results until the executive heads of the various industries show that they have more than a passive interest in our work. It is not enough merely to authorize the expenditure of money for safety committees, for there is the "human equation" to be considered.

In large organizations there must of necessity be a chasm between the chief executive and the workmen, because their duties are of different natures. The chief executive cannot come into close contact with the workmen except on rare occasions, but it is quite possible for him to acquaint them with his policies through intermediaries, such as heads of departments, superintendents and foremen.

In placing new employees, great care should be exercised in acquainting them with all details of their work. The foreman who does not look out for the safety of the men under him is not, in my opinion, qualified for his position no matter how efficient he may be in other directions. We are constantly striving for greater efficiency and increased production, but I hold that real efficiency and safety are inseparable.

The confidence and good will of the employees is the first essential step toward safety. The foreman who cultivates that confidence and good will is a big asset to an organization. I do not undervalue the vast amount of good done the safety movement by printed literature, cards, bulletins, etc., but in my judgment the spoken word is more effective, especially when that word comes direct from the man in authority and is spoken in a friendly way. The printed word may soon be forgotten and the caution sign go unread, but the kindly warning registers every time.

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*Abstract of paper read before Electric Railway Section, Ninth Annual National Safety Congress, Milwaukee, Wis., Sept. 30.

The Urgency of Observing Operating Rules*

Intelligent Selection of Men, Followed by Careful Training, Makes Possible Maintenance of Discipline and Enforcement of Rules

By C. E. Thompson
Assistant to the President Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

WHENEVER a task is to be accomplished by the united efforts of many, rules must be established to insure team-work. The company with which I am connected issued a book containing some 500 rules governing the employees of the transportation department. These are practically the standard rules used throughout the country and are designed to cover details of electric railway operation.

These rules may be considered in four general classes: (1) Those governing the physical fitness, appearance and personal conduct of employees; (2) those governing the instruction and training of employees; (3) those governing the operation of trains, and (4) those governing the attitude of the employees toward the public.

First in importance, in my opinion, are those rules governing the selection of men, because this is the very foundation upon which an operating organization is built. In selecting men for transportation work it should always be borne in mind that special physical and mental fitness is required.

Having used due diligence in the selection of the men, the next step is instruction and training. It is very important that new employees be instructed by men who are not only experienced and capable but who will see that rules are fully understood and complied with.

Conditions on every railway are changing from day to day, making changes in the rules necessary. It is therefore very important that the old as well as the new employee be examined as to the rules at frequent intervals. Much can be accomplished by having group meetings, where the rules can be discussed and the reasons behind them given.

Again, the employees are points of contact between the public and the company and must, therefore, so conduct themselves that the public will know the aim of the company to be all-round service. The real problem of the electric railway today is so to train its employees that they know the aims and needs of the organization and realize that the company's success is their success and that the company can be successful only when it serves the public courteously and efficiently.

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*Abstract of paper read before Electric Railway Section, Ninth Annual National Safety Congress, Milwaukee, Wis., Oct. 1.

Most delays in service are caused by failure of the human element, orders forgotten or rules broken. Whether the failure results in damage to equipment or injury to passengers, or neither, the delay is serious. Delays to service can be rectified, damaged equipment can be repaired, personal injury claims can be settled, but it is much more difficult to regain the confidence and good will of disappointed and dissatisfied patrons. Popularity of a public utility enterprise can only be retained by efficient service, which in turn requires a religious observance of correct rules by capable, intelligent, trained employees.

Pension Retirement Promised

Beaver Valley Traction Company Makes Provision for Regulating Voluntary and Forced Retirement with Pension

THE Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway Company, New Brighton, Pa., W. H. Boyce, general manager, have instituted a pension-retirement feature for all employees of the two systems.

This retirement is made on the following basis:

Class "A"—Regular Retirement

All male employees who have reached the age of seventy years, and all female employees who have reached the age of sixty-five years, shall retire from active service.

Class "B"—Retirement at Request of Employee, or at Discretion of Company

All male employees who have reached the age of sixty-five years, and all female employees who have reached the age of sixty years, and whose term of service has been twenty-five or more years, may at their own request or at the discretion of the company be retired from active service.

Class "C"—Retirement at Request of Employee

All male employees who have reached the age of sixty years, and all female employees who have reached the age of fifty-five years, and whose term of service has been thirty or more years, may at their own request retire from active service.

The payment for regular allowances under Classes "A," "B" and "C" shall be as follows:

For each year of his or her term of employment two per centum (2 per cent) of the average annual pay during the ten years next preceding retirement, provided, however, that the company may, at its discretion, base such allowance upon the average annual pay of the ten consecutive years of service during which the retired employee was paid the highest rate of wages. The minimum allowance shall be $25 per month, and the maximum allowance shall not be more than seventy-five per centum (75 per cent) of the average annual pay upon which said allowance is based.

Class "D"—Retirement at Discretion of the Company

Any employee whose retirement on account of advancing years is desirable, or who has become permanently and totally incapacitated or disabled as a result of sickness or injury, other than by accidental injury arising out of and in course of employment by the company, and whose term of employment has been fifteen years or more, may, at the discretion of the company, be retired from active service. If an allowance is granted it shall be for such period as the company may determine, and if at any time during such period the employee recovers sufficiently to resume active service, the allowance may be discontinued by action of the company, if the employee re-enters the service of the company, at the time such allowance is discontinued, the period of absence shall be considered a leave of absence and not as a break in the continuity of the employee's service. The amount and duration of each allowance under Class "D" shall be determined by the company.

It is provided that the decision of the company based on company records shall be final on possible disputed questions of term of employment and payment for service of employees. Many details of interpretation of how years and salaries are figured, of methods of paying allowances, of insurance provisions now in force, etc., are added to the formal statement.

H. O. Allison, safety engineer for the two companies, who has charge of the employment of all trainmen, states that the use of the pension feature as an inducement to the applicant and for the older employee to stay has been most effective. He thinks that men do give consideration to the future held out by the job offered.

In addition to the pension feature these two companies carry a blanket insurance policy covering all employees. These policies pay on the basis of ½ year's wages to dependents in case of death of an employee who has been in service for one year. An employee of two years' service holds a policy calling for the payment of a full year's wages to his dependents in case of his death from any cause. The only stipulation made in these policies is that none shall call for more than $2,400. There is no charge to the employee.

Pacific Claim Agents Meet

THE Pacific Claim Agents' Association held its annual meeting at San Diego, Cal., on Sept. 22, 23 and 24, and the following officers were elected to serve for the years 1921 and 1922: President, Charles A. Blackburn, Butte Electric Railway; first vice-president, John S. Mills, Oakland Terminal Railways; second vice-president, Frank D. Oakley, Tacoma Railway & Power Company; third vice-president, S. A. Bishop, Pacific Electric Railway; secretary and treasurer, B. F. Boynton, Portland Railway, Light & Power Company.

The following were elected members of the executive committee: J. H. Handlon, chairman, San Francisco; T. G. Aston, Spokane; C. M. McRoberts, Los Angeles; A. M. Lee, Seattle; H. G. Windsor, Tacoma, and J. W. Grace, Sacramento.

West Virginia Convention

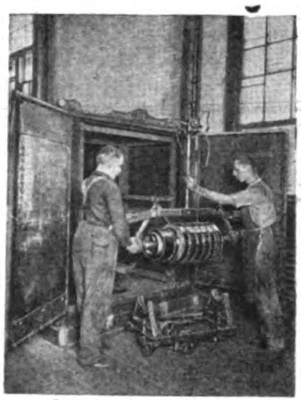
FOR the first time since the war the West Virginia Public Utility Association became operative when the first annual meeting since 1917 was held on Oct. 5. One of the important decisions reached was to establish permanent headquarters in Charleston and employ a paid secretary. The meetings were held at the West Virginia Engineers' Club.

The following officers were elected: President, Herbert Markle, Bluefield; first vice-president, C. P. Billings, Wheeling; second vice-president, M. Hetzer, Moundsville; third vice-president, E. W. Alexander, Charleston; treasurer, A. M. Hill, Charleston; executive committee: W. P. Rawley, C. C. Bosworth, W. R. Power, H. H. Grimsley, A. C. Babson, H. S. Newton, C. S. McCalla and C. H. Brewes.

The retail price of gasoline in England is now more than 4s per gallon; that is, it is approximately $1 in American money at the normal rate of exchange. Of course the "imperial" gallon is 20 per cent larger than the gallon which is standard in the United States. The *Electric Railway and Tramway Journal* attributes the recent rate increase to rise in ocean freight, increased railway charges, more expensive labor and higher maintenance charges.

Shop, Track, Power and Line

These Articles and Ideas Are From Men on the Job Who Find Special Applications and New Methods an Incentive for Greater Effort — If You Have Something Good Pass It Along

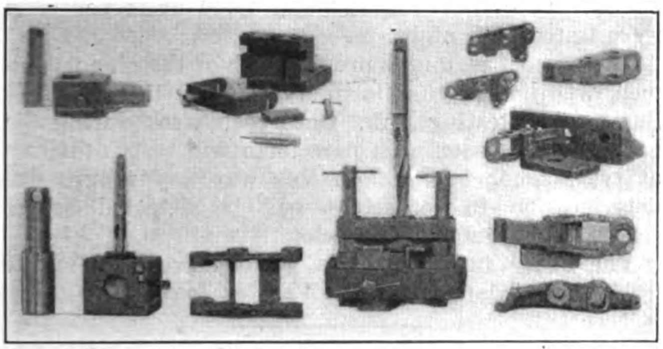


Repairs to Control Equipment

Shop Jigs for Drilling Magnet Plungers and Bushing Worn Contact Levers and Contact Fingers Increase Their Life

IN THE shops of the Wilkes-Barre & Hazleton Railway and the Lehigh Traction Company, Hazleton, Pa., under the direction of James W. Brown, superintendent of shops, jigs have been made up for use in making and repairing the wearing parts of D.B.-131 GE type M control interlock boxes. Accompanying illustrations show these various jigs and the manner in which they are used.

At the left of the illustration is seen the magnet plunger and the jig used to drill the $\frac{7}{16}$-in. hole near the end of this plunger. The plunger itself is turned down from soft steel. The jig is made of cast iron and the guide hole for drilling is bushed with hardened steel. A set screw holds the plunger firmly in position for drilling. Plungers have to be renewed due to the wearing of the shoulder and this jig insures that the drilling is properly done.



CONSTRUCTION OF JIGS AND METHOD OF APPLICATION TO CONTACT LEVER, CONTACT FINGER AND CONTACT PLUNGER FOR DRILLING AND BUSHING

The equipment used in bushing and repairing contact levers is shown in the center of the illustration. When the contact lever is worn it is placed in the jig and the hole originally $\frac{7}{16}$ in. in diameter is drilled out to $\frac{5}{8}$ in. and reamed. Small bronze bushings made up from brake valve stems and other scrap materials are used to bush these holes to the proper diameter. These bronze bushings are turned to a pressing fit on the outside and bored out to $\frac{7}{16}$ in. inside and then cut off at the proper lengths. As in the previous case, the jig is made of cast iron, the construction details being clearly shown in the illustration. The guide holes for drilling are bushed with hardened steel. The contact lever is placed in the jig and two set pins are used as illustrated to center the lever in the jig. A clamp is then hooked over two pins on the side of the jig and a set screw holds the lever firmly in place for drilling. Both a bushed and an unbushed lever are shown beside the jig illustrated.

Contact fingers become badly worn and have to be bushed in the same manner as the contact levers. The contact finger is of an awkward shape and is held in a squared position for bushing with difficulty. At the right of the illustration is shown the means used to accomplish this. Two specially constructed angle plates are screwed firmly to the finger, as shown in the illustration. These insure that the finger will remain in a squared position for drilling. As with the contact lever, the original $\frac{7}{16}$-in. diameter holes are drilled out to a diameter of $\frac{5}{8}$ in. and reamed, following which they are bushed with the same size bronze bushings as are used on the contact lever.

Pumping Corrosive Liquids

THE development of the chemical industry and more refined methods in water treating for power plant work have brought about a demand for apparatus to handle corrosive acid, gases or liquids at different temperatures and under varying amounts of pressure.

The substance which is most generally suitable for resisting the action of corrosive liquids is some kind of siliceous ceramic material, as this can be obtained in any form desired, can be molded and baked and is insoluble in any liquid and unattacked by erosion or by gases. Heretofore, Germany has had the monopoly on this business, but during the war a new acid ware, called "ceratherm," was prepared by the English. Like silica-ware, it can be plunged when red hot into cold water without cracking, and its good heat conductivity permits of a rapid equalization of temperature in vessels.

A line of centrifugal pumps made from this material in modified form has been placed on the market for use wherever a pump possessing the qualifications outlined is needed. By special features of design, the material, cemented into iron casings, is protected from excessive mechanical strains and what metal bearings are necessary are protected from contact with the liquid pumped. The range of sizes built by the manufacturers in England, the Guthrie Company, runs from deliveries of 10 gal. to 5,000 gal. per minute.

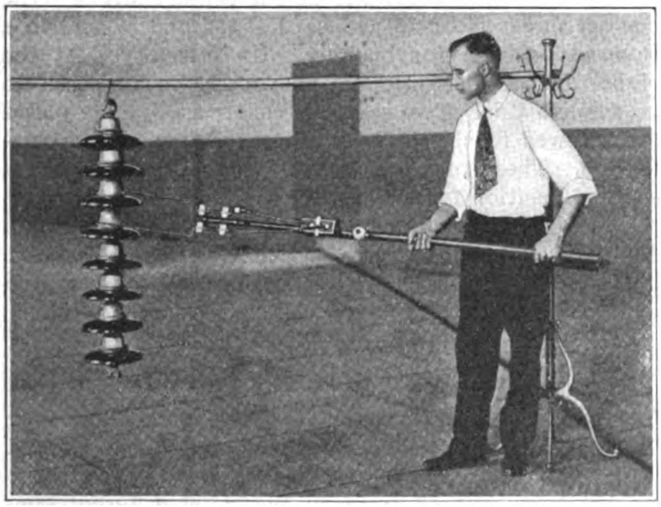
These pumps have been used successfully for pumping sodium peroxide and other liquids, such as hydrochloric, nitric and acetic acids, both hot and cold.

Unique Insulator Tester

Device Which Facilitates the Continuous and Special Inspection of High-Tension Transmission Line Insulators

DEFECTIVE insulators on installed lines are difficult to locate without serious disturbance to service or great expense for equipment. No matter how thoroughly defective units have been weeded out during the winter and spring months, the first few hot days of summer bring failure of insulator units. If the defective units are not immediately located and removed they become a serious menace to satisfactory line operation.

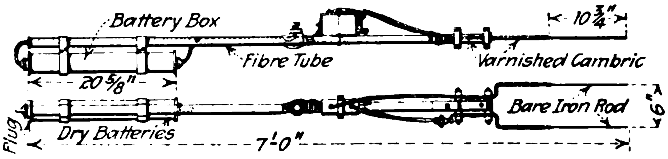
The Mississippi River Power Company has developed a unique method for testing the insulators on its lines which may be of interest to other line operators. This company operates two 110,000-volt transmission circuits, carried on a single tower line 144 miles between Keokuk and St. Louis. On these two lines 87,000 suspension-type insulator units are in service.



METHOD OF APPLYING INSULATOR TEST FORK TO INDIVIDUAL UNITS

Previous to 1915 it was possible to take one of the St. Louis lines out of service during daylight hours on weekdays for megger testing of insulators. The amount of power carried over these two circuits has increased, however, during the last two years to such an extent that at present neither line can be cut out during the week except at night, without reduction of load and resultant loss of revenue. Under these conditions testing which can be done during daylight hours only is limited to Sunday periods. The time necessary for testing the insulators by the megger method was limited by the great number of insulators on the line, and also the megger method for testing insulators gives trouble at night due to dampness. The company then attempted to work out some equipment which would be self-contained in a single-testing outfit which would not require any long wires connecting the test points to additional equipment on the ground. After trying out several schemes, the so-called Keokuk insulator tester was developed as can be seen in the accompanying figures.

Upon the handle of a fork is mounted an automobile induction coil, the high-tension winding of this coil being directly connected across the tines of the testing fork without an automobile spark plug connected in series with the circuit. The low-tension winding of the induction coil is connected in series with three dry cells in a container at the handle end of the fork, and in series with this circuit is a 5-amp. snap switch by means of which the induction coil can be energized during tests. This testing fork is not designed for use on live lines, and any circuit on which tests are to be made must be taken out of service and perfected before the fork is applied to individual units. When the line is ready for test the fork is applied to each unit in an insulator string. If the unit is of satisfactory resistance no discharge occurs across the spark gaps. Whenever the fork is placed across a defective insulator unit which has a low resistance a heavy discharge occurs across the spark gap, and in this way the defective insulator is easily located. Three ordinary dry cells are sufficient for testing several thousand insulator units.



DETAILS OF CONSTRUCTION OF THE TEST FORK FOR TESTING OF INDIVIDUAL INSULATOR UNITS

During the period from June 23 to July 26 of this year 44,000 insulators at dead ends and anchor towers on the Keokuk-St. Louis 110,000-volt line were successfully tested with this device, and 2,087 units, or 4.74 per cent, were found defective and replaced. As many as six testing tools were employed simultaneously during the interval between 10 p.m. and 6 a.m., and an average of between 700 and 1,000 units per crew were tested each night.

The present plan is to provide each of the nine patrolmen, who live at 16-mile intervals along the St. Louis line, with a testing fork. Once each week during the hot weather season each patrolman will test insulators at two anchor towers. In this way any progressive deterioration in insulators will be detected before severe line trouble can develop.

The above information is gleaned from an article by R. B. Howland, *Stone & Webster Journal.*

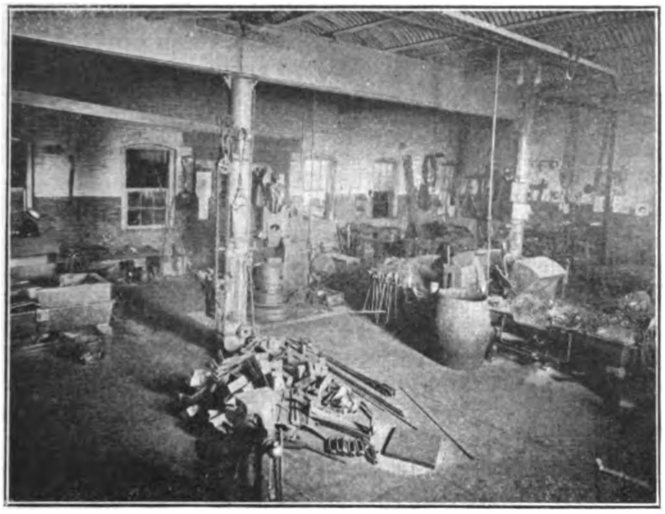
Efficiently Arranged Forge Shop

Washington Railway & Electric Company Located Its Forge Shop So That It Is Convenient to Iron Rack and to Machine Shop

THE forge shop of the P Street shops of the Washington Railways & Electric Company, Washington, D. C., was laid out with the primary view of efficient handling of materials to and from the forges and was as centrally located as the layout of the plant permitted. The accompanying sketch shows this general layout, together with the location of forges, anvils, etc.

For receiving and storing iron an iron rack was built in the adjacent yards. This is handy to the alley through which the iron is delivered and to the main door of the forge shop. This iron rack is built of horizontal pipe supported by wooden members and is large enough to take a large and varied stock of iron and steel.

The rack is 30 ft. long, 8 ft. high, and 16 ft. deep, and is convenient to the shear and punch, which is



INTERIOR ARRANGEMENT OF FORGE AND BLACKSMITH SHOP

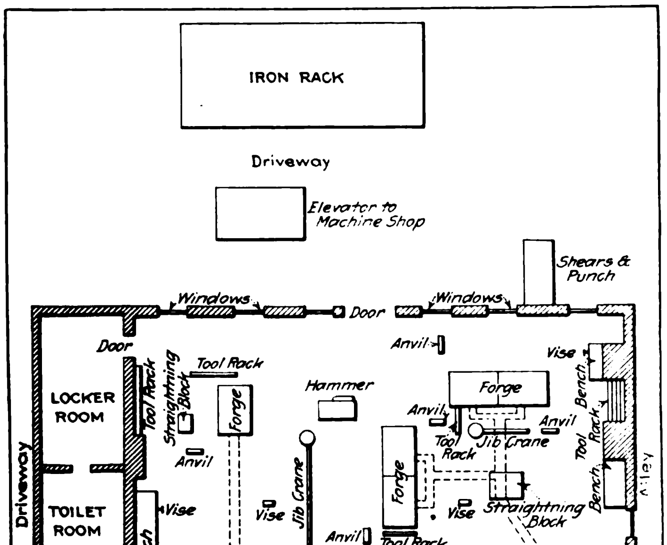
located just outside the shop so as to allow extra long pieces of steel to be cut and punched for use in the forge shop. For convenience in handling finished work, the elevator shown on the layout serves the machine shop and all work from the forge shop to the machine shop is carried this way.

A locker room has been constructed next to the blacksmith shop which is used by the machinists and blacksmiths. This is equipped with 6-ft. lockers. The toilet and washroom adjoins the locker room and is supplied with both hot and cold water. The shop itself is well lighted during the daylight by large windows opening direct onto the street, and at night by 100-watt incandescent lamps.

Five forges located as shown in the sketch are of the Buffalo down-draft type. The draft ducts are laid under the concrete floor and all come together at the blower, which is located as shown in one corner. This blower is operated by a 10-hp., 600-volt d.c. motor. Each forge has a separate draft fan and one 8-hp. motor, which is situated at head of the forge and readily accessible.

The shop is also equipped with a No. 7 Beaudry power hammer and a combined shear and punch, both with independent motor drives. The shear and punch, as already referred to, is located just outside the shop.

A ½-ton gib crane serves one end of the shop, and here all the heavy forging is done. A smaller gib serves the other end. In addition to this principal equipment other necessary benches, anvils, straightening blocks and tool racks are arranged in convenient locations.



PLAN OF BLACKSMITH SHOP OF THE WASHINGTON RAILWAY & ELECTRIC COMPANY

Economies in Car Painting

Methods and Processes Used in Painting Simplified Considerably During Past Few Years—Further Economies Can Be Accomplished

WITH a view of obtaining information on additional economies in car painting that might be possible, the editors of this paper have made some special investigations of the methods used in painting automobiles and methods recommended by paint manufacturers. From the information obtained it appears that a large saving in time can be obtained through the use of a rapid drying filler. Every painter knows that if a perfect job is to be produced it is of the utmost importance to begin with a good foundation. The filler should provide this foundation and should be of such a nature as to eliminate the natural suction that is peculiar to some forms of filler material, and so enable the varnish and body coats to remain in place until natural wear removes them.

The Poughkeepsie Paint Company has placed a filler on the market known as "Filkote." This filler is intended to replace the primer and plastering coats, and two coats of this filler will provide a surface equal to the primer and two plastering coats, a saving of one operation. Carriage and automobile painters in that vicinity have used this product for the past eight or ten years with very good results. The great advantage obtained from the use of this filler is due to its rapid drying. It may be applied at the rate of a coat every twelve hours, and with the employment of artificial drying may be applied as often as every three hours. By doing away with the primer lead and guide coats it cuts down the time required for a job by at least five or six days, and the labor necessary for applying these coats.

Another advantage claimed for this filler is that it does away with the use of water for rubbing and thus eliminates the necessity of waiting for the water used under the old way to evaporate before further work can be done. If the water is not thoroughly evaporated it will cause trouble in the finished job in the form of blisters scaling and the sinking of the varnish coat.

Most railways lay out their painting and varnishing schedule in a systematic manner and along lines which will require the removal of cars from service during periods when they are least needed. In former years it was considered necessary to have a car in the paint shop from two to three weeks while it was being repainted. Under methods which are now used this time has been reduced to approximately ten days on some railways. In pre-war days methods generally used for painting electric cars required one primer coat, one lead coat, three coats of rough stuff, one guide coat, one filler coat, one coat of colored varnish, one lettering coat and one coat of finishing varnish.

The methods now in general use consist, first, of scrubbing the car when it is received in the shop. After the car is thoroughly dry a primer is applied. In general with the usual type of surface car, the scrubbing will take two men approximately ten hours, and it will be necessary to allow the car to dry for the succeeding twenty-four hours before the primer coat can be applied. This priming coat will take approximately seven man-hours, after which the car must stand for drying an additional twenty-four hours. After the primer is dry plastering or glazing is done. This takes one or two coats, depending upon the condition of the car and the surface that is desired. With a car in ordinary condition the plastering would take from five to nine hours' time of a single man, and an additional ten hours would be required for drying after each coat. The car body would then be ready for the body color, after which it could be lettered and varnished. The application of the body color would take approximately fourteen man-hours, the drying twenty-four hours and the varnishing approximately seven man-hours, after which it would be necessary to dry twenty-four hours longer before the car could be returned to service. Many roads are now using enamel paint instead of the body color and varnishing. Where varnish is not used this saves nearly two days' time.

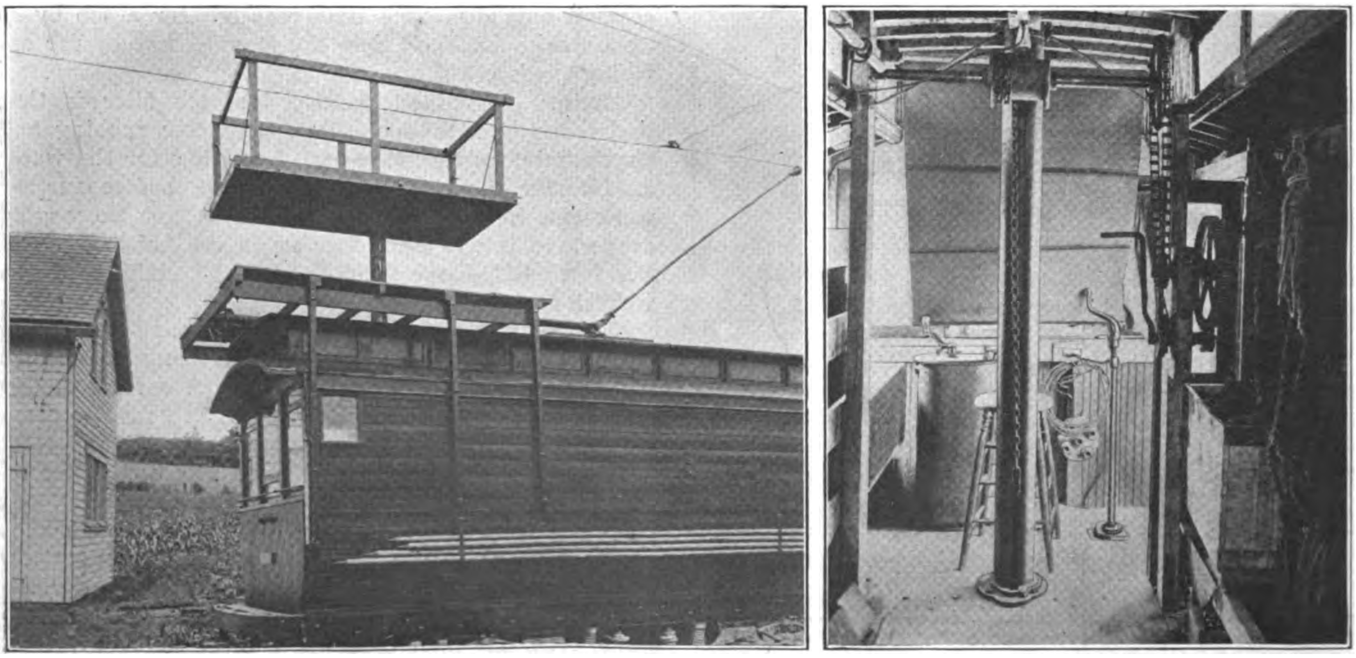
By analyzing the figures just given it is readily seen that a large amount of the time that a car is in the shop is consumed in drying. If this can be shortened the car could be returned to service more speedily. Where an operation can be performed in a week the car could be returned to service for the Sunday traffic. Ordinarily no work is done in shops on Sunday and the painting schedules are usually arranged so that the cars can dry on this day.

As a result of the high prices for paint and oils, the use of cheaper substitutes has received considerable attention. Great interest has been manifest in the use of semi-drying oils and driers in general. As a result of investigations, important advances have been made and some valuable scientific work has been accomplished with reference to the chemical reactions that take place while oils are drying. The question of how and why some metallic salts make an oil in which they have been dissolved dry to an elastic film has not yet been fully answered. This, however, is a very important factor in car painting, as cars in operation are frequently subjected to rapid changes of temperature which will cause the paint to crack unless the film is quite elastic. Under some conditions the oil used will dry with satisfactory speed, but to a tender, cheesy film, which is not serviceable.

An average figure for the revenue of a car under present conditions is approximately $40 per day. When a car is not in operation the greater part of that sum of money is definitely lost. If by employing new methods or different materials for car painting the time of completing a car can be shortened by four days, which it seems probable can be accomplished under favorable conditions, this would mean a saving of approximately $160. In addition to this saving there would be undoubtedly a saving in the labor charges. Neat and well-painted rolling stock adds materially to any operating company, and it is certain to result in increased revenue by attracting riders more frequently who desire clean and comfortable transportation.

Convenient Line Car Platform

ACCOMPANYING illustrations show the general arrangement and working details for a type of line car platform which was constructed by the Northampton Traction Company of Easton, Pa. All the working parts for raising and lowering the platform are installed on the inside of the car. The platform above the car is supported on a post and has a swivel joint where it is attached, so that the platform can be turned to any desired position. Gearing connected to the mast on the inside of the car enables one man to raise the platform to its full height with two men on the platform in less than one minute's time. As at present constructed the platform can be hoisted 7 ft. above the roof, which permits work on line and overhead troughs at railroad crossings which are 22½ ft. high. The platform is 8 ft.

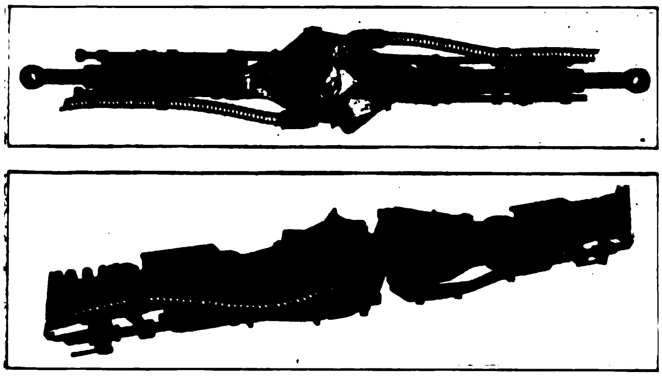


AT LEFT, LINE CAR WITH PLATFORM RAISED. AT RIGHT, INTERIOR GEARING FOR HOISTING PLATFORM x 4 ft. and has a railing 2 ft. 9 in. high, which is hinged so that it will fold down on the platform when not in use. This railing can be readily folded or turned up by hand. The car, together with this platform, was originated by Edward Welch, line foreman of this railway, who will be glad to supply others with additional details of its construction.

Automatic Car Air and Electric Couplers

Safety in Operation and Economy in Maintenance Have Proved an Incentive for Improvements in Car Couplers for Train Operation

TRAIN operation presents many problems which did not exist when cars were operated as single units or even occasionally as motor and trailer. Not the least of these is the means for connecting the cars together. In the early stages of electric railway development the primitive link and pin type of coupler was fairly satisfactory, as at infrequent intervals only was it necessary to operate more than one car at a time, such as the hauling of a light trailer to meet special demands, or the hauling of a disabled car to the carhouse. When, however, two or more cars are operated together regularly the means of connecting them becomes of great importance.



TOP AND SIDE ARRANGEMENT OF COUPLERS

The introduction of the automatic car coupler marked a wonderful advance in train make-up facilities, effecting, as it did, a saving in the matter of time and a reduction in the element of danger involved. However, this left something yet to be desired since manual coupling of the air connections was still necessary. Further progress was made when the Westinghouse car and air coupler was evolved a few years ago. This obviated the necessity for hose connections, but still required the use of separate electric jumpers. Obviously, the ideal condition is that in which all necessary connections between cars, mechanical, pneumatic and electrical, are made automatically.

The coupling of cars together for train operation involves the two important considerations of safety and economy.

The safety element is increased as the element of personal danger in making up trains is eliminated, there being no need for the train crew to go between the cars because the mechanical, pneumatic and electrical connections are all made simultaneously and automatically.

When the couplers are locked together it is impossible accidentally to separate them while the train is in operation due to uneven track, etc. Furthermore, the fundamental idea of the air brake is maintained in that unintentional separating of the cars will produce an emergency application.

If the lock of one coupler should become deranged or defective the other is not affected in any way, and it alone will prevent accidental uncoupling of the cars.

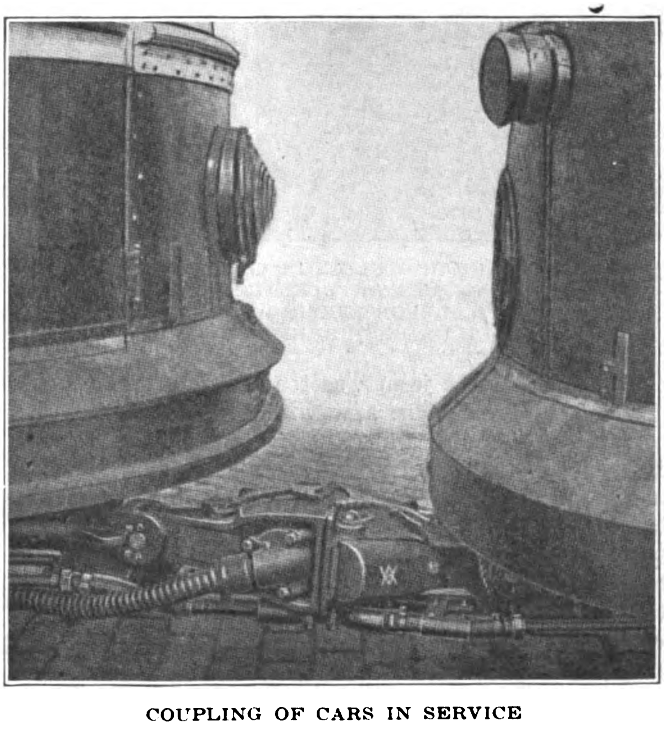
The couplers are of the "tight lock" type and are held together rigidly so that all slack is eliminated, and the train moves as a solid unit without severe shock or possibility of damage to car apparatus or equipment.

From the standpoint of economy there are many advantages. Time is saved because trains may be made up more promptly and congestion at terminals avoided. Delays due to failure of air or electric connections are obviated.

Maintenance is reduced because there is no expense for electric jumper up-keep or replacements and the wear and tear on hose connections is eliminated.

The coupler comprises a cast steel head and draw bar with suitable draft gear spring and an electric portion. The head has a hooked end and recess in its face adapted to engage with the corresponding face of another coupler. Vertical motion is provided where the head is attached to the draw bar and lateral movement at the point where the draw bar is attached to the car. The coupler heads are doubly locked together and become as rigid as a single casting, so there is an entire absence of slack, permitting the train to move as a single unit without shock.

The air connections are brought to outlets at the coupler face and provided with soft rubber gaskets to seal the joints. Thus the pneumatic connections are accurately and reliably made when the couplers are locked. The electrical portion consists essentially of a series of "butt" type contacts which are brought together when the couplers become engaged. These contacts while coming together are caused to rotate in opposite directions, which subjects the surfaces to



COUPLING OF CARS IN SERVICE

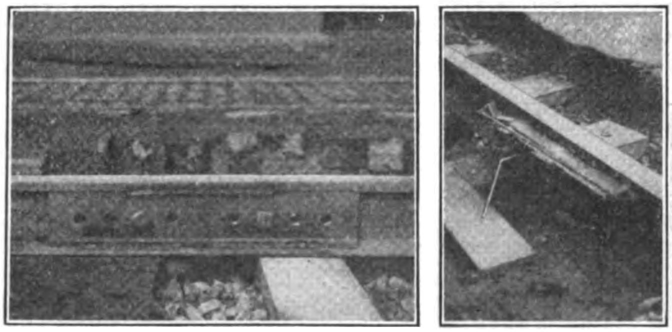
a rubbing action, removing all non-conducting material which may have accumulated and insuring a perfect contact. The contacts are well protected from mechanical injury on the open end of a car.

The K-1-A Coupler is adapted for multiple car or motor and trail car operation in street railway service. It is entirely automatic in the coupling operation, but the uncoupling is manual. The impact of the couplers, one against the other, locks them together and makes the air and electric connections, the operation being completed by manipulation of circuit closing switches and cutout cocks. The reverse movement of switches, cutout cocks and movement of unlocking handles comprises the uncoupling operation. When the coupler part the latch is automatically tripped to locking position, so that they are reset and ready to be coupled again without the necessity of further manual action.

The electric portion, consisting of a group of nineteen contacts which permit the use of thirteen separate circuits, is mounted in the face of the coupler. The contact faces are entirely within the contour of the coupler head and being in a cavity back of its projecting nose are well protected from accidental contact with any foreign object. When the couplers meet, and at a point where the gathering and aligning surfaces have engaged, the contacts come together and are compressed by each other against such a spring resistance as, combined with the self-cleaning feature, will insure good contact and provide full carrying capacity without overheating. A rubber gasket prevents the entrance of moisture to the contacts.

Welding Rail Joints to Obtain Flexibility

HAVING experienced a number of broken joints where the fishplates had been welded to the rail for the full length of the top and bottom edges, and also riveted, Charles H. Clark, engineer maintenance-of-way Cleveland (Ohio) Railway Company, came to the conclusion that the joint was too rigid and that it was desirable to weld it in a way that would introduce a certain degree of flexibility. The joints were breaking down completely, that is, the fishplates were breaking in two at the joint. This was caused, it was believed, by the action of the car wheels as they approach and pass over a joint. As the car approaches the rail tends to bend upward at the joint, causing a tensile stress at the top of the plates and a compressive stress at the bottom. Then as the wheels come upon the joint these stresses are suddenly reversed and in the absence of any flexibility there apparently develops a strong tendency to snap the plates.



AT LEFT, MANNER OF WELDING RAIL JOINTS TO SECURE A DESIRED DEGREE OF FLEXIBILITY. AT RIGHT, JIG USED TO SUPPORT FUSING ROD AND TO CUT OFF UNDERCURRENT OF AIR

In October, 1917, a different plan of welding was inaugurated, and since then not a single joint has broken in the manner previously encountered. The new scheme is shown in the accompanying picture. Along the head of the rail the plate and rail are fused or welded together continuously for a distance of 6 in. each side of the rail joint, leaving an unwelded length of about 8 in. at each end of the plate. Along the base of the rail the plate is welded for a 10-in. length on either side of the joint, but leaving a gap at the joint about 3 in. wide, and about a 3-in. unwelded length at each end of the plate.

Plates that are welded in this manner are placed on both sides of the rail and riveted in addition, following the standard joint practice in Cleveland. In the joint shown in the picture the riveting was omitted, since the track under construction was a short piece to permit a by-pass in case of a tie-up and is little used.

The welding of the joint, making use of a Lincoln Electric Company bonding machine, is facilitated by the use of a jig which is braced in position against the joint. This provides a copper surface just even with the top edge of the fishplate and fitting tightly against the plate, on which the soft steel welding rod is laid adjacent to the rail. The copper form on which the steel rod rests prevents the air from coming up around the arc during welding and thereby overcomes the tendency to oxidize and harden the metal.

The jig also includes a rod supported up above the copper form, on which the operator rests the insulated handle of his electrode while welding. This makes it possible to draw an arc of just the right length and then hold a steady flame of uniform length all the way across the weld. The rail, joint plate and soft steel rod are fused together rather than welded in the ordinary sense.

Cast Weld Joints in England

THE cast weld, or Falk joint, as it is sometimes called, has been successfully used in England, according to a recent issue of the *Tramway & Railway World*. A. E. Collins, city engineer of Norwich, is credited with the statement that the Falk joint has been continually used on the tramway system of that city for twenty-two years with very few breakages. Following a description of the process of manufacture of these joints, which is very similar to that now used in this country, Mr. Collins says that in the joints made twenty years ago the cast metal was carried to the top of the rail but it was later thought advantageous to stop it off at a lower level; this has now been abandoned and the previous method reverted to. It is of interest to note that American cast weld joint practice has passed through the same stages.

The rails used were principally those weighing 65 lb. per yard (presumably of the British type of narrow-groove section), but in relaying the weight was increased to 90 lb. per yard.

The Danes recently celebrated the one-hundredth anniversary of the announcement of the discovery of the magnetic effect of the electric current by Prof. Hans Christian Oersted on July 21, 1820. This celebration centers in Copenhagen, where he taught and where he founded a technical college. A statue of the scientist has been unveiled in his native town, Rudkobing, and a memorial museum in Copenhagen is projected.

OLD CROSSING WITH FAILING RAIL JOINTS, BUT WITH GOOD RAIL AND SLOT JOINTS

Thermit Welding for Special Trackwork Repairs

Interesting Combination of Thermit Welding for Rail Joints and Arc Welding for Rail-Slot Joints in Washington

By R. H. Dalgleish

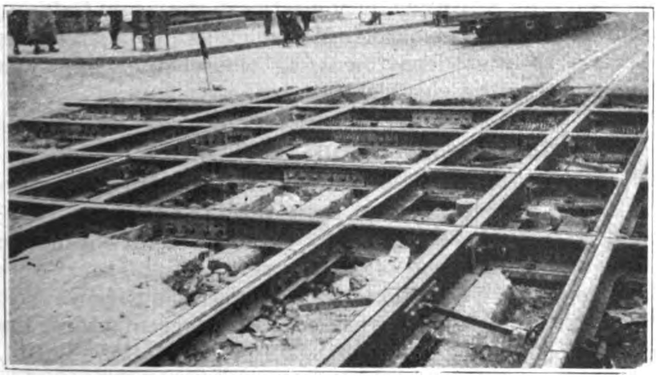
Chief Engineer the Capital Traction Company, Washington, D. C.

THERMIT welding for special trackwork repairs is being used by a number of railway companies and has been used by the Capital Traction Company for some time with satisfaction.

Special trackwork for a double-track surface track crossing a double-track conduit track has been recently built by this company in the main shops, using thermit for the wheel rail joints. This special trackwork was built by us for this intersection five years ago, using metal electrode arc welding at the joints. The wheel rail joints failed in the weld, but the joints where the wheel rail joined the slot rail were satisfactory, none of them having failed when the crossing was removed.

One of the accompanying illustrations shows some of the wheel rail joints that failed and also shows the slot and wheel rail joints in good condition. We were compelled to renew this crossing due to the failure of the wheel rail joints and decided to use thermit weld for the wheel rails and metal electrode welding for the slot rail joints, inasmuch as the slot rail joints were satisfactory in the old crossing.

The other illustration shows the new crossing installed with the thermit-welded wheel rail joints and arc-welded slot-rail joints. The crossing is made in four sections and the wheel rails and slot rails are continuous on the conduit track. The wheel rails on the surface track were cut ½ in. short to allow for thermit welding.



NEW CROSSING WITH THERMIT-WELDED RAIL JOINTS AND ARC-WELDED RAIL AND SLOT JOINTS

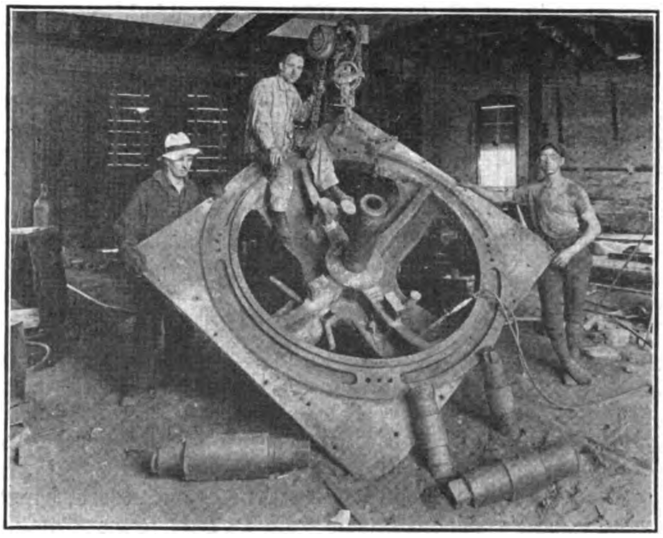
The old crossing was installed on planed head yokes for the conduit track, and as the new crossing was installed on the yokes already in place we were unable to have any thermit metal below the base of the rail. In order to get a good bond at the joint it was necessary to allow the metal to flow under the base of the rail and grind it off before installing the crossing in its permanent location.

In work of this character it is very important that the rails be securely clamped down before the thermit is poured in order to prevent them from twisting out of shape. It is also important that all the care possible be taken, as a very good job in this class of work can be easily spoiled by a little carelessness on the part of the workmen in the fastening of the rails in position.

Repairing an Electric Locomotive Crane Base

THE illustration shows a cast-iron turntable base of an electric locomotive crane which was recently repaired by thermit welding for the Boston Elevated Railway at the Worcester, Mass., plant of the New England Welding Company, of which R. M. Taylor, is president.

The crane base was broken in three places, the average dimensions of each break being 6 in. x 9 in. with a 6-in. opening. The job was turned over to the welders Saturday afternoon and repairs were immediately started on the first break. The first pour was made at 10 o'clock Saturday night. It was necessary to cover the entire casting with a charcoal fire to prevent unequal shrinkage, letting the fire die down and the casting cool before the second weld could be attempted. The job was completed on the following Saturday morning and shipped that afternoon as soon as the casting had become cool enough to handle.

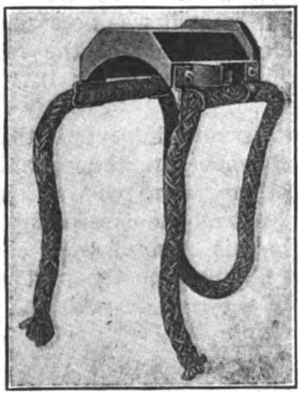


CRANE BASE AFTER WELDING

Thermit to the amount of 940 lb. was used in successfully making the three welds. This repair saved the Boston Elevated Railway many weeks' loss of the use of its electric locomotive crane.

New Method of Lubricating Car Journals

A NEW arrangement for lubricating car journals is being placed on the market by the Horrocks Desk Company of Herkimer, N. Y., in the form of the "Danight Lubricator."


WICK TYPE OF JOURNAL LUBRICATOR

The device as shown in the accompanying illustration consists of four stub brackets which are screwed to the four corners of the journal brass. A circular wick is threaded through the holes in these brackets so as to leave a loop at one end and the two protecting ends at the other end of the journal bearing. After the wick has been installed the brass containing the device is dipped in oil and pushed into the journal box over the journal, leaving the loop end of the wick so that it will pass under the journal and lay in the bottom of the journal box. This method of lubrication may be used as an auxiliary waste lubrication or it may be used independently without waste.

New Asbestos Insulated Wire

THE Independent Lamp & Wire Company, New York, N. Y., announces that it is marketing a new asbestos insulated wire which will be known as Salamander W.E. finish. This is intended for use in winding armature coils, fields and magnet coils for railway equipment. This wire has an insulation coating of pure asbestos free from molecular moisture and treated with compounds and heat in such a way as to make the asbestos resemble rawhide. The manufacturers claim that this wire will withstand extremely high temperatures and that it has high dielectric qualities as well as being impervious to moisture, fire, acid and oil.

New Line of Insulated Cloth

A NEW line of treated cloths for insulating purposes is shortly to be placed on the market by the General Electric Company. The cloths are all woven from long fibered yarn and treated by a special process to remove nap, thus eliminating the possibility of the varnish film being penetrated by the cotton fibers, which would reduce the insulation value. This process makes it unnecessary to starch the cloth to lay down the nap.

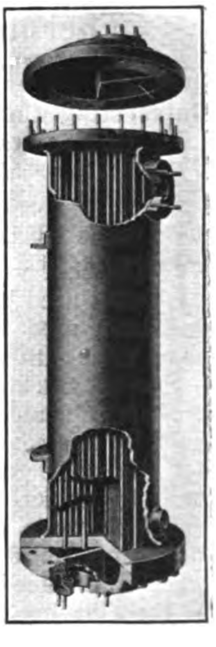
All the varnishes used in treating these fabrics are extremely flexible and age well under all operating conditions. By use of special machinery for impregnating the cloth, uniform coatings are obtained.

Yellow varnished cloth is a closely woven cloth treated with a high-grade yellow varnish which is baked in place. It has good dielectric strength and a hard surface film. Two others are yellow oiled muslin and oiled canvas. They are impregnated with insulating oil and oven treated to give them a hard, smooth surface. The linen is used for a large variety of purposes, such as wrapping armature coils, while the canvas is used for pads under railway motor field coils.

Black varnished cloths are very flexible and have longer life under elevated temperatures than the yellow variety. Their oily surface renders them particularly impervious to oil and moisture, and they are preferable wherever a hard surface is not required because of their better insulating qualities. They are of three kinds: First, a black varnished cloth of great mechanical strength, used either as a tape for wrapping armature, field and transformer coils and leads, or as a sheet for wrapping the slot portions of armature coils; second, a duck of a very close weave treated with a black japan of high insulating qualities, and oven cured, and third, a cloth similar to the first except that it is thinner, being used to wrap the slot portion of coils.

All of these fabrics may be put to other uses than those mentioned, it merely being the idea to suggest some applications to which their particular qualities make them especially adaptable.

New Oil Heater


STRAIGHT TUBE OIL HEATER

THE Griscom-Russell Company, New York, N. Y., manufacturers of the Reilly oil heater of the coil type, has recently placed on the market a new oil heater unit of the straight tube type. This is to supplement its coil heater line and is known as the G-R oil heater.

As shown in the accompanying illustration this is designed for the pre-heating of fuel oil before it goes to the burner and to insure complete atomization of the oil and perfect combustion under boilers or in furnaces. The oil is pumped through the tubes and high pressure steam in the shell serves as the heating medium.

The shell of the heater is constructed of wrought steel welded to steel tube plates. The tubes are of seamless drawn steel expanded into tube sheets at either end.

Alberta Engineers Organize

THE engineers of Alberta, Canada, have formed the Alberta Association of Professional Engineers, the first general meeting of which was held at Calgary on July 10. The president of the association is F. H. Peters, commissioner of irrigation and chief engineer Department of the Interior, Calgary, and the registrar and honorary secretary is Prof. R. S. L. Wilson, department of civil engineering, University of Alberta, Edmonton. R. A. Brown, city electrical engineer, Calgary, who succeeded Thomas H. McCauley as manager of the electric railway department, is one of the councilors representing the electrical section.

Final Registration at Atlantic City

AMERICAN Electric Railway Association headquarters reports the total registration for the 1920 convention to have been 3,330. Separate figures for the various associations, manufacturers, guests, etc., were not kept this year. This total registration shows that the 1920 convention surpassed any in recent years, the previous figures being: 1919, 3,166; 1916, 3,271; 1914, 2,454.

There were 136 exhibitors, occupying 59,678 sq.ft. of exhibit space.

Mobile Has Unique Fare Collection

Passenger Drops Metal Ticket in Fare Box, Through Which No Coin Can Fall; Hands Cash Fare to Conductor

FOR several months now the Mobile (Ala.) Light & Railway Company has had in force a 7-cent cash fare and a 6-cent ticket fare. While 86 per cent of the riders are making use of the tickets the company found that with the 14 per cent it was losing revenue and having arguments with the conductors because of passengers withholding one or two of the coins when dropping cash fares into the fare box. It was claimed by the conductors that it was difficult to detect this practice during rush hours when many people were boarding the car in rapid succession at a given stop. The company makes use of the double-check system of registration, the conductors being required to ring up on a clock having two cyclometers all fares and transfers collected. This is supposed to check against the fares registered in the fare box.

In order to overcome these troubles, the company had the tops of the fare boxes changed so that no coin would fall through. The metal ticket which has been in use for several years in Mobile is slightly smaller than a dime, and the new fare box tops were made so that nothing larger than this metal ticket would fall through. The metal pass used by employees is slightly smaller than the ticket. A third metal piece, termed a "slug," slightly smaller than the pass, is also used, as pointed out below, and the fare box mechanism was changed to register on separate dials these tickets, passes and slugs, with a fourth dial for total fares.

Passengers boarding the car with metal tickets simply drop them into the box and pass on into the car. Passengers boarding and paying the cash fare of 7 cents are required to hand the money to the conductor, who in turn drops a slug, representing a cash fare, into the fare box. Should the passenger put the cash fare into the box in error the coins will not drop through and can then be recovered by the conductor and a slug dropped in instead.

The fare boxes formerly were arranged to register nickels or dimes, tickets and metal passes. During the interim while the company was having the fare boxes changed over to handle the three classes of metal tickets a hinged cover was placed on all fare boxes, preventing passengers from dropping their fares into the box. All passengers were required to hand their fares, of whatever kind, to the conductor, who by receiving the money or ticket in his own hands could prevent passengers from withholding a part of their cash fare and assure, it was thought, that the company would collect the full revenue. The conductor then would lift the lid and drop the coins and tickets into the fare box.

The present system of fare collection was complicated somewhat by the fact that two of the lines of the company extend outside the city limits, where a separate contract with the county calls for a 5-cent fare. That is, a passenger boarding a car and riding between any two points outside of the city limits is required to pay only a 5-cent fare, although the end of the city-fare zone was some distance outside the city limits. To take care of this situation the company had to install another register, on which these 5-cent fares could be tallied in order to keep them separate from the 6-cent and 7-cent rates collected within the city zone. There are only a few of such passengers, so the fact that they are not registered in the fare box is not a serious matter.

Letters to the Editors

Mechanical Department Stores Accounting

THE CONNECTICUT COMPANY
NEW HAVEN, CONN., Oct. 21, 1920.

To the Editors:

Referring to the paper "Mechanical Department Stores Accounting," presented by Thomas Kennedy before the Iowa Electric Railway Association on Sept. 16, 1920, I have been very much interested in reading the paper and particularly interested in the forms as reproduced on page 719 of the JOURNAL of Oct. 9.

The form on page 718, "Not Stores" tag, to mark material not charged to stores account would seem to me to be more or less unnecessary, and I should think, if I understand the situation correctly, that it would be liable to lead to erroneous accounting.

It is my belief that all material should be charged to stores account, or some subdivision of stores account, and unless such material is so charged it would seem that it would be lost sight of. The master mechanic, or any shop foreman, might take some of that material and use it for repairs, or it might disappear from the storeroom entirely without any record being made of it.

In our storeroom accounting practice we have found it advisable to have all stores included in the stores account, or in some subdivision of that account. In that way we never lose track of it, and if it is used without a requisition to the storekeeper our system is such that it is charged to the proper operating account (or if not used, it is charged to the operating accounts) at the close of the year. This is because such material is usually inventoried at the close of the year, and if that inventory is short of the amount shown on the books for the same class of material the previous year, then the difference is charged off to certain operating accounts as are other inventory differences.

Perhaps I have misunderstood the purpose of the tag mentioned. If so, I should be glad to have Mr. Kennedy's correction. Let's have a little discussion as to the advisability of a "Not Stores" tag.

I. A. MAY, Comptroller.

Paper on "Creeping of Railroad Rails"

35 NASSAU STREET,
NEW YORK CITY, Oct. 12, 1920.

To the Editors:

There is about to be issued by the American Society of Civil Engineers a paper of mine, entitled "The Creeping of Railroad Rails." It consists mainly of a compendium of information received through a questionnaire from more than a hundred of the highest authorities on the subject in North America. I greatly desire to have this paper thoroughly discussed; hence, if any railroad man who wishes to discuss it will write me to that effect, I shall send him an advance copy, provided his letter reaches me before my supply of copies is exhausted.

J. A. L. WADDELL,
Consulting Engineer.

Suggestions on the Proposed Use of Movies

Letters Received as a Result of Editorial Suggestion of Sept. 25 Indicate Keen Interest—The Educational Possibilities of This Medium

SEVERAL letters have been received in response to the editorial suggestion in the issue of the JOURNAL for Sept. 25 with reference to the possibilities of the use of motion pictures in electric railway publicity. Space permits the publication of only a few of these this week, but other communications will be published in early issues.

Railway Propaganda Can Form Only a Flash of an Interesting Film

THE METROPOLITAN WEST SIDE ELEVATED RAILWAY
CHICAGO, ILL., Sept. 29, 1920.

To the Editors:

The proposal to tell the story of the electric railways in a film is a valuable suggestion and it only remains for some astute mind to work out how the story can be told so as to interest the average film audience. It must be borne in mind that an audience that pays to be interested will resent anything that is not to its liking, and no matter how great the problem it will not stand for education in the economics of street railways. It might be possible, however, that nine-tenths of a film would be like any other film, interesting and amusing, and just for one flash to work in something illustrating some feature of the street railway problem.

For instance, a real Western drama, with mountains, plains and cowpunchers, etc., and a brief scene in a town or city where the gas company or the street railway company has gone out of business and ceased to function, due to bankruptcy, with the consequent effect upon the merchants of no business and a dead town. Now this scene would only be an incident in order to convey what happens if the utilities cease to function.

BRITTON I. BUDD,
President.

Hopes That an A. E. R. A. Committee May Be Appointed to Study the Idea

INDIANAPOLIS STREET RAILWAY COMPANY
INDIANAPOLIS, IND., Sept. 29, 1920.

To the Editors:

I am thoroughly in accord with the idea of the many advantages that the motion picture plan offers in setting forth to the people the actual facts regarding the present street railway situation throughout the country. The great obstacle that seems to be in the way of accomplishing most excellent results through this medium is the difficulty of working up a set of films which would be sufficiently interesting to the public to draw them to the theater in connection with the regular motion picture scenes and which would in any adequate way tell the true story of the street railway and bring home the vital interest which every one has in the continued operation of the street railways.

There is no doubt that it is quite possible to produce a satisfactory film for some special local situation which may exist in any particular city. But to make a general film that would be descriptive and illustrative of the street railway, its needs and necessities, the dependence of the public on satisfactory street railway service, and depict it in a way that would be clear and understandable would be a most difficult problem. It would require the most careful thought of the ablest men in the industry, but assuming that the proper thought and attention was given, it should not be impossible of accomplishment.

Personally, I sincerely hope that the suggestion made in your issue of Sept. 25 will crystallize in the very near future into definite form, and that a committee of the ablest minds in the street railway business may be selected who, together with some expert in the motion picture business, may work out a general film which will tell the actual story of the street railways to the public, and impress upon it their needs and necessities in such an interesting way that it will convince the public of its vital interest and secure its hearty co-operation along constructive lines.

ROBERT I. TODD,
President.

Expense the Deterrent Feature for Single Company

PACIFIC ELECTRIC RAILWAY
SAN FRANCISCO, CAL., Oct. 14, 1920.

To the Editors:

I have no doubt of the value of using motion pictures provided arrangements can be made with motion picture theaters to carry out the necessary plans. We have used motion pictures in connection with the training of our men and our Pacific Electric reels have been loaned extensively throughout the United States to other companies and in connection with safety lectures. The subject of attempting to reach the public has also been considered, but the expense here on the Pacific coast has been a deterrent feature.

Possibly all the electric railways through the American Electric Railway Association or in some other manner might join together in one campaign which could be carried on throughout the United States. It would require, of course, a conference with the motion picture companies to determine how this could be best done if it be practicable at all.

PAUL SHOUP,
President.

Would Use Travelogue Rather Than Play to Carry Message

"MIDDLE WEST RAILWAY"
Oct. 1, 1920.

To the Editors:

The idea expressed in the items in the Sept. 25 issue of the JOURNAL on the use of motion pictures has so much merit that it ought to, and undoubtedly will, have the early attention of the industry generally. I am not so much impressed with the plan of preparing a scenario of nation-wide appeal as I am with the basic plan of using the medium of motion pictures to present the utility to its public. The attempt to prepare a scenario, however, could not but be helpful and it might prove successful. The street railway business is, truly, a national industry, but its situation varies in the different cities and municipalities. For example, snow removal, taxes, governmental regulation, competition, rates of fare, cost of injuries and damages are each of great importance to some companies and of none to others. Unless the presentation of the industry in the picture were general its use would be limited, and if general, what would be its effect in the various localities? I think I know what the reaction would be on our public if it saw some street railways that I have seen.

On the other hand it could not but be helpful to show people everywhere the service demands of twenty-four hours on a street railway, big or small. Congestion in the Loop District of Chicago, in Campus Martius, Detroit; Brooklyn Bridge; Park Street Station, Boston; Cleveland Public Square; vehicular traffic in the car tracks of Baltimore, Chicago and Pittsburgh; jitneys and automobile competion in Kansas City, Newark or Los Angeles, and interurban traffic at the Indianapolis and Akron stations are some of the things which would bring home to the car-riding public the daily operating burden carried by this industry.

From the above you will observe that I am inclined to use the movie in the form of a travelogue, instead of a play, but we are agreed on at least one thing, and that is, the motion picture ought to be used by the electric railways of the country as an educational medium.

PRESIDENT.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Progress at Detroit

Municipal Railway Commission Reports on Results Since $15,000,000 Bond Referendum

In its report covering the first six months' activities of the Detroit (Mich.) Street Railway Commission after the passage of the $15,000,000 bond issue to finance the municipal railway planned by Mayor Couzens, the commission enumerates the work done, work under contract, bids authorized and plans ready for execution and assurances from various sources, including the steel mills, that delivery of material needed will be made promptly.

WORK GOING AHEAD

The mileage of tracks already laid amounts to 1.75 miles. Three-quarters of a mile of pavement has been laid, while 3 miles of the first layer of concrete foundation has been completed and the excavation of 7 miles of roadbed completed, all for double-track lines. The advertising for twenty-five one-man safety cars has been authorized and according to a statement attributed to Joseph S. Goodwin, general manager for the municipal system, cars can be procured and will be running on the St. Jean line early next year.

It is reported that during the week ended Oct. 2, which indicates the rate of progress being made, 3,370 ft. of excavation was done, 3,975 ft. of concrete base was laid, 10,070 ft. of second course of concrete was completed, 1,850 ft. of track ballast was placed and 2,650 ft. of paving constructed. The first course of sub-base concrete on the eastern part of the Charlevoix line is finished. The excavation on the St. Jean line between Kercheval and Harper Avenues, including the Shoemaker and Montclair sections, is completed. The Harper Avenue line, on which work by the Detroit United Railway was stopped and construction started by the city, will be completed at an early date.

COMMISSION COMPLETES ORGANIZATION

The monolithic block type of foundation, in which all the concrete used as foundation, rail supports, and paving bed is in one unit, is considered by the commission to be better than the original type used, and it is estimated that its use will result in a saving of from $20,000 to $25,000 a mile. The depth of the excavation is considerably reduced and the use of steel ties is permitted. Paving between the rails will be asphalt instead of granite block.

Departments have been organized to handle equipment, overhead construction and engineeering construction. The organization, according to Mr. Goodwin, is complete and can be added to and expanded to meet the needs of construction.

Seven law suits have been begun against the commission. Four of these have already been dismissed and one, instituted by the residents of Clairmount Avenue to enjoin the commission from constructing a municipal line on their street, is referred to elsewhere in this issue. One case has been appealed to the Supreme Court. The Detroit United Railway will be given an opportunity to present to the Supreme Court its reasons why Mayor Couzens, the Detroit City Council, the City Comptroller, the City Treasurer and the Board of Street Railway Commissioners should be enjoined from using the public funds in the construction of a municipal railway. An order has also been granted for Mayor Couzens and the city officials to show cause why such an injunction should not be issued. Oct. 19 was set as the date for hearing oral arguments.

In accordance with its policy of doing as much of its own construction work as possible, bids have been asked by the city for apparatus including six gasoline-driven locomotives, 3½ tons each for hauling concrete, and six steam shovels, and ninety V-type bucket cars for dumping concrete. Bids for switches and other special steel track will also be opened in the near future.

Strike in Ohio Settled

The strike of the trainmen of the Springfield (Ohio) Railway has been settled. The men went out on Oct. 1 at the termination of their agreement with the company. The scale of wages under the old arrangement was 43, 45 and 47 cents an hour. The company had been negotiating with the city authorities for an increase in fare from 6 cents to 7 cents. During the month of September the city, instead of granting the necessary relief, amended the franchise providing for workmen's tickets during specified hours of the day on a 5-cent basis. After this action had been taken the company notified its trainmen that an increase in wages was impossible.

The trainmen declined to accept the existing wage scale and went on strike. The city was without service for thirteen days. Finally the City Commission allowed a 7-cent fare without special tickets during the rush hour as the former ordinance had provided. An adjustment of the wage scale was reached with the men on the basis of 53, 55 and 57 cents an hour, other conditions remaining the same.

M. O. in New York

Staten Island to Be the Proving Ground for Mayor Hylan's Five-Cent Ideas —Operation Planned Dec. 1

The Board of Estimate of New York, by a unanimous vote on Oct. 18, approved the contract between the city and the Staten Island Midland Railroad, providing for the operation by the city of the lines of the company for at least one year.

A PROFIT-SHARING CONTRACT

There were a few modifications in the terms of the contract which have to be approved by Federal Judge Chatfield, but Commissioner Grover A. Whalen announced that he had assurances that the court would approve the plan in its present form. Briefly, the terms of the agreement are that the city is to equip the lines, operate them for six months, standing all the loss and having all the profit, and that during the following six months the company is to share any profits equally with the city. A clause permits either side to cancel the agreement on a thirty-day notice, and power is left with the court to cancel it at any time. This last provision is to cover legal requirements.

To pay the cost of equipment and to operate the lines of the Midland Company and the Silver Lake line of the Richmond Light & Railroad Company, which will also come within the city control, the Board of Estimate appropriated $300,000. It is expected that this will cover all costs, although the city, if it carries out its announced intention of putting operation on the same basis it was before the company quit, will have to acquire twenty cars, and to buy virtually all of the equipment needed for their operation. Commissioner Whalen hopes to have the lines running by Dec. 1.

LINES TO BE OPERATED

The lines to be operated are the Richmond line between St. George and Richmond; the Silver Lake line between St. George and Richmond Terrace via Silver Lake; the Concord line between Port Richmond and St. George and Richmond Terrace and Port Richmond via Concord; the Manor Road line between West Brighton line and the Eckstein Brewery, and the seasonal lines between St. George and Midland Beach and Port Richmond and Midland Beach. The fare will be 5 cents.

The proposal to have the lines operated by the city was referred to at length in the ELECTRIC RAILWAY JOURNAL for Oct. 16, page 840.

Churches Plan Inquiry

Affairs of the Denver Tramway and Causes of Recent Strike to Be Looked Into

Dr. Edward T. Devine, associate editor of the *Survey* and formerly professor of social economy in Columbia University; the Rev. Father John A. Ryan, S. T. D., professor in the Catholic University of America, and Dr. John A. Lapp, managing editor of *Modern Mechanics*, are actively engaged in collecting information for a basis of a report on the Denver Tramway strike and the present situation. They have established headquarters in the Brown Palace Hotel and are working under the Federal Council of Christian Churches, following an invitation extended by a Denver commission of nine ministers and laymen named in August.

GOOD WILL AND JUSTICE SOUGHT

This is said to be the first time that the National Protestant Council of Churches and the National Catholic Council have been associated in such an investigation. The three representatives of the national body have issued a statement as follows:

> The report will attempt to present an unvarnished account of the relations between the tramway company and its employees, before and since the strike; will go as far as necessary into the question of fares and the financial problems of the tramway company which has in Denver, as in other cities, precipitated the question of increasing fares; the subject of public regulation, whether exercised by a state public utilities commission or by the municipal council, and especially into the question of compensation to employees and its relation to the cost of living, as ascertained by official investigations and otherwise.
>
> It is not the purpose of the investigation to try the case and to pronounce judgments, but to assemble the information which will enable citizens to form their own conclusions.
>
> The national bodies are undertaking this study at the invitation of the Denver commission because it is believed that the situation in Denver is typical and that lessons can be drawn from the experience of Denver which will be useful in other communities where similar situations arise.
>
> It is of course the purpose of the churches to promote good will on the basis of justice and fair dealing, and it is in the hope the investigation will contribute to this end, not only in Denver, but elsewhere, that the investigation has been undertaken.

"Plain Dealer" Articles Concluded

The series of articles which has been appearing in the Cleveland *Plain Dealer* on the present situation of the Cleveland Railway has been concluded. In this review several conclusions have been reached. They are as follows:

> 1—That at least 200 new cars, considerable track renewal, some rerouting of cars, connecting links between existing lines and new lines for the west side, the Collinwood district, the Flats, Brooklyn and parts of the Heights are immediately necessary;
>
> 2—That at least four new operating stations and two power houses are required to take care of present needs and that any material increase in the load on the system or any expansion must entail a more comprehensive building program;
>
> 3—That the improvements and extensions recommended, particularly in regard to the provision of new operating stations and power houses, will reduce both operating and maintenance costs;
>
> 4—That while the population of Cleveland proper has grown 150,000 and the number of car riders increased from 375,000,000 to 405,000,000 during the last five years, the system is short 271 cars, no new operating stations have been built and the annual track extension in this five-year period has been seriously curtailed.
>
> 5—That at least $5,000,000 is required to carry out the development program recommended by the street railway company and Street Railway Commissioner Fielder Sanders to improve service and bring the system up to immediate requirements;
>
> 6—That more than $4,000,000 worth of capital stock, sale of which has been authorized by city council, still remains unsold;
>
> 7—That city authorities, company officials and bankers are agreed that the program should be financed by the sale of capital stock rather than by the sale of bonds, preferred stock or Liberty bonds owned by the company;
>
> 8—That frequent appeals to company stockholders to buy new stock at par at a time when the company's stock is listed on the market at 93 and when other securities can be bought to produce a higher rate of return than 6 per cent have not been successful;
>
> 9—That unless new capital is raised not one new car can be purchased nor a yard of new track laid and that the present intolerable situation must get worse instead of better.

In the main the report goes on to say that the street railway problem in Cleveland is in the hands of the citizens themselves but that not one of the "improvements, betterments or extensions" imperatively necessary can be provided without additional capital.

City's Representative Wants P. R. T. to Expand

Colonel Sheldon Potter, the city's representative on the board of directors of the Philadelphia Rapid Transit Company, on Sept. 24 demanded that the company be forced to take steps looking to the future growth of the city. He said that the city was developing in a northerly direction, while the company was confessing its inability to construct the absolutely necessary extensions.

He stressed the underlying company rentals and expressed his opinion that rentals could be reduced. Everything, he said, depended on the valuation now being compiled before the Public Service Commission.

Colonel Potter was recently asked to appear before the transportation committee of Council when that body conducted its public hearing on the straight 5-cent fare. He then prepared a statement outlining his views and emphasizing the need for the company to make extensions, etc., that would take care of the transit development of the city. He is reported to have said:

> I am absolutely opposed to the city taking any action that would merely continue the present status quo in the transit situation. The company is entitled to all of its legal rights, but the city is likewise to be protected. We will not wreck the company, but it is appealing to us to save the company from bankruptcy.
>
> The city has given the right to our streets to the Philadelphia Rapid Transit and now that company is in the position of preventing other companies from doing that which it apparently cannot do—develop the city. The situation is very critical and important to the city's future. The company says it is on the verge of bankruptcy and needs a higher fare to save it. But it says nothing of using that money for extensions or improvements. The entire proposal merely temporizes and delays the day of reckoning.
>
> I feel that the company, as the party most affected, ought to enter the suit against the rentals and fight them in order to save itself. Then the situation would be clarified and the company enabled to do that which it is morally bound to do—give the people adequate facilities to enable the city to develop to the utmost.

Authority in Commission

Alabama Legislature Vests Public Service Body with Authority Over Rates and Franchises

All power to regulate public utilities was taken away from the cities of Alabama by the Legislature at a special session which ended on Oct. 2. The Alabama Public Service Commission, under a bill adopted with the support of the Governor and of the commission, was granted the exclusive right to regulate the rates of utilities and to govern all contracts and franchises. The City Commission of Birmingham and others vigorously opposed the bill.

RATE PETITIONS FILED

Since the adoption of the bill a petition for a 37 per cent increase in rates in Birmingham and for increases of from 20 per cent upward in other Alabama towns has been filed by the Southern Bell Telephone & Telegraph Company. The Birmingham Water Works Company has filed a petition for an increase and asks a revaluation of its property and that rates be fixed, which will give the company a fair and equitable return on its investment.

As yet the Birmingham Railway, Light & Power Company has not filed a petition for an increase, but it is expected that such a petition will be filed.

Under the terms of the bill as adopted by the Legislature even present existing contracts with utilities are affected and can be modified or changed by the Public Service Commission. In short, the commission is given exclusive right to fix rates and to govern all franchises and contracts between public utilities and municipalities of the State.

Further Canadian Hydro-Radial Commission Evidence

At a further sitting of the Ontario Hydro-Radial Commission in Toronto on Oct. 14, Chief Engineer Gaby of the Hydro-Electric Power Commission continued his evidence with respect to the Toronto to St. Catharines lines. It was stated that the Canadian Pacific steam line carried more than 80 per cent of the Toronto-to-Hamilton traffic because it ran a non-stop service over the Grand Trunk right-of-way and its station in Hamilton was centrally located. The hydro-radial line was estimated to carry 355,000 passengers a year, with an hourly service, making the time between the two cities in one hour for the 40 miles.

The revenue returns from the London & Port Stanley Railway, now operated by the Hydro Commission, were submitted, showing $24,000 a mile a year, the highest in Ontario. The Toronto & York Radial earned $10,000 to $12,000 per mile serving a population outside of Toronto of 20,000.

Mr. Gaby explained the report of W. S. Murray, New York electrical engineer. The estimated cost for the Toronto to St. Catharines line was $22,000,000.

New York Being Throttled

Head of I. R. T. Points Out How City's Short-Sighted Fare Policy Hampers Future

Frank Hedley, president and general manager of the Interborough Rapid Transit Company, New York, N. Y., says that nothing is more significant to New York in its rapid transit needs than the decision of the Public Service Commission of Pennsylvania authorizing a 7-cent fare in Philadelphia with a continuance of the existing 3-cent charge for transfers. In this connection he points out that New York is now the only large city left in the United States where the policy of preservation and expansion of transit facilities has not been followed. In no other city, he says, is the need for increased transit facilities so great as in New York.

2,000,000 PASSENGERS A DAY

The original subway in New York was opened sixteen years ago. The Interborough subway alone is four times as big as the original subway, but it is still overcrowded. The original subway was built to carry about 400,000 passengers a day. It was gradually increased in carrying capacity until 1,000,000 passengers a day were being handled. The present Interborough subway is carrying more than 2,000,000 a day. The only relief is more subways. Mr. Hedley says:

> Transit Construction Commiss'oner John H. Delaney made public on Sept. 24 a report by Chief Engineer Daniel L. Turner of the Public Service Commission, submitting for discussion a plan for the construction of about 830 miles of single-track rapid transit lines. It contemplates a twenty-five-year program of construction and a cost at present day prices of about $350,000,000, not covering, however, equipment, interest during construction, or engineering and superintendence. This is an official recognition of the need the Interborough Rapid Transit Company has pointed out on numerous occasions.
>
> The report does not explain how the money for the project is to be obtained. The report states that the operators of the lines would be required to equip them. Equipment cost would at least equal one-half the construction cost. The operators certainly could not raise $175,000,000 new money until their credit shall have been restored by an adequate fare. The way to get more subways is to make the present system self-supporting and investors will then furnish capital for new subways. On a 5-cent fare the city is obtaining no return on its present subway investment and until it does it is too near the constitutional debt-limit to finance the project for this gigantic system. As a 5-cent fare is not profitable the inducement for investors to furnish the funds is not made clear.
>
> The city is groaning in the anticipation of a budget in excess of $350,000,000. This is directly tied up with its policy as to fares. As the 5-cent fare is insufficient to give the city any return whatever on its present subway investment, it has to meet the interest on its subway bonds by taxation, which will amount to about $13,000,000 as soon as the present subway system is all completed and in operation. This increases the tax rate, which, in turn, increases rents and prices.

Additional Bus Permits Denied

The City Commissioners of Pasadena. Cal., have denied the applications of jitney bus owners to operate additional buses in the city until the Commissioners decide upon a fixed policy in regard to the regulation of jitneys.

The city will not allow the expansion of jitney lines within the city limits. It is pointed out by the City Attorney of Pasadena that sooner or later Pasadena must decide on a single form of local transportation.

The installation of the one-man car by the Pacific Electric Railway will doubtless lessen the increase of jitney bus competition in Pasadena.

Co-operation Urged Between City and Utility

Edwin F. Sweet, assistant secretary of commerce and vice-chairman of the Federal Electric Railways Commission, expressed himself in favor of "friendly co-operation between the company and the community" in an address before the Grand Rapids Rotary Club on Oct. 5. Mr. Sweet said in part:

> The practice of many cities, for instance, of forcing the street railway to pay for the paving between the tracks, to my mind, is an outrage. I would distinguish between the car rider and the rest of the community, for now the street car is the poor man's means of conveyance and he is forced to bear the burden of the other fellow when he must pay the company a fare high enough to meet all such burdens placed upon the company, whereas the entire community should help share the expense.
>
> No profit should be made by private individuals in the operation of public utility companies beyond a fair return on their investment. Whatever profit is produced beyond a fair compensation should be reflected in a reduction of fares, into the car rider's pockets.
>
> However, the period of antagonism to street railway companies is fast approaching the end. A period of better understanding is on the way and the problem will be solved with justice to all concerned. God grant that that time shall soon come.

Power Consumption Curtailed

Large users of industrial power supplies from the lines of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., have announced that they will reduce their power consumption by approximately 20 per cent. This action follows a recent appeal by the company in which the latter stated that, owing to shortage of power, the city was threatened with interruption of electric railway service.

Courtesy Pays

George I. Plummer, superintendent of traffic of the Dallas (Tex.) Railway, contributed some hints to transportation employees to *Partners* for September, published in the interest of the employees of the company. On the matter of service he said:

> Service is a commodity we are selling to the public. Are we selling the best and most efficient service? Or are we just getting by?
>
> To give first-class service, we must be attentive to our duty and courteous at all times. We are often called upon to do things not necessarily in the line of duty; we are often called upon to perform a disagreeable task; we are often called upon to deal with unreasonable passengers.
>
> The courteous man handles these situations and disposes of them without difficulty. The discourteous, "hard boiled" species sooner or later gets into trouble and spends most of his time working up excuses in order to account for his action.
>
> This latter type is considered undesirable for this class of work and his services are not wanted, while the other type finds many opportunities to perform real service and to advance in the employ of the company. The opportunity is here for advancement and the ambitious fellow who is always doing the right thing and trying to help out will have no trouble in getting along.

Detroit Injunction Denied

Residents Defeated in Attempt to Restrain City from Building Railway on Certain Streets

Judge William B. Brown, Grand Rapids has ruled against issuing an injunction asked by the 110 Clairmount residents to restrain the city of Detroit from building a municipal railway on their street. The ruling was made on the ground that no detailed plans had yet been made for the construction of the municipal line. The information was conveyed to Bernard F. Weadock, attorney for the Clairmount residents, and Corporation Counsel Clarence E. Wilcox before the court completed its opinion or reduced the decree to writing. **It was held that the majority of the voters must be observed, and any change the voters might desire could be obtained at a later election.**

SINKING FUND DECISION RENDERED

An opinion similar to that handed down by Judge Mandell was handed down by Judge Brown in ruling on the right of the Sinking Fund Commission to purchase street railway bonds. Judge Mandell refused to issue the injunction asked by the Detroit United Railway when it sought to enjoin the sale of the railway bonds to the Sinking Fund Commission, in order that the case might have an early hearing before the Michigan Supreme Court.

Because the issues were considered of such great importance to Detroit, Judge Brown decided that the local judges should be acquainted with the proceedings and accordingly he invited opinions by Wayne County Judges and suggested they hear the arguments on the case if they desired. The judges concurred with his opinion in the case.

Corporation Counsel Wilcox and a special attorney for the city of Detroit appeared before Judge Mandell asking that the case be reopened because facts had changed which were true previous to the suit.

BONDS DISPOSED OF

The city Sinking Fund Commission has disposed of the most of its holdings of 5½ per cent public utility bonds named in the bill of complaint when the suit was started by the Detroit United Railway. More than $1,500,000 of bonds have been disposed of to investors. It was stated that the practice of selling bonds to the Sinking Fund Commission has been of value to the taxpayers in that it allowed the city to save money which would be lost if the bonds were sold at a sacrifice to private investors. According to Mr. Wilcox, no further difficulty will be experienced in disposing of as many of the street railway bonds to investors as it is desired to issue.

It was held by Judge Mandell that he could not with propriety reopen the case. A later date was set for a hearing between the city and the Detroit United Railway on the return entered by Corporation Counsel Wilcox.

Wage Rise in Vancouver

A new wage scale effective on Oct. 1 has gone into effect on the lines of the British Columbia Electric Railway, Vancouver, B. C. This was the result of an offer made by the company which the men accepted. The men originally asked for 75 cents an hour, but the company offered an advance of 5 cents, making a maximum of 65 cents on city lines. The new wage scale for the various classes of work is as follows:

Motorman and conductors, 65 cents; interurban motormen and conductors, 67 cents; car repairers, 70 cents; mechanics' helpers, 65 cents; car cleaners, 58 cents; carpenters, 77 cents; blacksmiths and machinists, 80 cents; trackmen, 60 cents.

Mexico Men After More Money

It is asserted by the Mexican Tramways, Ltd., City of Mexico, that should the demands of the employees of that company for another 25 per cent increase of their wages be granted it would add 1,200,000 pesos, or approximately $600,000 in American money, to the annual pay roll.

In a statement which it has issued to the public the company claims that it is actually losing 250,000 pesos a month at the present time and that its financial affairs are in critical condition. The demands of its employees since 1914 have been excessive, it is pointed out. During the last six years the total sum paid out in wages each year has increased from 2,044,000 pesos to 6,250,000. This, with the 1,200,000 that is now being asked, would bring the total annual pay roll up to 7,812,000 pesos.

It is on account of the alleged unreasonable demands of its employees and the losses incurred by the company during the long revolutionary period that the company opened negotiations for the sale of its property to the Mexican government. Whether this transaction will be finally consummated is not known. Representatives of the Canadian banking interests that control the Mexican Tramways, Ltd., are now in the City of Mexico.

Vote Proposed on City Ownership

The City Council of Ottawa, Ont., has decided to recommend that plebiscites be submitted to the electors entitled to vote on money by-laws at the next annual election, to be held in January, on the following questions:

1. Are you in favor of the city applying for legislation enabling it to borrow money without a further vote of the electors to acquire the property and assets of the Ottawa Electric Railway under the agreement between the city and the railway at a price fixed by arbitration as provided by the agreement? And in the event of the question being answered in the affirmative, that legislation be applied for conferring the necessary borrowing powers.

2. Are you in favor of the city applying for legislation to provide that the city will not be compelled to acquire the property and assets of the railway pursuant to the agreement between the city and the railway unless a by-law setting out the amount of the arbitration award shall first be submitted to and receive the assent of the electors entitled to vote on money by-laws, or for such plebistice as in the opinion of the city solicitor will carry out the intention of this motion?

News Notes

Strike on Alabama Line.—Union carmen in the employ of the North Alabama Traction Company, Albany, Ala., went on strike on Oct. 5. Service on the company's lines was completely tied up. The men demanded an increase in pay.

New Agreement Being Prepared.—The union employees of the Virginia Railway & Power Company in Norfolk, Portsmouth, Petersburg and Richmond drew up a contract on Sept. 13 in Richmond which sets forth the working arrangements and wage agreement to be asked of the company. None of the terms have been made public.

Consideration of Franchise Proposal Put Off.—Consideration of the petition of the Virginia Railway & Power Company, Richmond, Va., for a general franchise in lieu of the group of franchises under which the company now operates was deferred to a later date at the meeting of the committee on streets of the Council held recently.

Fares an Election Issue.—The Labor party of Winnipeg, Man., is opposing the higher fares granted recently to the Winnipeg Electric Railway. It is making the controversy an election issue. The platform is confined solely to the election of a Council pledged to the establishment of a municipal motor bus service to reduce transportation to a reasonable basis and a demand that the company live up to its original franchise or surrender the same to the city.

Would Abandon Findlay Lines.—The Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, has appealed to the State Public Utilities Commission for permission to abandon service on its Findlay city lines. The use of automobiles by townspeople is said to have reduced passenger business in the small city to a minimum. Nov. 12 is set for hearing at Columbus. The Findlay City Council recently repealed an ordinance granting the company increase in fare from 5 cents to 10 cents.

Conciliation Board Suggests New Wage Scale.—The State Board of Conciliation has recommended to the Railroad Commission of Wisconsin that all trainmen of the Wisconsin Railway Light & Power Company operating in La Crosse, Wis., should be granted wage increases. Under the new pay scale recommended employees of three years will receive 58 cents an hour, two-year employees 56 cents an hour and first-year employees 55 cents an hour. The Railroad Commission will hold a hearing on the recommendation of the State Board of Conciliation.

Will Take Up Case of One-Man Cars.—William D. Mahon, president of the Amalgamated Association, is expected in Boston soon to take up with the executives of the Eastern Massachusetts Street Railway grievances of the men in relation to the operation of the one-man cars. In consequence of dissatisfaction among the men over the one-man cars and the alleged wholesale layoffs that have occurred since their inception and the establishment of the new wage schedule a few weeks ago, William J. Murphy, chairman of the joint conference board of the unions of the men, sent a telegram to President Mahon urging him to come to Boston at once. Mr. Murphy said nearly 1,000 men have been laid off within the last few weeks. He says this is due in part to the operation of the one-man cars and the new system of curtailment that is being followed out by the executives of the company since the men's maximum wage was increased from 51 to 63 cents an hour.

Akron Ordinance Awaits Review.—The proposed contract between the city of Akron, Ohio, and the Northern Ohio Traction & Light Company for the future operation of the railway system in the city is completed and awaits the final review by E. E. Brownell, the traction expert employed by the city to assist in working out the details. Mr. Brownell is engaged in other work at this time but is expected in Akron shortly to complete his work. As has been stated before, the proposed ordinance provides for service-at-cost, with the city assuming full control. A public utilities commissioner is to be appointed to represent the city and there is a limit placed upon fares. The ordinance provides for the establishment of auto bus lines. It provides also for the purchase or lease of the city system when the city so desires. In fixing the valuation only the physical property used and useful in the operation of the city system is to be taken into consideration by the appraisers. Matters under dispute are to be submitted to arbitration.

Program of Meeting

American Society of Mechanical Engineers

The 1920 annual meeting of the American Society of Mechanical Engineers will be held in the Engineering Societies Building, New York City, from Dec. 7, through Dec. 10. Sessions will be held on the subjects of appraisal and valuation and the application of engineering to woodworking.

The newly-founded professional sections on management, power, fuels, machine shop, railroads and textiles will also conduct sessions to consider the vital problems in their field. In addition to the above a number of valuable papers will be presented at general sessions.

A memorial session for Dr. Brashear is planned, as a fitting tribute to his life and work.

Financial and Corporate

Gross Earnings Increase

Gross Earnings Advance 12 per Cent, but Net Income of Interurban Is Decreased 20 per Cent

The annual report of the Chicago, North Shore & Milwaukee Railroad for the year ended Dec. 31, 1919, shows an increase in gross earnings of $337,946, but a decrease in net income of $103,240. The operating revenue for 1919 increased to $3,237,921, or 11.7 per cent. In 1919 the operating expenses were $2,319,464, as compared with $1,856,038 in 1918, an increase of $463,426, or 25 per cent. The net operating revenue decreased by 12 per cent, from $1,043,937 in 1918 to $919,457 in 1919. The taxes decreased about the same percentage. Due to an increase in non-operating income, the gross income decreased by only 11 per cent from $867,585 in 1918 to $773,235 in 1919. Net income transferred to profit and loss showed a decrease of $103,240, or 20 per cent, changing from $535,079 in 1918 to $431,839 in 1919.

The increase in the gross earnings was recorded in the face of a very large decrease in traffic which the company had enjoyed in connection with the Great Lakes Naval Training Station and other government activities along the North Shore. The decrease in net income was caused largely by increases in cost of labor and material. Increased wages effective on Aug. 1, 1919, amounted to $300,000 per annum.

INCOME STATEMENT—CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD

Year ended Dec. 31	1919	1918	Percentage change
Operating revenue:			
Passenger and special car revenue	$2,951,618	$2,678,693	+10.2
Freight and express revenue	219,397	151,729	+ 30.9
Miscellaneous revenue	66,906	69,553	—3.8
Total railway revenue	$3,237,921	$2,899,975	+11.7
Operating expenses:			
Way and structures	$306,524	$302,525	+1.3
Equipment	262,922	172,183	+52.7
Conducting transportation	923,913	650,042	+42.2
Power	351,011	354,173	—0.9
Traffic	56,223	35,100	+60.2
General and miscellaneous	418,871	342,015	+22.5
Total railway operating expenses	$2,319,464	$1,856,038	+25.0
Net operating revenue	$919,457	$1,043,937	+12.0
Taxes assignable to railway operation	163,101	185,822	—12.2
Operating income	$755,356	$858,116	—12.0
Non-operating income	17,879	9,469	+88.8
Gross income	$773,235	$867,585	—11.0
Deductions from gross income	341,396	332,506	+2.7
Net income transferred to profit and loss	$431,839	535,079	—19.5
Surplus at beginning of year	855,812	320,733	+166.8
Surplus adjustment	16,697	....	......
Surplus at end of year	$1,270,954	$855,812	+48.5

Service Suspensions Authorized in Brooklyn

Federal Judge Mayer on Oct. 16 granted the request of Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company and its subsidiaries, for authority to suspend indefinitely operation of nine surface lines which Public Service Commissioner Lewis Nixon recently directed him to operate for the convenience of the public. The lines are the Ocean, Rogers, Church and Park Avenues and the Thirty-ninth Street-Coney Island lines, operated by the Nassau Electric Railway and the Metropolitan and Wyckoff Avenues line and the Ralph Avenue shuttle of the Brooklyn, Queens County & Suburban Railroad.

Mr. Garrison, in his communication to Judge Mayer, stated that the lines of the Nassau system were losing $103,000 a year and those of the suburban system $400,000, exclusive of taxes and other charges. All of the other lines of the companies, he explained, were barely making operating expenses and if they were forced to carry the burden of these lines' deficits all would have to suspend, thus depriving the Brooklyn public of the limited service now supplied.

Judge Mayer said that if Commissioner Nixon would consent to a suspension of transfers on the Church Avenue line and to the substitution of a shuttle service for the Thirty-ninth Street-Coney Island line, these roads might speedily resume operation. None of the lines, with the exception of the Rogers Avenue line, has been operated since the recent strike.

The roads that it is proposed to abandon total about 65 miles of track.

The proposal has aroused much opposition on the part of residents served by the Church and Ocean Avenue lines.

Municipal Road Does Well

Small City Road in Florida, Purchased from Receiver, Has Net Operating Profit of $17,233

For the first year of municipal operation ended June 30, 1920, the railway system of St. Petersburg, Fla., shows a net operating profit of $17,234. While this was not enough to cover interest and sinking fund charges, the showing is regarded as a good one. The total receipts for the year were $93,168. The operating expenses were $75,934.

STATISTICAL INFORMATION — MUNICIPAL RAILWAY OF ST. PETERSBURG

Year ended June 30	Municipal Ownership 1919-20	Private Ownership 1918-19	Percentage Change
Total passengers carried	1,802,739	1,383,742	+30.3
Total passenger fare receipts	$89,303	63,585	56.2
Total car-miles	459,413	406,863	+12.7
Total car-hours	43,744	35,838	+22.0
Average car speed (m.p.h.)	10.50	11.35	—7.5
Average passenger fare receipts per car-mile (cents)	19.417	15.603	+24.4

The railway consists of approximately 26 miles of track. It was formerly owned by the St. Petersburg & Gulf Railway. This company went into the hands of a receiver, and the city was notified that service would be discontinued and the system sold as junk. Rather than lose the service of the railway, the city took charge of the operation of the system on July 1, 1919. A bond issue of $250,000 was voted. The railway was purchased for $175,000, about $75,000 being left for new work.

INCOME STATEMENT
MUNICIPAL RAILWAY OF ST. PETERSBURG
Year Ended June 30, 1919

Passenger fares	$89,303
Freight revenue	3,865
Total operating revenue	$93,168
Maintenance of way and structures	10,317
Maintenance of equipment	11,879
Power	14,853
Conducting transportation	31,420
General and miscellaneous	7,465
Total railway operating expenses	$75,934
Net operating revenue	$17,234
Loans from bondholders and city	4,777
Proceeds from bond sale	263,479
Sale of equipment	634
Total non-operating income	$268,890
Gross income	$286,124
Deductions from gross income:	
Purchase price to bondholders	$179,660
Improvements to overhead construction	9,490
Improvements to track and roadbed	14,007
Improvements to buildings	64
Improvements to rolling stock (new cars)	44,868
Real estate purchases	1,020
To Booker Creek bridge and various improvements	8,500
Contingent improvements	210
Back taxes	5,972
Refund of loans	4,777
Interest on bonds	6,875
Total non-operating expenses	$275,443
Balance on hand June 30, 1920	$10,681

The old equipment was used most of the year. This greatly increased the cost of operation. It is expected that with one-man cars in use on all lines, the operating cost can be materially reduced. Six new Birney safety cars were put in operation on April 15, 1920, and eight more have been ordered.

The railway has two suburban lines, 6 and 7 miles long, respectively. The cash fare on these lines is 10 cents with coupon books making the ticket fare 7½ cents.

Deficit for Vienna Municipal Railways

Aftermath of the War Proves Too Much for Municipal Tramways Despite Heavy Traffic—Road Overstaffed

The tale of a brave fight against overwhelming odds is revealed in the annual report of the Vienna (Austria) Municipal Tramways for the year ended June 30, 1919. It is a story similar, perhaps, to others elsewhere, but it is accentuated by the horrifying increases in the cost of material and labor, by the need for giving work to men who were in war service but who really are not required, and, above all, by the discouragement that comes from underfeeding and the slight hope for an early betterment of economic conditions.

HEAVY TRAFFIC STAVED OFF DISASTER

One gage to the low estate of the Austrian Republic is the fact that the international exchange value of the kroner has fallen from 20.3 cents to 0.45 cent. While the kroner's loss of purchasing power is not so great as this in Austria itself, the fact that the most popular ride (two sections) cost five times as much in June, 1919, as in May, 1916, is significant enough.

During the feverish war years there was a heavy increase in traffic. Part of this, however, came about through the cessation of taxicabs and private vehicles and through the reduction of service and eventual closing down (December, 1918) of the steam Stadtbahn. This increased traffic had to be handled in the face of severe fuel scarcity, shortage of workable rolling stock and lack of experienced personnel. The various fare increases caused only temporary recessions in traffic. The results are all the more remarkable in that traffic kept up after the armistice, although the population of Vienna as of Jan. 31, 1920, has just been announced as 1,842,005 compared with 2,031,496 in 1910, a drop of 9.3 per cent.

The Vienna system has a combination of zone fares, free transfers, unit fares for workmen, special low rates for children, special high rates for racetrack traffic, monthly and semi-annual season tickets, etc. It would take up too much space to note the increases in these various classes of fares, but the changes in the fare paid for the most common length of ride will give a picture of the whole. On June 7, 1916, the first increase raising the popular 12 heller (2.4 cents) fare to 16 heller (3.2 cents) went into effect; the second increase, Aug. 1, raised the fare from 16 heller to 22 heller (4.4 cents); the third increase, Aug. 28, 1918, raised the 22-heller fare to 30 heller (6 cents) and the fourth increase, June 11, 1919, raised the 30-heller fare to 60 heller (12 cents). Since the last report was issued a further increase is reported as of July 8, 1920.

During the period covered by the four fare increases, passenger traffic, density of traffic and revenue per passenger changed as indicated in the accompanying table.

Year	Passengers Carried	Passengers per Car-Mile	Average Revenue per Passenger in Heller (1/5 Cent) and Cents
1916	401,296,245	5.4	16.6 heller 3.3 cents
1917	458,587,787	6.7	18.2 heller 3.6 cents
1918	557,042,590	8.5	21.1 heller 4.3 cents
1919	560,712,667	10.2	28.9 heller 5.8 cents

*The heller is given here at its pre-war exchange value.

Thus, while traffic increased nearly 40 per cent, traffic density increased 88 per cent and revenue per passenger 77 per cent. During the fiscal year ended June 30, 1919, the railway revenue was 160,839,982 kroner. This included 116,862 kroner from freight and express—a service of considerable importance during the shortage of automotive vehicles and draft animals during the war. Operating expenses and other charges exceeded this by 16,202,295 crowns, the first deficit incurred since the municipality acquired the Vienna tramway systems in 1903. In the year 1918, the tramways turned over 8,500,000 kroner profit and in 1917, 7,000,000 kroner. Operating expenses and fixed charges per car-mile in 1919 were actually 100 per cent greater than in 1918, aside from earlier increases.

The chief item of increased expense was in higher wages and the care of employees discharged from the army at the end of the war, both in furnishing them jobs and relieving their immediate needs. Special payments were also made to the displaced female employees. An idea of the desperate state of affairs may be gleaned from the fact that because of fuel uncertainties many labor hours had to be wasted although paid for. The introduction of the eight-hour day January, 1919, (forty-eight-hour-week compared with fifty-one-hour week) and the inability of sadly-underfed men to work with their old-time efficiency also counted heavily. There were 18,364 employees in 1919 compared with 11,963 in 1916. Through the joint efforts of Ludwig Spängler, managing director, and committees of employees, more than twoscore co-operative food distribution shops and restaurants were placed in service.

IRON TROLLEY WIRE AND WOODEN TIRES

The total trackage of the system comprised 585 km. (363 miles) measured as single-track, only a mile or two having been added during the war to permit certain freight and post-office connections. As is well known, copper trolley wire in the former Central Empires was appropriated to quite an extent for military purposes. In Vienna, iron wire had been installed on 137 km. (85 miles) of track. Aside from the losses due to lower conductivity, the rough and easily pitted surface of rolled iron wire in particular has been found to reduce greatly the life of the aluminum sliding bow current collectors as compared with copper wire.

Although provided with 3,072 cars (1,494 motor cars and 1,578 trailers), shortage of labor and supplies was so acute that at one time there were but 759 single car or train units in operation compared with from 900 to 1,000 in pre-war times. On the average, the number supplied, as in July 1918, was only 800. This caused a drop from 173,600 car-miles to 161,200 car-miles a day and the absolute stoppage of nine routes and the partial suspension of service on others. With the arrival of a coal famine lasting from December, 1918, to April, 1919, service was cut off after 8 p.m. and 100 usual stops omitted. Sunday traffic was cut from the regular 736 to 357 operating units. By June 1, 1919, conditions had improved enough to permit service up to 10:30 p.m. in a city of 1,800,000 people. In spite of these amazing handicaps, the traffic actually was 0.7 per cent higher than the year preceding.

One curious item in war expedients relates to the tramways trackless trolley route. It appears that the substitution of wood for rubber as tires overloaded the motors because of the resulting increase in the size of the wheels. This difficulty was overcome by rebuilding the motors for self-ventilation. Gasoline motor-bus operation had to be suspended completely.

Would Issue Equipment Notes

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has applied to the Wisconsin Railroad Commission for permission to issue short-term trust notes to finance the purchase of new cars and other equipment. The application was heard before the commission at Madison on Oct. 9, and at the close of the hearing was taken under advisement.

In its order of Oct. 30, 1919, granting the company an increase in its rates of fare, the commission included a provision requiring the company to obtain not less than 100 cars with a total seating capacity of 5,000 persons. The cars were to be available for service by Nov. 1, 1920. The order was later modified to provide that at least fifty of the cars were to be in use on or before Sept. 1, 1920.

Owing to transportation and other difficulties, the St. Louis Car Company, to which the contract for the cars was awarded, was unable to supply them in time to permit compliance with the commission's order. At the hearing on Oct. 9, John I. Beggs, president of the Milwaukee Electric Railway & Light Company and also of the St. Louis Car Company, testified that deliveries on the new cars would begin on Nov. 1, 1920, and would continue until the 100 new cars are in operation.

P. R. T. Deficit Decreasing

Summary Presented of Earnings for September and for the Nine Months Ended Sept. 30

After deducting fixed charges, which amounted to $820,873, the Philadelphia Rapid Transit Company shows a deficit for the month of September of $50,860, as against a net income of $205,359 for the same month of 1919. This deficit for September contrasted with the showing for the month of August indicates an improvement. The company in its report makes mention of a deferred wage adjustment amounting to $187,500 and a 5 per cent return on stock amounting to $125.000. With these two items considered the company shows a deficit of $363,360.

For the nine months ended Sept. 30 the company shows a net income of $360,012, which is a decrease of 70.2 per cent over the net income for the corresponding period of 1919. The company shows a deferred wage adjustment for a four months' period amounting to $750,000 and with a 5 per cent return paid on stock amounting to $1,125,000 the company shows "an amount by which gross revenues are insufficient" of $1,514,989.

SUMMARY OF EARNINGS OF PHILADELPHIA RAPID TRANSIT COMPANY

Month ended Sept. 30, 1920		1920	1919	Percentage Change Over 1919
Operating revenue		$3,093,995	$3,030,931	2.1
Operation and taxes		2,384,731	2,055,299	16.0
Operating income		$709,264	$975,632	-27.3
Non-operating income		60,749	42,006	43.7
Gross income		$770,013	$1,017,638	-24.4
Fixed charges		820,873	812,279	1.1
Deficit, 1920 — Net Income, 1919		* $50,860	$205,359	-125.0
Deferred wage adjustment—				
One month	$187,500			
5 per cent return on P. R. T. paid in capital—one month	125,000	$312,500		
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges and the 5 per cent return upon P. R. T. stock		$363,360		

Nine Months Ended Sept. 30, 1920	1920	1919	Percentage Change Over 1919
Operating revenue	$27,854,734	$25,995,431	7.2
Operation and taxes	20,560,230	17,888,629	15.0
Operating income	$7,294,504	$8,106,802	-10.0
Non-operating income	422,351	396,095	6.6
Gross income	$7,716,855	$8,502,897	-9.3
Fixed charges	7,356,843	7,295,944	0.8
Net income	$360,012	$1,206,953	-70.2
Deferred wage adjustment — four months	$750,000		
5 per cent return on P. R. T. paid in capital, nine months	1,125,000	1,875,000	
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock		$1,514,989	

*Deficit.

Committee Appointed to Inquire Into Denver Finances

Members of the board of directors of the Denver (Col.) Tramway have appointed a committee to investigate the financial condition of the company and formulate, if possible, a method of preventing the company from being thrown into the hands of a receiver.

The payment on bonded indebtedness due on Oct. 1 was not met, but it is anticipated that within the six months intervening before another payment becomes due the money may be forthcoming. The total sum due on Oct. 1 was $87,000. It is the interest accumulated on outstanding bonded indebtedness totaling $2,500,000, issued for three years at 7 per cent.

An interest payment due on Nov. 1 totals $278,930. An additional sum will be necessary to retire 1 per cent of the bonds for the sinking fund, which is provided for annually. Mr. Boettcher, chairman, said:

> The company cannot pay the money at this time. That does not mean, however, that we will not be able to pay it in the near future. Of course, we have been at a big expense lately, and then our revenue was cut down for a time when there were no cars running. Before the second payment on the indebtedness comes due I think it highly probable that we will be able to meet the obligation. I do not think there is any possibility of a receiver being appointed. In the meeting of the directors we selected a committee to take up the matter and see what can be done.

Receivership Hearing

Court at Kansas City Sets Oct. 26 for Naming Permanent Receiver—Dramatic Appeal by Employees

Judge Stone in the Federal Court at Kansas City, Mo., on Oct. 21 set Oct. 26 for the appointment of a permanent receiver or receivers for the Kansas City Railways. Many other matters involved will also be heard then, including the suggestions of supply creditors and requests for immediate determination of the status of contractors.

The interests represented at the hearing before the court on Oct. 21 in connection with matters affecting the receivership expressly disclaimed any purpose to secure the appointment of a receiver who would conserve any special interest. The representative of the committee which is acting for the bondholders, however, suggested the appointment of James D. Mortimer as receiver. Kansas City, Kan., interests nominated L. H. Chapman, now Water and Light Commissioner, who has built up the light plant on the Kansas side.

Three intervening petitions were filed. The first was by the Continental & Commercial Trust & Savings Bank, Chicago, and E. F. Swinney, Kansas City, trustees under the first mortgage. The second was by the American Car Company in the interest of noteholders. The third was by the city of Kansas City, Mo., and the A. S. Heckert Construction Company, which is proceeding with work on the Twenty-third Street viaduct. Representatives of Wyandotte County announced that the county might intervene because of an obligation of $800,000 concerning the use of a bridge and viaduct.

Frank Hagerman announced that he was in court to represent J. O. Armour and nobody else, Mr. Armour having advanced $1.000,000 for interest, $500,000 for equipment and other sums for other purposes. Mr. Hagerman receded from any implied recommendations of men for appointment as receiver.

Henry Russell Platt spoke for the protective committee representing the bondholders.

Colonel Harbor, City Counselor of Kansas City, Mo., declared that it was possible for a receiver of the right kind to operate the property in the public interest without any further increase in fares. He also declared that it was impossible for the company ever to pay the bonds in full and that the facts would be shown to the court.

PRESIDENT KEALY SURPRISED

A dramatic feature of the proceedings was the presentation to the court of petitions and statements from employees of the Kansas City Railways urging that there be no disturbance of present pleasant relations between the employees and the company, and that Col. P. J. Kealy, now president of the company, be made one of the receivers or retained as operating head of the company. The document was signed, it was said, by 3,300 employees.

John B. Pew, attorney presenting the petition by the employees to the court, recited the steps of the past two years which have built up the present harmonious organization. The most impressive paragraph of the document was the promise by these signatories that they would co-operate heartily with the receivers and the court, and that they would resist any interruption of service.

Colonel Kealy, to the court, disclaimed any prior knowledge of the action of the employees. He expressed appreciation of the compliment, but asked definitely that the request of the men be disregarded.

Mr. Pew, further presenting the interest of the employees, requested definite assurance that they would be heard by the court and receivers, although he said that the men had no purpose to intervene in the proceedings.

There was no intimation as to whether a single receiver or several receivers would be appointed.

Receivers Would Sell Road

Application has been made to the Superior Court at New London, Conn., by Robert W. Perkins, receiver of the Shore Line Electric Railway, to sell the Norwich & Westerly Railway. Petitions have been signed for authority to discontinue the operation of the road on Nov. 15 if it should be deemed advisable by the receiver so to do. The application names $191,047 as the price at which the road could be sold, but Mr. Perkins states that this did not mean that he has a customer who would take the road at that price. Rather it is an "upset price" on which the court is to be asked to give him authority to sell in case he can find a customer at that figure or better. In regard to the application to discontinue the line Mr. Perkins said it did not necessarily imply that the road was to be discontinued on that date.

Financial News Notes

Jitneys Force Suspension.—Electric railway service between Danbury and Bethel, Conn., was suspended on Oct. 18 by the Danbury & Bethel Street Railway on account of the controversy over jitney regulation referred to in the department of Traffic and Transportation elsewhere in this issue.

Interest Payment Ordered. — The United States District Court has ordered Joseph K. Choate, receiver, to pay the coupons on the Aurora, Elgin & Chicago Railroad first mortgage 5 per cent bonds, which was due on April 15. The necessary funds have been deposited with the trustees.

Milwaukee Company Sells Bonds.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has completed the sale of $5,000,000 of 7½ per cent first mortgage bonds. The proceeds of the sale will be used to finance the company's new power plant now under construction. The bonds were purchased by a marketing syndicate. They will be retired by means of a 3 per cent sinking fund each year, so that during the twenty-five years the issue runs, 75 per cent will be paid off at the maturity date.

City Asks Receiver for Railway.—The suit which the city of Davenport has been threatening to file against the Tri-City Railway, in which it asks that the company be placed in the hands of the receiver, has been brought in the Scott County District Court by City Attorney U. A. Screechfield. The filing of the suit is in accordance with a resolution passed by the City Council several weeks ago. The petition charges that the company violated the terms of its franchise by failing to keep its property in repair and by charging excess fares, that the cars are unsanitary and cites other reasons why the company should go into receivership.

Interurban Results Improving. — Harrison B. Freeman, receiver of the Hartford & Springfield Street Railway, Warehouse Point, Conn., told the Superior Court an Oct. 16 that his lines had been operating at a profit the last three months. He obtained an order from the court to continue business for four more months. Operation of the company is under the scrutiny of a committee which represents the holders of the bonds of the company. Profits during the summer were reduced by the company's inability to get coal at any price, but on the whole the results were fairly satisfactory. The balance over operating expenses in June was $191.98; in July, $5,155, and in August, $2,195.

Service May Be Suspended in Concord.—At a recent public meeting held in the Town Hall of Concord the present status of the Concord, Maynard & Hudson Street Railway, Maynard, Mass., was discussed. D. P. Abercrombie, Jr., vice-president and general manager of the road, explained that unless financial assistance was rendered by the residents of the towns between Concord Centre and Concord Junction electric railway service in Concord and to Maynard would be suspended. The company has for some time been operating in this section at a loss. The townspeople have already voted against extending financial aid to the railway.

Master Appointed to Conduct Sale.—Announcement was made on Oct. 13 by United States District Judge Julius M. Mayer of the appointment of Francis M. Scott, former justice of the Appellate Division of the Supreme Court, as master in the sale at auction of properties owned by the New York Railways. The sale is the result of a suit instituted by the bondholders' committee. Joseph P. Day will auction the real estate holdings of the company on Nov. 9. Included in the offering is the carhouse property bounded by Fourth and Lexington Avenues and Thirty-second and Thirty-third Streets; the carhouse at Madison Avenue, Eighty-fifth to Eighty-sixth Streets; a large parcel of property on Front Street, and several on East Tenth and Eleventh Streets, near Avenue C, including a large warehouse.

City to Use Depreciation Fund.—The depreciation fund of the Municipal Railway of San Francisco is to be drawn upon to the extent of $250,000 so that the work on the city's Hetch Hetchy water-supply project can go on, according to reports of a meeting of the Board of Supervisors of that city held on Oct. 4. This action by the Supervisors was made possible through a resolution providing for the sale of $250,000 worth of Hetch Hetchy water bonds maturing from 1930 to 1932 and carrying 4½ per cent interest. These bonds are to be placed to the credit of the Municipal Railroad depreciation fund as a financial investment for the street railway, while the $250,000 cash will be applied to the credit of the Hetch Hetchy project. Acting Mayor Ralph McLeran made the statement that the depreciation fund now totals about $600,000. He considered the transaction a good investment for the railroad and at the same time a great benefit to the water project as, in the absence of immediate cash to finance the bills, all operations would have to be abandoned pending the outcome of the taxpayers' suit against the cost-plus fee contract with the Construction Company of North America which is still under advisement in the court.

I. T. S. Subsidiary Financing.—Emery, Peck & Rockwood, Chicago, Ill., recently offered $650,000 of five-year 8 per cent bond-secured convertible gold notes of the Danville, Champaign & Decatur Railway & Light Company at 100 and interest. The proceeds of the issue are to be used to reimburse the company for extensions and additions and for the retirement of underlying bonds. The notes are guaranteed unconditionally, principal and interest, by the Illinois Traction Company. The Danville, Champaign & Decatur Railway & Light Company controls through stock ownership the properties operating substantially all the electric light and power, gas, steam heating and electric railway systems in the Illinois cities of Danville, Champaign, Urbana and Decatur. The company has outstanding $730,000 of 6 per cent cumulative preferred stock, $3,688,000 of common stock, $3,318,000 of collateral trust 5's, $650,000 of five-year 8 per cent secured notes (this issue). In addition there are outstanding $1,980,000 of underlying bonds on mortgages which are now closed.

Intercorporate Claims Adjusted.—A decree has been entered by Presiding Justice Tanner in the Superior Court, whereby the Providence & Danielson Railroad, Providence, R. I., is to pay Receiver Cornelius S. Sweetland of the United Traction & Electric Company $60,000 in settlement of claims. The payment of $60,000 is to be made from the $200,000 damages which the city has agreed to pay the Danielson line in connection with the condemnation proceedings for the construction of the city reservoir. Decrees were entered for the purpose of obtaining releases from receivers of various transportation roads interested, so that future suits could be avoided. Receiver Sweetland will hold the $60,000 in trust for the Union Railroad, Pawtucket Street Railway and the Rhode Island Suburban Railway, all included in the system of the United Traction & Electric Company. The remainder of the $200,000 city payment is to be split, $100,000 to the Federal trustees and $40,000 for the Providence & Danielson Railroad. The $60,000 payment is to be in lieu of all claims against the Danielson line by all the companies involved for losses and deficits incurred by operation of the Danielson road by the Rhode Island Company receivers from the beginning of the receivership to and including Sept. 6, 1920.

Traffic and Transportation

Cleveland Increase Soon

City Council Authorizes Two-Cent Advance in Company's Operating and Maintenance Allowances

The City Council of Cleveland, Ohio, has granted the Cleveland Railway a total increase of 2 cents a car-mile in its operating and maintenance allowances. The Council took action at the urgent request of John J. Stanley, president of the company, who late in August notified the city authorities that the interest fund would fall below the minimum of $300,000 on Aug. 30. The increase in allowances for operation and maintenance presupposes an automatic advance in fare to a 6-cent cash basis, with nine tickets for 50 cents and 1 cent for each transfer.

The advance in allowances dates from Oct. 1 and was granted for six months only. The expected higher fare will probably not be for longer than that period, according to Street Railroad Commissioner Fielder Sanders. The fare rise may not come before the middle of November, or it may come during the present month when the September interest figures are established.

REFUSES 4.5-CENT ADVANCE

The increased allowances were made necessary by expenditures of over 4½ cents a car-mile more than the allowances in the last three months, the commissioner informed the street railway committee of the Council. Commissioner Sanders refused to sanction a 4.5-cent increase. The six months' limit was fixed, the commissioner explained, because he anticipates a drop in prices which would reduce expenses, make a high allowance unnecessary and probably bring back the present fare.

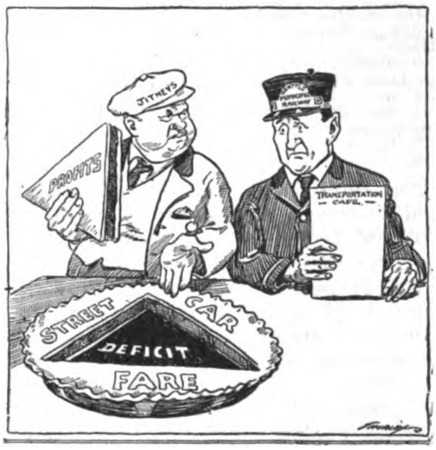
Commissioner Sanders, commenting on the Council's action, said:

> This means the interest fund will go down and the fare will inevitably go up.
>
> I say to you, frankly, I don't believe this railroad can be operated much longer on a 5-cent fare. Whether the break will come in two weeks or six, I do not know, but revenues the last two or three weeks have not been holding up and the maximum fare may come sooner than was expected. We are only doing the just thing in raising the allowances.

The Council also granted the company authority to reimburse itself for the deficiency incurred up to Oct. 1, at the rate of not less than $25,000 a month, the exact sum to be left to the discretion of the commissioner. The deficit from the first of the year to Sept. 1 was $332,534. It resulted from costs being higher than the allowances, which were 28 cents a car-mile for operation and 10 cents a car-mile for maintenance. The new allowances will be 29 cents for operation and 11 cents for maintenance. The interest fund, which is the fare gage, is figured on allowances and not actual expenditures. When the fund drops below $300,000 the fare goes up automatically. It was $316,000 Aug. 1. If the drop for September maintains the average of the previous six months the interest fund is below the turning point. The city will seek to enjoin the company from collecting the maximum fare unless the fund is more than $71,813 below $300,000. This $71,813 is the sum the company paid its stockholders during the controversy over an increase in the rate of dividend from 6 to 7 per cent, later defeated at the polls. The city is trying to get it back.

Seattle $500,000 Behind

In the second public speech within a week on the question of the municipal railway, Mayor Hugh M. Caldwell of Seattle, Wash., suggested as a possible alternative to a further advance in fare an increase in the city's general fund tax levy to provide additional money for the operation of the railway. He said that the road has been operating at a loss. The Mayor read a list of ten cities with fares ranging up to 8 cents, as compared with 6¼ cents charged in Seattle. He submitted figures which indicated that only during one month of the past year have the receipts of the road exceeded the expenditures. On Sept. 30, the railway was more than $500,000 "in the red."



From the Seattle Daily Times

"THE HOLE IN THE TOKEN"

During August of this year, a total of 9,964,000 people rode on the cars, as compared with 11,942,000 during August of last year. Mayor Caldwell asserted that he had not formed a definite opinion as to what was the best thing for the City Council to do in regard to the railway problem, but that he was anxious to have it discussed and considered by the people of the city, so that their wishes in the matter might be crystallized.

Eight Cents Asked in Lincoln

The Lincoln (Neb.) Traction Company has applied to the State Railway Commission for authority to raise its cash fare to a basis of at least 8 cents as an emergency measure. The company asks permission to sell four tokens for 30 cents. It now charges a 7-cent cash fare with three tokens for 20 cents. The higher fares are requested pending the fixing of permanent rates by the commission.

The company also asks for an increase in its allowance for maintenance and depreciation. This latter charge as fixed by the commission is 7.2 per cent. It asks that this be increased to 9 per cent of the valuation of depreciable property as heretofore fixed by the commission. This will add $40,000 a year to the operating expenses of the company.

The company represents in its application that on a 7.2 per cent basis for maintenance and depreciation the deficit at the end of the year will be $21,292. With the $40,000 added this will make a total deficit of $61,000 for the year. The report of passengers carried from 1915 to Sept. 1, 1920, shows a falling off of approximately 6 per cent for 1920 as compared with the year 1919. It alleges this is entirely due to the increased use of the automobile. The report shows the main decrease is on lines where automobiles are largely used. Another reason for asking for an increase in the present emergency rate is the increase of $1.80 a ton in the cost of coal for fuel since Jan. 1, 1920, and an increase in freight rates on all material since Sept. 1.

Recount Asked on Duluth Vote

The Duluth (Minn.) Street Railway on Oct. 15 filed with the Federal District Court at Duluth a petition for a recount of the votes cast in the special referendum election on Oct. 4 in which the company was refused an increase in fare from 5 cents to 6 cents. The company charged irregularities and errors in the counting of the ballots. The official count showed that the proposition to allow the company to raise its fare had been rejected by 635 votes.

Following the announcement by Herbert Warren, general manager of the company, that the service would be materially cut to allow a 10 per cent increase in wages to the employees, City Attorney John E. Samuelson has given an opinion that the City Council has the right to order changes in the schedules as it sees fit and proper. On Oct. 11 the company laid off several of its crews and discontinued all owl cars, contending that it had no funds with which to meet the demands of the men for higher wages and that it would be necessary to cut the service. No complaint has yet been made to the City Council of the cut in service and to date no action has been taken to force the railway to put on more cars.

Seven Cents in Philadelphia

Temporary Rate Fixed by Commission Pending Determination of Valuation—Tickets at Six and a Quarter Cents

The Philadelphia Rapid Transit Company was directed on Oct. 18 by the Public Service Commission of Pennsylvania to file with that body not later than Oct. 29 a tariff to become effective on Nov. 1, providing for a 7-cent cash fare and a 6¼-cent rate of fare where coupon tickets in blocks of four are purchased, with the present transfer and exchange ticket privileges remaining in force. The new rates are to continue for a period of six months unless the commission directs a different rate of fare prior to that time. Tickets are to be put on sale by the railway at its offices and are to be sold by conductors. The company is to file with the commission monthly reports of its receipts and expenditures. The company has agreed to accept the order.

THE order of the commission is simply a temporary finding. That body will not undertake to fix any permanent rate of fare until the valuation of the railway has been completed. This work will take several months and the testimony presented at the hearings showed that unless the railway received immediate relief by having provision made for more revenue it could not continue to operate and would suffer such financial embarrassment as would prevent its giving proper service. In the opinion of the commission this would be a catastrophe to the community at large. In consequence the commission announced that it was prepared to permit the company to file a new schedule which would provide more revenue.

On June 1, the company filed a tariff providing for the elimination of free transfers and the extending of the 3-cent exchange charge to all points in the city at which free transfers had theretofore been honored. At the public hearing in Philadelphia before the commission the city of Philadelphia presented objections to this new schedule.

ASKED CHARGE FOR TRANSFERS

At the suggestion of the commission, this tariff was voluntarily suspended and later, by order of the commission, dated July 26, 1920, the company was directed to make no change in its tariff, effective prior to July 1, 1920, until the commission should take final action. The company later withdrew the tariff and the commission revoked its order of July 26, in so far as it related to the rates.

The company then sought the consent of City Councils of Philadelphia to a change in the rate of fare under the 1907 contract. This consent the City Council did not give, and on Oct. 4 the company asked to be permitted to file a new schedule to become effective upon one day's notice, which schedule provided for the elimination of all exchange tickets and all free transfers and for a 5-cent straight fare.

Considerable testimony was taken in connection with this petition and a very careful investigation of the matter was made by the Bureau of Engineering of the Public Service Commission. As a result of its study of the matter the commission is convinced that to eliminate all exchange tickets and free transfers would result in a discrimination against certain sections of the city and would impose upon a large number of the car riders a burden which would not be fair and equitable.

WAGE INCREASE DEFERRED

At the hearings T. E. Mitten, president of the Philadelphia Rapid Transit Company, testified that the company had been unable to pay its employees the rate of wage agreed upon between the company and the men and that they voluntarily waived payment of the increased wages until such time as the revenues of the company could be increased to an extent that would warrant the payment of the increased wages. On this point the commission said:

> That the wages should be paid and that better service should be given by the Philadelphia Rapid Transit Company to the citizens of Philadelphia is beyond question. The Philadelphia Rapid Transit Company has been directed to file with the commission an inventory of its property, in order that the commission may determine the fair value of its used and useful property as a basis for the proper, permanent rate base.

The Bureau of Engineering of the Public Service Commission, by direction of its chief engineer, will, in association with the engineers of the Philadelphia Rapid Transit Company and the engineers of the city of Philadelphia, make a thorough investigation looking to the improvement of the service rendered by the company, necessary extensions to the system and needed additional equipment to enable the company to give better service to the car-riding public. It will promptly submit to the commission recommendations for the elimination of skip-stops that are unduly burdensome and dangerous to the public.

Asks Seven-Cent Fare

The International Railway, Buffalo, N. Y., has asked the City Council of Niagara Falls to approve a 7-cent fare for the company's lines in that city. A 5-cent fare is now being charged. In a letter to the municipal authorities, H. G. Tulley, president of the International, says that if the company is expected to make large capital expenditures for paving and track improvements in Niagara Falls some relief must be obtained from the conditions which now exist. It is suggested that action be taken by the city looking to the submission to the Public Service Commission the question of whether the company is entitled to more revenue to meet this and other necessary expenditures in its public service. The municipal authorities have asked the company to spend approximately $50,000 for track improvements and paving between its rails in certain Niagara Falls streets.

Ten Cents in Connecticut

The Connecticut Public Utilities Commission on Oct. 22 authorized the Connecticut Company, New Haven, to charge a 10-cent fare. The new rate is to apply throughout the company's system. The company has been operating at a 7-cent fare since early in August. The members of the commission approved the increase by a vote of two to one.

At a hearing before the commission on Oct. 1 Lucius S. Storrs, president of the railway, and other company officials testified that the 7-cent fare had proved entirely inadequate and that a fare of 10 cents was needed if the system was to remain intact. Evidence was introduced at the hearing to show that total receipts for the first eight months of 1920 amounted to $12,715,017. The estimated expenses of the company to Dec. 31, 1920, were placed at $15,657,222.

Transportation News Notes

Seven Cents in Hot Springs.—A 7-cent cash fare went into effect on the lines of the Hot Springs (Ark.) Street Railway on Sept. 25. The company has been charging a 6-cent fare since September, 1919. Prior to that time the fare was 5 cents.

Seven Cents in Selma.—The Selma (Ala.) Electric Railway on Oct. 1 raised its fare from 6 cents to 7 cents. At the same time rates for "owl" service were raised to 10 cents. The company recently increased the wages of its motormen and conductors.

One-cent Rise on Interurban. — The Hagerstown & Frederick Railway, Hagerstown, Md., will raise its interurban rates from 7 cents to 8 cents in each zone, beginning Oct. 1. Tickets will be sold at the rate of thirteen for $1. City fares in Hagerstown and Frederick will remain at 7 cents cash, with five tickets for 30 cents.

Seven Cents on Houghton Lines.—Fares on the lines of the Houghton County Traction Company, Houghton, Mich., have been raised from 6 cents to 7 cents in each zone. Four tickets are sold for 25 cents. The new rates were authorized by the Michigan Public Utilities Commission, and were put into effect on Aug. 16.

No Advance in Scranton.—The Pennsylvania Public Service Commission has denied the petition of the Scranton Railway for an increase in fare to 10 cents on its Scranton city lines. The commission declined to permit an advance in fare at this time owing to the fact that the valuation of the company's property had not been completed.

Wants More in Kingston. — The Kingston (N. Y.) Consolidated Railroad has petitioned the State Public Service Commission, Second District, for an increase in fare. The company asks the commission to fix such a rate which, after investigation, it shall find just and reasonable. The present fare is 6 cents.

Eight Cents in Ashtabula.—An 8-cent cash fare took effect in Ashtabula, Ohio, on Sept. 10. The City Council had previously approved a recommendation of Federal Judge D. C. Westenhaver that the Ashtabula Rapid Transit Company be permitted to raise its rates. Four tickets are sold for 30 cents. The fare was formerly 5 cents.

Fares up on Interurban.—Fares on the interurban lines of the Peninsular Railway, San José, Cal., have increased 20 per cent by authority of the State Railroad Commission. The new rates took effect on Oct. 16. The round trip rate, including war tax, between San José and Palo Alto is now 78 cents, Los Gatos 52 cents, Campbell 30 cents. The company has never paid a dividend.

Will Vote Again on Denver Fare.—Citizens of Denver, Col., will again be called upon at a special election in the spring of 1921 to decide the question of the fare to be charged by the Denver Tramway. An initiated bill providing that the fare be reduced from 6 cents to 5 cents was recently presented to the City Council. The Council, after consideration of the proposal, decided to submit the matter to a popular vote.

Cities Fight Fare Advance.—Steps have been taken by the city authorities of Louisville, Ky., and New Albany and Jeffersonville, Ind., to oppose an increase in fares by the Louisville & Northern Railway & Lighting Company, New Albany. The company proposed to raise its fares between Louisville and the cities of Indiana from 7 cents to 10 cents on Oct. 31. The sale of commutation tickets is to be discontinued.

Asks Rise on Kansas Line.—Application has been made to the Kansas Court of Industrial Relations by the Manhattan City & Interurban Railway, Manhattan, for permission to raise its fare on its lines in Manhattan from 5 cents to 10 cents. The company proposes to sell four tickets for 30 cents. It is also proposed to raise the fare on the interurban lines from a basis of 2.4 cents a mile to one of 3 cents a mile.

Will Argue Jitneys' Rights.—Final arguments on the petition of the Public Service Railway, Newark, N. J., to have thirty-one operators of motor buses competing with its lines ruled off the streets will be heard in the Court of Chancery in Jersey City on Dec. 13. The busmen recently filed their answers to the railway's complaint. They contended that the interest of the public demanded the continuance of the bus service.

Ten Cents on Suburban Line.—The Connecticut Public Utilities Commission has authorized the Waterbury & Milldale Tramway, Waterbury, to raise its fare to 10 cents. At hearings before the commission the company showed that in 1918 it operated at a net loss of $12,597. Its operating deficit for 1919 amounted to $25,505. The commission denied a petition filed by patrons of the road asking that the fare increase be refused.

Seven Cents in Plattsburgh.—The Public Service Commission, Second District, has authorized the Plattsburgh (N. Y.) Traction Company to increase its maximum fare between any two points on its line within Plattsburgh from 5 cents to 7 cents. The city authorities recently waived a franchise restriction limiting the fare to 5 cents, provided the commission found that the increase was justified. There was no opposition to the company's application at a hearing before Commissioner J. A. Kellogg.

Suspends Everett Increase. — The Washington Public Service Commission has suspended for a period of ninety days a proposed increase in rates by the Puget Sound International Power Company, Everett, operating the electric railway system in the city of Everett. This action was taken when a complaint was received by the commission from the city attorney of Everett, against the rates, which were to have gone into effect on Oct. 1. The company proposed to replace the present 5-cent fare with one of 10 cents.

More Buses for Wilmington.—The Wilmington & Suburban Transportation Company has been incorporated under the laws of the State of Delaware to operate a line of motor buses in Wilmington. The company is capitalized at $50,000. It proposes to begin operation before the end of October. Each bus will seat twenty-eight persons and will be fitted with cross seats and a vestibule. Officers of the new company are: President, Leslie R. Casperson; treasurer, Harry Butler; secretary, George McGee.

City Lines on Mileage Basis.—A petition asking an increase in fares has been presented to the Indiana Public Service Commission by the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis. The petition asks a passenger fare of 3 cents a mile in Indianapolis with a minimum charge of 10 cents. The present fare is 5 cents. The company also asks the commission to grant an increase in express and freight rates. The company operates more than fifteen miles of line within the city on various divisions.

Wants More on Interstate Line.—The Steubenville, East Liverpool & Beaver Falls Traction Company, East Liverpool, Ohio, has filed a new tariff with the Interstate Commerce Commission, the Ohio Public Utilities Commission and the Pennsylvania Public Service Commission under which a zone system is to be installed. The increase sought will be about 33⅓ per cent. The company operates a line between Vanport, Pa., and Steubenville, Ohio. It also asks for an increase from 5 cents to 8 cents on the city line in East Liverpool.

Asks Higher Commutation Rates.—The Schenectady (N. Y.) Railway has made application to the Public Service Commission for the Second District, for a modification of orders of the commission to permit it to abolish certain reduced fare rates and to increase its fifty-four-trip commutation ticket book rates. The company alleges that notwithstanding the increased fares allowed in July the revenue of the company is insufficient to meet increased wages and other increased costs. The reduced fare rates are on all divisions.

New Railway Guide.—A new pamphlet has been issued by the publicity department of the San Diego (Cal.) Electric Railway for free distribution to the public. It contains general information about the city, beach and suburban railway lines of San Diego. It tells an interesting story to residents of the city and is a valuable guide for strangers. A map is enclosed in the folder showing the exact location and extension of the railway lines. Copies of this "where-to-go" folder can be obtained at any information bureau.

Compromise on Higher Fare.—Announcement that the Youngstown & Suburban Railway, Youngstown, Ohio, would give up the franchise under which it was granted an increase in fare from 5 to 7 cents was made on Oct. 8 after a conference between officials of the company and Mayor Fred J. Warnock. The action will permit repeal of the ordinance at the next session, of Council, which, in turn, would call off the referendum on the ordinance set for Nov. 2. In recent negotiations with patrons of its lines the company offered to incorporate in a new ordinance a provision for the sale of 100 tickets for $5.50.

Would End Commutation Tickets.—The Pacific Electric Railway, Los Angeles, Cal., has applied to the State Railroad Commission for permission to discontinue the sale of commutation tickets between Pasadena and Alhambra and Los Angeles. The company also asks authority to abrogate the transfer privilege between its interurban lines and its local line in the two former cities. The prospect of motor-bus competition is given by the railway as the reason for its petition. Two petitions are now pending before the commission for authority to operate bus lines in competition with those of the railway in Alhambra.

Suburban Line Needs More.—Application has been made to the Public Service Commission for the Second District by the Hudson Valley Railway, Glens Falls, N. Y., for authority to charge 10-cent fare within each local zone outside Glens Falls and Saratoga

Springs, excepting in the zone within Troy, and that in the latter zone such rate of fare be established as may be just and reasonable. The company alleges that nothwithstanding the fare now in effect the revenue obtained does not yield an adequate return and that it has not received since Nov. 25, 1918, reasonable compensation for the service rendered.

Wants Parlor Cars Revived.—William C. Culkins, Street Railway Director of Cincinnati, Ohio, has suggested the renewal of the use of parlor cars by the Cincinnati Traction Company. He points to the fact that delegates attending conventions in the "Queen City" and who are desirous of seeing the outlying districts could charter parlor cars, which could be given the right of way and go over the various scenic routes in the city. Until recently such cars were frequently used in Cincinnati. The convention and publicity department of the local Chamber of Commerce is advocating their reintroduction.

Six Cents in Aberdeen.—The Gray's Harbor Railway & Light Company, Aberdeen, Wash., has raised its fare from 5 cents to 6 cents within the city limits of Aberdeen, Hoquiam and Cosmopolis, and from 10 cents to 12 cents on its lines between any two of the three towns. The new rates were authorized by the State Public Service Commission. In the petition the company asked for a 7-cent fare. With an allowance of 5 per cent decrease in traffic because of the higher fare, the commission finds that the company should be able to earn 7.4 per cent on its investment if its operating expenses repair the same as in 1919.

Service Withdrawn Because of Jitneys.—Electric railway service between Danbury and Bethel, Conn., was suspended on Oct. 18. Traffic is being handled by the jitneys and steam trains. The discontinuance of electric railway service will continue until the City Council of Bethel passes an ordinance barring the jitneys from the highways where electric railway cars run. The Board of Aldermen of Danbury on the night of Oct. 18 passed an ordinance barring all jitneys from the streets traversed by the cars of the Danbury & Bethel Street Railway. The railway had announced that it would stop all service in Danbury on Nov. 1 unless jitney bus traffic was restricted to the side streets not used by the trolley cars.

Will Hear Rate Appeal.—The Interstate Commerce Commission has ordered a hearing in Salt Lake City, Utah, on Nov. 1 of the appeal taken by a number of railroads from the decision of the Utah Public Utilities Commission with regard to increased freight and passenger rates. The petitioners in the proceeding are the Bamberger Electric Railroad, Salt Lake City, the Deep Creek Railroad, A. R. Baldwin, as receiver of the Denver & Rio Grande Railroad, the Tooele Valley Railway, the Los Angeles & Salt Lake Railroad. Oregon Short Line Railroad, the Salt Lake & Utah Railroad, the Southern Pacific Company, and other steam and electric roads handling intrastate traffic.

Suburban Rates Go Up.—Tariffs have been filed by the Twin City Rapid Transit Company, Minneapolis, Minn., providing for a 20 per cent increase in the fares on the company's lines to Stillwater and Lake Minnetonka. As the rates remain within the limit of 2 cents a mile provided by the Minnesota law, the company is not required to file a petition for the advance with the State Railroad and Warehouse Commission. The new rates became effective within ten days of Oct. 7. The advance amounts to 1 cent for each 5-cent zone. In an effort to improve its service in Minneapolis as a result of the recent granting of a 6-cent fare on the city lines, the company has placed in operation thirty additional cars since Aug. 16.

Wage Rise Brings Fare Plea.—The Cincinnati, Newport & Covington Railway, Covington, Ky., the employees of which were recently granted a 20 per cent increase in pay by a board of arbitration, has started a campaign to have the cities of northern Kentucky allow it to raise the fare from 5 cents to 8 cents. Under the provisions of present franchises granted by four Kentucky towns several years ago the company must transport passengers for 5 cents. The franchises also stipulate that cars shall be operated past a given point at least every fifteen minutes. The company has been supplying a three-minute service and threatens to revert back to the schedule provided in the franchises if an increase in fares is not allowed.

Opposes Service at Cost.—Dr. Henry Jameson, chairman of the board of directors of the Indianapolis (Ind.) Street Railway, declared at a recent hearing before the Indianapolis City Council that he was opposed to the adoption of a service-at-cost plan in Indianapolis. Dr. Jameson several months ago expressed himself as in favor of a flexible rate of fare as affording the best prospects of relieving the company's financial condition. At the hearing before the Council he stated that his change in attitude had resulted from a study of the plan as applied in other cities. Dr. Jameson also expressed opposition to the passage of an ordinance under which it is proposed to reroute the company's lines in the business district of the city.

Repeals Higher Fare Grant.—The City Council of Findlay, Ohio, has repealed an ordinance under the terms of which the Toledo, Bowling Green & Southern Traction Company, Findlay, was given permission to raise its fare from 5 cents to 10 cents on its local lines. The Council took this action after the company had refused to accept the fare ordinance except on conditions which the city would not grant. The Council authorized the company to raise its fare after the latter had made application for permission to abandon service on the ground that operation of the cars did not pay. The Council refused this request, allowing the increased fare as an alternative. The 10-cent rate was never put into effect. The company has since applied to the Ohio Public Utilities Commission for permission to cease operation.

Ten Cents in New London.—A 10-cent fare was placed in effect on Oct. 15 on the New London, Conn., Division of the Connecticut Company. The New London lines, formerly operated by the Shore Line Electric Railway, were returned to the Connecticut Company some time ago under a court order. The Connecticut Public Utilities Commission has received a petition of protest from the citizens of New London against the 10-cent fare. The petition declares that the new rate is unreasonable. The New London Common Council backed up the citizens in their appeal to the State Commission. The petition asks the commission to conduct a hearing on the subject and that the Connecticut Company be directed to show cause for the increase in fares.

Will Raise Northampton Fares.—A new schedule of rates will be placed in effect on the Northampton (Mass.) Street Railway on Nov. 8. On the Easthampton line the unit of fare will be raised from 7 cents to 8 cents, making the fare between Northampton and Easthampton 16 cents. Special tickets, good on all lines other than the Easthampton line, which have been sold at a rate of five for 50 cents, will be sold at a rate of five for 55 cents. The unit of fare on all but the Easthampton line remains at 7 cents. By the use of tickets or combinations of tickets and cash fares the following rates will be in effect: Between Northampton and Williamsburg, 29 cents; between Northampton and Leeds, 18 cents; between Northampton and Haydenville, 22 cents, and between Williamsburg and Haydenville, 11 cents.

New Publications

Proceedings of the National Safety Council for 1919

Paper, 1457 pages. Published by National Safety Council, Chicago, Ill.

This publication contains the detailed history of the eighth annual Safety Congress, held at Cleveland, Ohio, in 1919. There are 41 pages devoted to the Electric Railway Section, covering a discussion of safety devices and methods.

The Engineering Index for 1919

Published by the American Society of Mechanical Engineers, New York City.

The American Society of Mechanical Engineers took over the publication of the "Engineering Index" at the close of 1918 and has since been publishing the index monthly as a part of *Mechanical Engineering*. The present volume is the first to be compiled by the staff of the society and the arrangement of references has been changed to render them more readily accessible. Whereas the items have been previously grouped under divisions of engineering, such as civil, electrical, mining, mechanical, etc., in this volume the alphabetical or dictionary arrangement has been employed. Each item contains the exact title of the article indexed, the author's name, the name of the periodical in which the article appeared, the volume number and date of publication and the page numbers and numbers of figures in the articles. Each item concludes with a brief note summarizing the article indexed.

This index contains more than 12,000 items referring to articles in nearly 700 engineering and allied technical publications. A reference list of the publications, giving exact titles, place of publication and frequency of issue, is included. The thoroughness of the work is indicated by the fact that in preparing the items the engineering staff of the society has reviewed approximately 1,100 periodicals, reports and other publications regularly received by the Engineering Societies Library. These are printed in ten different languages.

Proceedings of the American Electric Railway Engineering Association for 1919

Published by the American Electric Railway Association, 8 West Fortieth Street, New York, N. Y. 400 pages.

The proceedings cover the activities of the association from 1916 to 1919, including a complete report of the seventeenth annual convention, held at Atlantic City in 1919.

Transactions of the Institution of Civil Engineers of Ireland—Vol. 44

Published by the Institution, 35 Dawson Street, Dublin, Ireland.

This volume is of particular interest to electric railway men as it includes a paper on "Modern Tramway Track" by Robert B. Holt. Mr. Holt outlines the European methods of constructing street railway track, practically none of which include the use of the customary American crosstie. In regard to the wear of rails, it is stated that speed is far more destructive to rails than traffic density. Particular emphasis is placed upon the contention that rails should be designed with a convexity of tread of about 12-in. radius, as this is approximately the shape which will ultimately be assumed under wear. It is said that much unnecessary wear is caused by the use of the flat "coned" tread design.

In reference to rail joints, the thermit welded joint is said to be the standard on the majority of English tramways. Some space is devoted to a discussion of rail corrugation, and it is concluded that this evil can be mitigated to a very considerable extent by raising the elastic limit of the steel.

Personal Mention

Mr. Yungbluth Promoted

Former Store-Keeper, Pittsburgh Railways, Now in Charge of P.R.T. Supplies Department

B. J. Yungbluth, formerly store-keeper of the Pittsburgh (Pa.) Railways, has been appointed supervisor of purchasing and supplies of the Philadelphia (Pa.) Rapid Transit Company. In his new position Mr. Yungbluth will have charge of the purchasing, supplies and printing departments of the P. R. T. System. Mr. Yungbluth resigned his connection with the Pittsburgh Railways last January to become connected with the Mitten Management Corporation, Philadelphia, for which he has been engaged during the past few months in a study of the general subject of materials and supplies. His new appointment took effect on Oct. 1.

Mr. Yungbluth was born on August 29, 1882, in Marquette, Mich. Upon leaving high school in 1899, he entered the employ of the Duluth, South Shore & Atlantic Railway, at Marquette. After serving in various capacities in the stores department for about a year, he entered the purchasing department of the Mineral Range Railway, at Hancock, Mich., where he acted as accountant and store-keeper until 1905. He then resigned to become chief clerk to the general store-keeper of the Lake Shore & Michigan Southern Railway at Cleveland, Ohio. Under the same management he served for three years as store-keeper of the Lake Erie & Western Railroad at Lima, Ohio.

B. J. YUNGBLUTH

Leaving the steam railroad field in 1910, Mr. Yungbluth entered the employ of the Pittsburgh Railways, where he served on the general manager's staff as general store-keeper for ten years. Under his direction the stores department, which had up to that time received little attention, was completely reorganized and was put on a sound basis. Mr. Yungbluth was one of the first to apply steam railroad methods of store-keeping to the electric railway field. As a result of his efforts the stores department of the Pittsburgh Railways is recognized as one of the best of its class in the country. Mr. Yungbluth has contributed a number of articles to the ELECTRIC RAILWAY JOURNAL dealing with the efficient handling of problems arising in this branch of the service.

George W. Bowie has resigned as superintendent of transportation of the Augusta Division of the Androscoggin & Kennebec Railway, Lewiston, Maine.

M. L. Ross has resigned as president and superintendent of the Vincennes (Ind.) Traction Company. Mr. Ross has announced no plans for the future. He began his railway experience in 1906 as timekeeper with the Jackson Railway & Light Company, Jackson, Tenn.

Ivy L. Lee has been retained by the board of directors of the Pennsylvania Railroad to act in an advisory capacity in matters of publicity and public relations. In the conduct of this work Mr. Lee will report to the president and the vice-president and will co-operate with the publicity department of the company.

William H. Clarke has resigned as a vice-president of the Byllesby Engineering & Management Corporation, Chicago. Mr. Clarke has been identified with the Byllesby organization for a number of years, his duties being connected for the most part with the bond department. He will continue in the investment banking field.

Joseph A. Phelan, formerly manager of the Gloucester Division of the Eastern Massachusetts Street Railway, Boston, Mass., has been appointed general superintendent of the Rockford City Traction Company and the Rockford & Interurban Railway, Rockford, Ill. Mr. Phelan succeeds C. R. Simcox, resigned. He was born at Lynn, Mass., on July 13, 1886. He began his traction experience as a conductor in the employ of the Bay State Street Railway, then the Boston & Northern Street Railway, in 1904. In October, 1906, he was appointed night operating foreman of the West Lynn carhouse and was subsequently promoted to inspector. In the fall of 1917 he was assigned to the office of the traffic department at the main office of the company in Boston, and in February, 1918, was promoted to chief inspector of the Bay State System. On July 7, 1918, he was appointed superintendent of the Quincy Division.

Philip H. Gadsden Heads American Association

William G. Gove Elected President of Engineering Association—Ray P. Stevens, Traffic and Transportation— J. J. Landers, Accountants'—John J. Reynolds, Claims

The new presidents of the American Electric Railway Association and its affiliated organizations, elected at the recent meeting in Atlantic City, are all well known to the industry at large, in which all of them have been active for many years. This is particularly true of Mr. Gadsden, whose work has long been of a national character. As regards the officers of the affiliated associations, however, their work naturally has come more particularly to the attention of the members of the associations with which they are immediately affiliated. On account of the significance of the positions to which Messrs. Gadsden, Gove, Stevens, Landers and Reynolds have been advanced and the need which goes with each office for co-operation with the other affiliated bodies, it has been deemed expedient to review the careers of all of the new presidents, both inside and outside of the industry. The portraits of all of the new presidents were published in the Convention Report Issue of the ELECTRIC RAILWAY JOURNAL, with the exception of that of John J. Reynolds of the Claims Association.

PHILIP H. Gadsden is president of the Charleston Consolidated Railway & Lighting Company, Charleston, S. C. A year ago Mr. Gadsden, after serving as chairman of the American Electric Railway War Board, was elected vice-president of the United Gas Improvement Company, Philadelphia. In this capacity he took charge of a new department of national public relations of that organization. The United Gas Improvement Company is owner and operator of a number of public utilities throughout the country, including railway, gas and power properties. The establishment by such an important company as the U. G. I. of a public relations organization under a vice-president, and his appointment to that office, should be of great assistance to Mr. Gadsden in the work to which he has put his hand in helping to improve the status of utilities.

Mr. Gadsden represented the American Electric Railway Association on the Federal Electric Railways Commission. Mr. Gadsden himself was largely responsible for making the commission's report of assistance to those trying to adjust relations so that railways may function properly. He is now chairman of the committee on national relations of the national association.

Mr. Gadsden was born in Charleston fifty-two years ago. He was educated in the public schools of that city, and afterward in the South Carolina University, at Columbia, which university has conferred upon him the degree of Doctor of Laws. A man of broad reading and experience, Mr. Gadsden is professionally a lawyer, and has practiced at the bar for fifteen years. He was a member of the South Carolina Legislature for six years, elected by the people for three successive terms. He is one of the charter members of the League to Enforce Peace, and is given credit for putting the word "Enforce" in its name, without which the league would have merely the title of a pacifist organization.

As a consequence of his work in behalf of public utilities during the war, Mr. Gadsden is constantly being sought to make speeches, and because of the national prominence he has attained in his study of the difficulties of public utilities, he is now being urged to explain these difficulties by writing articles for publication in popular magazines.

William G. Gove, elected president of the Engineering Association, is superintendent of equipment for the Brooklyn (N. Y.) Rapid Transit System, and engineer of car equipment for the New York Municipal Railway. He has been identified with the Engineering Association since its inception and was largely responsible for the work of its organization. After leaving college Mr. Gove began work in civil engineering on irrigation projects on the Pacific Coast. In July, 1896, he became assistant engineer of roadways for the Cincinnati Street Railway, and in March, 1899, joined the force of the Boston Elevated Railway as an assistant engineer.

From January, 1900, to May of the same year, Mr. Gove had charge of the construction and equipment of the trial trains that were used in a competitive test in the old Tremont Street subway, Boston. These tests of train operation mark an epoch in electric railway development as pointing the way to train operation with multiple unit equipment. After the tests had been completed and a decision reached as to the type of equipment to be used, Mr. Gove drew up the specifications and worked up the designs for the first elevated cars used in Boston. Later he was associated with Messrs. Winsor and Lindall in the construction and equipment of additional cars for their service.

In June, 1903, Mr. Gove joined the Brooklyn Rapid Transit Company as assistant mechanical engineer, and in December, 1905, he became superintendent of equipment for that company.

In April, 1913, he had the duties of engineer of car equipment of the New York Municipal Railway added to his duties of superintendent of equipment for the Brooklyn Rapid Transit Company. The design, construction, and equipment of the new subway cars for use by this corporation were carried out under Mr. Gove's direction. This type of subway car has proved most efficient in the handling of passengers in a very exacting service, and their construction embodied many new features. The reputation of this car has traveled around the world, as is evidenced by its influence on the new London underground cars and those proposed for the Sydney suburban electrification. The New York Municipal Railway has now provided 900 of these cars at a total cost of $18,000,000 and the necessary reconstruction of shops and equipment to take care of their maintenance cost several millions more.

Mr. Gove is probably best known among his railway associates for devotion to the standardization of equipment, and the far-reaching results which he has accomplished in this direction for his company. This enthusiasm for standardization was reflected largely in the work of the committees of the Engineering Association with which he was then connected, and the early start which this association has made in standardization and the far-reaching results which have already been accomplished are largely due to Mr. Gove's untiring efforts.

In addition to the work of standardization, Mr. Gove was a pioneer in adopting steel wheels for electric railway service. At present the B.R.T. has 50,000 steel wheels on its system, which is by far the largest number in use by any electric railway property. Mr. Gove has consistently advocated the use of steel wheels for electric railway service, and the adherence to the association standards as adopted, and today he has no other wheels in use but those of association standards.

As a member and official of the Engineering Association, Mr. Gove has participated in the work of many of its committees. In addition to his work with the American Electric Railway Association, Mr. Gove is a member of the executive committee of the New York Electric Railway Association and chairman of its committee on equipment. He is also an active member of the American Society of Civil Engineers.

Ray P. Stevens, who heads the Transportation & Traffic Association, is president of the Republic Engineers, Inc., New York City, of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, and the Youngstown Municipal Railway Company, and is vice-president of the Republic Railway & Light Company and a member of the executive committee of the Cleveland Electric Illuminating Company. He has been prominent as a railway operator and executive for the past twenty years, and during this time he has been called several times from one property to another, each time to assume more responsible duties.

Mr. Stevens was born in Maine in 1877. He was graduated from the University of Maine with the degree of Bachelor of Electrical Engineering in 1898. He immediately engaged in work for the Bell Telephone Company, later for the General Electric Company, and then in consulting engineering work in Chicago. His first electric railway connection was in consulting work at Everett, Wash., where he practically built an entirely new railway and power and light system, including power house and shops. Before he had finished this work he was persuaded to take charge of the railway and lighting properties in Everett, and under his management the earnings doubled in less than five years.

He next went to Auburn, N. Y., as general superintendent of the Auburn & Syracuse Electric Railway and the Auburn & Northern Electric Railway and as manager of the Skaneateles Lake Transit Company and remained there two years. His record during this short period was so notable that in 1907 he was offered and accepted the presidency of the Lehigh Valley Transit Company at Allentown, Pa., which company controlled at that time about 150 miles of track and practically all the light and power properties in the Lehigh Valley. He was then but thirty years old. Mr. Stevens' connection with this company lasted six years, when he resigned to join the Youngstown and New York properties, with which he is now connected. Mr. Stevens was president of the Pennsylvania Street Railway Association for two years and has always taken an active part in national association affairs.

J. J. Landers, elected president of the Accountants' Association, has been connected with public utility undertakings for the greater part of his business career, mostly in accounting work. Mr. Landers was born in 1876 in Bucks County, Pa. At an early age he removed to Philadelphia. He received his education at St. Joseph's College and shortly thereafter entered the employ of the Philadelphia Traction Company, later the Union Traction Company, as chief clerk to the superintendent of power. This position he held until 1899, when he went to Scranton as the chief clerk in the auditing department of the Scranton Railway. In 1903 he was appointed cashier of the Conneaut & Erie Traction Company, then under construction. When operations started he assumed the duties of treasurer and manager. In 1905 he was appointed superintendent of the Rock Hill (S. C.) Light & Water Company, and after two years in the South returned to Pennsylvania as auditor for the York Railways and subsidiaries. Mr. Landers has served three terms as a vice-president of the Accountants' Association and this election is a promotion from the office of first vice-president.

John J. Reynolds, the new head of the Claims Association, is claims attorney of the Boston Elevated Railway. Mr. Reynolds is a native of Massachusetts. He received his early education in the Boston public schools and was later graduated from the Northeastern College School of Law. In 1902 he was admitted to the Massachusetts Bar and soon thereafter to membership in the American, Massachusetts and Boston Bar Associations.

His experience in railway work dates from his connection with the Boston Elevated Railway and its predecessors in 1885. He began as a horse-car driver and then became a driver and conductor on a coach line and later a starter. With the introduction of the electric car he became a motorman and during the rapid growth of the electric lines worked for about a year in the shop as a motor-car and wire repairman, after which he was appointed instructor of new motormen.

As soon as the electric railway was firmly established, Mr. Reynolds held successively positions as inspector, investigator and adjuster in the claims department, and then became claims attorney in 1902. Various offices of the Claims Association have been held by Mr. Reynolds and during his membership he has contributed to the association papers on the following subjects: Uniformity in claims department records, accident reporting by car crews, training of men for car service, benefits of publicity, mechanical devices for prevention of accidents (in collaboration with M. P. Spillane), near-side stops, guides for claim agents, the importance of operating rules, the Claims Association, etc.

J. J. REYNOLDS

Daniel Connors has been appointed superintendent of the Weymouth and the Hinghman-Hull Divisions of the Eastern Massachusetts Street Railway, Boston, Mass.

Guy McCallum has been appointed auditor of the Lowell Division of the Eastern Massachusetts Street Railway, Boston, Mass. Mr. McCallum was formerly connected with the main office of the railway in Boston.

Harrah K. Bennett, general claim agent of the Eastern Massachusetts Street Railway, Boston, Mass., has been appointed manager of the newly created Melrose-Woburn Division of the company. This division comprises the cities of Melrose and Woburn and a number of neighboring towns. The position of general claim agent has been abolished, and the duties of that office will be performed by the legal department of the railway.

Floyd W. Parsons, who conducts the department "Everybody's Business" in the *Saturday Evening Post*, discussed the public utility situation in the issue of that paper for Oct. 9. Mr. Parsons is particularly well qualified to deal with a subject of this kind on account of his wide knowledge of engineering and industry. Before becoming connected with the *Post* he was editor of *Coal Age*, one of the papers included with the ELECTRIC RAILWAY JOURNAL under the McGraw-Hill management.

L. P. Hockett, for the past two years auditor and accountant of the Utah Utilities Commission, has resigned to accept a position with the Public Service Commission of the state of Washington. The attention of the Washington Commission was attracted to Mr. Hockett's work by his efforts to obtain betterments in the accounting systems of public utilities. He was instrumental in bringing about a recent conference at Boise, Idaho, attended by representatives of the accounting departments of the Washington, Oregon, Montana, Idaho and Utah commissions, at which a uniform system of accounting to be put into effect in the various states represented was taken up. Mr. Hockett joined the Utah Commission soon after his discharge from the Signal Corps of the United States Army. Previous to the war Mr. Hockett had spent many years in various branches of railroad service.

Obituary

Elisha S. Williams, vice-president of the United States Rubber Company, died on Oct 8. Mr. Williams was born in Malden, Mass., in 1873. He became vice-president five years ago.

J. M. Means, assistant superintendent of transportation of the Georgia Railway & Power Company, Atlanta, Ga., was shot and instantly killed on Oct. 12 by a conductor whom he was reprimanding for infraction of company rules. This conductor, after attacking Mr. Means, shot himself, but not fatally.

Elvin L. McGrew, purchasing agent and general traffic manager of the Standard Underground Cable Company, Pittsburgh, Pa., died on Oct. 8 in New York City. Mr. McGrew was born in New Alexander, Ohio He began his business career as a telegraph operator, and after entering the service of the Pennsylvania Railroad, became freight agent at New Cumberland, W. Va., where he remained four years. In 1900 he became connected with the Standard Underground Cable Company. He was a leader in the formation of the Purchasing Agents' Association of Pittsburgh and was its first president.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Insulation Prices Reflect Lower Cotton

Demand Has Slackened, but Good Business Is Seen for Next Year—Prices May Go Lower

Lower prices of raw material have reacted upon the market for insulation of all kinds, according to representative manufacturers in this line and jobbers. The price of tapes, webbing, sleeving, cambric, both varnished and plain, and silk material has dropped slightly owing to lower cotton. Varnish, too, is a little easier in price. On the other hand, insulating papers, pressboard, etc., show no signs of a reduction, and in some quarters it is said that even higher prices may prevail there in view of the great scarcity of paper. No fluctuation is evident on mica. Opinions differ as to the probable tendency of prices on that material. One distributer reports that prices quoted from England are being slightly shaded, but on the other hand it is said that European countries have entered into competition as buyers of mica in India so strongly that the supply does not exceed the demand. One large company which does considerable business in built-up mica used in fractional motors and automobile ignition sets states that there is little or no demand from that quarter.

Further Price Trend Uncertain

Questioned whether or not insulation prices have reached their bottom level most manufacturers state that the trend is almost entirely dependent upon raw material prices. It is pointed out in some cases that cotton has been contracted for some time in advance and that it requires from about eight to ten weeks before a drop in raw cotton is reflected in prices of finished insulation. For this reason some producers state that if cotton remains at its present low level or drops further some additional softening of prices may result, but this readjustment will come about gradually if at all. Demand, while fair at present, is considerably less than it was a few months ago, probably owing to price uncertainties, it is said. Some cancellations have been received, but outside of the automobile industry these have not been alarming. There have been requests for extensions of time on filling orders in a number of instances, however. Manufacturers agree that the present dullness is only temporary and that a good volume of business should develop after the first of the year. This optimistic tone seems to be quite prevalent in the field. One of the large interests reports that in spite of the recent decrease in demand the present year will show a volume of business one-third greater than ever before. Even at present, though individual orders are smaller, this company reports that the actual number of orders and inquiries is increasing. The most active buyers of insulating material just now are said to be the repair shops, and cable manufacturers are also ordering varnished cambric fairly well. Foreign demand is conceded to be on the increase, and prospects for orders from abroad are brighter. Inquiries are coming in from England, France, Germany, Australia and the Scandinavian peninsula, it is said.

Raw material, except for paper, is plentiful, but not all producers have been able to catch up with back orders, which in one representative instance are still piled up one to three months ahead. Deliveries are improving, however, and on some classes of material orders can almost be filled from stock, it is stated.

Favorable Conditions in Car Wheel Market

Demand Good, with Bright Prospects for Future — Deliveries Are Improved and Prices Steady at Present, Though Trend Is Dependent Upon Raw Material

Demand for car wheels on the part of electric railways has been good and is well up to the standard of other years, manufacturers report. In some quarters sales to traction companies are said to be on the increase and the general tone of producers is optimistic. Prospects for 1921 business are held to be excellent. This view in large part is due to an anticipated buying movement from steam roads and to hopes of better financial conditions with street railways. As yet the effect of higher rates upon orders of car wheels by steam railroads has not been felt strongly, but manufacturers take an encouraging view of this situation and say it is still too early to expect definite results. One large producer is receiving more orders for replacements, however, though buying on behalf of new cars has not increased. The general tendency of electric traction companies has been to make their car wheels, both chilled iron and rolled steel, run a greater distance without making replacements, it is stated. This tendency is not now so evident, however.

Conditions of production are generally improved compared with the past summer, when one of the representative mills reported being frequently closed down because of a shortage of coal and coke. The shortage of cars added its depressing influence at that time so that orders piled up for sixty days and deliveries ranged in the neighborhood of three months. At present the supply of rolled steel and chilled iron wheels is reported favorable. In several cases a thirty days' reserve supply of wheels is kept on hand for regular customers and deliveries can be made in good time. One manufacturer's representative in the far West reports that orders from that territory can be filled in from thirty to sixty days. Furthermore, railways are anticipating their needs sufficiently to relieve the pressure of immediate delivery demands.

The supply of raw material is said to be much easier compared with a few months ago. Less complaint is heard of the coal and coke supply though existing prices in that line are considered high. There is, however, more or less of a scarcity of scrap wheels according to some wheel makers. These are very largely used in the manufacture of chilled iron wheels and during the war excess stocks of old wheels became depleted. Prices are holding steady and the opinion is quite generally expressed that quotations in this line have reached their peak.

Manufacturers seem to believe that present price levels will prevail for some time to come, but also add that some softening may be expected to follow, dependent upon the trend of raw material, coal, coke, wages, etc. Labor conditions in general are reported good, with an increasing tendency for more work to be accomplished per man in many instances. Cancellations, it is stated, have not been felt at all in the car wheel market.

Pittsburgh Railways Plans for 150 New Cars

Rehabilitation of the street car service in Pittsburgh is the object of a petition of the receivers of the Pittsburgh Railways to the United States District Court for permission to buy 150 latest model cars. The receivers, C. A. Fagan, W. D. George and S. L. Tone, plan to purchase 150 double-truck steel cars and other equipment, and also to build two new carhouses.

Purchase of the new cars will be on the allotment plan. The receivers, in their petition to the court, say that to carry out their plan 150 cars will be required, but for immediate use they need twenty-five. The receivers called attention of the court to the fact that since Jan. 1, 1920, they have been setting aside each month from the revenues of the system the sum of $25,000, which they regard as a very conservative amount, as a reserve fund for the purchase of cars.

"In view of the delays we have encountered in connection with the purchase of 150 additional cars," declared C. A. Fagan, "we have decided that it will not be best to delay commencing purchase of cars until we are able to purchase the full 150, but we recommend that twenty-five of this number be purchased immediately, paying for them out of the fund we have created in order that the equipment may be increased and improved to that extent. By obtaining bids we have found that we can purchase twenty-five double-truck, low-floor steel cars, each equipped with four motors, air brakes, heaters, fare boxes, etc., to be built immediately, at an aggregate cost of $375,000. This amount we can pay out of our reserve fund."

The program outlined by the receivers includes the first two of a number of new carhouses, replacing with new material all old trackage throughout the system, and a new system for cleaning cars in line with the receivers' plan for a perfect sanitary condition besides other important changes.

Wire Prices Closely Follow Raw Material Trend

Buying Is Light on Falling Market—Stocks Are Not Large and Deliveries Cover Wide Range

Demand for copper wire, both bare and insulated, is at a low level at present, according to manufacturers. This condition is attributed to the falling market, which automatically curtails buying until price readjustments are completed. Foreign demand is also light at present, though the exchange situation is partly to blame there. In some quarters it is stated that manufacturers are curtailing production in order to guard against overstocking.

As a result of lower cotton, rubber and copper prices, there has been a general easing off of prices on the whole line of bare and insulated wire. This reduction has been gradual and varies according to type and size. One producer estimates the extent of the price drop to be from about 10 to 15 per cent. Opinions differ as to whether prices have reached their lowest level. In many cases manufacturers have contracted in advance for cotton. Copper prices are also held to be close to the margin of producing cost. In view of these facts one large wire producer at least is buying copper at the present time. On the other hand, a great many interests seem to feel that still lower wire prices may prevail, provided that raw materials remain at their present level or drop further. This view holds that lower raw-material cost, especially of cotton, has not yet had time to make itself felt fully. Bare wire base at present ranges from about 20 cents to 20¾ cents, compared with about 22¼ cents two months ago.

In general the view is expressed that demand will remain light for the rest of this year, but that starting next spring a good volume of business will develop. Buying may even start heavily before then, one manufacturer says, if copper and cotton should start to move upward. In the opinion of this company, a rush to place orders would then ensue that would tax the capacity of wire mills and leave many consumers who have waited "out in the cold."

FEW CANCELLATIONS RECEIVED

A number of cancellations and requests for extensions have been received, especially from automobile manufacturers, but outside of that industry the number does not seem to be great. The chief reason for cancellations is felt to be the overbuying that has taken place in an effort to insure deliveries. Stocks, on the whole, are not large. One company has unfilled orders ahead for three months on certain sizes of weatherproof wire, and another is quoting deliveries of from six to twenty weeks on some sizes of insulated wire and four to six weeks on bare. Many sizes are available from stock, however. Magnet wire stocks are generally short and deliveries cannot be made from stock. One representative producer is quoting eight to ten weeks. Another manufacturer presents the exception to the rule by reporting a good stock of fine insulated wire but a short supply of the large sizes, which in that case are meeting a stronger demand.

Prices generally are very unstable and, as one manufacturer puts it, are "all over the lot." No prices can be quoted on going to press which can reasonably be expected to hold over publication date.

Further Encouraging Word from St. Louis Car Company

Further word received from the St. Louis Car Company states that the company is not out of production, but is still building cars, as the capacity of the plant is but partially and temporarily interrupted. As stated in last week's issue the main car building section of the plant was saved. The lumber stock, dry kilns, foundries and foundry machine shops, automobile plant, west side mill, cabinet and erecting shops, tool room and stores department were not damaged, thus enabling partial production to be resumed immediately and which is expected to increase daily. The plant is resuming operation on three shifts of eight hours each, it is announced.

Rolling Stock

St. Petersburg & Gulf Railway, St. Petersburg, Fla., mentioned in the June 12 issue as ordering eight safety cars, has been promised delivery sometime during this month, it is announced. A strike delayed the fulfillment of the contract.

Twin City Rapid Transit Company, Minneapolis, Minn., will put twelve of the 300 cars being changed over to the front exit type, as announced in the Sept. 11 issue, into operation on Nov. 1 it is announced. The remainder will be in service by Jan. 1, it is said.

The Salt Lake & Utah Railroad, Salt Lake City, Utah, has recently put into service on its lines, thirty-six new open cars of an order of fifty, it is announced. The company has also secured the use of forty-five cars belonging to the Nevada Copper Belt Railroad, during the beet-hauling season which is now on.

United Railways of St. Louis, Mo., lost fifty trailers, valued at $8,412 each in the recent fire at the plant of the St. Louis Car Company, it is announced. The car parts had been completed in the fabricating plant and were ready for assembling. Deliveries of two cars a day were intended to have begun next month. The program of the Public Service Commission which recently ordered the United Railways to add six cars a week to its equipment beginning Nov. 1, may now have to be held up for six months it is thought.

Georgia Railway & Power Company, Atlanta, Ga., besides the fifteen new center entrance cars placed in operation last spring, announces that it has 27 more in process of construction, divided among fifteen city, eight suburban and four interurban cars, the latter of which are for service on the Marietta line. The cost is said to be $11,937.87 each, compared with about $4,000 for the same cars some six or eight years ago. The company hopes for delivery to be made in the course of the next two or three months when the cars will be put into service.

Recent Incorporations

North Carolina Lines, Inc., Charlotte, N. C.—The North Carolina Lines, Inc., has been formed for the purpose of constructing an interurban line from Charlotte to Winston-Salem. The company is headed by Harry F. Hann, Winston-Salem. It has a tentative capital stock of $500,000.

Track and Roadway

New York State Railways, Syracuse, N. Y.—There will be an early hearing by Public Service Commissioner Frank Irvine on the petition of the New York State Railways for permission to construct in Milton Avenue and on private right-of-way in Solvay loop tracks connecting with the main line and for approval of a local franchise given by Solvay. The loop track, it is understood, is for the use of employees of the Solvay Company.

New York State Railways, Rome, N. Y.—The Public Service Commission, Second District, has granted permission and approval to the New York State Railways to construct and operate an extension in Rome consisting of a single track line to connect with the present line in Expense Street at Thomas Street northerly along Expense Street, westerly in Bloomfield Street and north on Kent Street to Elm Street. The commission also approved the franchises which were granted by the city officials. There was no opposition to the company's application at a hearing before Commissioner Frank Irvine who holds that the construction of the extension and exercise of the franchises are necessary for the public service.

International Railway, Buffalo, New York.—Application has been made by the International Railway to the town board of Tonawanda for permission to construct, maintain and operate an additional track along the River road from the Buffalo city line to a point near the Wickwire-Spencer Steel Company's plant, a distance of 6,068 ft. The International now operates a line along the River road to the new frontier industrial district but increased traffic warrants the double tracking of this line. The City Council of Buffalo will oppose the application when it comes before the Public Service Commission on the ground that there is more urgent necessity to improve existing lines in Buffalo than to double-track a stub interurban line.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa.—The Trenton, Bristol & Philadelphia Street Railway has been requested by the Borough Council of Tullytown, Pa., to relocate its tracks through the entire town in order that the State Highway Department might lay a concrete pavement for a distance of 7,180 ft. The railway will bear the expense of the relaying of the tracks from the middle to one side of the street.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—The Salt Lake & Utah Railroad, an electric line, which operates between Salt Lake City and Payson, Utah, has built four new spur tracks to take care of the shipping of sugar beets this season over the company's lines.

Bamberger Electric Railroad, Salt Lake City, Utah.—Work upon the complete double tracking of the Bamberger Electric Railroad between Ogden and Salt Lake City has been begun by the company. Work upon that part of the line between Ogden and the site of the new U. S. government arsenal at Sunset, which is about six miles, is being rushed in order to handle the heavy traffic in connection with the construction and operation of this plant.

Trade Notes

The Ohio Brass Company, Mansfield, Ohio, announces that D. McLaughlin who has been superintendent of the Michigan Railways for several years, has joined the service organization of the company and will devote his attention principally to car equipment material.

C. J. Logan, for twelve years connected with the Railway Audit & Inspection Company, Inc., Philadelphia, Pa., announces the organization of "Logan Service," of which he is president. Mr. Logan will continue this new company for the handling of "service" to railway properties and industrial corporations.

The American Gear Manufacturers' Association, anounces that as standardization and costs are closely related, these will be the pricipal subjects discussed at its semi-annual meeting to be held at Mohonk Lake, N. Y., Oct. 27, 28 and 29. Among the speakers will be P. G. Agnew, secretary of the American Engineering Standards Committee, whose subject will be "Standardization from the Point of View of the American Engineering Standards Committee"; Calvin W. Rice, secretary of the American Society of Mechanical Engineers, who will speak on "Standardization"; C. L. Collens, II, president of the Reliance Electric & Engineering Company and past president of the Electric Power Club, whose subject will be "Industry Organization," and Christopher Haigh, supervisor of costs, General Electric Company, who will describe the "Machine Rate Method of Distributing Expense." At an informal banquet to be held Thursday night, Oct. 28, Charles W. Woodward, vice-president in charge of personnel for the Hydraulic Pressed Steel Company, will be the pricipal speaker, taking as his subject "The Human Element in Industry." The American Gear Manufacturers' Association is making rapid strides in standardization and has received requests from Canada, England and Australia for copies of standards and recommended practices for the gear industry.

American Car & Foundry Company recently announced from its New York office that as part of its plan of extension in the Buffalo District, W. H. Sanford, for many years district manager of its Buffalo plants, had been appointed assistant vice-president and would be placed in charge of sales in that vicinity. Prior to the formation of the American Car & Foundry Company, Mr. Sanford was employed by the Union Car Company. When that company was absorbed he was appointed paymaster and cashier at the Depew plant. In 1902 he was appointed local auditor of the Buffalo district followed by promotion to the position of resident representative. Later, in 1912, he was made district manager in charge of the Depew as well as the Buffalo Plants.

Mr. Sanford will be succeeded as district manager by Andrew H. Gairns, now occupying a similar position with the company in Chicago and who has had an extended experience in steel car work and locomotive building. Announcement was made at the same time that the company's new plant now under construction in Buffalo will be used for building all-steel cars, with a capacity for turning out twenty to thirty cars per day. It will be equipped with the most modern machinery and labor-saving devices known. In addition to the new car-building plant a modern up-to-date office building will be erected on property recently acquired across Babcock Street. The soft foundry at the Buffalo plant has been completely re-equipped and is now engaged in quantity production. The Niagara Wheel Department has also been brought up to a high state of efficiency. The car company's plans thus outlined involve a total expenditure of $3.500,000.

New Advertising Literature

Car Seats.—Hale & Kilburn Corporation, New York City, has issued a folder announcing its "Duplex Reversible Seat," which is designed for light cars.

Insulated Wire.—The Standard Underground Cable Company, Pittsburgh, Pa., has recently issued a forty-page bulletin describing its lines of insulated wire.

Motorman's Seat.—The J. G. Brill Company, Philadelphia, Pa., has issued bulletin No. 249, which describes and illustrates its new motorman's seat for standard Birney safety cars.

Hoists.—Sprague Electric Works, New York City, is distributing bulletin No. 48961 on type W, floor controlled hoists in capacities of 1 to 6 tons, both direct and alternating current.

Safety Cars.—The J. G. Brill Company, Philadelphia, Pa., is distributing publication No. 250, entitled "A New Point of View," which discusses editorial opinions of Birney Safety Cars.

Engineering Service.—Ford, Bacon & Davis, engineers, at 115 Broadway, New York City, have published a booklet called "Strength in Union," dealing especially with their valuation and report department.

Clamshell Buckets.—Blaw-Knox Company, Pittsburgh, Pa., is distributing two folders, one dealing with the "Blaw Bulldog Bucket," and the other with "lever arms, rated capacities and S-bends" as related to lever arm buckets.

Welding Apparatus.—The Bastian Blessing Company, Chicago, Ill., is distributing catalog No. 20, on "Rego" welding and cutting apparatus, with a booklet enclosed which is entitled, "A New Principle in Welding and Cutting Apparatus."

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

Volume 56 New York, Saturday, October 30, 1920 *Number* 18

Fitting Interurban Schedules to Traffic

ONE of the greatest opportunities for reducing operating expenses on city properties has been repeatedly found to be in a revision of schedules and rerouting to make the service conform to the traffic available. We wonder if this same trend of study might not well be applied to the interurban railways. In the early days the idea of running a car every hour—frequent service—was thought to be the characteristic of the electric line that formed the principal attraction for patronage. This tradition still prevails, and there is no doubt that it is a convenience to travelers well worth preserving provided there is enough traffic every hour to make the trip profitable. But the cost per car-hour is so high nowadays that it is more important than ever that the interurban manager should check up his schedules with a view to cutting any unprofitable car mileage. It is our observation that a good many unprofitable trips are being run on a good many interurban lines. We know of one case where a study of the service requirements and an adjustment of the schedule thereto resulted in increasing the revenue 20 cents a car-mile without any apparent loss of business. Another company has been gradually remolding its schedule to fit the traffic, with a favorable result on car earnings and no apparent loss of business. In other words, if the traffic available at a certain hour of the day is not enough to justify the expense of running that car it shall be taken off or the interval between cars spaced out until the patronage is adequate. The interurbans are well established now and we believe they can advantageously adhere to paying schedules even though it may mean paying less attention to the position of the hands of the clock in setting the leaving time.

"Trusteeship" and the Company Section

THE company sections of the American Electric Railway Association are organizations whose possibilities, it appears to many observers, have not been fully realized or at least have not been fully capitalized by those railways which are fortunate enough to have company sections on their properties. A company section provides the best possible medium for the circulation within the organization of information regarding the electric railway situation in general and of the local company in particular. It is also a most active force for the development of a sense of responsibility and obligation among the section members who are the rank and file of the industry today and the leaders of the industry of tomorrow.

In a recent address one of our leading public utility commissioners dwelt on the subject of "trusteeship," which, he said, rests upon every electric railway man today. He emphasized the absolute necessity of the electric railway to the community and at the same time referred to the inertia and lack of knowledge evidenced by the public in trying to settle what is now recognized as the electric railway problem. He then said that meanwhile, until the American public has shown itself capable of finding the solution, the electric railway operating personnel are and must be the trustees for the public in keeping in operation these most necessary railways. That it is a trust of no mean magnitude is evident to all who are in a position to have all the facts, and the more closely one examines the situation the more evident this truth becomes. Some one must realize both the duty and the opportunity, and the electric railway men are the ones to do it.

How to get all railway men to sense this situation is not so easily answered, but the commissioner, seconded by others present, suggested that the company section, composed of men of all ranks on any given property, is the place to develop the idea. Is this an opportunity in company section work? It isn't something which can be treated as part of an evening's program, but it is a purpose which every company section can well strive to attain as part of its regular work.

The Best Way to Dispose of Claims Is Not to Have Them

DURING the last few years the proper function of medical science has come to include the prevention of disease as of even greater importance than its cure. The latter will still remain, of course, part of the duty of the physician, but if he can reduce the causes of particular kinds of illness a great step in advance in the welfare of mankind will be made.

Much the same situation exists in the claims departments of our various railways. A decade or so ago, for example, the annual conventions of the Claims Association were devoted largely to discussions of such topics as the best means of securing the names of witnesses of accidents, the approved methods of preparing cases for trial, the practical value of expert medical testimony, whether medical examinations should be obtained in all accident cases, whether the best method of settling claims is by cash or check, what statistics of accidents should be kept, and whether so-called permanently injured persons should be kept under observation after their claims have been paid.

Problems of this kind remain, of course, to engage the attention of the claims department because accidents still occur, in spite of all that can be done, just as physicians will still have to study how to cure patients of disease. But the great part of the work of the claims department in the modern railway is now the prevention of accidents, and of the four technical sessions at the 1920 convention three were devoted entirely to this side of the work. It is obvious that this is a most desirable plan, from both a humanitarian and a financial point of view. It is logical also that the claims department should be the one to lead in this work, because it is the one which comes closest to the unfortunate results of accidents.

The Automobile Hazard and How It May Be Abated

THE widespread use of the automobile has involved many problems of an economic and social relation to the business world as well as to the electric railway, but none perhaps is more serious than that of the personal hazard to which the heedless operation of automobiles subjects every other user of the streets. Formerly, when the electric car was the most rapidly moving vehicle on the highway, though running on a fixed track and at a maximum speed of perhaps half of that of the average automobile of today, this speed was carefully regulated by the authorities in the interests of safety. Now, many of these restrictions remain, although the electric car in many cases is practically the slowest moving vehicle on the street. At the same time, powerful gasoline locomotives, for that is practically what they are, not bound by any track and in charge of inexperienced drivers, are allowed to run amuck.

The Claims Association did well to give up a day to the discussion of this subject and means by which this danger can be abated. In the papers presented at that session some very striking statements were made, including the one that automobiles are now causing half as many deaths in this country as industrial accidents and more than railroads and mines combined. The automobile evil is one also which is not confined to any one section of the country, but seems to be equally felt in all. It does not, of course, concern electric railway companies only. It affects all citizens alike, and it came up for discussion at the electric railway convention only because electric railway men have expert knowledge of transportation conditions and are trained to the use of traffic statistics and thus have probably a quicker perception of a situation of this kind than the ordinary citizen.

Various suggestions were made in the Claims meeting in regard to remedial measures. Where there is an evil there is usually a remedy, and the situation in regard to automobile hazards was not regarded by the claim agents as entirely hopeless. Means by which the highway can be made more safe were clearly pointed out at the meetings—nothing very radical, only the application of common sense to an admittedly serious situation. Now that the electric railway men have shown the way the reforms should be made effectual by the general body politic.

Motion Pictures at the Convention

DELEGATES to the Engineering and Transportation & Traffic association meetings at Atlantic City had an opportunity to see motion pictures turned to the use of the electric railways. The engineers, in a space of thirty minutes, saw practically the full process of track construction in Cleveland, something they could not see completely otherwise without spending perhaps several weeks in Cleveland at a particular time when track construction was under way. The Cleveland Railway has had so many inquiries about its advanced methods of building new track and tearing up old that it was decided to have this picture taken in order to be able more intelligently to tell other maintenance engineers about these methods. The film is thus a contribution to the advancement of the art, for, seeing it, other engineers will gain new ideas out of which may come not only the use of more modern methods on their own properties but perhaps an improvement on C. H. Clark's Cleveland ideas and machines.

So much for this film designed to educate those within the industry. The other film shown in the T. & T. Association meeting was prepared by the Kansas City Railways and designed to educate those without the industry. This film, as presented at Atlantic City, was not in its finished form. It had been very hurriedly put together to enable its showing at the convention and, as exhibited there, was subject to the obvious criticism of being too long and at points uninteresting to laymen. These things will of course be corrected before the film is shown locally. It was developed for the purpose of giving Kansas Citians a better understanding of the tremendous plant involved in giving street car service with which the public has no contact and little knowledge. Having some idea of this plant, such as power house, shops, etc., it was thought that patrons of the company would be better able to comprehend the items of expense which add up to make necessary the present high rates of fare and would have a more sympathetic appreciation of the intricacy of the transportation system.

In this film the convention delegates saw a concrete example of one phase of how the motion picture can be used to foster the public relations of the electric railway, a subject treated at some length in an editorial suggestion on the use of motion pictures, published in the ELECTRIC RAILWAY JOURNAL for Sept. 25, 1920, on page 604. The Kansas City Railways has pioneered in this undertaking and while the film may bear some of the inevitable evidences of an initial attempt, it points the way to what may be done. In last week's issue and again in the issue of this week views of different executives on the general plan are published. We solicit other contributions on this topic as the suggestion is evidently meeting with much interest.

Facts, Figures and Opinions Regarding Railroad Electrification

THE immense audience which gathered in the auditorium of the United Engineering Society's building in New York City on Oct. 22 demonstrated a compelling interest in heavy electric traction, the topic which brought mechanical and electrical engineers together on this occasion. Under the general direction of E. B. Katté, New York Central Railroad, with the co-operation of representatives of the A. S. M. E. and the A. I. E. E., a program of papers was presented, containing information of the kind needed to permit a correct estimate to be made of the present status of the subject. The material was set forth in carefully prepared papers, presenting alternately the respective merits of steam and electric locomotives, one might almost say in debate form. This fact must be kept in mind in reading the abstracts of the principal addresses given in last week's issue of this paper and those of the contributors to the discussion which is printed this week.

The proceedings differed from an "orthodox" debate in that the papers were all prepared in advance, there was no decision rendered on the merits of the presentation and of the question itself by a board of judges, and each side, more or less, admitted the other to have some ground to stand upon. As the discussion proceeded, the need for a co-operative effort to determine the conditions under which electrification is desirable became increasingly evident.

While there will always be differences of engineering and economic opinion regarding the wisdom and practicability of electrifying a given section of track, there ought to be no difference in the aspects of the facts involved. In other words, a fact ought to look the same to an electrical or a mechanical engineer whether he is connected with the operating or the manufacturing side of railroading. The engineer of either type is apt to be prejudiced in favor of the apparatus which he most admires and most fully understands. Again, the manufacturer has something to sell, whereas the operator has much capital tied up in existing equipment and in the development of present practices, which he does not wish to disturb. Each needs general information to offset his own bias. The most helpful function which a meeting like that held in New York can perform is, then, what might be termed the "mitigation of prejudice," or, maybe better, the "stimulation of tolerance." It is to be hoped that some such result will follow and that it will take tangible form.

In getting together the first step is to agree upon a few salient principles or facts. There are some sections of some railroads that obviously are not suitable for electrification, while others ought to be electrified at once, even in the present state of the money market. The reasons in both extreme cases are easy to find. Between these extremes are zones of less definiteness gradually approaching a region of doubt. There are, in each case, certain controlling factors, or "peremptory" factors as they were termed by C. O. Mailloux in an address delivered at the International Electrical Congress at Turin as far back as 1911. Why could not these factors be listed for present and prospective electrifications by a group of competent engineers, say by a composite committee made up of appointees of the railroad and engineering societies? This would not be a formidable task and the result would constitute a piece of really constructive work.

Engineers Seem to Be Getting Together

ONE of the hopeful signs in the transportation and general engineering fields is the way in which engineers are coming to confer more and more upon their common problems. This is illustrated by the numerous joint technical committees which are engaged upon various pieces of constructive work. The New York meeting discussed above shows what can be done by concerted effort. In spite of the fact that the meeting did not settle anything very definite regarding the future of electric motive power, it was well worth while. In our opinion, it was the most successful attempt so far made to get at the facts regarding heavy electric traction experience and comparable steam locomotive operating information. While, as we have already said, the meeting was in a sense more the presentation of arguments than an attempt of each speaker to give a judicial opinion on the issues involved, in this case pleading was entirely in order; in fact, it was expected. The point is that through coming together to hear the subject of heavy electric traction capably presented 1,500 or more interested engineers became better acquainted and they will pull together the better because they did so.

This meeting was the first of a series of joint meetings of the local sections of the two great engineering societies which are to be held this winter. This first one, "staged" by the A. S. M. E. railroad section, set a smart pace for those which are to follow.

A New Chapter in Labor Relations

IT IS seldom indeed that a large employer of labor is paid the compliment and shown the loyalty and support that came to Col. P. J. Kealy upon the occasion of the Oct. 21 court hearing looking to the appointment of a permanent receiver for the Kansas City Railways. This was reviewed briefly on page 893 of our Oct. 23 issue, and another chapter is added in this issue, covering the hearing of Oct. 26. The expression of sentiment referred to came in the form of a petition signed by 3,300 employees who had initiated the petition and financed the engagement of competent counsel, unknown to President Kealy, in order to present their interests to the court. After promising the court, the receivers and the people of Kansas City to "work wholeheartedly and together for the good of the company and the service of the public," and that "under no circumstances will we permit any interruption of this service," the employees petitioned as follows:

> First—That no outside labor interests nor those not in the company's employ be given any part in the present proceedings.
>
> Second—That nothing be done to disturb the present pleasant relations existing between the employees and their officials.
>
> Third—That Col. P. J. Kealy, under whose leadership this organization has been built up, be retained either as a receiver or as the operating head of this company. We have confidence in his ability and we know that the spirit of co-operation he has made possible will result, if possible, in better operation than at present . . .

The reasons cited to substantiate these requests upon the court are significant. The first was supported by the statement that it had been freely reported that those who left the employ of the company during the strike in December, 1918, would attempt either openly or otherwise again to interfere in the operation of the property upon the control passing to new management. The employees went on to point out that the feeling now prevailing among "the employees themselves and the relation between them and the company officials are those of co-operation, mutual help and square dealing," that collective bargaining has been provided for and grievances immediately adjusted, these conditions forming a situation which the employees are very much loath to have disturbed. In support of the second request, and speaking generally as to the man who shall have charge of the property in the future, they voiced the sentiment through their attorney that, with present conditions in mind, the future control of the company should be in the hands of a man to whom they can go, easy to approach and whose duties are not so numerous but that he can give personal attention to the men.

Whatever the outcome of the future in working out the Kansas City Railways' financial situation, it is apparent that the present labor situation, following as it does in the wake of a very costly strike, has very important significance for other companies. Whoever may assume control of the Kansas City property under the court will have the good fortune of being able to start out with a labor situation unusually favorable, for which he may thank the present management.

Accident Prevention Chief Topic Discussed by the Claims Association

S. B. HARE
Retiring President

The Papers and Discussions at the Meeting of the American Electric Railway Claims Association at Atlantic City on Oct. 11-14 Centered About the Subjects of Accident Prevention and Automobile Hazards—Technical and Office Matters Were Also Considered in One Session

J. J. REYNOLDS
President-Elect

THE meetings of the American Electric Railway Claims Association at Atlantic City on Oct. 11-14 were devoted almost entirely to discussions of means for preventing accidents, especially accidents with automobiles, which have grown to constitute such a large proportion of the accidents on electric railways.

The meetings, which were held in Claims Hall on the pier, were well attended and an active interest was displayed by the delegates in the subjects considered.

Monday's Session

A novel feature of the opening session of the association on Monday afternoon was the action of President S. B. Hare in calling upon members to rise in turn, and to state name, company and city. This done he read his address, which appears in abstract below.

ADDRESS OF PRESIDENT HARE

"With the extraordinary growth of transit facilities throughout the country, the increasing business demands for speed and the universal devotion to the 'god of hurry' the most important problem with which the public utilities have to deal is the prevention of accidents. The reduction of the number of accidents among employees and the public is prompted not only by humanitarian motives but by consideration of business expediency and financial profit. It does not make for efficient operation when valued employees are continually being killed or injured and when their places must be taken by less experienced men. A company is maintaining the integrity of its working organization when it safeguards by every means in its power the health and welfare of its employees. Every employee should be made to think and act safety. This applies to every member of the organization from the general manager to the humblest workman. The general manager, the superintendents of departments, the man in authority in any corporation who does not take an active interest in safety and welfare work is a dangerous man. Their greatest business should be to conserve life, limb and property of the employees and the public, thereby conserving the finances of their company.

"The appalling proportions to which accidents have reached in the State of Pennsylvania are enough to make one shudder. During the year 1919 the total number of accidents reported to the Department of Labor and Industry was 152,544; of this number 2,569 were fatal accidents, 38,942 were serious accidents and 111,033 were minor accidents. Children under the age of 16 years to the number of 768 were injured. The dependents of those injured totaled 125,380.

"Government experts have asserted that no less than 98 per cent of all personal accidents are preventable and but 2 per cent are due to defects in machinery and acts of God. Of this 98 per cent 70 per cent are due to thoughtlessness, 15 per cent to bad habits, 10 per cent to recklessness and 5 per cent to ignorance.

"Experience has taught that no marked or lasting results are obtainable unless an educational movement is made general, embracing the various plans that have proved practical. The elimination of thoughtlessness, carelessness, bad habits and ignorance can only be accomplished by education and instruction.

"Local safety drives have proved successful. Their benefit may not be apparent, but comparative figures have shown marked decrease in accidents after such drives.

"In St. Louis, Cleveland and Rochester marked reductions in accidents have followed intensive campaigns. In these cities thorough instruction in safety has been given in the schools. The influence of this instruction on the children, and through the children on the homes, has had much to do with the splendid record made in these three cities.

"A canvass of the automobile situation in the United States at the close of 1919 and a study of the relation between the numbers of automobile accidents and of motor vehicles in use show that the automobile, as much because of the carelessness of pedestrians as of drivers, is now the deadliest machine in America. It is estimated that there are now 7,600,000 automobiles and motor trucks in the United States, an automobile or truck to every third family; one to every fourteen persons, and the manufacturers predict that 2,000,000 automobiles and trucks will have been produced and sold during 1920. During recent years automobile accidents have resulted in approximately one-half the deaths caused by industrial accidents of all sorts.

"During the year 1919, 10,000 persons were killed in automobile accidents. What will be the harvest for the year 1920, when the total will reach more than 9,000,000? It remains for men in our position to offer some positive and lasting solution to this problem.

"Accident prevention should be considered from the financial side also. During 1919, 2,053,277 days were lost through accidents, and the wages lost totaled $8,755,697. Of the 152,544 accidents reported, 57,105 involved compensation to a total of $10,982,836. In public service industries alone compensation was awarded and paid in 3,905 cases, of which 316 were fatal, and the compensation paid amounted to $881,433. In the United States the sum expended by public utilities each year for accidents amounts to more than $300,000,000. Electric railways pay from 2 per cent to 12 per cent of gross income for damage suits and accident settlements.

L. H. ROCHE
Pittsburgh Railways

F. E. SHUMATE
Georgia Railway & Power Company

J. H. HANDLON
United Railroads of San Francisco

THREE OF THOSE WHO CONTRIBUTED PAPERS AT THE CLAIMS CONVENTION

"Statisticians say that 14,000,000 persons will be injured in accidents in the United States within a year and that 100,000 persons will be killed. If accident prevention does not appeal from a humanitarian standpoint, then it can be reasoned out from a financial side with a view of the proposition as one involving a great public trust.

"Accident prevention should be the aim of all. Safety first and safety always should be the watchword of all. 'I am my brother's keeper' should be the universal acknowledgment."

At the conclusion of the president's address Secretary J. S. Kubu then read the executive committee report covering the minutes of a meeting held in Cleveland in January. He also read his report as secretary-treasurer showing how the instructions of the executive committee had been followed during the year. Mr. Hare then appointed as a nominating committee R. E. McDougall, W. F. Weh and William Tichenor.

Next, reports were received from several committees as follows: Mr. Kubu reported for the subjects committee, giving the program outlined at the Cleveland meeting. Mr. McDougall, for the safety committee, recommended active participation in the work of the National Safety Council. H. D. Briggs, for the committee on claims statistics, presented elaborate data compiled by the committee from a questionnaire sent to companies having gross receipts of $1,000,000 or over, covering numbers of accidents, settlements, lawsuits, etc. Finally J. J. Reynolds outlined some changes in the constitution and by-laws which were taken up later, and the meeting adjourned to the joint session with the T. & T. Association. A report of this joint session was published in the issue of this paper for Oct. 16 in the proceedings of the Transportation & Traffic Association.

Tuesday's Session

The session of the Claims Association on Tuesday afternoon was devoted to a discussion on automobile hazards. The main paper on this topic was presented by Ralph Stickle, assistant superintendent accident department Cleveland Railway. There were also written discussions by L. H. Roche, general inspector Associated Bureaus, Pittsburgh Railways; W. G. Fitzpatrick, general claims attorney Detroit United Railway, and J. H. Handlon, claim agent United Railroads of San Francisco. This program was followed except that owing to a delay in its receipt, the paper by Mr. Handlon was not presented until a later session. Abstracts of these four papers appear on another page in this issue.

The discussion which followed their presentation related principally to the laws of the different states in regard to the issuance of licenses for drivers of automobiles and the laws governing automobile operation. Generally, it was found that the casual driver of automobiles was the one most liable to accidents. It developed also that in some states examinations of drivers were not required before a person was permitted to operate an automobile. Failure of the authorities to enforce automobile laws was also held to account for many of the accidents.

Wednesday's Session

The program on Wednesday afternoon covered three papers. The first was entitled "Accidents—Cause and Prevention" by F. E. Shumate, general attorney Georgia Railway & Power Company, Atlanta, Ga. This paper was followed by two discussions of the same subject. The first of these was on "Causes and Prevention of Accidents" by R. N. Hemming, superintendent of transportation Indiana Service Corporation, Fort Wayne, Ind. The second was on "Co-operation of Trainmen" by J. E. Duffy, general superintendent New York State Railways, Syracuse and Utica lines. Mr. Shumate's paper was read by L. F. Wynne, Atlanta; Mr. Hemming's by H. O. Allison, Pittsburgh, and Mr. Duffy's paper was presented by the author. Abstracts of these papers follow:

PAPER BY MR. SHUMATE

After explaining that his company classified accidents under twenty-eight heads Mr. Shumate said that collisions with motor vehicles constituted the largest accident item in Atlanta, after which came collisions between cars, followed closely by boarding and alighting or step accidents.

The streets in Atlanta are narrow and the large amount of riding requires frequent cars. Practically all of the downtown streets are occupied by double tracks, leaving the space between the tracks and the curbs very narrow, with scarcely room for an automobile to pass between the curb and the car. Where parking is permitted in this area, traffic can move only upon the part of the street upon which the tracks are. This makes the transportation situation bad all over the city, with traffic congestion in the downtown districts and reckless running by automobiles in the less congested areas. In the speaker's opinion if the city would pass ordinances to clear the streets of parked vehicles and would institute strict control of traffic there would be a material reduction in automobile accidents. Such an anti-parking ordinance has recently been put in operation in Atlanta applying to all streets in the center of the city between 7 a.m. and 7 p.m., and it has cleared up traffic to an almost unbelievable extent, and while it is impossible yet to determine definitely the effect on auto accidents, the speaker believed that they certainly will be reduced to a considerable extent.

As regards collisions between cars, the speaker believed that carelessness was at the bottom of nine-tenths of these accidents, excuses to the contrary notwithstanding. "Slick track" and "bad brakes" are the excuses advanced most frequently, but the motorman and conductor, before they start out, should know when these conditions are present. It is helpful also for the company to have emergency automobiles equipped with sand bins and sanding apparatus, making the sanding of tracks on short notice possible.

Up to within recently very few cars in Atlanta have had inclosed platforms. Fifteen cars of this type were put in service in January, 1920, and not one step accident of any consequence has been reported in connection with them. The paper urged those who did not have inclosed cars to install doors.

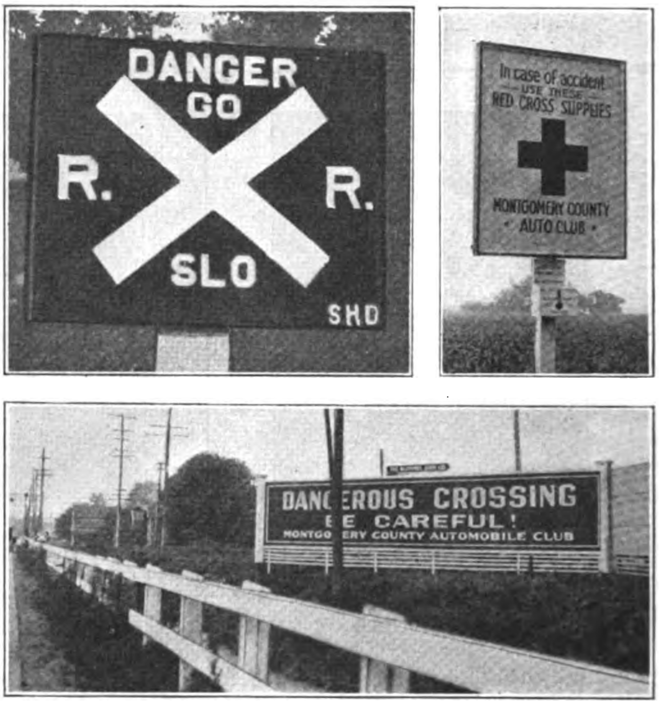
Mr. Shumate's paper also spoke of claims made by persons in, approaching and after leaving cars, caused by defective pavements and conditions incident to paving and repairing streets. Crews should be taught to look out for and avoid stopping their cars at places which do not afford a safe alighting place. If such a condition exists they should be instructed to stop their cars short of the regular stopping place or move beyond it. It has been his experience that the co-operation of crews in this respect is easily secured.

DISCUSSION BY MR. HEMMING

In his paper Mr. Hemming first pointed out some striking facts, as that only 7 per cent of economic human life is covered by insurance, whereas 82 per cent of the combustible property in the country is covered by insurance, and that out of 942 electric railways in this country only 120 belong to the National Safety Council. He believes that all companies should join the council and that each city should have its local safety council.

Continuing, the paper declared that carelessness will thrive so long as it has food to feed on, and that the ever-increasing vehicular traffic constitutes an increasing source of danger. Inexperienced youthful drivers are to be found among the habitual accident breeders, but recklessness is also found in every community among the leading citizens, who assume that their social or political standing will release them from any fine or imprisonment.

Railway companies should burn the story of the need for carefulness into the hearts of the people in their respective communities. Safety must eventually become a part of the daily curriculum of the schools, and the railway companies should come forward in greater numbers in co-operating with the National Safety Council. Every electric railway sets up a yearly fund of at least 3 per cent of its gross receipts for accident claims, but how much is set up for accident prevention? Mr. Hemming asked.


DANGER
GO
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In case of accident USE THESE RED CROSS SUPPLIES
MONTGOMERY COUNTY AUTO CLUB
DANC EROUS CROSSING
E CAREFUL!
MONTGO ERY COUNTY AUTOMOBILE CLUB

ROAD SIGNS PRAISED BY MR. HEMMING

The same arguments for safety are not effective with all people. Some have to be pushed, others pulled; some have to be thrashed into obedience and others appealed to.

Much can be done at railroad crossings, and the accompanying illustrations show commendable work done by the Montgomery County Automobile Club in Ohio. The signs placed at railroad stations are down low and within vision of the driver and within range of his headlights. There are also massive billboards reading "Dangerous Crossing, Be Careful." Electric railways should act jointly with steam railways in conspicuous billboard displays on the subject of safety. The bridges and viaducts where railroads pass over city streets or country roads afford good places where timely suggestions in life-sized objects, characteristic of location can be shown. In this manner and in many others striking visualizations can be made.

DISCUSSION BY MR. DUFFY

The first way for co-operation pointed out by the speaker was an exchange of information between the superintendent of transportation and the claim department in regard to the details of an accident. Often damages are minimized by crews in making out their reports to the transportation department, and the superintendents are without knowledge as to the facts unless they are fully informed by the claim department as to the results of investigation. The transportation department, therefore, should see that all the necessary information is furnished on the report made by the trainmen, and the claim department after a careful investigation should furnish the transportation department with a statement where witnesses differ from the statements furnished by the trainmen. If there is a difference in facts the matter can be taken up with the trainmen, and this should accomplish good results.

On many properties the constant changing of employees during the war period had a marked effect on the number of accidents, and the larger number of accidents are usually caused by new men. After new employees have been placed on the extra list, they should be carefully watched by the instructor and other officials of the transportation department to see that they fully understand their duties and are careful in their handling of car and passengers. Instructions should never cease, and the necessity for care in the prevention of accidents should be brought to their attention as often as possible. This may be done by talking with the men or by printed bulletins.

Trainmen can best co-operate by freedom from accidents and, if one occurs, by supplying the fullest information as to how it happened and securing the names of the largest number of witnesses. The advent of heavy automobile traffic should only make the motorman more alert in operation of his car and take no chances.

Before these papers were discussed G. B. Muldam of the Underwriters Laboratory, Chicago and New York, explained the service of that organization, which was originally founded by the National Board of Fire Underwriters and is maintained by that board in connection now with the casualty insurance companies. The laboratories pass on the safety qualities of devices submitted to them, whether relating to fire protection or prevention of accidents. Information on these points is available to those interested.

A. H. Ford, formerly manager Cumberland County Power & Light Company, Portland, Maine, and now of the Ford Insurance Company, New York, then addressed the association, mentioning among other things that through an arrangement which he had made with the Underwriters it is now possible for a railway company to secure a policy which will protect it in case of accident where the damage to any one accident is in excess of $25,000, exclusive of the damages to the company's own property or employees; in other words, insurance against catastrophe.

ACCIDENT BOARD AND HONOR LIST

The paper "Accident Board and Honor List" by Alves Dixon, superintendent El Paso Electric Railway, was then read in the absence of the author by R. E. McDougall. An abstract follows:

In this paper Mr. Dixon described a plan by which the company each month posted the names of all trainmen who had no accident for which they were responsible during the previous month and also those who had had such an accident. The posting is done on a bulletin board about 14 ft. wide, 5 ft. high and 6 in. deep, inclosed by sliding glass doors. Each trainman has a separate record card 3 in. x 5 in. and this is hung on a card on one side of the board or the other, depending upon his accident record during the previous month. The card also carries a notation relating to the accident. The question of responsibility is determined at a joint daily meeting of the superintendent, superintendent of transportation, chief inspector and claim agent, but any request for reconsideration of their decision by the man affected is always granted.

Beginning last January, those trainmen whose names appeared for three successive months on the "No Accident" side of the bulletin board received one day off on full pay. This plan has since been followed each month. In addition every man on this honor roll can take a day off for each following month during which no accident is charged against him, but if he has an accident he must again work three months before getting a day off. Eleven months' experience with the plan indicated to the speaker that it was a desirable one.

In the discussion which followed one delegate suggested that the practice of posting the name of the employee responsible for an accident would furnish a good lead for the ambulance chaser, who might in this way get earlier information in regard to an accident than even the claim agent of the property himself.

After discussion, the association then passed a resolution recommending that the American Electric Railway Association become a member of the National Safety Council and that the Claims Association should appoint a committee to work in conjunction with a similar committee from the Transportation & Traffic Association in outlining the work to be done by the two associations in the National Safety Council.

Thursday's Session

The session on Thursday was devoted to a free-for-all discussion on a number of topics of interest to the claims department. The first topic considered was in regard to the increased cost of claims and some of the reasons contributing thereto. The evidence seemed to be that there has been an increase in the amount of settlements. The next question was on the prosecution of claims for damages to company property. The practice in this matter was found to vary, but in general the evidence was that, especially in the smaller cities, smaller claims were not prosecuted, but where the claim, as one representative expressed it, amounted to $50 or $75 or perhaps $200 or $300, the claim was prosecuted.

The next topic was how best to safeguard releases from attack. It developed that some companies took releases under seal, while others did not consider that necessary if the claimant thoroughly understood that the payment was for settlement in full and was satisfied and this fact could be proved in court, and the payment was considered legally "sufficient." There was some discussion also as to the relative advantage of payment by check and by cash. It developed that small sums were often paid in cash, but larger sums usually by check. The next subject was "the best method of keeping in touch with witnesses." One practice described was to procure the name of the nearest relative as well as the occupation of the witness and by whom employed, then when the case is set for trial to get in touch with the witnesses by telephone or personally, notifying them that the case is likely to come up within the next two or three weeks.

The next topic considered was the value of secret service, and one delegate cited a case where a secret service operator had greatly assisted in securing the names of witnesses of an accident. The final subject was the handling of blind and fraudulent cases. In this connection one case was cited where a malingerer who asserted that he had been crippled from an accident was photographed by the company with a moving picture machine in the act of moving heavy potted plants. Later the pictures were shown in court. After several trials the original verdict was greatly reduced.

After a further discussion of the hazards introduced by inexperienced drivers of automobiles, the suggestion was made that at further meetings the association go on record as approving or disapproving the suggestions or policies under discussion, so that the members would know the general consensus of opinion reached by the delegates at the sessions.

OFFICERS FOR ENSUING YEAR

The nominating committee then presented the following nominations:

For president, John J. Reynolds, claim attorney Boston Elevated Railway.

First vice-president, C. G. Rice, manager Associated Bureaus, Pittsburgh Railways.

Second vice-president, Wallace Muir, claim agent Kentucky Traction & Terminal Company, Lexington, Ky.

Third vice-president, W. H. Hyland, claim agent Fonda, Johnstown & Gloversville Railway, Gloversville, N. Y.

Secretary and treasurer, J. S. Kubu, claim agent New York State Railways, Utica.

Executive committee, H. D. Briggs, assistant claim agent Public Service Railway, Newark, N. J.; E. L. Lindemuth, claim agent Wilkes-Barre Railway; C. B. Proctor, claim agent Memphis Street Railway; W. G. Fitzpatrick, general claim attorney Detroit United Railway.

On motion, Mr. Tichenor cast the ballot of the association for these officers.

After a vote of thanks to the president and other retiring officers, taken while the chair was occupied by Mr. Hyland, the association adjourned.

Grand Rapids Safeties Doing Well

More Frequent Service and a Seven-Cent Fare Are Expected to Improve the Financial Showing of Railway

BY OBSERVER

NINETEEN safety cars have been installed on two lines of the Grand Rapids (Mich.) Railway and had been in operation a little more than a month at the time of this writing. The first cars were placed in operation on June 1 and the entire number had been received and put in use by June 24.

The more important line on which the one-man cars were given their initial trial in Grand Rapids was the Cherry Street line. Coincident with the change in equipment a rerouting of lines was placed in effect, so that a definite comparison of the results obtained is impossible. In general, however, it may be said that the Cherry Street line now has a six-minute service to replace the ten-minute headway with the old double-truck cars and in rush hours a five-minute service instead of eight-minute. The same schedule speed has been retained.

The Cherry line was selected for the first safety car installation because it serves a residential section, without any industrial plants or railroad crossings, and has the characteristic that there are few stops at which there are both boarding and alighting passengers in large numbers. The experience in Grand Rapids is that the waiting time at stops is a little excessive if both leaving and boarding passengers must be handled in any number at one stop, and this is the one thing about which the public has made unfavorable comment. The delay which comes from overcrowding is avoided by the use of "car full" signs. As soon as a car coming through Monroe Avenue, the main business thoroughfare, is well loaded, which means about fifty passengers, so that the movement of passengers in the car becomes slow, the operator displays his car-full sign and proceeds without stopping. This not only enables the safety cars to give good regular service but prevents delaying the cars of other lines, practically all of which operate over Monroe Avenue.

When the cars were first installed they were slow on account of the inexperience of the operators in their numerous duties, but after the first few days this sluggish operation had been pretty well overcome. This is the usual experience. The number of collisions with other vehicles also showed a noticeable increase at first, but this is improving as the men become more familiar with the speed and braking action of the light cars.

The most definite example of what the safety cars have done in Grand Rapids in the way of increased earnings and decreased expenses was afforded in the temporary installation on Butterworth Avenue before this line was through-routed with Shawmut. Here three safety cars displaced two double-truck cars and produced an increase in earnings of 14 per cent with a decrease in platform expense of 12 per cent, or a differential of over 20 per cent in favor of the one-man cars, omitting consideration of savings in power and maintenance.

HOW FARE INCREASE WAS HANDLED

The rate of fare was made 7 cents cash, with sixteen metal tickets for $1, by action of the city commission on June 24. This, together with the increased riding due to improved service, is expected to overcome the deficit which prevailed under the 6-cent fare, with nineteen tickets for $1, unless it becomes necessary to increase the payroll substantially at the expiration of the present contract with the trainmen. The present wage scale calls for a maximum of 51 cents an hour, with 9 cents additional for safety car operators.

When the rate of fare was changed the use of metal tokens was discontinued temporarily and paper tickets were used for the new ticket rate. After about a month, when practically all of the metal tokens were in, the paper tickets were discontinued and the same metal tokens again placed in circulation. By this means it was not necesasry to junk the old tokens and substitute new metal tickets of different design. Of course, the paper tickets used in the interim could not be deposited in the registering fare boxes with which a large number of the old cars and all the safety cars are equipped.

Symposium on Automobile Hazards*

THE SUBJECT of automobile hazards to electric railway companies was introduced at the session of the Claim Agents on Oct. 12 by the paper presented by Mr. Stickle. In this paper the author presents figures of the extent of the injuries from this cause which, he says, should alarm even the most complacent management and care-free public. Much, however, can be done to reduce accidents from this cause and the remedies suggested are listed in his article.

The tremendous increase in automobiles and the recklessness of chauffeurs have created a serious menace to the safety of all other users of the streets. One whole session of the claim agents at Atlantic City was devoted to a consideration of ways by which accidents from this cause can be reduced

AT THE MEETING on Oct. 12 Mr. Stickle's paper on automobile hazards was followed by written discussions from L. H. Roche, general inspector Associated Bureaus, Pittsburgh Railways; W. G. Fitzpatrick, general claims attorney Detroit United Railway, and J. H. Handlon, claim agent United Railroads of San Francisco. Each of these authors gives his views on ways in which claim agents can help in this matter. Abstracts of these discussions are published.

The Automobile Hazard

BY RALPH STICKLE
Assistant Superintendent Accident Department, Cleveland Railway

THE "automobile hazard" is today the greatest risk of the electric railway claim man, one of the most difficult problems of the transportation official, and the public's deadliest traffic menace. It affects not merely company schedules and treasury but the general public welfare.

Just what is the automobile hazard, and how may it be lessened by railway companies, autoists and public?

The auto is the most numerous, as well as the swiftest and most dangerous, vehicle on our highways. Commercially, born with the century, it has increased, with rabbit-like prolificness, from 3,700 in the United States in 1900 (Encyclopedia Americana) to 7,558,848 in 1919 (National Automobile Chamber of Commerce). The world total is 8,837,000. And the number is still increasing. If the entire country were as well supplied per capita as Iowa is, there would be twice as many in the United States as there are. Two million autos are building this year. The manufacturers say there will be one to every family in the country in five years. Admittedly, the auto is a problem in more ways than one. The street railway industry has also expanded—at least physically. In twenty years trackage has increased from 22,589 miles with 61,404 cars (Census Office, 1902) to 48,484 miles with 83,015 cars (*World* Almanac, 1920). Consequently, with the steady increase in the railway business, and the marvelous development of the automobile industry, the traffic problem between auto and trolley has become serious and yearly becomes more serious.

TABLE SHOWING TOTAL ACCIDENTS AND THOSE CAUSED BY AUTOMOBILES, CLEVELAND RAILWAY

Year	Total Accidents	Auto Accidents	Total Claims Paid	Auto Claims Paid
1911	18,948	1,150	$224,694	$8,846
1912	17,953	1,803	232,873	10,687
1913	19,596	2,258	308,634	26,133
1914	21,549	3,270	408,863	31,851
1915	20,018	3,987	361,422	35,195
1916	23,136	5,666	570,829	46,286
1917	26,607	8,242	739,815	*95,144
1918	22,884	7,085	791,072	110,611
1919	24,045	8,078	1,001,846	161,062

* Largest item in classification.

Some figures of the Cleveland Railway since 1911, when a separate classification for auto accidents was first made, may serve to illustrate the growing seriousness of this hazard. The data are tabulated above.

During these eight years the percentage of auto accidents to the total number of accidents increased from 6.1 to 33.6; the percentage of cost to the total accident expenditure from 3.9 to 16.1 per cent. The increase in number of accidents in the 1911-1919 period was 600 per cent; the increase in cost 1,720 per cent.

This is all urban territory, but surburban and interurban districts show about the same condition. In one country division of the Public Service Railway of New Jersey the number of auto accidents increased 345 per cent between 1914 and 1919, and the cost increased 1,445 per cent. In another country division the number increased 452 per cent and the cost 741 per cent. Figures from various parts of the country will show a similar trend. They ought to alarm even the most complacent management and the most care-free public. For these growing accident lists are accompanied by growing death lists.

Here are a few more figures from our Cleveland experience. The company in 1919 had 6,972 passenger accidents while carrying 402,808,820 passengers. In the same period the 80,000 autos of Cleveland had 8,078 accidents with Cleveland street cars. There was one passenger accident for 57,760 passengers, one auto accident for ten autos. Or, to put it another way, 10 per cent of the autos had accidents with street cars. Or again, we had more than a thousand more accidents with autos in the year than we had with 400,000,000 passengers.

Such facts might be multiplied to show the increasing hazard of the auto. Its deadly work, aside from its trolley accidents, might be noted. For instance, the United States Census Bureau lists 6,021 deaths by auto in 1917 in twenty-seven states that kept records of auto casualties. The National Safety Council places the number in the country in 1919 at 11,000 and avers that autos are now causing half as many deaths as industrial accidents, and more than railroads and mines combined. It points out that deaths by auto are increasing in proportion as autos increase.

Claim men are familiar with these facts. They know what the autombile hazard is. What they want to know is what can be done about it?

Frankly, as claim agents they can do little; as publicists much; as advisers, in co-operation with safety men and transportation officials, much more.

Claim men realize the seriousness of the situation as no other class does, for they deal at first hand with the results of the evil. Transportation men know about it, but it isn't their biggest task. The public has been told about it but does not understand its magnitude.

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*Abstracts of papers presented at the annual convention of the American Electric Railway Claims Association, Atlantic City, N. J., Oct. 11-14, 1920.

It should be the business of claim men to try to make transportation men, autoists and the public realize—visualize—see the importance of this problem and solve it. It should be their business, either as safety men or in co-operation with safety men, to lead in solving it.

Little can be done to relieve the claim department in handling auto accidents except to prevent the accidents. The courts might change their attitude on some points, without discriminating in favor of "the rich corporation"—for example, on the doctrine of imputed negligence, or the lack of it. As the law is now interpreted in most of the states a passenger in an auto is responsible for nothing except the prosecution of his claim after he gets hurt. He should assume, or be legally held, to a little more responsibility. But such relief is unlikely soon to come.

There is one thing however, that might be done. The electric railways still are laboring under the incubus of a mass of laws, mostly city ordinances, passed in the last century, when trolleys were the swiftest and most dangerous vehicles on streets and roads. Today they are not the most numerous nor the most deadly users of the streets. That distinction belongs to the auto. These archaic laws, useful simply to furnish grounds on which to maintain damage actions, should be repealed, and laws should be enacted which recognize the auto as the greatest vehicular menace.

Cleveland was freed from eight or ten such antiquated ordinances last summer, thanks to the good sense of the City Council, acting under the advice of its street railway commissioner, Judge Fielder Sanders. One of the repealed ordinances required the motorman to ring his gong at least 100 ft. before reaching each street intersection, and to continue to ring it until he passed the intersection! But it was, and still is, perfectly legal for a pauper epileptic who has just broken out of an asylum and who never before held a steering wheel to take an eight-cylinder car through the densest traffic.

But the real solution is to prevent the accidents. And as reforms, like charity, should begin at home, we should work first on the problem of what may be done by the companies to decrease the number of auto accidents.

HOW THE EMPLOYEES AND AUTO DRIVERS MAY HELP

Employees never will get, or soon will lose, interest in any accident-prevention movement if the management is indifferent. The company which permits dangerous equipment to be used, or neglects to eliminate all possible hazards, will not get its employees to co-operate in safety work. Nor will the public believe in its sincerity.

What motorman will be influenced by a plea for more careful car operation when he knows the management will not help him by so much as removing a bush or trimming a tree that may obstruct his view at a grade crossing?

The Bureau of Safety of the Midwest Utilities Company recognizes this idea. Its first move in organizing for safety work is to attempt to put equipment, car shops, depots, substations and grade crossings in the safest possible condition. For instance, the bureau will take a stretch of track, chart each grade crossing, give figures showing the number and expense of accidents that have occurred there, state the reasons why it is dangerous, attach photographs to prove it dangerous, make a recommendation as to changes, and offer an estimate of the cost. And the recommendations are usually followed.

In this connection there are many improvements, so called, on which operating and safety men do not agree —the near-side stop, warning signals at crossings, etc. But with a "dead man's crossing" in every community through which rails pass, there must be plenty of room for work of this kind on which we all can agree.

When the management has shown its sincerity, then is the time to begin on the employees. Inaugurate a systematic, continuous campaign among the platform men to get them in the right spirit, to make them realize that their personal good as well as the general good will be promoted by avoiding accidents. Point out to them the suffering that carelessness causes. Show them the material loss, and the fact that if they avoid this waste they will profit personally.

Also, operate on the public. Reports show that in large cities a considerable percentage of the auto accidents are with the autos of big employers—taxi, ice, milk and transfer companies, department stores, etc. Why not get in closer touch with such organizations? If a railway company were prepared to send a well-equipped speaker to address gatherings of taxi drivers and delivery men on the question of auto accidents, how to prevent them and what to do if they happen, the drivers' employers would be glad to furnish the audiences. And it would be constructive prevention work; it would help to prevent accidents and to prevent lawsuits if accidents happened.

CHANGES POSSIBLE IN THE LAWS

We should take more interest in the prosecution of persons who violate safety ordinances and laws. Laws are of little consequence unless enforced, and when the violation of a safety law is clear and the proof certain, we should get back of the prosecution.

But when it comes to reforms, it is human nature to think that most of the reforming should be done by the other fellow. We are not exceptions. We feel ourselves more sinned against than sinning. Every claim man believes, and every operating man is certain, that the vast majority of auto-trolley collisions is the fault of the autoist. Investigation by the National Safety Council of 18,000 such collisions places the blame wholly on the driver in 64.2 per cent of the cases, and wholly on the motorman in only 8.1 per cent of the cases. Even semi-hostile authorities agree with us. Of sixteen auto club secretaries, fourteen thought autoists more careless than motormen. Two thought the fault was fifty-fifty.

Without exception, auto clubs, civic bodies and traffic officials are convinced there should be decided changes in auto and traffic laws, and more stringent enforcement of the laws.

Traffic laws in state and nation should be uniform. The obligations and rights of the driver and the pedestrian should be defined clearly, and should be general in application. As it is, a city's regulations frequently are different from those in its suburbs, and a traffic virtue in one county may be a misdemeanor in the next. Who can tell whether it is permissible in the next town to pass a street car on the left side, turn in the middle of the block, or run by a standing trolley?

The electric railway section of the National Safety Council, recognizing the safety feature of uniform traffic laws, is working with auto clubs and police departments on this, and something may be accomplished.

Two years ago our Transportation & Traffic Association named a committee to work on this subject, and a model traffic ordinance has been drafted. One feature of this model ordinance that would be particularly helpful in preventing auto-trolley mishaps and in protecting the companies from unjust claims is the creation of "main thoroughfares." In many of our cities ordinances give traffic in certain streets the right of way. But these ordinances generally mean little or nothing, being neither enforced as traffic regulations nor of benefit as a defence in damage actions. The practical effect of the establishment of "main thoroughfares," which, of course, would include street car streets, would be to compel the drivers of autos or other vehicles crossing or entering these favored streets to "stop, look and listen."

It is surprising but true that few cities have done anything to limit the weight, size or width of trucks. Yet in addition to destroying pavements and roadbeds and congesting traffic, cumbersome, over-wide trucks are responsible for many accidents. No one questions the wisdom of curbing the truck builders, but how little has been done to curb them.

A model traffic ordinace necessarily includes parking regulations, the lack of which is a fruitful source of auto-trolley accidents, and a great slower of schedules. It affects the general public more adversely than it does the railway company, yet little has been done, except possibly in New York City, to correct the evil. There is popular sentiment in the larger cities in favor of more stringent parking regulations, including a no-parking rule on "main thoroughfares." Of course the companies should do what they can to get back of such sentiment.

It is axiomatic that autos and street cars cannot collide if they do not meet. They could be kept out of each other's society to a considerable extent by a separation of traffic. Why do we not boost the idea of "street car streets" and "auto boulevards?" It is coming. And it will lessen materially the automobile hazard in urban territory. The auto clubs favor it, and it will be an accomplished fact as soon as the public is shown that the expense will be small compared with the benefits from fewer accidents and improved traffic conditions.

Will you permit another reference to Cleveland to illustrate? A double-deck bridge across the Cuyahoga River and connecting with an auto boulevard was opened about Jan. 1, 1918, relieving auto traffic on parts of five "street car streets." In the railway division which includes these five streets our auto accidents decreased from 3,903 in 1917 to 2,710 in 1918 and 2,704 in 1919. On every other division there was an increase.

The public demands that motormen be trained to avoid accidents. There is another class that should be trained similarly--the traffic police. Only trained officers are permitted to search pawnshops for stolen goods, but it still seems to be *au fait* for police with no training to take a turn handling traffic—at least, in some cities. We have not fully awakened to the necessity for larger and better-trained traffic forces.

State and county could help to avoid accidents at grade crossings by placing warning signs at a fixed distance from crossings. These should be distinctive and uniform, and their usefulness should not be impaired by permitting advertising "warnings" in the vicinity. This brings us to the most important and radical reform of all, a real driver's licensing law. Small wonder Europe knows us as "careless America" when we show an absolute disregard for and indifference to the very essentials of safety. To permit any one who wishes to do so to drive an auto is such disregard. Except in a few states, any one may drive, or attempt to drive, an auto who can get the auto. True, in some states he must have attained a certain age and be sober, to a degree, but physical or mental fitness and knowledge of driving are of no consequence.

Licensing laws have been enacted in New Jersey, Massachusetts, Connecticut, New Hampshire, Maryland, Pennsylvania, Rhode Island and possibly one or two other states. Reports from safety officials in these states indicate that the effect has been good, although there is a feeling that the revocation and suspension features of the acts have not been invoked sufficiently. But this is a detail depending for its enforcement upon public opinion. It should be reasonably easy to get a driver's license in the first instance, and reasonably difficult to keep it. Probably every man in this room knows drivers he is convinced are unfit to drive. Every one cannot be a driver, any more than every one can be a Napoleon or a Babe Ruth.

Immature, intoxicated, feeble and mentally deficient persons should not drive, not to mention those who do not know how to drive. Where they have received licenses, prompt suspension or revocation should follow when their failing has been demonstrated. Police, insurance and railway company records in every city will show certain drivers who have had repeated accidents. Usually this is not chance. It is evidence of unfitness to drive.

Restrictions should be particularly severe on professional drivers, chauffeurs and truck drivers, who too often are temperamentally unfit and financially irresponsible.

CONCLUSIONS STATED

To recapitulate: The following ideas would tend to lessen the automobile hazard:

1. Repeal of antiquated anti-trolley legislation.
2. Improvement of the physical property.
3. Systematic continuous safety work among employees.
4. Propaganda directed toward the education of the public.
5. Uniform traffic laws in state and nation for:
    (a) Creation of main thoroughfares.
    (b) Proper parking regulations.
    (c) Separation of traffic by creating or establishing "street car streets" and "auto boulevards."
    (d) Uniform warning signals at grade crossings.
    (e) More and better trained traffic police.
    (f) Limitation of size and width of trucks.
6. Prosecution of safety law violators.

Individually and as an organization we should be working on these problems. As an organization we should try to arrive at some united understanding of what is wrong, and what we want, and then as a unit strive for it. It is not a subject in which we alone are interested. Every thinking person and every wide-awake public or semi-public body is seeking information on this subject and making suggestions. We should be alert to the opportunity to make our influence felt, to get what we want and need. There is scant sympathy for the man or organization that takes no interest in the discussion of proposed legislation and then objects to it when enacted.

But, after all, laws enacted or repealed, and traffic rules changed or perfected, will not eliminate the auto hazard. Accidents do not happen; they are caused. The careless person will continue to have them; the careful person will avoid them, laws or no laws.

The personal element is the vital factor. Most accidents are the result of human failing, not of mechanical defects. The auto or the street car itself rarely causes the trouble. The motorman says, "The brakes would not work." The difficulty was he did not work the brakes. Carelessness or ignorance, and who can say where is the line of demarcation between the two, is the predominating cause of accident. Great progress has been made in the war against accidents, but much remains to be done.

Let us do more than work for the enactment or repeal of laws or the correction of mechanical defects. Let us support and promote intelligent, continuous effort to make America careful. The task will be accomplished when once the public awakens to a realization of the suffering and waste that come from carelessness.

Discussion on the Automobile Hazard

By James L. Roche
Chief of Inspection Bureau, Associated Bureaus
Pittsburgh Railways

Education of Motormen and Chauffeurs Will Help, but Stricter Laws Are Also Necessary—The Pennsylvania Law on Responsibility of Passengers in Automobiles for Their Own Safety Is Cited

THIS paper is presented on the presumption that we are agreed that the motor vehicle hazard is our greatest one and that we are all doing our utmost to prevent this particular kind of accident as far as the education of our own men is concerned. If that be true, then the burden is entirely upon the motor vehicle driver and owner and the discussion is continued with that viewpoint. Regardless of the careless acts of the motor vehicle driver—in fact, because of them—we must redouble our efforts with our own men. Everything possible for their safety education should be done, making clear to all men—especially the new men—the great danger of automobile accidents. A safety organization is almost indispensable to the present-day traction company.

There are today approximately 7,500,000 motor vehicles in the United States and if the calculations of the motor manufacturers are correct there will be 12,000,000 motor vehicles in this country in 1923. The amount of capital invested in the automobile industry has been estimated at $1,297,000,000, and the industry has become the third greatest in the country. Along with the phenomenal growth, new and heavier types of machines were introduced until they rival the locomotive in speed, and with the continued increase in the number of machines and the improvements in speed and endurance, together with the increased size, came the greater number of accidents. These have increased to such an extent that the automobile hazard has become our greatest one and it is well that we take serious consideration of the situation and endeaver to do our share to cut down the number of these motor vehicle accidents. The motor vehicle has continued to expand beyond all human expectation. Self-starting devices and other improvements have made it possible for any one to operate it over the age of fifteen. But the sense of obligation to exercise a degree of care commensurate with the increased risk has not developed, and we have reached the stage where rights and privileges have run wild, with nothing much more to curb them than the individual's sense of responsibility.

Owners and employers are beginning to recognize the folly of placing a poorly trained or incompetent man in charge of the commercial vehicle. In the larger cities of the country successful schools have been held for the education of chauffeurs. These schools have been conducted in Pittsburgh, St. Louis, Detroit, Rochester, Milwaukee, etc. They have been attended by from 200 to 800 drivers and a regular course of lectures has been delivered. Bonuses have been given by employers to drivers who attended the entire course and no doubt great good has been accomplished by the National Safety Council, which conducted these schools. In Minneapolis, within the past two months, a successful school graduated sixty drivers. At all of the meetings there were in attendance from 200 to 300. It is suggested that in the territories not covered by the National Safety Council the local claim departments conduct such schools. Full information as to the proper manner and the subjects covered can be readily secured from the headquarters of the National Safety Council at Chicago.

Education will play an important part in the prevention of accidents arising out of the use of motor vehicles. A proper understanding of the hazards of the road, of the rules and regulations for the government of the machine and a decent regard for the rights and safety of fellow travelers will prevent accidents. It would seem as though the automobile manufacturer and the sales agency should take an active interest in this particular matter of education. The time is fast coming when the manufacturers will be caught up with their orders, and they will be forcing the sale of their machines. Why not sell the safety idea with the machine and spend some time with the new owner, teaching him the laws and rules of the road, and above all, impressing upon him the way accidents happen and how to prevent them.

For the habitually careless we must depend upon the laws that are made to control him. The ones with which I am familiar are either not severe enough or are not enforced as they should be, in my opinion. A locomotive engineer must spend years of apprenticeship and pass strict examinations before he assumes command of his engine; a motorman is taught the mechanism of his car and spends a considerable time with an instructor before he is permitted to operate his street car; even the man in charge of a stationary engine or boiler is subject to governmental supervision, yet any one not badly crippled, who has the money, can purchase an automobile and with the least amount of instruction take his place with thousands of others on our streets and roads and attempt to operate this dangerous vehicle. I believe that strict laws must be enacted to govern those who may be permitted to drive a motor vehicle and that they must be enforced by conscientious safety officials.

The automobile hazard has become so great that the courts are beginning to recognize it, as is indicated in the following summary of the legal standing of the motor vehicle by Mr. Chief Justice Cullen of the Supreme Court of New York State:

> That the motor vehicle on account of its size and weight, of its great power and of the great speed which it is capable of attaining, creates, unless managed by careful and competent operators, a most serious danger to other travelers on the highways and to occupants of the vehicles themselves, is too clearly a matter of common knowledge to justify discussion. The fatalities caused by them are so numerous as to permit the Legislature, if it deemed wise, wholly to forbid their use.

We find in our territory that owners are either ignorant of the law governing licenses or care not whether they violate it. Licenses are issued, of course, for one particular machine and no other. Exchanges of license plates from one machine to another are not infrequent. A man may buy a second hand machine and retain the plates of the former owner; dealers sometimes allow a machine under their dealers' license to be used for hacking or other purposes and a man may purchase a new machine and use thereon his old license plates. We subscribe to the published lists of motor vehicle owners, which gives the license number, name of the owner, name and description of the machine and manufacturer's number and in all of our accident cases compare the license number and manufacturer's number with the official list. In case the machine is being operated under a wrong license number under our law it is a trespasser upon the highway and the legal right of the owner to recover damages is at least under question. We are furnished also with a list of drivers and their license numbers as issued and are prepared to check their number or to learn whether they have a license to drive a motor vehicle.

The Public Safety Section of the National Safety Council is making a special study of the automobile hazard. I believe that it needs our help and that we need its and that some effort should be made to co-operate with it. It is definitely committed to the solution of the problem and is now beginning a thorough-going campaign of education through organized community effort, publicity, chauffeurs' schools, public schools and special bulletins. The seriousness of the problem is revealed in the following four striking facts:

1. There were approximately one-half as many people killed by automobiles in 1919 as in all the industries, mines and railroads in the United States.
2. Deaths from automobiles are increasing each month with the increase of the number of automobiles.
3. While in the United States not more than one-fourth of the people are exposed to industrial hazards, practically every person, the moment he leaves his doorstep, is exposed to the automobile hazard on the streets.
4. While in the industries, through organized safety, the hazards are coming under control and accidental deaths are being reduced, the fatalities from automobile accidents are mounting by leaps and bounds and we have barely made a start toward the solution of this new problem.

Recently in the city of Washington, D. C., the Public Safety Department made motion pictures of the proper ways to turn at street intersections, showing them at the different motion picture theaters; the city of St. Louis sent a representative to visit the other large cities of the country to study traffic problems and conditions and their solution, in an effort to cut down the accidents on their streets; the city of Pittsburgh is about to organize a traffic court to handle traffic violators only; at the recent first meeting of the national committee on highways and highway tranportation plans for a nation-wide publicity campaign through the newspapers and motion picture theaters were considered to teach traffic regulations and the dangers of the streets, and a committee was organized by P. P. Claxton, United States Commissioner of Education, on the advice of President Wilson for investigating the advisability of teaching traffic regulations in the public schools. Efforts of a similar character are being made throughout the country, all tending to the education of the public, that the number of street accidents might be reduced. The State of Pennsylvania has already established by law the study of safety first methods in the public schools.

Surely we are all agreed that no person should be permitted to operate a motor vehicle without a license and that he should be required to pass a strict examination as to his fitness not only mentally and physically to handle a motor vehicle, but also as to his knowledge of the mechanism of his machine.

In suburban territory where the highway crosses our interurban tracks it should be a requirement that the driver of a motor vehicle stop, look and listen in the same way that some states require the driver to act when approaching railroad tracks. On our city streets it should be a misdemeanor for a motor vehicle to pass a street car on the left on double track streets.

The law should clearly state that where there is a good roadway beside the street car tracks no motor vehicle should occupy the tracks, and make it a misdemeanor for a driver to pull across the tracks directly ahead of the street car. A speed limit of 15 m.p.h. or less should be maintained within the limits of every city and village in the country. These provisions in addition to the present automobile laws will not be made unless we lend our influence toward this end.

I believe that the association could well appoint a committee for the purpose of making a canvass of all the traction companies in the country to learn the increase in automobile accidents and just what is being done in each locality to prevent such accidents, so that we may get ideas from all over the United States and to secure copies of the automobile laws from each state and make up a model automobile law. This latter would be for the purpose of co-operating with the National Safety Council in securing the passage of such a law in as many states as possible.

One particular menace that we have to contend with in the streets of our territory is the savage mail truck. It has become so notorious in the way of running into street cars and running down men, women and children that the newspapers have taken a decided stand in their editorial columns toward abating the nuisance, and the Public Safety Department gave official warning to the Post Office Department within the last month that it would from then on wage a vigorous warfare against its careless drivers. Young and inexperienced drivers seem to be the cause apparent from the outside and it may be that they have careless supervision, and there is no way of collecting a cent for the damage they do. If this evil is as great in other localities, the association may deem it proper to officially call it to the attention of the Government authorities.

Mr. Stickle mentions the matter of the doctrine of imputed negligence and regrets the fact that in Ohio the passenger of the motor vehicle is responsible for nothing except the prosecution of his claim after he gets hurt. I am glad to report that in Pennsylvania we have a decision of the Supreme Court of the State in Dunlap vs. Philadelphia Rapid Transit Company at No. 4,762, Dec. Term, 1912, Common Pleas Court of Phila. County, filed June 5, 1914, in which plaintiff was a passenger in the automobile which was in collision with a street car. It was held that the driver was guilty of contributory negligence, but the same was not imputed to the passenger, yet the passenger was also guilty of negligence in saying or doing nothing when the operator of the automobile approached the crossing without proper precautions. A verdict for plaintiff was reversed and entered for the defendant.

We have done in Pennsylvania just what Mr. Stickle suggests in the doing away with the antiquated city and village ordinances. The Pennsylvania automobile law supersedes and repeals all city and borough ordinances pertaining to the motor vehicle and is the only law governing them inside and out of the city and borough limits.

Before the birth of the chauffeurs' school we had in Pittsburgh attempted something of the kind. The experience may be worth relating to member companies where chauffeurs' schools cannot be regularly conducted. We arranged meetings with the chauffeurs of the different department stores, ice companies, taxicab companies, reduction company, milk companies, etc., and gave them safety talks. I happened to be the one chosen for the work and it lasted all of one season. I spoke before from 40 to 300 chauffeurs and drivers at each meeting and felt from the beginning that some good was being accomplished. The employer we found, in every instance, only too willing to co-operate.

To summarize, I believe that we have the following methods to help combat this growing hazard of the motor vehicle:

1. Maintain persistent and consistent safety efforts with our own men.
2. Encourage and assist in the formation of chauffeurs' schools or conduct lectures among chauffeurs and drivers whenever and wherever they can be drawn together.
3. Watch the enactment of state laws and through state organizations or individual companies assert ourselves with a view of getting into the laws favorable articles, particularly:
    (a) Stricter provisions as to granting licenses to drivers.
    (b) Lowering the speed limit in cities and villages.
    (c) Providing for drivers to stop, look and listen at suburban crossings.
    (d) Providing that drivers in city streets cannot turn against the current of traffic in two-way streets.
    (e) Providing that motor vehicles cannot occupy the street car tracks, and making it a misdemeanor to cross directly ahead of a street car.
4. Co-operate with the National Safety Council in efforts to reduce motor vehicle accidents.
5. Appoint a committee to make a survey as suggested above.

Discussion on the Automobile Hazard

By JOSEPH H. HANDLON

Claim Agent United Railroads of San Francisco

Forty-seven per Cent of All Accidents Involving the Cars of the Author's Company Were in 1919 Automobile Accidents—An Outline of What Can Be Done

AT A RECENT safety-first gathering, the principal speaker, a man of national reputation in accident prevention work, made these remarks:

> The automobile is the most deadly weapon known to mankind. I think it can be safely stated that automobile fatalities are now happening at the rate of 15,000 a year—forty-one every twenty-four hours—an average of one every thirty-five minutes.
>
> The economic loss to a community caused by automobile fatalities is well illustrated by the careful estimate that the earning capacity of the 599 persons killed by automobiles in the city of St. Louis alone in the last thirteen years would have been more than $12,000,000.

It is to be noted that no reference was made to the thousands of persons who are injured by automobile accidents yearly, and what that means to a community, or the millions of dollars' worth of property destroyed annually in such accidents due to somebody's carelessness.

Recently I wrote to the coroners of twenty principal cities of the United States seeking information as to the number of persons killed directly or indirectly from automobile accidents each year during the past five years in their respective cities. Seven of these coroners have so far not replied, but in the remaining thirteen cities there was a total increase in automobile fatalities during the year 1916 as compared with the year 1915 of 23 per cent; an increase in 1917 over the preceding year of 84 per cent; in the year 1918 of 21 per cent; and in the year 1919 of 24 per cent; showing a steady growth in the number of such accidents. The year 1919 compared with the year 1915 reveals about 200 per cent more fatalities from automobile accidents.

To what extent are the electric railway companies suffering from these appalling conditions?

In 1910 but 6 per cent of all accidents involving the cars of the United Railroads of San Francisco were automobile accidents, in the year 1911 but 9 per cent, in 1912 but 12 per cent; in 1913 the percentage had increased to 15, in 1914 it was 17, in 1915 it was 32 (due mainly to the advent of the jitney), in 1916 it was 34 per cent, in 1917 it was 32 per cent (when jitneys commenced to diminish in number), in 1918 it rose to 43 per cent, and in 1919 to 47 per cent; so that today approximately one-half of the total accidents in which the above company is concerned are automobile accidents.

It may be asserted that there was a corresponding decrease in horse-drawn vehicle accidents. Such is not the case. During the year 1910 only 27 per cent of all accidents were horse-drawn vehicle accidents and in 1919 the company's records show all such accidents were 5 per cent of its total number, making a decrease of but 22 per cent.

Statistics just received from seventeen street railway companies operating in large cities disclose some impressive figures. During the years 1915 to 1919 inclusive the total number of automobile accidents in which these companies were concerned was as follows:

Year	Number of Automobile Accidents	Increase Over Preceding Year	Percentage of Increase Over Preceding Year
1915	32,912	......	.
1916	46,109	13,197	40
1917	61,017	14,908	32
1918	64,771	3,754	6
1919	76,420	11,649	18

The increase in the number of automobile accidents involving the above companies for the year 1919 as compared with the year 1915 was 132 per cent.

WHAT DOES THE FUTURE OFFER?

What does the future offer in the matter of eliminating this alarming condition of affairs?

In a recent magazine article a well-known writer on economics who is qualified to make an intelligent survey of the automobile industry stated that it is easily the third industry of the day, ranking next to steel and cotton, and perhaps, by the census of 1920, over-reaching both of these. It is conservatively estimated that this nation could buy and continuously operate 12,000,000 automobiles without reaching what might be called the point of saturation.

With an automobile to every six persons in the state of Iowa and the young men of today placing their savings of $500 as first payment on an auto instead of in a home or a farm, some impression is obtained of the conditions with which the companies will have to battle in the future.

CAUSES OF ACCIDENTS

What are the causes of automobile accidents that directly concern the drivers of automobiles?

Here are some of them: Reckless driving; speeding; violation of traffic rules due to ignorance, a careless disregard of the law or a craving for excitement; inexperience; incompetence of chauffeurs arising from deformed or amputated limbs or defective eyesight, hearing, epilepsy or heart trouble or due to the fact that they have not reached years of discretion, or possibly they are in their dotage, or again they may be mentally inactive or ill balanced; irresponsibility, since some of them do not have a proper regard of their obligations to their fellow traveler, whether he be a driver or a pedestrian, or in their anxiety to "beat the other fellow" they will take an unnecessary risk, and again there are others who are irresponsible because they assume a carefree attitude arising from the fact that they carry liability insurance.

So far as the automobile itself is concerned we find that many accidents are due to faulty construction or defective brakes, lack of the use of mirrors or satisfactory headlights or tail-lights at night and absence of non-skid equipment in wet weather.

Again, automobile accidents arise from the lack of uniform traffic rules governing the operation of automobiles in all states of the Union; also there is no uniform method of placing warning signs at danger points or grade crossings; no standard type of warning signs; no specific signaling device at crowded street intersections; no uniform method of signaling by one driver of a vehicle to another; no standard rules requiring automobiles to surrender the right-of-way to vehicles operated on rails or automobiles proceeding toward the same intersecting point, and the additional fact that our streets were never designed to meet the congested traffic conditions the automobile has created.

WHAT CAN BE DONE?

What can we street railway claim agents do toward eliminating automobile accidents, especially where our individual companies are concerned?

I would suggest that by means of lectures or personal instruction all trainmen be shown numerous types of automobile accidents and taught how to avoid them. Sketches, lantern slides or motion pictures can be well utilized for that purpose. A map can be maintained at each carhouse upon which there could be placed colored pins indicating the location of automobile accidents as well as other accidents that occur from time to time, so that trainmen could familiarize themselves with the danger points on the routes over which they operate their cars. The co-operation of trainmen should also be sought in having them report all traffic violations so that the police can be notified.

Efforts could be made to prevail upon the local authorities to compel all drivers of vehicles to pass a physical examination; to place age limits between which ages a person must be, else he will not be allowed to operate an automobile; to require applicants for chauffeurs' licenses to furnish satisfactory proof of their ability to operate an automobile before being given a license; to compel each chauffeur to carry a card with his photograph attached showing that he has passed a satisfactory examination before being allowed to drive a machine, on the reverse side of which should be recorded all arrests for traffic violations; to have the traffic officers maintain a card index system of traffic offenders so that the police magistrate will have a record of any violation of a local traffic law previously committed by an offender; to induce police judges not to fine the continual offender, but either to commit him to jail or to impound the vehicle so that neither he nor his family can use the machine for a specified period, all storage charges meanwhile to be paid by the convicted person; to enlist the co-operation of the local automobile association in eradicating from their ranks the traffic-law breaker; and to impress upon taxicab companies, motor drayage and delivery companies and other large users of motor vehicles the company's desire to enlist their aid in the work of accident prevention. Warning signs can be placed to advantage in garages, especially those illustrating different types of accidents and their causes.

MODEL TRAFFIC ORDINANCE

In the matter of state laws governing motor vehicle traffic, the officials of the International Traffic Officers' Association which recently convened in San Francisco had hoped to formulate a universal traffic law which would apply throughout the United States and Canada, but the limited time at their disposal prevented them from accomplishing all they desired. The subject was referred to a committee, which will meet during the winter in Cleveland, Ohio. The chairman of the committee, W. H. Maltbie of the United Railways & Electric Company of Baltimore, who is a member of a committee appointed for a similar purpose by the American Electric Railway Association, submitted a proposed model traffic ordinance which is being used as a basis for drafting an ordinance that will have the approval of the International Traffic Officers' Association.

It was very evident to a person attending the convention that further co-operation will have to be sought from such organizations as the American Bar Association, the National Safety Council, the American Automobile Association, the Automobile Manufacturers' Association and similar bodies before a code of traffic laws that will apply everywhere so as to meet with universal approval will be adopted by all of the state legislatures.

For the present it may be possible to secure the passage of a statute that will compel owners of automobiles to file with each secretary of state or with the State Motor Vehicle Department duplicate insurance policies which will indemnify each occupant of the automobile up to $5,000, in event of accident, or require automobile owners to file a bond or establish proof that they are financially responsible; further requirements should be the filing of an additional insurance policy or bond for $5,000 to indemnify a person injured who was not a passenger of the automobile.

In advocating such a measure let me suggest that claim agents realize perhaps more than any other class that very often the bread-winner of the family is injured, perhaps permanently and sometimes fatally, and the burden of supporting his dependents usually falls upon the community when the person found responsible for the injury is financially unable to meet the judgment imposed upon him.

Responsible liability insurance companies, under those circumstances, as an economic necessity, would refuse insurance to those known to be careless, reckless or incompetent, and the companies that assumed such a risk would charge so high a premium that careless or negligent automobile owners, in their efforts to qualify in the "preferred risk" class, would drive more prudently.

Another proposed statute deserving of much consideration would be one imputing the negligence of the driver to the occupants of the automobile so as to eliminate the common occurrence where the passengers in the automobile recover for an injury solely due to the driver's negligence.

The problem of accident prevention so far as automobiles are concerned is now becoming more and more important in the public eye and we as accident specialists should deem it our duty to take an active part in this work of further educating the public to the seriousness of the problem now so acute. Further, we should endeavor in every way to devise and urge the adoption of various methods of minimizing this evil which is of such recent origin and yet so dangerous to the body politic.

Discussion on the Automobile Hazard

By WILLIAM G. FITZPATRICK
General Claim Attorney Detroit United Railway

Among the Topics Considered by the Author Are Accident Maps, Recent Court Rulings and Settlements With Insurance Companies

AN ANALYSIS of the reports of the various cities of the country discloses a tremendous increase in vehicular accidents as the growth of the automobile industry has increased by leaps and bounds. This condition has been found in the city of Detroit. For the year 1919 the number of reported automobile accident cases on the city lines was 11,564, which shows a large increase over the previous years, and for the first six months of 1920 the total number of reported cases in the city was 7,764, which would be at the rate of more than 15,000 a year.

In some respects the situation in Detroit in regard to the motor hazard is peculiar. Detroit is the center of the industry, and the increase of automobile ownership in the last few years has been very great. There have been but few additions to the railway permitted by the city authorities, and the rapidly increasing population of the city must be accommodated on practically the same lines as have existed for a number of years. A great many automobile factories being located in Detroit, a very large number of testers and demonstrators help to swell the automobile traffic. The street railway lines of the city all converge in the center of the business district. Many of the lines are constructed upon very narrow streets, which of course increases the hazard. Before the company was permitted to reroute one of its lines which crossed Woodward Avenue, so as to avoid this crossing, the corner of Michigan and Woodward Avenues in the city of Detroit was the most congested corner for traffic in the world.

I heartily agree with the suggestions for lessening this hazard outlined in Mr. Stickle's paper. The suggestion as to improvement of physical property, of course, is very much to be desired and is perfectly feasible for each company. Suggestion No. 3 as to "systematic continuous safety work among employees" is extremely important and I had assumed it was being carried out by most of the larger companies.

Suggestion No. 4, recommending propaganda work, is being carried out in Detroit, and the company has devoted weeks to this purpose. About a year ago I had prepared a blue-print map, about 5 ft. x 7 ft., of the lines of the urban system, showing all intersecting streets and congested areas. On this map were put red-top pins, indicating the locality of every motor vehicle accident as shown by the crews' reports from day to day for a full month. At the end of the month, two additional maps were "pinned up." One went to the general manager's office, another to the general superintendent's office for use in the crew instruction section, and the other found a place either in the lobby of one of the larger automobile clubs or in the traffic squad room of the police department. The maps were also exhibited in the windows of the interurban station. The maps were repeated about every third month. I am told by our operating department that effective use was made of these maps with the crews, especially the new men who were breaking in, and the data indicated were used with good results by the police department in its "safety first" and "safe driving" campaigns. As a graphic chart of conditions, the red pins on the blue and white background makes more than a passing impression.

RIGHT OF WAY AT RIGHT-ANGLE CROSSINGS

Subdivision 5 for uniform traffic laws in state and nation is of course "a consummation devoutly to be wished," but experience in other lines teaches that this is a slow and uncertain process.

It does seem to me, however, that we can adopt a policy with reference to automobile accidents which will eventually greatly reduce the hazard and more thoroughly educate the drivers of automobiles in a practical way than any theoretical instructions. This is in regard to right-angle crossings where a large proportion of automobile accidents occur. Some jurisdictions have recognized the justice of giving the street cars right of way on all street car streets. An ordinance of New Orleans gives the right of way "along such tracks," and the traffic laws of New Jersey provide that "street cars shall have the right of way between . . . cross streets over all other vehicles." The Detroit United Railway has adopted as a policy on its lines absolutely to refuse to settle claims growing out of right-angle crossing accidents unless the facts are overwhelmingly against the company. In refusing to consider appeals for compromise in these right-angle cases, the company has the backing of a recent decision of the Michigan Supreme Court on the subject (Colborne vs. Railway, 177 Mich., 139), where the court lays it down as the duty of the automobile driver "before passing into the line of danger from his place of safety where he had ample opportunity to observe without obstruction . . . to assure and reassure himself that there is not a car directly upon him, of which situation the fact that he is struck is conclusive proof. . . . He should have made sure of the safety of proceeding by looking just before entering upon the track and at such a point that he could stop his machine if necessary in order to avoid a collision."

The court in this case, recognizing the "automobile hazard," insists that the rule of conduct with respect to crossings by pedestrians should be as strictly applied to automobiles, and that the reasons for such application are more impelling, as the careless pedestrian as a rule perils only his own safety. Continuing, the opinion says: "In the light of common knowledge courts can well take judicial notice of the automobile not only as a most useful and pleasing means of swiftly transporting persons and property for pleasure or business when properly controlled and cautiously driven, but as a vehicle in its possibilities so destructive when in the hands of careless and reckless drivers as to spread over the land the maimed and dead until it has belittled the cruelties of the car of the Juggernaut."

When drivers of automobiles become convinced that they cannot carelessly and recklessly cross street car tracks and expect in case of an accident to secure a speedy settlement, they will learn to exercise that degree of care which will avoid the great majority of collisions. There is in my opinion absolutely no excuse for a collision between street cars and automobiles at right-angle crossings. It is not like two automobiles meeting at an intersection where one might not reasonably expect the other. In case of street cars, the tracks are there, and known to be there, and a street car may be expected coming in either direction at any moment, and it should be the duty of the casual vehicle approaching those tracks to take every precaution for safety. I find from my experience in this regard that while the number of accidents may not have been decreased, the number of claims in such cases has.

Another suggestion which I desire to impress upon this body is that more care should be taken in the settlement of cases with insurance companies. Many insurance companies have a policy of making a liberal settlement with claimants, then go to the railway companies hoping to get all, or as large a proportion as possible, from them of the money expended by them. I have therefore adopted the policy of inquiring first whether a claim has been adjusted by the insurance companies before application is made for the payment of the claim by my company, and I am in every way discouraging settlements in these cases. If the insurance companies are put to the trouble of fighting these claims through their assignments, they will be much more careful in their adjustments. While I realize the wisdom of quick settlement of claims where there is a chance of liability, yet I am strongly of the opinion that a united policy of resisting these extravagant claims, which have already been paid by insurance companies, will result in good in the long run.

In regard to one suggestion made by Mr. Stickle, namely, the effort to get the courts to be more liberal in their interpretation of the law as to imputed negligence, I am thankful to say that the Supreme Court of the State of Michigan has so far held to the doctrine that the negligence of the driver is imputable to any volunteer passenger over the age of twenty-one, and quite recently the court has intimated that the negligence of the driver might be imputed to his volunteer passenger, a married woman under the age of twenty-one (vide Granger vs. Farrant, 179 Mich., 19, 20, 34).

Equipment Records on the Erie

IN AN ACCOUNT of the electrification of the thirty-seven-mile branch of the Erie Railroad, in the Genesee Valley, south of Rochester, N. Y., published in the Oct. 9 issue of *Railway Review*, Q. W. Hershey gives some figures for the records of this equipment which are of interest.

Inspection of motor equipment is made every 800 miles, as cars normally come to the inspection house. The cars are operated in regular rotation to obtain a car about every three days. Repairs are ordinarily occasioned on account of burnouts from lightning or overloading, but are very infrequent. The commutators are averaging about 75,000 to 90,000 miles between turnings; gears around 300,000 miles; pinions around 150,000 miles; brushes around 10,000 miles; pantagraph shoes make about 10,000 miles between changes. The change required consists of replacing a plain ⅛-in. galvanized steel shoe without wearing strips. These have a cost at present of about $2.50 each. The pantagraphs are lubricated with "used" gear grease about every 800 miles when the cars come into the inspection shed. The total cost of power and maintenance of equipment, including the maintenance of overhead trolley and structures, averages about 10.4 cents per car-mile.

Providence Section of A. I. E. E. Discusses Automatic Substations

ADDRESSES by G. H. Roosevelt of the Railway and Traction Engineering Department, General Electric Company, and R. J. Wensley of the Switchboard Engineering Division, Westinghouse Electric & Manufacturing Company, were the chief features at a meeting of the Providence (R. I.) section of the American Institute of Electrical Engineers which was held in that city on Oct. 8. Mr. Roosevelt discussed with C. M. Gilt, lighting engineering superintendent General Electric Company, as joint author, "Automatic Systems for Lighting and Railway Service," and Mr. Wensley outlined recent progress in "Industrial Automatic Substations."

E. W. Allen, Chicago office General Electric Company, briefly outlined the history of automatic substation development, paying a tribute to the faith of early purchasers of this class of apparatus. Voltage regulation, the speaker said, is the best measure of excellence of any distributing system. The large amount of feeder capacity required with hand operation is an obstacle to the best distribution service in many cases. In future railroad electrification automatic substations will have to be considered, as they offer some advantages over both the 3,000-volt direct-current and the alternating-current system of operation.

Mr. Wensley stated that his company has recently quoted a central station on an automatically operated high-pressure steam plant with thermostatic control.

A. V. Thompson, San Francisco office General Electric Company, said that the load-limiting feature of the automatic substation is advantageous to traction companies purchasing energy under contracts in which demand is penalized. Motormen find it of little use to attempt to draw power beyond the limit set by good practice as a result of this equipment. Mr. Allen stated that, at a substation of the automatic type near Camp Dodge, trainloads of troops and army supplies were handled by a 300-kw. rotary-converter installation with automatic control, whereas if hand-operated substation equipment had been in service the breakers would have had to be set for 1,000 kw.

A feature of the meeting was a visit to the Rhode Island Company's Oakland substation.* W. C. Slade, superintendent of power Rhode Island Company, Providence, was elected chairman of the section for the coming year.

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*Described in ELECTRIC RAILWAY JOURNAL, Dec. 14, 1918 (page 1038).

Ninth Annual Safety Congress

Electric Railway and Public Utility Sections of the National Safety Council Discuss Enforcement of Safety Measures and Other Topics

THE Ninth Annual Safety Congress of the National Safety Council was held in Milwaukee, Wis., Sept. 27 to Oct. 1. Abstracts of several of the papers have appeared in earlier issues of the ELECTRIC RAILWAY JOURNAL during October. On account of space limitations it has been impracticable to abstract heretofore all of the papers of interest to electric railway men. In the following paragraphs some notes regarding the congress are given, together with abstracts of the remaining papers selected from the large number presented, as of particular timeliness and appropriateness:

R. C. Richards, retiring president, in his opening address, reviewed the progress of the safety movement during the past year and outlined the work for the new year. He said that there are today thirty-seven cities in which local safety councils have been organized to promote the cause of both public and industrial safety in all parts of the country. Sixteen of these local councils in the larger cities have reached the point of activity where they require paid officers who devote their whole time to the work. In his prospectus of the work which lies before the Safety Council, Mr. Richards laid particular stress upon the necessity of combating and mitigating the automobile menace and the importance of educating school children in safety.

In the absence of R. M. Hemming, superintendent of transportation Indiana Service Corporation, Fort Wayne, Ind., chairman of the electric railway section of the council, the two meetings of this section were presided over by John H. Mallon, vice-chairman. Mr. Mallon is assistant general superintendent Chicago Elevated Railways and he was elected chairman of the section for the ensuing year.

More than 3,100 persons were registered at the congress, in addition to 1,400 boys from the Milwaukee schools who attended a special meeting and 1,200 school principals and teachers from Milwaukee who attended another special meeting. There was a gathering of 1,500 Boy Scouts who participated in the demonstration in the arena of the Auditorium.

The result of the election of officers for the coming year was as follows: President, Charles P. Tolman, chief engineer National Lead Company; vice-presidents, W. H. Cameron, L. A. DeBlois, W. E. Worth, John A. Oartel. The following staff officers, with national headquarters at Chicago, were re-elected: C. W. Price, general manager; Sidney J. Williams, secretary; W. H. Frater, treasurer; R. T. Solensten, assistant secretary.

NECESSITY FOR OBSERVING OPERATING RULES

At the electric railway session of the congress on Oct. 1, Hugh Wilson, safety department Northern Ohio Traction & Light Company, Akron, Ohio, impressed on those in attendance the importance of drilling new men on the safety aspect of operating rules. He said that 98 per cent of all accidents are caused by disobedience of rules, or man failure. The operating rules are violated mostly by new men, the disobedience sometimes being caused by ignorance and sometimes by willful negligence. Two remedies for this evil are (1) caution in hiring men and (2) review of the rule book with new men before they are permitted to begin their work on the cars.

Mr. Wilson said that before a man is hired to operate a street car an investigation should be made relative to his home life, his general habits and his former place of work. If he comes from a home where carelessness is a characteristic he will probably be a careless operator. If he is careless in regard to his own affairs he will not be likely to observe rules and work efficiently for some one else. As to his former working place, if his employer there could not depend upon him, he has no place in the electric railway business. The time and money cost involved in such investigation is small compared with that of its lack.

As to going over the rule book, Mr. Wilson said that this brings up the need for a good instructor, a man who has had years of road experience and who is able to impress a new man with the importance of strict observance of rules. Further, the superintendent should take an interest in the new man, to impress upon him the fact that he has been accepted as an important part of the railway family. As an instructor for a year past, Mr. Wilson had been impressed by the fact that it is possible to apply practically the principles which he outlined.

ADVERTISING TO REDUCE ACCIDENTS

In a paper read on Sept. 30 before the electric railway section, Charles B. Hardin, general claim agent United Railways of St. Louis, St. Louis, Mo., took up some of the points which he thought should be considered in planning safety advertising campaigns. After determining the amount of money to be spent, the next thing, he said, is to observe the principle of applying intensive efforts.

Mr. Hardin took up the several ways in which advertising can be done; for example, by the use of paid-for space in newspapers, editorial articles printed on account of the news value of the safety effort and posters and signs carried on cars, mounted on trolley poles, etc., as well as general publicity obtained through clubs, city departments and other organizations. Among other things he said: "The very fact that we are contemplating an advertising campaign should impress the newspapers and other publications favorably. It should show them that we realize the great importance of doing everything possible to reduce the trolley car accidents. While newspapers are somewhat sensitive to 'box office returns'; while they like and probably need the money, they are not moved entirely by mercenary motives. To the average city editor the very fact that the traction company proposes to spend money on a safety campaign is 'news' and will be so treated."

EXHIBIT AS HERETOFORE A GREAT ATTRACTION

As has become the custom in connection with the Safety Congresses, an exhibit of modern safety appliances and practices was held in connection with the Milwaukee congress, this time in the Milwaukee Auditorium. Mr. Price estimates that at least 10,000 persons visited the Auditorium while the congress was in session and that from 5,000 to 6,000 were in the building each day of the week.

An Argentine reader of the ELECTRIC RAILWAY JOURNAL calls attention to a typographical error on page 276 of the issue for Aug. 7. The price paid for energy by the Anglo-Argentine Tramways in 1918 was $0.0783, gold, per kilowatt-hour instead of $0.0183 as printed.

The Electric Locomotive, Pro and Con

At Sectional Meeting of A. S. M. E. and A. I. E. E. Held in New York City on Oct. 22 Experts Discussed the Respective Merits of the Two Types of Motive Power Available for Heavy Traction

A GATHERING which overtaxed the large capacity of the auditorium of the United Engineering Society's Building in New York City was held on Oct. 22 to discuss the respective characteristics of the steam and the electric locomotive with respect to modern transportation conditions. The meeting was the first to be held under the joint auspices of the railroad section of the American Society of Mechanical Engineers, the metropolitan section of the same organization and the New York section of the American Institute of Electrical Engineers. The meeting was well advertised and the enormous attendance indicates the lively interest which is taken by engineers in the subject of heavy electric traction.

The principal papers read were abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 23. One of the advantages of the steam locomotive was presented by John E. Muhlfeld, Railway & Industrial Engineers, Inc., while the cause of the electric locomotive was championed by F. H. Shepard and A. H. Armstrong, respectively connected with the Westinghouse Electric & Manufacturing Company and the General Electric Company. The program was presented under the direction of E. B. Katté, chairman of the railroad section of the A. S. M. E.; H. W. Buck, chairman of the New York section of the A. I. E. E., and W. S. Finlay, Jr., chairman of the metropolitan section of the A. S. M. E.

In opening the meeting Mr. Katté said that not only was it the first to be held under the auspices already mentioned, but the occasion was the first on which mechanical and electrical engineers had come together for the discussion of the electrification of steam railroads. It was fitting, he said, that at this meeting attention should be directed to the electric locomotive. He then introduced first Mr. Buck and later Mr. Finlay, who spoke briefly of the importance of the subject and the interest of their respective organizations in it. Next Frank J. Sprague was called upon for introductory remarks, and he responded for the "purpose of 'dressing the window,'" as he expressed it. The chairman referred to him as the "father of electric traction."

Demand for Increased Track Capacity Will Bring Electrification

At the outset Mr. Sprague said that he would not attempt a history of the development of the electric railway, but would refer briefly to some facts incident to his own association with it. He quoted from the *Sun* of a certain day in August, 1887, as follows: "They tried an electric car on Fourth Avenue yesterday. It created an amount of surprise and consternation from Thirty-second to 117th Street that was something like that caused by the first steamboat on the Hudson. Small boys yelled 'dynamite' and 'rats,' and made similarly appropriate remarks until they were hoarse. Newly appointed policemen debated arresting it, but went no further. The car horses which were met on the other track kicked without exception, as was natural, over an invention which threatens to relegate them to a sausage factory." Soon afterward the famous Richmond road, which is fairly called the forerunner of the modern trolley, was equipped, and in three years there were in operation or under construction, here and abroad, something like 350 electric trolley roads, and a quarter of the street tramway mileage of the United States had already been converted to the new power. The reason for this astounding growth was simply that the electric car could do what was impossible to its predecessor.

A result of this success was that wild prophecies were made by imaginative enthusiasts of the coming debacle of the steam railway, so that Mr. Sprague found it necesssary, as the incoming president of the A. I. E. E., in June, 1892, to sound a warning in his inaugural address, cautioning against undue optimism.

MULTIPLE-UNIT IDEA WAS FUNDAMENTAL

Mr. Sprague said further that the solution of the trunk line transportation problem had to be preceded by another and more pressing development which signalized the growth of a new idea, one essential to urban rapid transit, namely, the multiple-unit system. This, now the fundamental of electric rapid transit the world over, for a long time met only with contemptuous regard, despite an existing willingness to put it to a conclusive test on the elevated railroads at his personal risk. Then came the larger developments in the broad field of trunk-line operation for which it has supplied a vital essential.

Looking ahead Mr. Sprague said that he wished again to record his unchanging belief in the coming supremacy of electric power for transportation. This faith was based, not upon a vast disparity between the best which can be built in a steam or electric locomotive, nor upon any overwhelming claims of superior fuel economy when both are dependent upon coal supply, nor upon any material saving in operating expense sufficient to pay the charges incident to the increased capital cost when considered on existing traffic density and methods of operation, but rather upon the broad ground of the overwhelmingly vital demand for increased capacity, a demand which ultimately can be met only by the electric system, because of characteristics individual to it.

He admitted that there are inherent differences between the steam locomotive and its rival. The former is a moving power plant, limited both as to its maximum and its continuous rate of power development by the capacity of its boiler and portable fuel supply. It has, it may be granted, a certain apparent advantage because of its independent entity, but that very independence limits its capacity, not materially in maximum tractive effort, for any locomotive can slip its wheels, but in the amount of energy, that is, the product of speed and drawbar pull, which is possible. The electric locomotive, on the other hand, is but the user and transformer of electric energy created at distant power stations and transmitted to it by stationary conductors, and, thanks to the multiple-unit system, any desired concentration or distribution of power units, under a common control, can be had, and any number of power plants, taking their energy from the centuries-old and diminishing supplies, or the annually renewed frozen white coal of the mountains, may be joined together in common supply.

Mr. Sprague attributed the need for the great concentration of power to the insistent demand for increased capacity. There will come a time when duplication of tracks and increases in bridges, tunnels and terminals and the power of individual units will reach practical limits, when physical facts will rebel against engineering dictum or operative demands, and then the way, and the only way, to meet the demand for increased capacity is by increase of speed, which can only be obtained when unlimited power is at the command of the operator.

Already, said he, the electrification of railway terminals is an essential, suburban service has long been in operation, and through-operation of freight and passenger trains on mountain and other main-line roads satisfactorily negotiated. The same kind of service which characterizes suburban operation can be as readily applied to the longer local runs, such as those between New York and Philadelphia, and one's watch will be the time-table. Where, then, is the limit of the use of electricity? Mr. Sprague fails to see any. All the while the demand for a someday maximum of capacity will persist, as well as the present-day demand for vastly increased expedition in freight movement.

As these demands increase it will become more and more necessary to eliminate as far as possible nonessential rail transportation, and among such will be that coal which can be better burned at or near its source of supply and have its energy transmitted by wire. Unless those responsible for and in control of the country's transportation are sufficiently broad and far seeing to visualize the country's future requirements, and to realize how the welfare of every man, woman and child is bound up in the question of transportation, we shall have a hardening of the arteries and fatal blood clots in the circular system of transportation which will tend toward apoplexy.

In conclusion, Mr. Sprague said that the general electrification of trunk-line railroads is not a matter of immediate possibility of accomplishment. It will only come, as it is coming, progressively and with the accelerating power of example. It will be governed very largely by financial conditions, however justified under a sufficiently enlightened public policy railroads might be, if given sufficient encouragement, to assume the large added burdens incident to electrification. But the test of wisdom of railway officials, financiers and national and state governments is the ability to anticipate and plan against the inevitable before the slowing down and paralysis of traffic, such, for example, as is illustrated by the rapid transit situation in New York City, where congestion affects the daily life and well-being of the whole community.

Mr. Sprague referred to a recent article by President Underwood of the Erie Railroad in which the statement is made that the motive power of a railroad represent but 8 per cent of the capital invested, and that the remaining 92 per cent is wholly dependent upon its earning capacity. Considering the business as a manufacturing proposition only, the making and selling of transportation, Mr. Sprague asked, what would be the verdict with regard to any other manufacturing property in which the tool equipment represented but a twelfth of the invested capital. One would naturally suggest an increase of the investment in tools, and so it should be with transportation. There will come the time when the great increase of capacity available because of the use of electricity, plus the fact of its already successful use in many portions of the railway field, will compel the enormous increase in motive power investment inseparable from the adoption of electricity, large as it may prove, a fact which will be justified by the need existing and the results obtainable.

After the reading of the papers by the authors the chairman called in succession upon a number of speakers, each of whom spoke particularly with reference to one or the other type of motive power. In the following report the contributions are grouped, the speakers for the steam locomotive being listed first.

Advantages of the Steam Locomotive

The first advocate of the steam locomotive was F. J. Cole, chief consulting engineer Locomotive Superheater Company, his paper being read by H. B. Oatley, chief engineer of the same company. Mr. Cole said in part: In the twenty-seven years which have elapsed since the first electric locomotive was built for the operation of the tunnel into Baltimore slow progress has been made in this country toward superseding the steam locomotive. In all the papers and reports of the electrical installations we find much about their advantages and much of what has been accomplished, but we search in vain for a complete financial statement showing at what cost in dollars and cents all this is accomplished. Many electrical installations are necessary for special needs such as are mentioned elsewhere in this paper, but it has yet to be proved that there is any great demand for the wholesale electrification of railroads in this country. In the motor trucks and automobiles on the highway, carrying much of the passenger and freight business, we can appreciate something of the value of self-contained, independent power units, which have extreme flexibility and lend themselves readily to some of the transportation needs of this country. While a steam locomotive is limited in its movements to the track on which it runs, yet because it is a self-contained unit it serves well and economically many of our transportation requirements.

In the case of electricity, the entire cost of changing over from steam operation must be taken into account. For electrification it is customary to supply power station capacity in boilers, engines, turbines and generating apparatus largely in excess of the normal demand, located in more than one station so that there may be no interruption in the supply of current. Presumably railroads are now in possession of the necessary appliances for steam operation, and electrification means that much of such equipment must be diverted into other channels or discarded.

The electrification of terminals, tunnels and certain mountain divisions where water power is available is now recognized as desirable installation. Some of this is absolutely necessary, regardless of cost. There may also be a few zones in this country which by reason of density of traffic and co-ordination with the electrified terminals could be changed from steam to electric power with profit and the quicker despatch of business. It is a question, however, whether the best interests of electrical development are served by sweeping generalities and propaganda which has the object of relegating the steam locomotives to the scrap heap, and instilling into the mind of the public how unprofitable, how wasteful and how unsatisfactory is the transportation business when operated by steam locomotives, and recommending as a remedy for some of the ills from which we have been suffering in transportation matters the electrification of the principal roads in this country.

Admittedly, there should be a considerable decrease in fuel consumption for electric operation, but it is doubtful whether it will save anything like the enormous amount which we have recently been told could be saved if all the railroads in this country were electrified. And I think consideration of all the factors entering into the cost of both methods of transportation will show that one is very much exploited at the expense of the other.

THE gist of the presentation of the steam locomotive side of the electrification question seems to be this: Electrical engineers have been somewhat over-optimistic in their expectation of early replacement of steam by electric locomotives. The latter have been greatly improved of late and they have certain inherent virtues which are highly regarded by operators. Moreover, where is the money for electrification to come from, anyway?

In the paper read by A. H. Armstrong[*] in Schenectady, Feb. 20, 1920, it is claimed that 122,500,000 tons of coal can be saved by electrification of railroads. These figures are based on tests which assume that locomotives used 7.86 lb. coal per horsepower-hour, or 10.23 lb. per kilowatt-hour at the driver rims. In regard to two points raised in this paper: (a) Not all of the coal consumed by railroads is used by locomotives. Shops, power stations, passenger and freight depots, offices and sometimes floating equipment have to be supplied; therefore, deduction must be made from the total amount charged to railroad use. Actual figures from one large railroad show that when winter and summer months are considered, 88.6 per cent of the coal consumed is used by locomotives and 11.4 per cent for other purposes. (b) The amount of coal per horsepower-hour of the steam locomotive given in the paper is entirely too high.

Much of the argument is dependent upon the high assumed rate of coal consumption, 7.86 lb. coal per horsepower-hour. For electric locomotives the estimated input required is 40 watt-hours per ton-mile. For coal the estimated amount is 2½ lb. per kilowatt-hour. Now the grand total for all regions (229,057 miles) reported in 1918 for steam locomotives is 190.7 lb. coal, hence the following values per 1,000 gross ton-miles: Electric locomotives 100 lb., steam locomotives 190.7 lb. If all of the engines were new and of modern design, a much better showing could be made. In 1918 the average cost of coal used by locomotives was $3.49 per ton. At 190.7 lb. per 1,000 gross ton-miles the cost of fuel was 33.4 cents per 1,000 gross ton-miles for steam locomotives over the entire United States. On the Virginian Railroad, where the power is comparatively modern, 163.3 lb. coal in 1917 and 160.6 in 1918 was used in steam locomotives per 1,000 gross ton-miles. The cost of fuel for the same railroad in 1917, 1918 and part of 1919 was from 18.7 cents to 25.9 cents per 1,000 gross ton-miles with coal at $2.38 to $2.74 per ton. On the Norfolk & Western for 1918 (five months) and the second quarter of 1919 the cost of fuel was 23.3 cents and 26.6 cents per 1,000 gross ton-miles with coal at $2.51 and $2.65 per ton.

These figures compare very favorably with 28.8 cents for water power given on page 730 of the *General Electric Review*, September, 1920. The cost of electric power for the Baltimore tunnel, 1910 to 1914, was from $1.049 to $1.435, average $1.199 per 1,000 gross ton-miles.

The increasing cost of coal permits the economical use of many fuel-saving devices on locomotives. A few years ago there was not much interest shown in such appliances; therefore, many locomotives are now running which are not so economical as modern engines. A Mallet compound locomotive, if in good condition and using superheated steam, in road tests will average 3.14 lb. dry coal per developed horsepower-hour at moderate speeds mostly on ascending grade. At an average of 3.10 lb. coal per horsepower-hour useful work can be done for 39.5 per cent of the figure given by Mr. Armstrong. Adding standby losses, taken at 17.5 per cent, the consumption is 3.75 lb. coal per developed horsepower-hour. In electrical units this is 5.05 lb. of coal per kilowatt-hour. If a kilowatt-hour can be produced at driver rims for 2½ lb. by electrification and by steam locomotives for 5.05 lb., the total amount of coal required by the roads of the United States if all were electrified will not show the great saving claimed.

The relative merits of steam versus electric locomotives are largely matters of cost. If a correct estimate of energy required to replace a steam engine is taken, in the first instance, it is possible then to estimate with some degree of accuracy the cost of electrification. Then the number of electric locomotives required, the number of power stations, the overhead construction, or third rail, changes in signaling system, shops and appliances to take care of the electric locomotives and power stations and the hundred and one items which go to make up a complete transformation from steam to electrification must be considered. A balance can be struck between the present cost of steam (which is known with a great deal of accuracy) and the computed cost of operation electrically with interest on capital expenditures at the present high rates. After this is done the operating costs can be correctly determined.

There are, admittedly, many attractive characteristics of electric power, but when it comes to a wholesale replacement of steam locomotives, especially on roads not peculiarly adapted to electrification, those responsible for the financial returns to the owners and to the public may well hesitate and ask to be shown the cost, not only of the installation under consideration, but of those now in operation, and the probable return on the investment for the large expenditure they are asked to approve.

After the presentation of the above paper by Mr. Cole the steam railroad standpoint was further explained by A. W. Gibbs, chief mechanical engineer Pennsylvania System. His paper will be abstracted in a later issue of the ELECTRIC RAILWAY JOURNAL.

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[*] See issue of this paper for Feb. 21, 1920, page 878.

Remarks of Chief of M. P., New York Central

A paper written by F. H. Hardin, chief engineer of motive power and rolling stock New York Central Railroad, was read by R. M. Brown, engineer of motive power of the same road. Mr. Hardin wrote in part:

In comparing the cost of maintenance or operation of electric and steam locomotives it must be remembered that in the steam locomotive a complete power plant must be maintained and operated, whereas in the electric locomotive there is merely the tractor. However, in computing comparative costs, from either the maintenance or the operating standpoint, it seems absolutely necessary to consider the proper proportion of the cost of operating the central power plant in electric service and also the cost of power. One phase of the question is whether the matter of cost is to be based upon existing conditions or the situation fifteen or twenty years hence. The railroad today must pay 7 per cent interest on money, and capital expenditure involved in the construction of power plants, substations and electric transmission lines would be enormous.

Referring to Mr. Armstrong's suggestions as to certain things which the train dispatcher might be able to accomplish with electric locomotives, Mr. Hardin said that if the present steam locomotives could be removed from the rails and replaced with electric locomotives of equal capacity, the question would be how often the electric locomotive could "deliver the goods" at the other end of the line without delay or failure as compared with what the steam locomotive now does. If the electric locomotive can be made to run 1,000 miles without change and without breakdown or diminished power the dispatcher might accomplish a great deal even with present cars, track facilities, etc., but there is more involved than merely replacing a Mikado or Mallet locomotive with an electric locomotive of equal capacity.

MAINTENANCE COSTS NOT UNREASONABLE

As to the statement that there is no need of the back shop for electric locomotives unless turning tires or painting may be considered heavy repairs, Mr. Hardin said that shops will be required, as electric locomotives must be heavy, so that drop pits, cranes and other shop facilities will be needed even for running repairs. Ability quickly to substitute repair parts would be an advantage, but no one can tell how many kinds of parts would be required for the different kinds and types of electric locomotives which would exist after fifteen or twenty years of electric operation. Furthermore, the spare parts or repairs would have to be made in shops maintained either by the railroad or outside concerns. As to the quoted maintenance cost of 60 cents per mile for a steam Mallet as compared with 14.65 cents for the St. Paul electric, costs on a New York Central division which used Mallets for most of its heavy freight trains in 1918 and 1919 amounted to from 21 cents to 25 cents per mile. These figures included some simple locomotives in operation on the same division. Some further figures covering back shop repairs of Mallet locomotives on two different divisions for the year 1919 showed averages from 12 to 19 cents per mile. Engine house maintenance cost is not readily obtainable, but may be assumed at not more than the shop cost per mile. Therefore, the total cost for the Mallet locomotive, including shop and engine house repairs, would be from 24 cents to 37 cents per mile.

Referring to costs, Mr. Hardin said that electric locomotives had been stated to cost possibly 50 per cent more than steam for equal driver weight, etc. In 1917 five modern 4-8-2-type freight locomotives cost about $205,000, about the same as one St. Paul electric locomotive. The five steam locomotives had total maximum tractive effort of about 250,000 lb., whereas the one electric had only 115,000 lb.

Taking up some points in Mr. Shepard's paper he said that the solution of the railroad problem lies in obtaining the money to build, more than electrification or any other factor. As to present standards of train make-up, classification and terminal handling, as to which Mr. Shepard thought that electrification would double the capacity of any railroad and, as methods are improved, double it again, he felt that electrification is only one factor in the solution of the problem and perhaps not the greatest one involved in accomplishing what Mr. Shepard sees in the future. As to the practicability of greatly increasing the speed of freight trains almost to that of superior trains, this undoubtedly means that improvements in freight car design must be made.

Mr. Hardin concluded by reference to Mr. Armstrong's statement that the Mikado locomotive burns 158 lb. of coal per 1,000 ton-miles. Some recent figures on one of the New York Central principal main-line divisions show a fuel consumption varying from 125 to 130 lb. per 1,000 gross ton-miles in freight service. In passenger service the consumption is from 12 to 17 lb. per passenger car-mile.

Coal Consumption on Steam Locomotives

In the absence of W. F. Kiesel, Jr., mechanical engineer Pennsylvania Railroad, some comment which he had prepared was read by title. His contribution in abstract follows:

Mr. Shepard expresses his belief that electrification is bound to be the most potent factor in the relief of the transportation problem. For electric locomotives he claims greater power, speed, flexibility and mobility; intimates that under electric operation divisions can be made much longer, and electric locomotives can be built to take any train which will hold together over any profile, at any desired speed, limited only by condition of track and car equipment. The same claim can truthfully be made for the steam locomotive.

For either kind of operation the length of divisions and location of terminals are governed by other than locomotive limitations, or, at least, there is no valid reason why any features of either electric or steam locomotives should affect the location of, or distance between, terminals.

In power, speed, flexibility and mobility either type can furnish all that track and car equipment will permit. To illustrate this, attention is directed to three recent locomotives: One was built by the General Electric Company, for the Chicago, Milwaukee & St. Paul Railway. According to a General Electric Bulletin* it has a starting drawbar pull of 115,000 lb., and a drawbar pull of 56,500 lb. at 25 m.p.h. on a 2 per cent grade. The two others were built by the Pennsylvania System. One is an electric locomotive having two synchronous speeds (10 and 20 m.p.h.), and the other a steam locomotive with four simple cylinders.

Both Pennsylvania locomotives have a drawbar pull, in starting on level tangent, of 135,000 lb. On grade

*No. 44,102.

the effect of truck and tender weight of the steam locomotive shows its influence, and the net drawbar pull, at 20 m.p.h. at rear drawbar (calculated) of these locomotives is as follows:

	Electric	Steam
On level, lb.	81,000	83,375
½ per cent grade, lb.	78,000	80,250
1 per cent grade, lb.	76,000	77,125
1½ per cent grade, lb.	73,500	74,000
2 per cent grade, lb.	71,000	70,875

Furthermore, the steam locomotive can deliver more net drawbar pull than the Milwaukee electric locomotive at any speed up to 50 m.p.h., and on any grade that it would have to encounter.

The strongest coupler in use today (American Railroad Association Type "D") has an elastic limit of about 200,000 lb. On present equipment there are several million couplers of a strength inferior to this. Therefore, it would scarcely be advisable to build locomotives of greater pulling capacity than two-thirds of the elastic limit of the strongest coupler, or 135,000 lb.

Mr. Shepard mentions retirement of weaker car equipments, which no doubt is advisable but will require time. His sentence, "Every other industry that has been electrified has experienced a revolution in methods and service, due to electrification," invites the most careful thought of those contemplating a change in operation.

Will electric service produce greater returns? Can the revolution in methods and service be accomplished without serious handicap during the transition period?

The capital investment for electric service will be more than five times as much as for steam service. The cost of an electric locomotive is about twice as much as that of a steam locomotive of the same power. The electric locomotives have shown some saving in repairs over steam locomotives, but after ten or twelve years' service they require rebuilding, especially in the electrical equipment, which runs the total cost of repairs beyond that of the steam locomotives. Possibly this can be improved.

From the report of the commission which investigated the advisability of substituting electricity for steam, in Chicago, it appears that the maintenance cost for wages and material would be 30 per cent more for electric operation than for steam. This is offset, at least partially, by electric traction advantages of regeneration, no reforking of ballast to remove smokestack cinders, less wheel and brakeshoe wear, etc.

With the exception of three factors, capital investment, coal per drawbar-horsepower and standby losses, there is too little difference between the two, for operation in open country, for further consideration.

Mr. Shepard speaks of one locomotive as a generator of power, and the other as a transformer of power coming from central stations with many refinements and high thermal efficiency. He credits the best steam locomotive with an average coal consumption of twice that of electric operation, for the same work performed.

FINE COAL CONSUMPTION RECORD ON PENNSYLVANIA

The Pennsylvania System steam locomotive referred to has the same steam distribution system as that of a 2-10-0 locomotive, which has been fully tested on the locomotive test plant* and will burn no more coal per drawbar-horsepower. The average coal consumption per drawbar-horsepower of the locomotive tested on the plant was 2.7 lb. for all firing rates up to 100 lb. per square foot of grate per hour and 3.27 lb. for all firing rates from 100 lb. to 160 lb. per square foot of grate per hour. Locomotives seldom have to burn more than 100 lb. per square foot of grate per hour. These steam locomotives had no feed-water heaters, the use of which, as proved by other tests, would reduce the amount of coal per drawbar-horsepower appreciably.

Inquiries were sent to various electrified roads, not including those with only short transmission terminal operation, requesting the average cost in coal per kilowatt-hour at the power plant, the average efficiency of the transmission line from power plant to the locomotive and the average efficiency of the locomotive.

One road, which has been electrically operated a number of years, and records each month's operation, has a power-plant "cost" of coal per kilowatt-hour of 2⅝ lb. as the minimum when the plant output is maximum. Taking this as 100 per cent load factor, the cost is per kilowatt-hour 3.2 lb. of coal for a load factor of 50 per cent, and 3.53 lb. for a load factor of 40 per cent. Most of the monthly record figures lie between 35 and 50 per cent load factors, and the average of coal per kilowatt-hour is above 3¼ lb. These figures necessarily reflect both the daily and monthly variations in load factor, and are, therefore, high.

Another road reports 40,000 to 44,000 B.t.u. per kilowatt-hour at switchboard for coal varying between 13,000 and 14,200 B.t.u. per pound.

MR. BEEUWKES QUOTED

The coal used in the test of the 2-10-0 steam locomotive given above averaged 13,429 B.t.u. per pound.

Replies as to the line efficiency appeared inconsistent, therefore the data given by Reinier Beeuwkes in his paper before the Pacific Coast section, A. I. E. E.,* are cited. These show an average ratio of net input at locomotive to actual system input for locomotive of 66.3 per cent for the Missouri division, and of 68.3 per cent for the Rocky Mountain division. Replies as to locomotive efficiency indicate that this is less than 75 per cent in all cases.

Apparently the fluctuations in load factor present a greater menace to coal economy than steam locomotive standby losses. The average load factor may be taken at 50 per cent. Neither line efficiency nor locomotive efficiency is likely to average as high as 75 per cent.

Existing installations may be taken as approaching, but not yet reaching, 3 lb. of 13,500-B.t.u. coal per kilowatt-hour at the power plant, a line efficiency of 75 per cent and a locomotive efficiency of 75 per cent, resulting in a consumption of 4 lb. of coal per drawbar-horsepower-hour. Therefore, the standby and other losses of the steam locomotive can be 32.5 per cent to equal the probable best average performance of present-day electric traction in coal consumption, and that much loss would be a sorry reflection on operating methods.

Possibly improvements may change this situation, but until the electric locomotive is ready to do the work as cheaply as the steam locomotive it is illogical to tear up the old operation by the roots and substitute a much more costly plant whose habits are not so well known.

Mr. Armstrong also dwells on greater power, speed, flexibility and efficiency, and speaks of running a thousand miles with no attention, except by crews. He describes ideal characteristics of a locomotive, none of which apply to the electric locomotive in any greater measure than to the steam locomotive. The "precedent and prejudice" to which he refers seem to be imaginary. As he uncovers step after step of his flights of imagination a gradually increasing desire for "facts" is felt.

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*See Pennsylvania System Test Bulletin 31.

*See ELECTRIC RAILWAY JOURNAL, July 31, 1920, p. 227.

In view of existing locomotives described in the foregoing, the table of comparisons between two steam locomotives, a Mikado at 14 m.p.h. and a Mallet at 9 m.p.h. (evidently not good specimens) and an imaginary electric locomotive at 16 m.p.h., is, to say the least, inconsistent, and the claim that a mountain division will have an increase of 50 per cent in daily tonnage over possible steam engine performance is not so "modest" as claimed.

In this statement the claim that "electric locomotives can be maintained for 20 to 25 per cent of the upkeep cost of steam locomotives" should be included.

Two statements in the fuel comparison deserve some analysis. The standby losses for steam locomotive are given as 9,042 lb. of coal. The regenerative braking on the electric locomotive is credited with a saving of 1,430 lb. of coal. About half, or 4,595 lb. of coal, of the standby losses are for making fire and drifting, which is high. The coal used for making fire is not all loss.

As to regeneration returning 18 per cent of current used back into the line, that appears high, and leads to the suspicion that Mr. Armstrong uses a comparison between a very bad steam operating condition and a very good electric operating condition, which is not representative of averages.

At present steam locomotive standby losses are high, but when railroads get back to normal these losses will be materially reduced, and the average will no doubt be less than 15 per cent of the coal used. Regeneration may be a slight factor, but it will be nearly negligible in averages.

ELECTRIFICATION SOMETIMES HAS PRIORITY RIGHTS

For certain local conditions electric traction should be given priority rights, even if the cost is greater. They are: (1) In tunnel operation; (2) in large cities and their suburbs; (3) where sufficient water power is available; (4) where super-power plants can be built in juxtaposition to an adequate supply of culm, or other low-grade combustible not easily marketable.

In the open country, where smoke and gases from the stack are not seriously objectionable, existing installations do not yet indicate that electric traction can be carried on with as little coal consumption as modernized steam traction. Where steam locomotives are too small and inefficient, larger and more economical steam locomotive units to meet any power and speed requirements within the limitation of track and equipment can be substituted without in any way interfering with the continuity of traffic or educating the personnel to handle the new power. As tersely stated by Mr. Shepard, the substitution of electric traction will require a revolution in methods and service.

The answer to the problem is governed by whether there is a saving in coal with electric traction over that with steam traction, including standby losses, and whether this saving is sufficient to pay interest, depreciation, taxes, insurance, etc., on more than 400 per cent greater capital investment, and for the interruption of traffic and the revolutionizing of the organization during the transition period.

Maintenance of Electric Locomotives Affected by Overload

The fifth speaker for the steam locomotive was W. L. Bean, assistant general mechanical superintendent New Haven Railroad. Mr. Bean declared that while, broadly speaking, electrical operation requires less coal per unit of traffic handled than steam operation and the mileage per unit of electric equipment is ordinarily greater per unit of time, yet on one road the first cost of the electric engines per unit of capacity was 84 per cent greater than in the case of steam. Referring to the comparative flexibility of the two types he said that a certain modern passenger electric locomotive will handle a heavy train of Pullmans at high speed on a through run with few stops such as would require a modern Pacific type steam engine of about 43,000 lb. tractive effort, but because of heating caused by frequent starting in heavy local service, the maximum train which could be handled by the same electric locomotive is one which could be hauled by a steam engine of about 30,000 lb. tractive effort. There is also not much elaboration of the fact that an inconsiderate or overambitious yardmaster may overload the electric engine, and that machine, possibly in sympathetic endeavor to live up to the expectations of its sponsors, goes after its job like a spirited horse. A steam locomotive, on the other hand, being what might be termed more phlegmatic, will do about so much and no more, and either stalls or loafs over the road without injury to itself. The electric engine may not be subject to "creeping paralysis," but since it leads a strenuous life, it acquires a sort of hardening of the arteries in the way of accumulative depreciation of insulation which leads the way to heavy repairs.

Again, it is difficult to understand how railroads are to maintain electric locomotives without back shops, unless they job the work out to manufacturers of electrical equipment. Bearings wear, springs fail, axles and frames break on electrics as much as they do on steam engines. Switch groups, transformers, motors, both main and auxiliary, air compressors, blowers, control and collector apparatus, all require overhauling periodically. Officers in charge of maintenance of electrical equipment on one Eastern road are at present insisting that $350,000 be expended soon for an addition to the present back shop.

While the design of a steam locomotive is said to be utterly circumscribed by the necessity for tying it up to a steam boiler, the statement can also be made that some modern high-powered electric locomotives are so compact with apparatus, both inside the cabs and beneath, as well as on top, that additions to, or enlargements of details, even of a minor nature, are well-nigh impossible. When one comes to the problem of heating passenger trains, electrically drawn, the difficulty of finding room for the boiler, water and fuel oil storage, auxiliaries, etc., and keep within weight limitations, lead one to the conclusion that on electric passenger locomotives the boiler is circumscribed by electrical apparatus. Electrical engineers on one road have even advocated the construction of a tender for carrying the boiler, water tanks, etc. Imagine an electric locomotive requiring a tender!

The steam locomotive, except in a moderate way as to clearance and weight limits, has a wide range of application. Railroads loan steam power back and forth with advantage usually to both parties, but no case comes to mind where electrical equipment for heavy traction can be interchanged. It is to be hoped that the lines of development of electrical facilities will tend to converge along lines of common usage rather than diverge too widely. Some reasons for such desirability are: (a) Railroad managements will not be so fearful of becoming tied up with a heavy and inflexible type of investment, which may quickly become obsolete through not lending itself reasonably well to extension of modernization, and (b) the need for a broader field of design and manufacture of equipment and the furnishing of repair parts for the same.

Dependence largely on one manufacturing concern which must unload heavy overhead charges at surcharge rates, unheard of in the case of steam locomotives, is highly undesirable and is restrictive to the extension of electrification.

Virtues of the Electric Locomotive Extolled

The first speaker to reinforce the arguments of Messrs. Shepard and Armstrong in favor of the electric locomotive was C. H. Quinn, chief electrical engineer Norfolk & Western Railway. He said that if we are to maintain our standing in the commercial world our railroad facilities must go forward. Obviously the movement of freight traffic takes precedence over other transportation problems, hence interest and study should be concentrated on the freight locomotive. The following extracts indicate Mr. Quinn's line of thought:

If our knowledge of the development of freight car equipment is indicative of what our freight transportation motive power needs may be in the future, we should begin to look into the possibility of the steam locomotive being able to keep up with development of other transportation facilities. Freight cars for carrying coal within the past ten years have been increased in capacity from 50 to 100 tons per car for 100 per cent. Apparently the steam locomotive may be called upon indefinitely to meet the ever-growing demand for heavier trains which must be operated at higher speed and with minimum delay between terminals. During this same period the largest type of steam locomotive has added generally about 13 per cent to its weight and number of driving wheels. In 1909 the Mallet engine had up to a total weight of 700,000 lb., with 412,000 lb. on driving wheels (Santa Fé 2-8-8-2). In 1919 the engine of the same type had a total weight of 731,000 lb., with 478,000 lb. on driving axles. With the exception of a special design only permissible in restricted track districts these are characteristic figures for the representative steam locomotive development during this period. With vertical and side clearance limited to fixed values the engine can only be enlarged by adding to its length. Again the rigid wheelbase stops the expansion along the track.

Reference has been made to similarity in capacity of the 2-10-10-2 Mallet locomotive on the Virginian Railway and the electric freight locomotive on the Milwaukee. However, it was only by reason of the extremely wide side clearance existing on this one road that such an engine could be used. Furthermore, the engine could not be handled by its own power over any railroad but had to move over a special route from factory to point of delivery. If we are to provide for the use of these larger steam engines on all railroads the cost of bridge and tunnel work and possibly the rearrangement of clearances on some double-track railroads must be given consideration and the cost charged against the future increase in capacity of the steam locomotive.

Again, in the improvement in fuel economy in the steam locomotive for the past ten years we find that relatively little has been done to keep pace with the ever-increasing demand for fuel conservation.

The American Locomotive Company in 1911 issued a bulletin giving in detail the results of six dynamometer-car tests, made behind a 0-8-8-0 Mallet engine. This locomotive had a total weight of 523,500 lb., with 376,800 lb. on drivers. It operated on saturated steam and was hand-fired.

This particular engine, under special supervision of the testing crew, as an average of six tests delivered a drawbar-horsepower hour on 5.15 lb. of coal fired. In 1918 under similar operating conditions a practically new 2-8-8-2 Mallet engine, weighing 695,000 lb., with 472,000 lb. on the driving wheels, and equipped with superheaters, brick arch and stokers, as an average of six tests gave a drawbar-horsepower-hour on 4.33 lb. of coal.

30 PER CENT OF COAL SAVED ON N. & W.

The above figure of 4.33 lb. of coal may be compared with the performance of the electric locomotive on the Norfolk & Western, the operating conditions being very similar. Converted into electrical terms this is 5.77 lb. per kilowatt-hour at the drawbar. Adding to this 23 per cent, a nominal amount for standby losses, we have a total of 7.12 lb. During 1919 our Bluestone plant generated for traction purposes about 67,395,000 kw.-hr. and burned 103,034 tons of coal, which is equivalent to about 3 lb. of coal per kilowatt-hour at the switchboard. As a total loss between busbar and drawbar of 40 per cent is an average for electric locomotives of the size and weight of those on the Norfolk & Western the coal consumption is 5 lb. per drawbar kilowatt-hour, a saving of 2.12 lb., or 29.3 per cent in favor of the electric locomotive. During this twelve-month period we handled 4,714 eastbound trains and burned 103,034 tons of coal, or slightly under 22 tons per train. An average of three tests with hand-fired Mallet engines in the same service and using a sacked coal showed a total consumption per train of 35 tons, or an excess for the steam engine of 13 tons per train over the electric locomotive.

The suggestion has been made here this evening that we consider from twenty-five to fifty years as the useful life of a steam locomotive and that the steam locomotive designer and builder become active in the direction of superheating and compounding of steam locomotives for the purpose of increasing their capacity. Might we ask what has become of the four-cylinder and cross-compound engines of thirty years ago and likewise of the experience gained with compound engines during this period? If the benefits derived from compounding are not thoroughly understood after thirty years of experience how can we expect the next twenty-five years to develop such data as will materially improve the situation. It required fifty years to settle upon 4 ft. 8½ in. as the standard track gage. It is inconsistent to attack the electric locomotive because after a limited trial of fifteen years we still have two systems of power distribution in use.

Reference is made to the handling of heavy tonnage trains as reflecting in peak loads on power plants and the transmission system. On the Norfolk & Western we handle our entire electric operation without any instructions from train dispatchers and without any system of arbitrary train spacing. Our power plant and transmission system are fully able to take care of 100 per cent more tonnage in a given time than had ever been handled by steam power. The prospective user of the electric locomotive need not fear any failure or limitation from this source if the installation is laid out with the present degree of latitude in providing general facilities over the right of way and at terminals for steam power.

The electric locomotive is charged with imposing definite spread of traffic over a division, the inference being that this is necessary for economical and successful operation. In this connection I may say that the automatic block signals on the Norfolk & Western are the only devices used to guarantee a spread traffic in our electric zone, and so far they have been very successful.

Further reference is made to some uncertainty in the functioning of the regenerative control of the electric locomotive. Like all other systems of braking, the regenerative system is susceptible to man failure. On the Norfolk & Western we are moving in one direction an average of 4,000 trains per year. We have had the electric locomotives in service about five years and in that time have handled more than 20,000 trains, using only the regenerative apparatus to brake a 3,250-ton train down a 2.3 per cent grade.

So far we have not had a man failure and the regeneration still has 100 per cent operation to its credit.

If our freight-car carrying capacity can be increased 100 per cent in ten years are we to be satisfied in considering the freight locomotive as having reached its maximum development? Is the railroad operating world as a whole going to be satisfied with the freight revenue obtained by using 100 per cent larger cars and be forced to reduce the number of cars per train by the limitation of the steam locomotive? Do we expect our operating officials to be satisfied with the continued payment of premium overtime for freight train crews brought about by the slow movement of trains and the eight-hour day? The average engine and train crew is held 25 per cent of its time at terminals. If we are to eliminate the ever-growing labor expense of premium overtime and reduce the standby losses of our locomotives running time per 100 miles must be reduced to five hours instead of eight, now about the best we can expect from the steam locomotive.

If we are to aproach this problem with the purpose of providing such motive power at the head end of our freight trains as will develop not only the drawbar pull up to the maximum capacity of the heaviest gear now in use but such an engine as will sustain this pull at a speed that will permit train operation over a 100-mile division of varying profile within the time limit of the eight-hour day we fail to find a steam locomotive record that will answer this specification.

Following Mr. Quinn, the case for the electric locomotive was carried further by A. L. Ralston, mechanical superintendent New Haven Railroad. His paper will be abstracted in a later issue.

Mr. Beeuwkes Sends a Contribution

The Milwaukee Railway was represented in the discussion through a communication sent by Reinier Beeuwkes, electrical engineer of that road. Mr. Beeuwkes' paper, which was read by title, is abstracted below:

Mr. Beeuwkes said that as frequent references were made in the papers to the Chicago, Milwaukee & St. Paul electrification, he wished to correct mistaken impressions which might be derived from such references in Mr. Muhlfeld's paper. He quoted Mr. Muhlfeld's statement to the effect that "few if any existing steam roads can justify or stand the additional capital expenditure per mile of road for electrification, etc." The statement, he said, is supported by neither facts nor figures. It is not borne out in the case of the St. Paul electrification, and there are many roads with like conditions which might expect results similar to those which the St. Paul has obtained. The electrical operating experience of this road enables accurate determination to be made of what the results of electrification will be in any similar case, and there are few cases which will not profitably warrant at least consideration of electrification. In any event actual available operating data will permit of settling the matter one way or the other in the individual case. That Mr. Muhlfeld's opinion does not represent the foregone conclusion of steam men in general is evidenced by the serious attention they have more and more been giving the matter of electrification.

Mr. Beeuwkes also referred to the comparison made between a St. Paul electric articulated and a Virginian steam articulated locomotive. In this the assumption seems to be that the electric locomotive had been designed to secure the maximum capacity possible, and the purpose of the comparison seems to be to show that the steam locomotive can be built with still greater capacity. The St. Paul locomotive, he said, was actually designed for capacity sufficient to handle a 2,500-ton trailing load over any portion of the profile without helper on grades of 1 per cent or less, at a speed of approximately 16 m.p.h. It was designed for no greater capacity, because that specified was deemed by the railway to be sufficient. The tractive effort of this locomotive at 15 m.p.h. is about 88,000 lb. instead of 71,000 lb. as given in the tabulation. The figure of 71,000 lb. represents approximately the continuous tractive capacity, and the speed corresponding would be approximately 16 m.p.h.

The item of train speeds is important to consider in connection with the many cases in which the question of terminal capacity does not enter, but rather that of increasing existing track capacity or, in lieu thereof, providing additional tracks. While it might be practicable to secure any desired speed at any tractive effort in an electric locomotive, provided the necessary resistance were supplied, actual practice has demonstrated that ample flexibility is secured by providing two or three running speeds for any particular tractive effort. There was no particular difficulty involved, however, in securing as many as nine running speeds in the case of one of the new types of St. Paul passenger locomotives.

In connection with the comparison between a Pacific steam locomotive and the St. Paul passenger locomotive, Mr. Beeuwkes stated the facts to be: That the electric locomotive is designed to handle, and tests have shown it capable of handling, a trailing load of not less than 960 tons over the profile, including the 2.2 per cent grade at the Columbia River. This is equivalent on the average to a train made up of thirteen of the St. Paul steel cars, or of fourteen cars of the average weight of the cars in the train mentioned by Mr. Muhlfeld.

Referring to Mr. Muhlfeld's comments on fuel consumption, Mr. Beeuwkes said that fuel economy does not constitute the principal claim for electrification. This depends, in the individual case, upon the relative cost of delivering coal or electricity to the locomotive after all fixed and operating charges are considered. It may for such individual case develop that the savings from electrification will be those due to decreased cost of engine repairs, engine house expense, train and enginemen's wages, increased ton-mile capacity of locomotives, etc. In the case of the St. Paul the power contracts apply for 100-year terms, and a fixed price for energy is thus assured. The figure of 40 kw.-hr. per 1,000 ton-miles used by Mr. Armstrong represents an average for the whole year for trains of varying tonnages and under all weather and other affecting conditions. A corresponding figure based on special test runs as derived by Mr. Muhlfeld would obviously not be comparable. The comparable fuel figure for all trains and for the whole year for the district to which Mr. Muhlfeld refers could hardly be expected to run very high, as the average grade between the points mentioned is only about 0.06 per cent and the ruling grade only 0.8 per cent, as compared with the mountain grade conditions on the St. Paul. Mr. Beeuwkes also took up the reference made to the steam equipment which was replaced by the electric locomotives. This was stated to be antiquated or obsolete. The line of the St. Paul west of Mobridge has only been in operation since 1908 and most of the locomotives for it were purchased new. While most of the new locomotives were not of the most improved present-day type, they are probably representative of what is in general use by other roads.

THE proponents of the electric locomotive contended that fuel economy does result from its use. But the greatest boon conferred by electrification is increase in track capacity. This results from the possibility of obtaining higher speed and greater tonnage per train. Regenerative braking also is a unique contribution to the art of railroading. Railroads which have electrified sections appear to be enthusiastic as to the future of electrification.

The list in Table I shows the types in operation on the Rocky Mountain Division in December, 1915 (excluding locomotives in shop), just before electrification. The coal per 1,000 ton-miles for October, November and December, 1915, averaged for freight service 276 lb. as against 39.4 kw.-hr. per 1,000 ton-miles for October, November and December, 1916, under electrical operation.*

TABLE I—C., M. & ST. P. STEAM LOCOMOTIVES IN FREIGHT SERVICE, ROCKY MOUNTAIN DIVISION

Number	Class	Weight on Drivers, Pounds	Rated Tractive Power, Pounds	Remarks
		Road Engines		
7	Prairie	152,000	33,300	Simple
3	Mikado	216,500	50,600	Simple, superheater
12	Mikado	201,000	46,630	Simple
7	Mallet	327,500	76,200	Comp., superheater
5	Mallet	323,500	76,200	Compound
		Helper Engines		
1	Mikado	213,500	50,000	Simple, superheater
2	Mikado	205,000	46,630	Simple
2	Mallet	323,500	76,200	Compound

Taking up the item of efficiency of locomotive operation, Mr. Beeuwkes said that allowance for transmission losses between power plant and railroad electric system depends on the conditions of the particular case, provided that the station coal consumption, in this case 2.5 lb. per kilowatt-hour, is not already sufficient to cover the transmission loss. If the power plant is located on the railroad adjacent to the railway transmission system, no additional loss allowance is necessary. If the plant is not so located a maximum allowance of 10 per cent of the power delivered would cover the transmission loss, even for a considerable distance, without expensive transmission construction. He also said that comment is superfluous regarding such indefinite remarks as: "When, on account of transportation conditions, a motor is required to carry an overload for periods of five or six hours it either breaks down due to heating, etc." An electric motor can exert abnormal tractive effort for considerable periods without injury, whereas the steam locomotive has a well-defined maximum tractive capacity, depending upon the steam pressure at which it is supplied.

By way of summary of Mr. Beeuwkes' comment on several other points in Mr. Muhlfeld's paper, the following points are of interest: (1) One of the marked economies effected by electrification is the reduction of train and enginemen's expense, on account of the increased ton-miles per train-mile and per engine-mile, and the reduction of equipment repair and roundhouse expense. (2) The spacing of trains to hold down the power demand on the St. Paul electrification has in combination with the action of the power-indicating and limiting system worked out very well. When the load factor was running 60 per cent or higher the automatic slowing up of trains involved an increased expenditure for freight train and enginemen's time of about 10 per cent. With a load factor of from 50 to 55 per cent, however, the limiting action takes place through only a small part of the day, and while there is a considerable reduction in the maximum demand there is little effect on the operation. (3) As to ease of starting trains, this feature of electrical operation is noticeable, conducing to increased comfort of passengers, an electrical operation asset whose value is not always recognized. As to starting each car successively, this does not apply in the case of a train on a mountain grade. (4) The performance, described by Mr. Muhlfeld, of a heavy steam freight train going down a 17-mile grade averaging 2.2 per cent, without stop to cool brakes, is unusual. His information as to the accident on the St. Paul is incorrect. There is nothing in the regeneration system which prevents the application of the air brake at any time, and if they are applied soon enough and properly, and are in good condition, the train will stop. At an investigation of the accident, testimony was introduced by some of the crews to indicate that the brakes were not in proper condition, but it was admitted that the brakes were tested before the train was started down the grade and the brake-inspection crew testified that the number of good brakes per car was above the requirement. The speed-recorder tape was not operating, so direct knowledge of the speed at which regeneration was attempted was not available. In any event the overload relay or overvoltage relay on the locomotive operated and disconnected the motors from the line, and the engineer, whatever the reason, failed to bring the train to a stop by means of his air brake. The enginemen, trainmen and others connected with the electrical operation were unanimous in declaring that the accident was in no way an electrical failure. The electric locomotive in this case attained a maximum speed of about 50 m.p.h. and at this speed passed round a sharp curve at the foot of the grade without leaving the track or damaging it in any way. (6) Frequent references are made in the paper to improvements which are being or can be made in steam locomotives and steam operation which will make the average steam locomotive compare favorably in its performance with the electric locomotive. Steam locomotives have been used for a great many years and the electric locomotive is comparatively new. It is not too much to expect that the electric locomotive and electrical operation will also be progressing while the steam locomotive and steam operation are trying to catch up.

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*See issue of this paper for March 24, 1917, page 541.

Mr. Katte Sums Up the Case for the Electric Locomotive

The chairman had prepared some comment for the close of the discussion, but owing to the lateness of the hour he omitted the reading of his notes. These were of a conservative tenor. The conservative engineer, he wrote, on considering the papers prepared for the meeting, would be apt to conclude that too much has been claimed for the steam locomotive as well as for the locomotive operated by electricity. Without doubt there are advantages peculiar to each, but it will always rest with the railroad engineer to determine and decide which type of locomotive will be best suited to the peculiar conditions surrounding the railroad which he serves.

Because of the different operating characteristics of steam and electric service it may be misleading to compare the time the locomotives are in use. For example, the electric locomotives of the New York Central Railroad operate only in a terminal zone, which makes the comparison with locomotives on steam-operated divisions hardly a direct one. However, the following comparison of per cent of "time ready for service," compiled from actual records for the first eight months of this year, will be of interest:

READINESS OF LOCOMOTIVES FOR SERVICE

Condition of Locomotive	Electric Locomotive	Steam Locomotive
Ready for service, waiting, per cent	56.2	24.3
In service, per cent	31.3	47.8
At terminals, per cent	4.0	4.6
At engine house, per cent	8.5	23.3
	100	100

The fact that the electric locomotives stood waiting for service 56 per cent of the time and were actually in use only 31 per cent of the time is due to the train schedule and the grouping of a large number of trains night and morning with comparative inactivity between these hours. This clearly illustrates the necessity of carefully studying local conditions before coming to the conclusion that electric operation will prove more economical than steam operation for a given railroad proposition.

Unfortunately, a direct comparison, applicable for all railroads, between the coal burned on the steam locomotive and the fuel consumed in the power house for supplying energy to the electric locomotive cannot be made with the same accuracy as, say, between a reciprocating engine and a steam turbine. This is because there are not a representative steam division and an electric division operated under anything like the same conditions. The following comparison of fuel consumption has been computed from the reasonably accurate records of three railroads operating both steam and electric locomotives under widely different conditions both as to equipment and service:

COMPARATIVE FUEL CONSUMPTION—STEAM AND ELECTRIC.

Items	C., M. & St. P. R. R.	N. & W. R. R.	N. Y. C R. R.
Kilowatt-hours per train-mile measured at alternating-current side of substation	29.1	361.	34.5
Pounds of coal burned on steam locomotive per train-mile	188.	1400.	112
Pounds of coal on steam locomotive equivalent to 1 kilowatt-hour measured at alternating current side of substation	6.46	3.88	3.25
Computed pounds coal at power station per kilowatt-hour referred to alternating current side of substation	2.44	2.44	2.44
Saving of coal in favor of the electric locomotive, per cent	62	37	25

This wide range of results and the apparent discrepancy in the relative fuel consumption are due to widely different conditions. Even a wider difference in power consumption will be found on trains in different service on the same division, as, for instance, on the New York Central Railroad, a multiple-unit train making stops every mile or so will consume 150 watt-hours per ton-mile, whereas the through trains making no intermediate stops in thirty miles or more will consume but twenty-six watt-hours per ton-mile.

Finally, too much reliance should not be placed on results obtained from test runs, even if they fairly well simulate actual conditions. To be of comparative value, service records should extend over several years, and the data should be carefully collected, correlated and averaged to give results that may be expected in everyday operation.

CLOSING REMARKS BY GEORGE GIBBS

The discussion of the evening was closed by George Gibbs, chief engineer electric traction Long Island Railroad. Mr. Gibbs spoke as a railroad man. He said that in discussing this subject it is presumably permissible to view it from the standpoint of either design or performance. It concerns the relative advantages of two kinds of power plants for conducting railway transportation. An abstract of Mr. Gibbs' remarks will appear in a later issue.

Electrolysis Committee Active

THE research sub-committee of the American Committee on Electrolysis is making an important series of investigations in Cleveland, with the financial support of the Cleveland Railway and the Cleveland Electric Illuminating Company. L. P. Crecelius, superintendent of power of the railway and American Electric Railway Association representative on the research sub-committee of the A. C. E., has been active in this work. Pipe drainage as a means for electrolysis prevention is being particularly studied, and the first work includes new installation. Problems of interchange of current between conductors, of joint electrolysis, etc., are being considered in connection with gas and water piping and power and railway cables.

PUBLICITY

HOW WHEN WHY

Further Suggestions as to Movies

SOME suggestions regarding the use of movies were printed in last week's issue of this paper, and the following additional communications are given to indicate the continued interest in this subject as a practical means of railway publicity.

Motion Pictures Can Be Used if Film Is Prepared by Experts

TOLEDO RAILWAYS & LIGHT COMPANY
TOLEDO, OHIO, Sept. 30, 1920.

To the Editors:

I have read with much interest the articles in the Sept. 25 issue of ELECTRIC RAILWAY JOURNAL on publicity and the use of motion pictures in telling the story of the railways.

We have used motion pictures in our safety campaign in the schools, in clubs and in every place where we could secure an audience. In the coming campaign when Toledo votes on municipal ownership and the service-at-cost plan the committee of citizens is planning to use the moving picture houses with a real campaign.

In considering motion picture advertising the advertiser must remember that only a few motion picture houses will run advertising pictures or advertising slides and they are generally neighborhood picture houses and often on the outskirts of the city. People go to the motion picture theater to be entertained and resent it if their time is taken up by a lot of advertising slides. Advertising to do much good must catch the people when in a receptive mood and if they have paid their money to see pictures and have to look at slides or at a motion picture that is clearly advertising propaganda they are not likely to let the message get far into their cranium.

There is a way, however, to get advertising into a picture when experts take hold of it and get a real cast and tell a real story so that there is a punch to it. I believe that the national association is in a position to secure and circulate such a film or films through the co-operation of the various companies. It is very expensive, however, and should not be attempted without plenty of capital.

E. B. KELSEY.

Need for Educational Film Is Now

VIRGINIA RAILWAY & POWER COMPANY
RICHMOND, VA., Oct. 4, 1920.

To the Editors:

I have read the editorial entitled "Proper Publicity, Its Need and How Shall We Get It" and the editorial suggestion headed "The Next Step in Publicity Work," appearing in the Sept. 25 issue of the ELECTRIC RAILWAY JOURNAL and have noted with keen interest the idea of filming the problems of the utilities for use in the "movies." The suggestion strikes me as being very good and I am sure would result in a better understanding of our difficulties.

Practically all over the country the problem of the electric railway industry is the same in the main; it is without credit and its franchises need revamping with a view to restoring its credit as well as for making them more flexible, ridding them of the many onerous taxes indirectly required, such as through paving, sprinkling and various other ways in different cities, all of which must reflect in the fare charged. It would seem to me that such a film might be very interestingly worked out along an educational line, reviewing the history of the electric railway industry, in which could be shown how the paving requirement is today the relic of horse-car days rather than a just requirement of the electric railway and how little the fare has increased in proportion to the costs of labor and materials. Such a film might be entitled "The History of the Trolley" or "The Past, Present and Future of the Electric Railway," featuring the possibilities of the trackless trolley in the smooth-paved residential districts.

Of course, the need for such educational work is now, and I presume it is too late to have any consideration at this convention of the American Electric Railway Association, but I think it should be made a subject for special consideration and study by that body. A. H. HERRMANN,
Editor *Public Service News.*

[Thomas S. Wheelright, president, writes that he fully concurs with the above views expressed by his assistant, Mr. Herrmann.—EDS.]

People Should Be Induced to Think of the Utilities

TERRE HAUTE DIVISION
TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY
TERRE HAUTE, IND., Oct. 5, 1920.

To the Editors:

I think that the suggestion of using the motion picture is a very good one. I have long felt that there was a great opportunity to get the story before the people in this way, though how impressive it would be, or how lasting the effect, it is of course hard to say. Some years ago I secured "The King of the Rails" from the General Electric Company and got one of the movie managers to show it in his house as an extra film, and I watched its effect the first night it was put on. After the film was run the house applauded very generously, and that was the only time I ever saw an advertising or a propaganda film applauded.

We used the motion picture a little bit last year, as we have a photographer in town who takes moving pictures and runs them in one of the local houses every week or so, under the title "Weekly Pictorial Review of Terre Haute." The occasion was our annual employees' picnic, and we had the photographer take 200 or 300 ft. and include it in his "Weekly Review." This took very well and we heard a good deal of comment about it on the street.

The fact is that people do not think enough about the problems of public utilities, and have not done so in the past, and they should be induced to do so by any legitimate possible means. As the editorial suggestion says, it is not a job for one man or one mind.

If I were going to do anything along this line for the industry as a whole I would call in an expert moving picture producer, the best in his line if possible, and tell him the whole story and the purpose that I had in getting this story before the people through the medium that he could provide, then let him go away and think about it for a few weeks, or as long as he wanted to, and then come back and have another talk, when he could ask questions and straighten himself out on things that might not have been clear to him from the first conference. After that let him go away and work out some plan that he thought would be the best means of putting the story over. Of course, in order to be most effective, this style of publicity would have to have a good deal of local interest, but once the plan were decided upon local features could easily be worked out.

E. M. WALKER,
General Manager.

Pictures Must Be Entertaining and of General Interest

Many Problems Are Common to All Companies and They Could Be Woven Into a Broad Educational Film

By FRANK WERT
Director of Public Relations Pennsylvania-Ohio Electric Company, Youngstown, Ohio

EVERY medium of publicity is good—for something. The question that bothers us from time to time is the selection of the best means to aid in selling the commodity, service or idea in which we happen to be dealing. What may bring excellent results in one case may prove of little value in another.

The editorial in the ELECTRIC RAILWAY JOURNAL of Sept. 25 on "Proper Publicity, Its Need and How Shall We Get It?" and the editorial suggestion on "The Next Step in Publicity Work," both dealing with the use of motion pictures as a medium for electric railway publicity, are most timely and open up a broad field for consideration.

That the motion picture presents an excellent medium for reaching the great bulk of the people need hardly be argued when the millions of persons who weekly attend the motion picture shows are considered and when it is recalled that there is hardly a village so small as not at least occasionally to have its "movie" attraction. It is also a well-known fact that "educational films" have been found valuable by a variety of businesses in acquainting the people with their methods and thus popularizing their product. In the railway industry itself pictures have been found helpful in accident prevention movements and, to a milder degree, in other ways.

The question then does not appear to be the value of the motion picture as a medium of publicity, but rather the ways and means of utilizing it acceptably and beneficially. In this regard two essentials (perhaps obstacles) come to mind:

First—The pictures must be interesting and entertaining as well as instructive.

Second—They must approximate conditions as they exist in the locality in which they are exhibited to carry conviction to the spectators.

In regard to this first condition, we must not forget that virtually all the old methods of advertising in motion pictures have been barred from the better classes of motion picture theaters. They were ruled out because they bored spectators who came to the theater for the sole purpose of being amused and entertained. It proved to be bad business to inflict upon these persons advertising slides and even the cleverer devices which, however, bore the indelible imprint of advertising.

Unless the film has sufficient merit to interest the larger number of the spectators it will be of little benefit. If they simply view it to endure it as it passes before their eyes little or no good can result. As was pointed out in the JOURNAL, the motion picture is a 100 per cent medium in that it is read by all its subscribers, but, by the same token, what is thrown on the screen must be interesting or the medium will soon be closed to such films. If an item in a newspaper is not interesting, it need not be read; if a part of a picture program is dull, it cannot be dodged, and the manager will find difficulty in filling the house at each performance, and that is what he is in business for.

For these reasons the wisdom of the suggestion in the JOURNAL that the making of pictures be in charge of competent and experienced picture men is apparent.

The matter of the acceptability of pictures from a local viewpoint, however, is one that lies largely with the railway management. It is probable, for instance, that a film, no matter how well designed, that revolves around the use of open summer cars would lose much, if not all, of its force in a community where that type of car is never seen. Again, traffic pictures taken in a city that has broad streets would seem to carry little conviction to the average spectator in a city where all thoroughfares are narrow. There would be unreality in the atmosphere of such pictures which would militate against the lesson of the film, whatever it might be, making the desired and necessary impression.

This is hardly so much of a problem for the railways which are contained within one of the larger cities. With them the expenditure of several thousand dollars for a picture wholly local in its scenes might well be worth while. It is, however, a problem of some moment to the properties which serve the smaller cities, or, perhaps, a chain of small towns, for the initial outlay for a local picture might prove prohibitive.

It is to such companies as the latter that the proposal to make pictures which can be used widely and generally has the strongest appeal, and certainly the development of a plan to this end will be awaited with interest by many of them, and would be of value also to the larger companies, even though they could afford to have their own pictures made.

This might seem like a difficult task, but it should not be deemed impossible. There are many problems of the street railways that, minor details excepted, are about the same throughout the country and in the solution of which the understanding and co-operation of the public is necessary. Films dealing with one or another of these might feel the way to effective motion picture publicity.

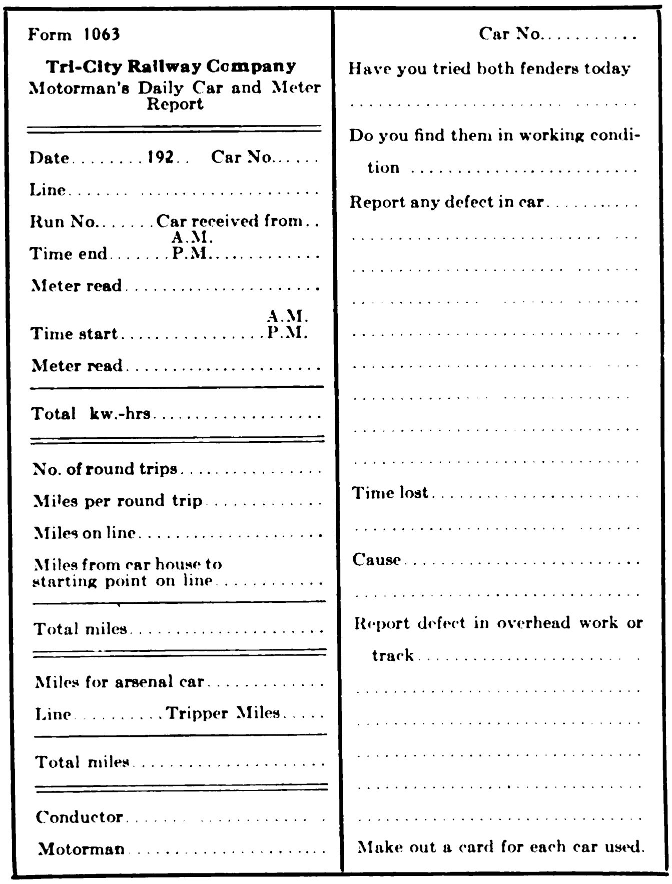
One such problem will suffice for illustration. A committee of the American Electric Railway Transportation & Traffic Association has been busy for the last two years on a code of traffic principles. The result of its work will be a generally accepted standard dealing with street traffic from the railway point of view. Regulation of street traffic is a subject of very general interest in all cities, large and small. It is a problem that is pressing for solution more and more each year. No doubt an interesting film could be built around this theme and no doubt many persons could be impressed with the need of local regulation and the direction that regulation should take. Salient points in regard to delays to traffic, accidents and the like could be further impressed upon the spectators by the judicious use of motion picture graphic charts. Perhaps arrangements could be made for the use of localized statistics for such charts to be inserted in the film, bringing this phase of the film close to home, even if the pictorial views must be of "foreign" cities.

Perhaps a better topic might be developed for the screen, but in any event the suggestion of the ELECTRIC RAILWAY JOURNAL that careful consideration be given to the use of motion pictures for publicity purposes deserves the attention of the managements of properties, large and small, throughout the country, and there can be no better time for the inauguration of such work than right now.

New Car-Mileage Report System

New System for Keeping Car-Mileage, Taken from Motorman's Meter Report Record, Adopted by Tri-City Railway

THE Tri-City Railway (Davenport, Iowa) installed 100 Sangamo meters during June, 1915, and twenty-five additional cars were equipped with meters one year later. This provides a complete equipment for all single cars. Two-car trains are not equipped with meters. For convenience in obtaining and recording car-mileage the Tri-City Railway has recently adopted a new system. A new form of report card has been adopted which includes space for meter reports, number of trips and mileage made on one side and defect reports on the other. As every car taken out of the carhouse must have a report card turned in for it, this provides a convenient record of obtaining mileage made by the different cars. The contract under which the men work allows a motorman fifteen minutes per day for turning in meter, accident and car reports. Any motorman who does not turn in reports is not allowed this time.


Form 1063

Tri-City Railway Company
Motorman's Daily Car and Meter Report

Date........192.. Car No......
Line........................
Run No.......Car received from..
Time end.......A.M. P.M.............
Meter read......................
Time start................A.M. P.M.
Meter read......................
Total kw.-hrs.................
No. of round trips...............
Miles per round trip............
Miles on line......................
Miles from car house to starting point on line...........
Total miles.....................
Miles for arsenal car.............
Line..........Tripper Miles.....
Total miles......................
Conductor.......................
Motorman......................

Car No...........
Have you tried both fenders today
....
Do you find them in working condition.............................
Report any defect in car............
Time lost..........................
Cause............................
Report defect in overhead work or track...........................
Make out a card for each car used.

REPORT CARD FOR METER READING MILEAGE AND CAR DEFECTS

As a convenience in carrying out this system, the correct mileage for each run is posted at the station and each motorman is furnished with a small book with the number of miles per round trip on each line, also the distances from all crossovers, junctions and turning points. This enables a motorman to deduct any lost miles, should he fail to make a complete run, and so correct his report for the actual mileage made.

When these reports are turned in they are looked over by the barn foreman for car defects and are then placed in trays. The correct mileage for each run is stamped on the tray so as to make it easy for the operating department to check the various reports for any wrong mileage or other mistakes. Where mistakes are found, the report is returned to the motorman and a correct report is put in its place. A record of the number of bad reports sent in by each motorman is kept and every time a report is returned to a motorman the number of incorrect reports received to that date is written on it. After these reports are checked by the operating department they are sent to the meter clerk to make out the car-mileage per line, the extra car-miles and the total car-miles. He also makes out a monthly meter record for each motorman.

After the meter clerk has finished, the reports are sent to the storeroom, where the mileage is kept for wheels, gears, pinions and lubricants. This new system has reduced the clerical work necessary for keeping mileage records by about 50 per cent and gives each department a correct record. It was quite a task to instruct the motorman in the correct method of figuring out the mileage, but now for every thirty days there averages but one incorrect report from every 300. An accompanying illustration shows the form of report card used.

Resolution by Investment Bankers

AT THE recent annual meeting of the Investment Bankers' Association of America, held in Boston, a resolution was adopted on Oct. 3 urging co-operation between investment bankers and the owners and operators of public utilities and regulating officials in laying the salient facts of public utility operation before the public. The full text of the resolution follows:

Whereas sound and constantly expanding public utilities are essential to the welfare and prosperity of the communities served;

Whereas the conditions resulting from the war have increased the costs of utility operation and of new money required for expansion, and prevented the growth of utility service to meet the increasing requirements of the public and of industry;

Whereas there is a recognized shortage of electrical power, and it is of vital importance to the industries of the country that means be found for providing additional power supply;

Whereas the street railway systems are so tied into the business of the nation that their rehabilitation, maintenance and growth must be permitted and provided by the public dependent on their efficient service;

Whereas the telephone and telegraph have become so important in our daily business and social life that they must extend their service daily to meet the public demands;

Whereas the diminishing coal resources and the increasing demands on the oil supplies throw additional burdens on the gas industries which can be met only by their expansion; therefore, be it

Resolved, That it is the sense of the board of governors of the Investment Bankers' Association of America that there should be co-operation between the investment bankers and the owners and operators of public utilities and the regulating officials in laying before the public full information respecting the vital importance of prompt and continuing expansion of all kinds of utility service, and in encouraging such utility regulation as will provide sound credit as the basis for financing, to the end that the investing public may provide the necessary funds by investment in sound public utility securities; be it further

Resolved, That copies of this resolution be sent to the Governors and the regulating authorities of the several states.

The *Literary Digest* quotes extensively from an editorial in this paper urging that those who use the highways should pay for their maintenance, or at least pay more than those who do not use the highways or who use them little.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

D. U. R. Still Fighting

Alleges Illegal Use of Tax Money by City in Behalf of Municipal Railway Project

Argument is being heard before the Supreme Court of Michigan at Lansing in the suit brought on the motion of the Detroit (Mich.) United Railway seeking to compel Circuit Judge Henry A. Mandell to issue an injunction against the city of Detroit and the city officials concerned in putting out electric railway bonds purchased by the city treasurer and sinking fund commission.

The Detroit United Railway attorney argued that wrongful use was made of tax money by the city treasurer and sinking fund commission in the purchase of the bonds. He also argued that since the city charter prohibited the use of tax money in building or buying a railway, the bond issue was merely a subterfuge for evading that provision of the charter. It was further claimed that the sinking fund commission has authority to buy only such city bonds as are an outstanding debt against the municipality, and that the railway bonds which had never been issued did not constitute an outstanding obligation.

The suit is characterized by Corporation Counsel Wilcox as an attempt on the part of the Detroit United Railway to throttle the city because the company is opposed to competition in the city of Detroit. Mr. Wilcox maintains that the claims of the Detroit United Railway have already been disproved. The bonds which were purchased by the city treasurer and the sinking fund commission are now in the possession of the investing public, having since been sold. The sinking fund and the money in the city treasury are now intact.

In answering the claim of the Detroit United Railway that contracts let by the city for approximately 30 miles of municipal railway are void because they were made before the money was actually obtained for the railway fund by the sale of the bonds, Mr. Wilcox stated that the Detroit United Railway ignores the fact that it has been the practice for the past thirty years to enter into contracts as soon as bond issues have been authorized and before the bonds were actually sold. The validity of this practice has never been questioned before. The statement was made that the sinking fund commission not only had the right but was in duty bound to purchase the bonds since it is required to invest its money in city bonds if possible and at that time there were no other city bonds to be purchased in the market.

While the Detroit United Railway contends that the purchase of the bonds out of tax money was a form of juggling funds, it is claimed that the city could not sell the bonds since Detroit can pay only 6 per cent interest and the loan market at that time was 7 or 8 per cent. Former instances were cited where the city had to buy bonds in abnormal times, in order to allow the carrying on of municipal work. This action was never questioned before.

That buyers of large experience have not hesitated to purchase these bonds is cited as evidence that the suits filed by the Detroit United Railway are not being taken seriously by the public.

In the claims stated by the Detroit United Railway it is held that the bonds were illegally issued and that contracts made because of them were made illegal inasmuch as at the time the contracts were drawn there was no money in the railway funds with which to meet the obligations involved. The subsequent sale of these bonds to innocent purchasers does not validate the contracts and the bonds are still illegal, according to the company. It asks that the court issue an order to impound the money realized from the sale of the bonds to the public so that the city and investors might be protected.

Curtail Power Consumption

A threatened interruption in the railway service of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will be avoided through the co-operation with the company by the business, manufacturing and amusement interests of the city in temporarily curtailing their use of electric energy during the hours from 7 a.m. to 7 p.m.

Twelve steel manufacturers who are among the heaviest users of electric power in Milwaukee have agreed to close their electric furnaces one day each week, two closing each day. Milwaukee theaters will also co-operate by eliminating all out-door advertising for five days in the week, from Monday to Friday inclusive. Similar action will be taken by the local grain milling interests. The Association of Commerce will endeavor to obtain the co-operation of other business interests.

The power shortage has been caused by an unprecedented demand for power. The first unit of a new power plant now under construction is expected to be ready for service in the near future and to relieve the situation. The co-operation of the public was asked through the medium of large advertisements in the Milwaukee newspapers.

$50,000,000 for 450,000 Hp.

Mr. Gaby Continues His Testimony on Hydro-Radial Costs—Estimates of Prospective Railway Business

At the sitting of the Ontario Hydro-radial (Sutherland) Commission in Toronto, Ont., during the week ended Oct. 23, F. A. Gaby dealt with the Chippewa Canal power undertaking now being constructed by the commission. The estimated cost for 450,000 hp. was $50,000,000. In addition there would be 160,000 hp. from the Ontario Power Company and 50,000 hp. from the Canadian Niagara Power Company for which the Hydro Commission was paying $12 per hp., and $18 per hp. for an additional 10,000 hp. Mr. Gaby stated that the cost would be $12 per hp., delivered to the radial railways at Niagara, and that after construction and maintenance charges were added this was $2 to $3 per hp. higher than was charged today.

200,000 HP. AT CHIPPEWA

The original estimates for the Chippewa Canal power scheme called for only 200,000 hp., while the present plans provided for 450,000 hp., which could be developed for $9 per hp. per year.

With respect to the Toronto-St. Catharines radial electric railway as projected. Mr. Gaby estimated that 550,000 tons of general merchandise would be handled, of which 300,000 tons would be in carload lots. Most of this would come from the urban districts, while 65,000 tons would come from Hamilton.

On the Toronto & Suburban line the Hydro Commission was prepared to spend some $287,900 on improvements which would greatly better the service. A deficit was anticipated under Hydro management at first, but Mr. Gaby expected the increase in business to care for increasing operating costs.

OPERATING RATIO ADVANCING

On the London & Port Stanley, now under Hydro supervision, the operating expenses in proportion to revenue had been 66 per cent in 1916, 69 per cent in 1919 and 75 per cent in 1920.

On the Toronto & Eastern Railway, Mr. Gaby stated that when completed and extended into the centre of Toronto, the Hydro-radial line expected to handle 75 per cent of the downtown traffic from the Danforth district within a quarter-mile radius of the route during rush hours, and 60 per cent during non-rush hours.

At the sitting on Oct. 21 Mr. Gaby submitted estimates showing a total of 320 miles of track.

Mr. Mitten Outlines His Attitude

Reluctantly Accepts Commission's Order for Seven-Cent Cash Fare—Men Will Receive Higher Wages at Once

Thomas E. Mitten, president of the Philadelphia Rapid Transit Company, has announced that the company will accept the order of the Pennsylvania Public Service Commission fixing the fare to be charged in Philadelphia after Nov. 1 at 7 cents cash, four tickets for 25 cents. At the same time Mr. Mitten makes it plain that he is keenly disappointed that the commission has seen fit to impose upon the P. R. T. a form of fare increase for which it has not asked. Mr. Mitten has also announced that the company on Nov. 1 will begin paying its carmen at the rate of 72.5 cents an hour, and that they will be given back pay as soon as funds are available. The amount of back pay due the men approximates $1,000,000.

OFFICIALS of the company estimate that the 7-cent fare with reduced-rate tickets, free transfers and 3-cent exchanges, will yield less in revenue than the straight 5-cent rate sought by Mr. Mitten. Before the Public Service Commission had announced its decision, President Mitten was asked whether he was willing to try out any fare plan other than the one he had proposed. He declined to answer the question. It is believed now that he is quite willing to give the commission's plan a fair trial, knowing that if it proves unsuccessful, the blame cannot be put upon him.

MANAGEMENT DISAPPOINTED

Posters defining the company's attitude have been placed in all the cars. These posters addressed to the riding public read as follows:

> The Public Service Commission orders P. R. T. to collect 7 cents cash, four tickets for 25 cents, commencing Nov. 1, 1920.
>
> P. R. T., men and management, fought hard for the 5-cent fare and thank you heartily for your most generous help and appreciation. We are surprised and sorry that your big petition and your voluntary payment of the second fare did not receive more favorable consideration.
>
> P. R. T., men and management, value your friendship. We will try to hold the short distance riders by giving you the very best service possible under present conditions.

In announcing to the men that payment of the higher wages would begin at once, Mr. Mitten said:

> We are not quitters; we are not cowards. You must not feel that this is a defeat, because if you will remember when Tulley and I tried to teach you nine years ago what was in our minds in regard to the results to be secured by co-operation, we had more than one disappointment and you did not believe it in one telling. Now the tables are turned and you have become the teachers. You are trying to tell the world how peaceful relations can be established and maintained between capital and labor under our co-operative plan, and what wonderful economic results have been here secured.
>
> POLITICIANS TO BLAME
>
> You are trying to tell Philadelphia and certain politicians that their failure to recognize our good work and great accomplishment cannot disturb the integrity of our organization. Courage is sustained when the cause is just. Setbacks such as we have just received only serve to strengthen our determination, even as the healthy, well-nourished tree is strengthened when its energy is driven back to its roots by the pruning of its branches. Strike talk must be discouraged for that harks back to earlier days. Strikes are the weapon of the ignorant; persuasion and persistency in the right are our great weapons and must prevail.
>
> You are, I am confident, going through with this fight in the same dignified way that you have thus far. This, despite the abuse of the Councilmen when you went down to present your petition, despite the thing that has been done to us here and now.
>
> There is unquestionably in this community a feeling that we have been wrongly dealt with. Our best remedy is to let that seed sink in and flourish. We have the right of this question and it is going to be impressed upon the people.
>
> We must not talk against our government, because in America our government is of ourselves. We all have our votes. We ourselves select our representatives. To find fault with our hand because it is not clean and therefore desire to cut it off is futile. We would clean our hand and it is again a useful member. So it is for us to work for clean government.
>
> COMPANY'S CAUSE JUST
>
> The unrest of today that we see throughout the world is born of distrust and disbelief in the good intent of those in high places. P. R. T. men and management, have confidence in each other, and as surely as you and I now sit here we will succeed. Every seeming defeat we meet, such as now, but strengthens us, strengthens our purpose and weakens our enemy. Why? Because we are right and right must prevail.
>
> I do not want you to lose your dignity with your passengers. You will be asked, particularly by those who are not overly well educated, why this increased fare? I know what you have been saying; I know what I would be inclined to say, but I don't want you to say it. This is the reason for the window sign, which will have been placed in the cars. Take the contents of this window sign for your text and you cannot go wrong. We cannot lose so long as our cause is just. We have got the money to pay our rent.
>
> We will start our new wage scale Nov. 1 and we will accumulate the rest of the money as quickly as we can for your back pay. The amount due you for back pay up to Nov. 1, when we begin paying on the higher scale of wages, will be about $1,000,000, and when we pay this to you we will try to pay it in one lump sum, so that you may put it away and add it to your savings, for as sure as we are sitting here the time is coming, and coming soon, when prices will be lower, houses will be cheaper, and every dollar you save now, in your saving account, will have at least $2 worth of purchasing value in days to come.

Removal of New Jersey Commissioners Before Court

The Senate of New Jersey, in special session, has refused to confirm the appointment of the new Board of Utility Commissioners, named recently by Governor Edwards. In consequence it is expected the whole matter will now be threshed out through quo warranto proceedings instead of certiorari.

Supreme Court Justice Swayze refused to issue a writ of certiorari against the Governor at the behest of the members of the old board to review the executive's action.

The Senate in refusing to confirm the nominations referred them to the judiciary committee. The Senate also asked Attorney-General McCran to determine the legality of the Governor's act.

It is expected that the Attorney-General will apply for a writ of quo warranto to require the members of the present commission to show by what right they hold office.

In commenting on the refusal of the Senate to confirm the nominations, Governor Edwards said:

> It is the plain duty of the Senate to act upon the appointment of the new commissioners. They have the right of rejection if in their judgment any of the men I have nominated are improper appointments, but they have no right to hold up the business of the state by a refusal to act at all.

The message sent by Governor Edwards to the Senate with the nomination was as follows:

> As you are perhaps aware, charges were filed with me by the city of Jersey City against John W. Slocum, George F. Wright, Harry L. Knight and Andrew Gaul, Jr., former members of the Board of Public Utility Commissioners, for neglect of duty and misconduct in office. In accordance with the provisions of the statute, copies of such charges were served upon those former members and protracted hearings held.
>
> Full opportunity was given for the presentation of evidence by both sides. The result of the hearing was my finding that the charges had been proved. I accordingly removed the said persons as members of said Board of Public Utility Commissioners.
>
> It therefore becomes necessary for me to make certain nominations to fill the vacancy caused by such action. Those nominations accompany this message.
>
> It may be suggested that the removal of the persons in question was without warrant in law, and for that reason your honorable body should not act to confirm the new appointments. It is a sufficient answer, it seems to me, to say that the Supreme Court, to which the removed persons applied for relief, has refused to review the action of the Executive Department.

Improvements at Springfield Are Progressing Satisfactorily

Early in the year the Chamber of Commerce of Springfield, Mass., declared in favor of a monopoly of transportation by the Springfield Street Railway under proper regulation and guaranties. The wisdom of this action was certified to when Peter Witt presented his report on the Springfield Street Railway as an investigator employed by the city of Springfield.

During the winter the officials of the chamber held several meetings with officers of the Springfield Street Railway with a view to securing the extension of the Carew Street line to East Springfield, the double tracking of the St. James Avenue line from Thompson Street to the Westinghouse plant, and the extension of the Page Boulevard line to connect with the Indian Orchard line.

The railway from the beginning recognized the necessity for this work, but was unable to finance the extensions. The officials of the company realized that the Chamber of Commerce is not a financing organization, but that the extensions were necessary, and that the transportation facilities of the city must keep pace with its other activities.

The Chamber of Commerce decided to help sell $300,000 of bonds of the railway, this being the amount necessary to finance the projects mentioned. This issue has now been nearly all subscribed. The railway began the construction of the lines some time ago, and by the end of the year hopes to have the new routes in operation.

Employees Before Court in Receivership Case

Kansas City Trainmen Ask Court to Retain Present Management and Preserve Pleasant Relations

The presentation by representatives of employees of the Kansas City (Mo.) Railways of a promise and petition was one of the striking features of the receivership hearing in Kansas City on Oct. 21. The employees promised their co-operation in operation and service to the public, declared that they expected and would promote uninterrupted service and asked that present pleasant relations with officials be continued. Judge Kimbrough Stone, on the bench, expressed appreciation of the spirit in which the petition was offered, and said that the employees' suggestions would be considered.

ONE of these suggestions was that Col. Philip J. Kealy, president, be made a receiver, or continued as operating head of the company. Colonel Kealy, immediately after the petition was presented, declared that he had not been aware that such a recommendation was being considered and that it was unauthorized. He asked that the petition be disregarded as to himself.

Mr. Pew Speaks for Men

The employees were represented before the court by John P. Pew. He said that he did not appear in behalf of any one party of the receivership proceeding, but desired to speak for a moment. He explained that when the employees learned that the receivership proceeding was pending, they voluntarily circulated petitions for signature and subsequently asked him to appear for them. He represented 3,300 working people. The position of the employees was this:

> Perhaps 60 per cent of the gross receipts of the company go to pay for labor. Of every 8 cents you deposit for a fare practically a nickel goes to pay for labor. The pay-roll is about $6,000,000 a year. Their attitude is that the first interest to be considered is the public; that the next interest to be considered is the interest of the employees; and the third the property. The property, indeed, has right in this, but what it gets is incidental to these others, and unless these others are considered first then property rights are of little value.

He said that following the strike in December, 1918, a new operating organization had been built up around 200 platform men who remained in the service of the company. Moreover, a most comprehensive plan had been devised for collective bargaining and for the settlement of grievances, the details of which were set out in a book which he offered as evidence. Since December, 1918, no grievance had come up for settlement that had passed beyond the division committee. He then read the objects sought to be attained by the Kansas City Railways Employees' Brotherhood.

Employees Promise Co-operation

In concluding Mr. Pew said the employees promised the court, the receivers and the people of Kansas City that "we will work whole-heartedly and together for the good of the company and for service to the public. Under no circumstances will we permit any interruption of this service." The employees desired:

(1) That no outside labor interest or those not in the company's employ be given any part in the present proceedings. (2) That nothing be done to disturb the pleasant relations existing between the employees and their officers. (3) That Col. P. J. Kealy be retained either as a receiver or as the operating head of the company.

Mr. Pew apologized for speaking in behalf of parties not in actual interest to the suit, but expressed the belief that the court would welcome the suggestions of the employees and heed their request.

Mr. Kealy at this point stated to the court that he should like the record to show that the matter which Mr. Pew stated came to him as a great surprise; that it was not authorized and that while he appreciated the compliment, he would not have the court consider the matter as authorized by him. He respectfully requested that his name be withdrawn from any consideration in the matter suggested by Mr. Pew. He said:

> It is embarrassing and, while complimentary, I should like the court to consider the withdrawal of my name under the circumstances.

The court said that it was a source of gratification to know that the attitude of the employees was as stated. Assurance was given that the suggestions from the men would be carefully considered.

Except for the preamble the petition presented by Mr. Pew was as follows:

> Since the appointment of a temporary receiver there have daily appeared in the newspapers statements that numerous interests would ask representation. We respectfully submit that the interests of the 3,500 men whose daily labors make possible this public service, and whose livelihood is dependent upon the success of this company, are just as important as those of financial and civic interests.
>
> There have been rumors that those who left the service in December, 1918, without warning to the public, causing tremendous financial loss to Kansas City, and untold inconvenience to the public, would attempt either openly or otherwise again to interfere in the operation of this property. Such an attempt if successful could only result in bad feeling, factional strife and again allow of the interference of foreign agitators in the present situation.
>
> **Labor Situation Good**
>
> The labor situation on this property is without question the best in its history. The feeling between employees themselves and the relations between them and their officials are those of co-operation, mutual help and square dealing. Collective bargaining has been provided for and grievances are immediately adjusted. In the past eighteen months under our present officials this organization has been developed from practically nothing to its present state of efficiency. There are today only about 600 in the employ who were here prior to December, 1918.
>
> We therefore respectfully petition the court:
>
> 1. That no outside labor interest nor those not in the company's employ be given any part in the present proceedings.
>
> 2. That nothing be done to disturb the present pleasant relations existing between the employees and their officials. 3. That Col. P. J. Kealy, under whose leadership this organization has been built up, be retained either as a receiver or as the operating head of the company. We have confidence in his ability and we know that the spirit of co-operation he has made possible will result if possible in better operation than at present.
>
> Should a different man be placed at the head of this property it would require months for him to familiarize himself with the organization, the property and the service. The employees would be at a disadvantage, as would the public.
>
> **Employees Promise Co-operation**
>
> On our part we promise the court, the receivers and the people of Kansas City that we will work whole heartedly and together for the good of the company and for service to the public. That under no circumstances will we permit any interruption of this service.
>
> This petition is the joint effort of the Kansas City Railways Employees Brotherhood, to which over 2,000 employees belong, and of the presentation committees elected by and representing every employee of the company. It is the outgrowth of a unanimous feeling that we have won the right to ask representation before the court.
>
> The amounts opposite our names are subscribed for the purpose of employing counsel and defraying our expenses in the present proceedings.

On Oct. 22 Colonel Kealy addressed his fellow employees as follows:

> Your action before the Federal Court yesterday is one of the most remarkable examples of loyalty and co-operation in the history of the electric railway industry. There should now be no question in the mind of anyone where this organization stands in relation to agitators, dictators or outside labor interference. You have demonstrated that you are able to conduct your own affairs without such influence; that you have all the necessary machinery for collective bargaining, and that you have the ability to use it.
>
> I cannot find words to express my deep gratitude for your expression of confidence. There have been many heavy responsibilities connected with the Kansas City Railways, especially during the troublous times of the past eighteen months. The knowledge that I have had the respect and loyalty of my fellow employees has lightened this load and made a most arduous task a pleasure.
>
> In the pending proceedings I have no personal ambition. I have long looked forward to the day when I could with a clear conscience lay down the responsibilities my position imposed, when I could escape the ofttimes unfriendly criticism and publicity. I had thought the time had come when I could step aside.
>
> However, if I should be asked to continue the work we have carried on together, my acceptance would be only because of your wishes, and in the knowledge that I have behind me the united and loyal co-operation of a wonderful organization.
>
> Should my connection with the organization be severed, however, I shall take away with me the knowledge that I have enjoyed your friendship and respect, and that your co-operation has made possible the progress we have made in the past year. This knowledge is sufficient reward. Your action will remain a treasured memory. With all my heart I thank you.

As noted elsewhere in this issue Francis M. Wilson and Fred W. Fleming have been named permanent receivers of the railway.

Seattle Men Want Seventy-five Cents

Trainmen of the Seattle (Wash.) Municipal Railway have applied to Mayor Hugh M. Caldwell for a conference, with a view to revising their contract, looking toward increased wages. The communication to the Mayor points out that at a special meeting of the railway employees on Oct. 8 it was decided to ask for a conference between the employees, the Mayor and D. W. Henderson, superintendent of street railways, "at the earliest possible date." Among the demands of the men are the following:

All motormen and conductors to be paid 75 cents an hour; the regular day to be eight hours, with time a half for all time over eight and a half hours; guarantee of eight hours' pay a day, seven-hour runs to be considered a regular run; all runs not completed in ten consecutive hours to be paid half time for all time intervening. This affects "swing runs," where men work two or three hours, then are off for three or four hours, and return for a second shift. The men also ask that 75 per cent of the runs be made straight through.

All trainmen who work as extra men to be guaranteed $150 a month; all regular Sunday and holiday runs to be completed in 4½ to six hours, the same to pay eight hours; allowance for the ten minutes spent at the carhouse after reporting and before taking their cars; allowance of fifteen minutes extra time each day to turn in daily reports; extra time when relieving crews where it is necessary to report at the carhouse earlier than the customary ten minutes; guarantee of eight hours when regular runs are canceled; discontinuance of the practice of allowing men who have worked regular runs to take trippers or do other extra work; this change, the letter says, is designed to distribute the work.

Mayor Caldwell has not yet replied to the communication, or indicated what action will be taken.

Welfare Reports Published

The reports of the welfare departments of the Interborough Rapid Transit and the New York Railways for the year ended June 30 have just been made by H. H. Vreeland, director of welfare. The policy of the organizations is to benefit each and every employee physically, mentally and morally. The work is carried out under definite and concrete rules of helpfulness. The Bureau of Nurses alone made a total of 2,925 calls upon the sick.

Finding employment for the idle and assisting widows of employees to obtain the State Widow Pension, sending employees to the country to regain their strength and vigor are also practical demonstrations of what these benevolent organizations have been doing.

Not satisfied with caring for the physical comforts of the employees the Interborough and the New York Railways' welfare organizations offer educational advantages in the school for operators where training in the elementary theory of electricity is given.

In the matter of purely social activities in the interest of the entertainment of the employees in their non-working hours the past year has been a very successful one. The reports in detail are given in the October issues of the *Interborough Bulletin* and the *New York Railways Employees' Magazine.*

Toledo Awaits Local Election

Settlement of Franchise Matter There Overshadows the National Issues

The fight for a railway settlement in Toledo, Ohio, assumed toward the close of the campaign more importance than the national contests. The vote on Nov. 2 will be a double one with the possibility of approval of both municipal ownership and service-at-cost plans as submitted.

M. O. DEFEAT PREDICTED

On Oct. 28 the indications were that the twin bond issues for a municipal line will be defeated. Very little campaigning has been done in the city in behalf of the municipal ownership proposal, members of the municipal ownership commission, which drafted the ordinance, centering their energies on a drive against the service-at-cost franchise.

The election will provide Toledo citizens with the opportunity of making a definite and clean settlement of a problem that has kept the city from development for many years. The Doherty interests have operated the lines of the Toledo Railways & Light Company for more than six years. They inherited a bitter fight for franchise renewals. Past history has been dragged into the present battle for the service-at-cost plan.

W. L. Milner, chairman of the cost-of-service commission, has made a strong campaign for his ordinance. This measure Mr. Doherty and other railway experts have declared to be one of the best of its kind even though the company was forced to yield on many disputed questions. Of the two afternoon dailies, the *News-Bee* is fighting the franchise and favoring the municipal ownership propositions. Negley D. Cochran, its editor, has made a personal matter of the question with Nat Wright, editor of the *Blade*. The *News-Bee* has opposed a settlement of the issue for several years. Its editor once served on a commission which drafted a community ownership plan which at no time during the pending discussion had a chance for adoption. Many of the provisions of this grant, however, were better for the railway than the present service-at-cost franchise, which he is opposing.

RAILWAY OUSTED LAST YEAR

At the primary election municipal ownership was given a dreadful thrust. A few more than 20,000 voted on the measures. The registration for the Presidential election has totalled more than 89,000 and will be the largest expression ever polled on any railway matter in Toledo. It is thought the majority of the women voting will support the service-at-cost plan.

It is nearly a year since the famous ouster ordinance went into effect. That measure was directly responsible for the negotiations which have led to the plan of settlement now before the people.

News Notes

Algiers-Gretna Men Vote to Strike.—Motormen and conductors of the South New Orleans Light & Traction Company operating between Algiers and Gretna, La., have voted to strike on Nov. 1 unless granted an increase in wages. The officials of the company believe there will be an amicable arrangement between the company and the employees in view of the hoped-for increase in fares. The wage demand will probably be granted to the men if the Commission Council of New Orleans passes favorably upon the application of the company for increased rates.

Cities Asked to Operate Lines.—General Manager Pulliam of the Wisconsin Public Service Company, after testifying before the Wisconsin Railroad Commission that service in Manitowac and Two Rivers is given at a loss, invited these cities to take over the lines and operate the cars. The city is asking for extension of lines on the west and south sides. On the other hand, the company is demanding increased fare on city lines, dismissal of the petition for extensions, and the right to remove tracks on certain streets. The city contends that if the proper extensions were made the lines could be operated at a profit for the company. The matter is pending before the Railroad Commission.

City Planning Commission Promoting Inquiry.—The City Planning Commission of Kansas City, Mo., has appointed subcommittees to investigate and report on the following subjects of improvement: Transportation, industry, commercial districts, highways, zoning, residential districts, recreation. The committees have available data included in a report by George E. Kessler, adviser to the board of park commissioners. Mr. Kessler made a report of similar import more than twenty-five years ago, and as engineer assisted in putting that report on the landscape as the present park and boulevard system. His report on this present subject made special reference to the possibility of subways and elevated structures for diverting heavy traffic and alleviating congestion and to the possible necessity for interurban freight and passenger stations. It was intimated at the meeting that additional interurban lines may be expected to enter Kansas City. R. P. Woods, vice-president and general manager of the Missouri Short Line, an interurban electric road, was made chairman of the committee on transportation. Mr. Woods was formerly city member on the board of control of the Kansas City Railways.

Financial and Corporate

Trolleys Continue Decline

Long Island Roads Report a Decrease of Nearly 230 per Cent Over Year 1918

Electric railways operated by the Long Island Railroad show a total deficit for year ended Dec. 31, 1919, of $22,308. This is more then double the deficit of 1918. Five companies are included in the returns. Only one of these, the Ocean Electric Railway, is self-supporting. The net income of even this company decreased over last year by $13,000. The returns of the Huntington Railroad are not comparable, because the company was dissolved on Sept. 23, 1919, and a full year's report is not available.

Year ended Dec. 31, 1919	Ocean Elec. Ry.	Huntington R. R. †	Northport Trac.	Nassau County Ry.	Glen Cove R. R.	Total
Operating revenues	$205,578	$37,699	$11,645	$17,977	$26,400	$299,299
Operating expenses, taxes and uncollected railway revenue	153,708	48,133	18,017	20,721	28,018	268,597
Operating income	$51,870	*$10,434	*$6,372	*$2,744	*$1,618	$30,702
Non-operating income	302	155	212	212	212	1,093
Gross income	$52,172	*$10,279	*$6,160	*$2,532	*$1,406	$31,795
Deductions from gross income	50,993	2,340	586	38	146	54,103
Net income	$1,179	*$12,619	*$6,746	*$2,570	*$1,552	*$22,308
Dividends	None	None	None	None	None	None
Balance to profit and loss	$1,179	*$12,619	*$6,746	*$2,570	*$1,552	*$22,308
Outstanding capital stock	$35,000	$28,950	$45,000	$35,000	$10,000	$153,950
Outstanding bonds	$20,000	$26,000	None	None	None	$46,000
Miles of single track	15.59	19.97	2.74	1.60	3.50	43.40

*Deficit. †Dissolved Sept. 23, 1919.

Consent of City Needed

Saul Zielonka, City Solicitor of Cincinnati, Ohio, in a recent opinion returned to W. C. Culkins, street railway director, held that under the existing franchise the Cincinnati Traction Company cannot dispose of any property with a clear title without the consent of the city. The City Solicitor held that under the present service-at-cost plan and the recently enacted ordinance the city has an option on the company's property, and that the company is not in a position to dispose of its property without the consent of the city. The question was brought up after the railway had disposed of the Bogan Street carhouse without first notifying the office of the Street Railway Director.

Petition for Abandonment Denied

The Public Service Commission for the Second District of New York has denied the application pending before it for approval of abandonment of certain lines of the Kingston Consolidated Railroad, pending the disposition of an application to be made for a 7-cent fare in that city in place of the recent 6-cent fare. The Kingston Common Council has consented to the additional 1 cent, providing the commission shall find upon application made to it that the company is entitled to the advance.

Steps taken by the company to abandon certain lines were met with remonstrances by Kingston people and its Taxpayers' Association, and at a hearing before Chairman Charles B. Hill, Francis C. Merritt, representing the Taxpayers' Association, stated that in his opinion residents of Kingston would much prefer to pay a higher rate of fare than to see any part of the road abandoned. Mayor Palmer Canfield, Jr., expressed the opinion that a majority of the people would prefer to pay 7 cents than to have the line abandoned.

Chairman Hill holds that it is the duty of the commission to withhold its approval of the proposed abandonment and deny the application. His recommendation to the commission provides that the present proceedings may be renewed after the application for an increase in fare has been decided.

Surplus Earnings Increase

After Paying Preferred Stock Dividend Surplus of United Light & Railways Amounted to About $700,000

Surplus earnings for the United Light & Railways Company, Grand Rapids, Mich., for the year ended June 30, 1920, show an increase over 1919 of $145,000, or 26 per cent. This surplus was obtained after a preferred stock dividend of $603,000 had been deducted. The net income for 1920 was $1,302,599. Compared with $1,161,583 in 1919 the increase in net was $141,016, or 12 per cent.

Gross earnings of the subsidiary companies increased about $1,000,000. The operating expenses increased almost as fast, allowing the net earnings to be increased only $538,850, or 1.9 per cent over 1919. The net profit of the subsidiary companies due the United Light & Railways Company amounted to $1,935,605, an increase of $67,184, or 3.6 per cent. After adding the interest and dividends receivable, and miscellaneous earnings, and subtracting all the deductions for interest and general expenses, the net income was found to be $1,302,599 as previously mentioned.

This company is a holding corporation. It controls public utility concerns in Iowa, Indiana, Michigan, Illinois, and Tennessee. The total capital stock in the hands of the public amounts to $19,905,099. Total funded liabilities in the hands of public are $29,218,800, making total capital liabilities of $49,123,899.

Among the railway properties which the company controls are the Cedar Rapids & Marion City Railway, the Grand Rapids, Grand Haven & Muskegon Railway, the Mason City & Clear Lake Railroad and the Tri-City Railway & Light Company. These companies operate more than 200 miles of electric railway.

INCOME STATEMENT—UNITED LIGHT & RAILWAYS COMPANY

Year Ended June 30:	1920	1919	Percentage Change
Gross earnings of subsidiary companies	$10,695,639	$9,664,500	+10.7
Operating expenses (including maintenance, general and income taxes)	7,868,653	6,891,364	+14.2
Net earnings of subsidiary companies	$2,826,986	$2,773,136	+ 1.9
Deductions from net earnings:			
Interest on bonds, sub-companies due public	$681,008	$695,550	— 2.1
Interest on notes, etc., sub-companies due public	28,028	29,199	— 3.5
Dividends and earnings on preferred stock	170,238	170,795	— 0.3
Profit due minority stockholders	12,107	9,170	+32.0
Total deductions from net earnings	$891,380	$904,714	— 1.5
Net profit of subsidiary companies due United Light & Railways	$1,935,606	$1,868,422	+ 3.6
Interest and dividends receivable:			
On bonds and stocks of other companies	$1,241	$1,203	+ 3.2
On bank balances and certificates of deposit	6,122	5,816	+ 5.3
Miscellaneous earnings	545,271	323,289	+68.7
Total gross earnings of United Light & Railways	$2,488,240	$2,198,730	+13.2
Deductions from gross earnings:			
General expense, including taxes	$253,066	$178,530	+42.0
Interest on first and refunding 5% bonds	456,129	438,462	+ 4.0
Interest on 6% three and five-year bond secured gold notes	44,533	90,000	—50.5
Interest on 6% 2½ year bond secured gold notes, "series A"	72,252	90,000	—19.7
Interest on 7%, 5 year bond secured gold notes, "series B"	105,000	76,903	+36.6
Interest on 7%, one year bond secured gold notes, "series C"	57,807	....	......
Interest on 7%, bond secured gold notes, "series of 1920"	32,396	....	......
Interest on ten-year convertible gold debentures	120,000	120,000	......
Interest on commercial loans	44,458	43,252	+ 2.8
Total deductions from gross earnings	$1,185,641	$1,037,147	+14.3
Net income	$1,302,599	$1,161,583	+12.1
Preferred stock dividend	603,249	606,986	— 0.6
Surplus earnings	$699,350	$554,597	+26.1

Permanent Receivers Named

Messrs. Wilson and Fleming Placed in Charge of Affairs of Kansas City Railways

Judge Stone in the Federal Court at Kansas City, Mo., on Oct. 26 named two permanent receivers for the Kansas City Railways to succeed F. C. Niles, temporary receiver. The permanent receivers are Francis M. Wilson, now United States District Attorney, and Fred W. Fleming, real estate dealer, formerly manager of the Kansas City Life Insurance Company. Each will give bond for $50,000.

It was expected that the receivers would qualify before Saturday and have had time by then to reach conclusions as to certain contracts now under way. The court set Saturday morning for receiving the recommendations of the receivers and establishing the status of contracts, particularly that on the Twenty-third Street viaduct.

The final order appointing Messrs. Fleming and Wilson receivers of the company was made on the afternoon of Oct. 27 by Judge Stone. Midnight Wednesday was set as the hour for them to take charge of the property.

ORDER OF CLAIMS FIXED

The final order avoided establishing general rules for priority of claims and accounts. The receivers are expected to make up lists of bills due, of contracts and similar obligations, prepare their recommendations and present the lists, the recommendations and the opinions to the court.

The original order mentioned Aug. 1 this year as the date previous to which supply bills for operating necessities would not have priority, but the final order of the court on Oct. 27 threw all these bills into the class of other obligations, the status of which must be fixed after the receivers have considered them and reported to the court. Such listing and reporting to court will, it is considered, avoid the necessity for creditors coming in with intervening petitions as they will have their day in court.

Municipal Road Has Small Deficit

Fred Boeken, superintendent of the San Francisco (Cal.) Municipal Railway, expresses himself as well pleased with the showing of the railway for the fiscal year ended June 30. There was a deficit of $22,131, but at the present 5-cent fare this is considered auspicious, particularly as $486,551 was set aside for depreciation. The total earnings for the year were $2,729,015. Against this was charged off the following amounts:

Operating expenses	$2,002,101
Depreciation (18%)	486,551
Bond interest	233,503
Compensation insurance	28,991
Total	$2,751,146
Total earnings	2,729,015
Deficit	$22,131

Mr. Boeken states that the month of September was one of the best in the history of the road and that the system more than paid all charges last month with $7,000 actual net profit. In this connection Mr. Boeken said:

> If business keeps going through the fiscal year as it has started we will be able to wipe out any deficit that may have been shown for the last fiscal year and have a profit to the road's account in addition to the depreciation fund that we are gradually piling up.

Accumulated Shortage of $591,365 in Dallas

The Dallas (Tex.) Railway has issued a statement covering operation for the month of August and for the thirty-five months under the present franchise. The company operated under a 5-cent fare up to June 27, 1920, when a 6-cent fare was put into effect to continue for one year. It is pointed out by Richard Meriwether, vice-president and general manager, that the company even under the 6-cent fare has failed to earn the authorized 7 per cent on its invested capital by $24,574, and that the accumulated shortage on permissible return, covering the thirty-five months of operation under the franchise granted on Oct. 1, 1917, is $591,365.

The detailed financial statement of the company follows:

Total property value, determined in the manner provided by the franchise—close of business Aug. 31, 1920 ....$8,971,533

(This represents the amount of money invested in the actual property as agreed with the city, and is not the stock, bonds or outstanding securities.)

Authorized return—7% per annum on property value (for August)..$51,884

(This is the 7% per annum on the amount of money invested in the actual property; not on stocks, bonds or other outstanding securities. It is the amount the company is permitted to earn by the franchise now in effect with the city.)

Gross income from all sources, month of August, 1920..........$279,201

Operating expenses, month of August, 1920 251,891

(Operating expenses do not include interest on bonds, stocks, notes, commissions or discounts on loans or cost of raising money, Oak Cliff rental or dividends on stocks; these items are paid out of the "return," if any is earned; otherwise they are not paid.)

Balance earned for return, month of August, 1920......................$27,309

(This is the actual amount of money earned during the month, and is the difference between the gross income and the operating expenses. Out of this return must be paid interest on bonds notes and securities, commissions or discounts or loans or costs of raising money, Oak Cliff rental and dividends on stock, if any.)

Shortage in permitted return, month of August, 1920..................$24,574

(This represents the difference between the amount of money the city franchise says we are permitted to earn and the actual amount of money earned.)

Amount net earnings for August available for distribution to stockholders.None

Amount net earnings for August available for transfer to surplus reserve.None

(Self-explanatory. If there is a shortage in the "permitted return" for the month, there cannot be any money available for transfer to the surplus reserve.)

Total shortage for thirty-five months (Oct. 1, 1917 to Aug. 31, 1920, inclusive) on permissible return...........$591,365

(This is the total amount of money which we have fallen short of earning the 7 per cent per annum on the dollars invested in the actual property since we have been operating under the new franchise.)

NOTE—Six-cent fare became effective June 27, 1920.

Passengers carried in May, 1920..5,682,705

Passengers carried in Aug., 1920..4,955,580

Decrease in passengers carried in August compared with May.... 727,125

Bus Line Sold

Puget Sound Railway Disposes of Auto Lines Started as Experiment When Jitneys Appeared

A deal has been consummated whereby the transportation business of the Puget Sound Auto Bus Company, a subsidiary corporation of the Puget Sound Power & Light Company, has been transferred to Joseph Silver and W. W. Whipple, Seattle. Five 2-ton Mack trucks, the good will of the company and the assistance of the company that made the sale in getting the new owners started in the business are included in the deal. The amount of money involved in the transaction has not been made public.

The route heretofore served by the Puget Sound Auto Bus Company lies between Seattle and Bothell, a distance of approximately 19.5 miles. The bus system was organized about five years ago and developed by the Puget Sound Power & Light Company, under the capable direction of W. H. McGrath, vice-president. The line has maintained hourly schedule between Seattle and Bothell. It is understood the system has been well patronized and that some money was made.

TWO LINES STARTED

Shortly after the "jitneys" made their appearance on Seattle's streets the Puget Sound Traction, Light & Power Company, as it was then known, determined to go into the auto bus business, as an experiment, using the buses as feeders to its interurban lines. The company was after data; it wanted statistics on the cost of operating bus lines. Two lines were started, one between Bothell and Seattle, the other between Auburn and Enumclaw. The project was undertaken originally as the Washington Auto Bus Company, but later following a re-incorporation and the sale of the Auburn-Enumclaw line the name of the company was changed to the Puget Sound Auto Bus Company.

W. J. Grambs, manager of auxiliary operations of the Puget Sound Power & Light Company, handled the negotiations attendant upon the sale of the line. In speaking of the sale he said:

> We sold for several reasons. The two most pertinent ones are: first, we got a fair price, and, second, the business is too small for us to continue to engage in it. I believe it is safe to say, the Puget Sound Power & Light Company will not engage in the auto bus busines again. What plans we may have had have been abandoned. We are through with the auto bus business. It is too small.

Mr. Grambs believes under private ownership the lines will thrive. He states that Silver & Whipple, the new owners, have gone about the proposition in a way that cannot help but produce results. Already they have interested patrons of the line by selling them stock in the company. The company is incorporated for $15,000. Shares in the concern are sold for $10 each. To date more than 200 shares of stock have been sold without solicitation.

Detroit Lines May Be Segregated —Company in Strong Position

Confirmation comes by way of Montreal of the rumor current in Detroit of the possible segregation of the suburban and city lines of the Detroit United Railway. A. J. Ferguson, vice-president of the company, resident of Montreal, says the company is in a position within its own resources to provide for its financial needs for a considerable time in the future. In consequence no temporary financing is contemplated. Demands upon the company for increased facilities are increasing and if any permanent plan of financing is adopted segregation of the lines will undoubtedly result. Mr. Ferguson is quoted by the Montreal *Gazette* as follows:

> The general situation of the company is that by reason of withholding increased dividends, representing a fair return on the value of its property it has employed in serving the public, the railway has accumulated a large surplus. In January, 1902, the company was authorized to issue $25,000,000 of bonds, secured by a mortgage on its property, to provide for underlying bonds and to meet requirements from time to time with reference to the extension and development of its lines.
>
> It was considered at the time that the provision made by this $25,000,000 mortgage would provide for necessary extensions and betterments indefinitely, but the increase in population and the development of industries and commercial activities within the territory that is served by the company has been so great that the provision thus made has been exhausted, the mortgage having now been closed several years.
>
> The increased demand for extension of the company's system and general facilities continues, and our bankers have advised that before, or in connection with, the adoption of any permanent financial plan, the company's properties be segregated—the city lines from the suburban.
>
> If this plan, which is under consideration, shall upon full investigation and consideration be deemed wise, it would involve a reorganization to some intent, and also the adoption of a comprehensive program with reference to the financial needs of the company, both for the near and distant future.
>
> The company proposes efficiently to serve the people within the territory occupied by its system, having full regard to the future increase in population.
>
> If a plan of reorganization and for permanent financing be finally approved by the board of directors of the road it will of course be submitted to the stockholders for their consideration.

Utility Credit Cannot Be Injured with Impunity

Chester Cleveland, a member of Mayor Thompson's cabinet, and a special assistant corporation counsel of the city of Chicago before the Public Utilities Commission in matters affecting the Chicago companies, in a recent interview in the Chicago *Herald-Examiner* says that any newspaper printing a statement concerning a public utility company such as affects its credit or standing in the community and upon which full proof cannot be furnished may be sued for libel by the utility and a full recovery of damages obtained.

The city representative cited the point in connection with the suits for $20,000,000 damages brought by Mayor Thompson in the name of Chicago against two newspapers. In those suits it is claimed that articles were "recklessly and maliciously published" and have "made it difficult for the city to borrow money because of the alleged reflections upon the name of the corporation—the city of Chicago."

In commenting upon the suits, Mr. Cleveland said in the interview:

> If these newspapers persistently published that the Chicago Surface Lines or the Chicago Telephone Company or the Chicago Elevated Railroad, or any other of the great financial institutions of Chicago, were bankrupt and their credit exhausted, the corporation so libeled would undoubtedly sue for more than the city has sued in these suits.

The Chicago official says that not only could suit be brought and damages obtained because of publication of statements affecting credit, but that any other untrue charge which might hold a corporation, such as a public utility, up to ridicule or incite public feeling against it, would offer full grounds for legal action under the libel law, some such statements offering the basis for indictment and prosecution on criminal charges.

American Light & Traction Net Earnings Reduced

Gross earnings of the American Light & Traction Company, New York, N. Y., for the twelve months ended June 30, 1920, were $4,162,515 as compared with $4,211,398 in 1919, a decrease of $48,883, or about 1.2 per cent. The net income was $3,894,234, a decrease of $77,483, or 1.9 per cent.

During the twelve months, cash dividends on the preferred stock required $854,172, and the common stock $2,340,492. Stock dividends on the common required $2,340,491, making a total deduction for all dividends of $5,535,154, $79,338 more than the previous year.

Commenting on the action of the directors in cutting the common dividend from 2½ per cent in cash and stock to 1¾ per cent, quarterly, Alanson P. Lathrop, president, said:

> The reduction in common stock dividend as compared with previous quarters was deemed advisable in consequence of the decreased earnings due to the abnormal advance in cost of material and labor and to the necessity of conserving cash to take care of extensions and betterments required by subsidiary companies to meet franchise requirements.

Among the railway properties controlled by the company are the Muskegon Traction & Lighting Company and the San Antonio (Tex.) Public Service Company.

INCOME STATEMENT—AMERICAN LIGHT & TRACTION COMPANY

Year Ended June 30:	1920	1919	Percentage Change
Earnings on stocks of subsidiary companies owned by this company	$3,215,996	$3,417,867	— 5.9
Miscellaneous earnings	946,519	793,531	+19.3
Gross earnings	$4,162,515	$4,211,398	— 1.2
Expenses	268,281	239,681	+11.9
Net earnings	$3,894,234	$3,971,717	— 1.9
Surplus reserve June 30, 1919	11,150,696	12,634,796	—11.8
Total surplus earnings	$15,044,930	$16,606,513	— 9.4
Dividends deductions for 1920:			
Cash dividends on preferred stock	$854,172	$854,172	.....
Cash dividends on common stock	2,340,492	2,300,823	+ 1.7
Stock dividends on common stock	2,340,491	2,300,822	+ 1.7
Total dividends	$5,535,155	$5,455,817	+ 1.5
Surplus balance June 30	$9,509,775	$11,150,696	—14.7

Winnipeg Bus Costs Are 25.71 Cents per Bus-Mile

Experience of the Winnipeg (Man.) Electric Railway with its motor bus service in operation since May, 1918, indicates that the motor bus can be used to the best advantage in a new district where travel does not justify the initial cost of railway construction.

The company operates seven sixteen-passenger buses on routes which serve as feeders to the railway. Only five buses are in regular operation, the others being held in reserve for emergencies. The bus services were started as an expedient. It is the company's intention to replace the buses with electric railway service when conditions warrant. The company has prepared a statement covering the cost of operating five of these buses for the seven months ending July 31, 1920. The figures follow:

		Total Costs	Cost per Mile, Cents
Cost of five busses			$12,930
Total miles operated			66,183
Drivers		$5,366.30	8.12
Tires		980.84	1.48
Gasoline		3,593.14	5.42
Oil		328.90	.48
Labor for repairs		2 056.42	3.11
Materials for repairs		1,072.91	1.62
Storage rental		350.00	.53
Insurance:			
Liability	$630.00		
Fire	52.78	682.78	1.06
Taxes including driver's licenses: provincialand city car licenses		152.00	23
General expenses, including supervision, accounting and other overhead expenses		312.93	47
Total of above expenses		$14,896.22	22.52
Depreciation		1,508.50	2.28
Interest on investment		603.40	.91
Total costs		$17,008.12	25 71

It will be noted from the above that motor bus costs total 25.71 cents per bus mile. The cost of street railway service in Winnipeg during the same period was 27.60 cents per car mile. In the comparison it is seen that there is a difference of 1.89 cents per mile in favor of the bus, but this makes no allowance for the greater carrying capacity of the car. Another factor is the increasing price of gasoline. Gasoline in Winnipeg cost 37 cents per gallon in January last, 47 cents last June and in October is costing 51 cents. The price for electricity, on the other hand, has remained practically constant.

International $44,735 Behind

The income account of the International Railway, Buffalo, N. Y., for the period from Jan. 1 to Sept. 30 follows:

Operating revenue	$8,249,140
Operating expenses	A-6,370,064
Net operating revenue	$1,879,076
Taxes	495,534
Operating income	$1,383,541
Non-operating income	38,815
Gross income	$1,422,357
Deductions from gross income	1,237,209
Net income	A-$185,147

A—Does not include $229,882 additional charge for the six months January to June necessary to comply with the Public Service Commission formula for the determination of the proper allowance for depreciation.

Financial News Notes

Municipal Road Authorizes Bonds.—The municipally-owned Norton & Taunton Street Railway, Taunton, Mass., has authorized a further bond issue of $30,000, to be shared equally by the cities and towns, for the purpose of providing car and power additional equipment.

Decade Average Values in Iowa Valuation.—The report of the property appraisal of the Tri-City Railway of Iowa in Davenport will probably not be filed for another month. The appraisers will furnish data on replacements for 1920 as well as an average of replacement values for the period since 1910.

Lee-Huntington Line Being Removed.—The work has started of removing that part of the Berkshire Street Railway from Lee to Huntington, Mass., built in 1913 when the road was under New Haven domination. Ten or twelve miles of track will be removed. There has been no regular service by the company over the road for several years now.

Receipts Falling Off in Baltimore.—According to Herbert B. Flowers, general manager of the United Railways & Electric Company, Baltimore, Md., the number of fares to be shown on fall records will be below that of the past few years. Half-time operation and abandonment of night shifts in many industries are being reflected in the company's receipts.

New Note Issue Plan.—It is expected that the one-year 6 per cent notes of the Hagerstown & Frederick Railway, Hagerstown, Md., will be paid at maturity, new financing having been arranged to provide funds therefor. It is contemplated that a new issue of $1,050,000 of 8 per cent notes will be issued, to be dated Oct. 15, 1920, secured by collateral pledge with the trustees.

Petition for Abandonment Denied.—A petition of the Delta Light & Traction Company, Grenada, Miss., for authority to abandon its railway service was heard recently by the Railroad Commission and the petition was denied. Disposition of the matter is now pending in the Circuit Court on a writ of certiorari with prospects of a settlement at a conference between the Mississippi authorities and the officers of the traction company.

$13,000,000 Issue Planned at Youngstown.—A syndicate of local investment houses in New York has purchased and will probably offer to investors soon $13,000,000 of twenty-year 7½ per cent bonds of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio. The proceeds of the sale will be used in part to redeem $11,967,000 of 5 per cent bonds of the Mahoning & Shenango Railway & Light Company maturing on Nov. 1.

Paducah Company Reports Profit.—An amended bill of complaint showing earnings from operation for twelve months ended Sept. 30 has been filed in the Federal Court by the Paducah Street Railway. The amended bill submits a detailed account of its business and an estimate of the value of its properties. The total revenue of the company was $159,424, and the cost of operation, excluding taxes and depreciation, was $129,590.

Road at Carlisle to Suspend.—The committee representing the holders of the bonds of the Cumberland Railway, Carlisle, Pa., has announced that operation of the road will be discontinued on Nov. 1. The road extends from Carlisle to Mt. Holly Springs Park and Newville Glens Springs Park. The property of the railway was sold under foreclosure recently, following failure by the company to pay interest on outstanding bonded indebtedness.

Hearing by Court on Service Suspension.—Federal Judge Julius M. Mayer has issued a temporary injunction restraining the Public Service Commission from bringing action in any court other than that of the United States to compel Lindley M. Garrison, receiver for the Brooklyn Rapid Transit Company, to operate certain lines which have been idle since the strike two months ago. A hearing on the injunction is to be held on Nov. 1. Residents of Brooklyn deprived of service are protesting vigorously against the abandonment.

Threat to Surrender Franchise.—Surrender of the franchise held by the South Covington & Cincinnati Street Railway in Cincinnati, Ohio, is probable if the present agreement between the city and the company cannot be amended by act of the City Council, it recently developed at a conference of W. W. Freeman, president, and Polk Lafoon, general manager of the company, with W. C. Culkins, Director of Street Railways. A clause in the present franchise specifies that not more than a 5-cent fare may be charged on this line as long as that is the rate paid on the Cincinnati Street Railway. Whether this can be interpreted to warrant a 3-cent increase on the "Green Car Lines" following the precedent established by the Cincinnati Street Railway will be passed on by the Cincinnati City Solicitor.

$28,702 Needed for Hyde Park Line.—An expenditure of $28,702 is necessary to put into safe and proper condition the roadbed, tracks, poles, wires and other appurtenances of the Hyde Park railway system for its operation for one year by the Boston (Mass.) Elevated Railway, according to a report Mayor Peters has received from the State Department of Public Utilities. To put the system into safe and proper condition for five years operation $68,208 is needed according to the report. The city will provide $30,000 under the provisions of a legislative act of this year. The city has appropriated so far this year $80,000 for Hyde Park transportation facilities. Of this sum $30,000 remains unexpended. This will probably be used to meet the $28,702 expense estimated by the Department of Public Utilities.

Reorganization Rumors Denied.—Rumors to the effect that an early reorganization of the Pittsburgh (Pa.) Railways, now in the hands of the receiver, will be made are denied by W. A. Thompson, president of the Philadelphia Company, which controls the Pittsburgh Railways. He says reorganization is out of the question until the matter involving the foreclosure of the Southern Traction Company, a subsidiary, is straightened out and that this seems a long way off. Receivers Charles L. Fagan, S. L. Tone and W. D. George also declare there is nothing to the rumor. They say the report developed through the visit to Pittsburgh of Eastern bankers, who hold bonds of the Philadelphia Company, to look over the physical properties. This they do frequently. No unusual significance is to be attached to their trip now.

May Buy Bay State Property.—The property of the Bay State system in New Bedford, Mass., controlled by the Eastern Massachusetts Street Railway, is desired by the Union Street Railway. This company will offer to purchase the Bay State line from Lund's Corner to the city line. There has been a temporary agreement under which the Union Street Railway has been operating cars over the Bay State tracks to Sassaquin. This agreement will expire on Dec. 1. If the trustees of the Eastern Mass. Street Railway should refuse to sell the road the line might be torn up. In this event the Union Street Railway will probably build a new system on the present location. Homer Loring, chairman of the trustees of the Eastern Massachusetts Street Railway, seems anxious to hold on to the line in the hope that the Legislature of next year will do something toward having the company which now owns the line restore its abandoned service.

Traffic and Transportation

Galveston's Need Great

Company Seeks Injunction Against City in Fare Case—Engineers Differ on Valuation

Henry J. Dannenbaum, special master representing the Federal District Court for the Southern District of Texas, has concluded the taking of testimony in the suit of the Galveston Electric Company against the city of Galveston. The company is seeking an injunction restraining the city from enforcing the provisions of a municipal ordinance limiting the fare on the local lines to 5 cents. The railway contends that the 5-cent fare, which was reimposed by the city after a 7-cent fare had been installed, is confiscatory.

The chief points of difference between the engineers who made surveys of the property are: The amount of going concern value to be added to the "bare bones" value of the property in order to determine a valuation for rate-making purposes; the probable reproduction new value of the property; the amount of accrued depreciation now existing as pertains to the company's property; the amount to be allowed the company annually from current earnings as depreciation value, and the rate of a fair return which the company should be allowed to earn on the valuation figure thus arrived at.

Differ on Valuation

The engineers have reached an agreement on the undepreciated record cost of the property from 1881 to June 30, 1920, which they place at $2,100,537, exclusive of the value of the franchise and of material and supplies on hand. They have also reached an agreement on the undepreciated cost of reproduction new of the plant on a historical basis, exclusive of franchise value, going concern value, bond discount and brokerage fee. This they place at $1,720,000.

Consideration was given in this estimate of $202,000, consisting of overhead expenses; $136,281, cost of grade raising, together with various estimations made on the cost of rails. This item also includes $186,000 worth of transmission property. Other material issues that have been reconciled by the engineers are the record costs of the property and the reproduction value based on the prices at which the component parts of the plant were purchased.

H. P. Gillette, valuation engineer representing the company, offered statistics to show that the company had earned a fair return on its investment in only ten years since 1881, and that the company is now facing receivership unless relief is afforded in increased earnings. Mr. Gillette testified that during the years when a fair return was earned, the company earned 8 per cent after 1.5 per cent of earnings had been charged off for depreciation. He also offered testimony to show that the company's plant had been practically rebuilt during the last twenty years.

Henry E. Elrod, representing the city, maintains that the annual depreciation should be balanced by the development, in so far as these two items are equal, for with the funds allowed for depreciation new equipment is purchased and new parts of the plant installed to replace the old parts. The two engineers are more than $100,000 apart on the matter of accrued depreciation.

Attorneys for the city, basing their calculations on Mr. Elrod's findings, maintain that the company is now making a return of 8 per cent on its invested capital. The company's representatives assert that a rate of 8 per cent return would be adequate, but that the company is not now making anything like that per cent. The difference in the two calculations lies in the amounts to be charged off for development and maintenance and for depreciation.

Concessions for Steady Riders

Regular patrons of an electric railway are entitled to concessions in the shape of reduced rates, according to an opinion recently handed down by the Pennsylvania Public Service Commission. The commission ordered the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., to reduce the ticket rate on its lines in Erie, Pa., from 7.5 cents to 6¼ cents. The railway was authorized to continue charging an 8-cent cash fare on its Erie lines. For rate making purposes the commission fixed the value of the company's lines in Erie at $4,100,000.

Commissioner Rilling, in ordering the reduction, said that every one who regularly uses an electric railway line "has more than a temporary interest therein." Mr. Rilling remarked that "the house in which they live has a greater value if the means of communication between it and their place of business is adequate and ample." He said further:

> A reciprocal regard by the utility and the public for their respective interests and duties and a frank avowal of respective obligation and interdependent relations, would be most helpful in adjusting any conflicting situations that may at any time arise.
>
> It is important that the service rendered a community by its public utility be efficient, economical and adequate, the same as its fire department or any of its other local governmental functions. * * *
>
> Rates to be paid utilities should not be maintained at a fixed and definite stationary amount, but should reflect the conditions under which each is obliged to operate; same to be increased or decreased as existing conditions require.

Fare Settlement Nearer

Court Orders Des Moines Receivers to Curtail Wage Payments Unless Adjustment Is Reached

Federal Judge Martin J. Wade has issued an order looking to a permanent settlement of the financial difficulties of the Des Moines (Iowa) City Railway. Judge Wade has ruled that unless a permanent fare adjustment has been made within thirty days, the employees of the railway shall be paid the back wages due them only in such amounts as shall be available after the payment of operating expenses, including current wages.

Judge Wade has also annouced that he will appoint a special master to recommend to the court a plan for the relief of the company. He has declined to sanction a further increase in fare pending the master's report. A temporary 6-cent fare is now in force.

In handing down the order Judge Wade said:

> I find that contrary to expectations the extra 1-cent fare provided in order heretofore made has reduced the travel so that there is little left, after paying the current advanced wages, to apply on the back pay. I also find that the company is not earning enough to meet fixed charges. I intended of course that the net results from the 1-cent increase should be applied upon wages.
>
> CANNOT DEPLETE OPERATING FUNDS
>
> Last month the full amount from the 1-cent extra fare was so applied and under all the circumstances I feel that the same should be done this month, but of course this cannot continue. As I have repeatedly said, I cannot take the money which belongs to other funds to pay the advanced wages, and I am only making this order in the hope that before another month is up some plan will be devised which will make some definite provision for payment of a substantial amount each month upon the back wages.
>
> I do not feel that I am justified in making another advance in fares until the matter has been thoroughly considered whether it is possible for the city to work out some plan to take care of this emergency. I am going to appoint a master not with any view of fixing permanent fares, but with a view of arriving at a plan which will carry the company a few months in the hope that by that time something definite will be done by the city. The street railway cannot run unless there is enough income to pay wages and fixed charges. There is no question of profit involved, because the company is willing to operate so long as the expenses of operation can be paid from income.

The 6-cent fare was authorized by the court last August to allow the company to grant a demand of its carmen for an advance in wages from 60 to 70 cents an hour. The men subsequently struck because of the failure of the order to provide for the payment of back wages. Judge Wade thereupon made the wage increase retroactive to March 1.

One-Man Cars for Morgantown

One-man cars will be operated on the loop lines of the West Virginia Utilities Company, Morgantown, W. Va., at an early date. J. K. Buchanan, general manager, said:

> We have reached the point where we cannot operate and maintain the loop line with our present revenues. I do not believe that higher fares would solve our problem, because if we boosted the fare the volume of passenger traffic would be reduced to the point that our income would be no greater than at present. We have finally decided upon the one-man car. In the past few years this style of car has become increasingly popular and each month sees its introduction into more towns. It is no new thing.

Ten-Cent Fare in Connecticut

Commission Grants Company's Application for Higher Rate as an Emergency Measure—Zone System Completely Scrapped

The Connecticut Public Utilities Commission on Oct. 22 granted the petition of the Connecticut Company, New Haven, for a straight 10-cent fare on its lines throughout the State. The new rate goes into effect on Nov. 1. The only exception where the ruling does not apply is in the New London territory, where a 10-cent fare is already being charged. Free transfers will be continued. Commutation tickets will be issued good between the traffic centers of towns. The present fare on the other lines within the State is 7 cents. The commission explained in its decision that the ruling was only temporary, as the commission hopes that when the Legislature convenes next January it will solve the traction problems that exist throughout the State. The order granting the increase was signed by Commissioners Richard T. Higgins and Joseph W. Alsop. Commissioner C. C. Elwell opposed the 10-cent fare and filed a dissenting report.

When the 10-cent rate goes into effect the zone system will be scrapped completely and the fare limits which prevailed under the former 5-cent rate will again come into existence. The zone system was put into effect in November, 1919, and was modified in May and again in August, but has never been a paying proposition to the traction company in any section of the State.

Lucius S. Storrs, president of the company, contends that the 10-cent fare is a partial but not a complete solution of the State's traction problems. He holds that the provision in the commission's ruling that the trolley question is to come before the Legislature does not necessarily imply that fares can be reduced at that time, even if the Legislature gives the railway relief from taxation. He points out that the large amount of unpaid taxes would have to be handled and provided for before reduction of fare rate could take place even if relief is given in other respects.

Legislature May Act

Several of the Connecticut cities, which at first thought of appealing for a rehearing on the commission's order have decided to await legislative handling of the transportation problem of the state. There is a realization that both the Connecticut Company and the Public Utilities Commission are laboring under certain restrictions in that neither can take any steps regarding jitney competition or the elimination of any of the various imposts, both of which make the fare situation difficult. The legislature convened in January and while it failed to make any move in 1919, the situation has grown so acute that public sentiment will demand action in 1921. Under the Connecticut borough system of legislative representation however, the suburban and rural districts are in control, whereas the fare situation is more acute in the cities.

The fare change from 7 cents urban and 6 cents per two-mile suburban zone to 10 cents on the old 5-cent zone limits needs explanation in order that the real change in charges be understood. The actual effect is that all 7-cent riders under the present scheme will pay 10 cents under the new and practically all 13-cent riders will pay 10 cents. This practically covers the various city areas.

Outside of the cities, the new rate per mile is the same as the present—namely approximately 3 cents. In other words the new rate will be 10 cents for the old 5-cent zone of about 3 miles. The ultimate result therefore is that the congested city rider is raised from 7 to 10 cents, the rider on the outskirts has his fare reduced from 13 to 10 cents, whereas the suburban or interurban rider is charged the same as before.

Monthly Tickets Continued

The Connecticut Company under the new schedule will not return to the form of commuters' ticket book, issued under the old fare system, but will issue monthly commuters' tickets as at present on the basis of 2.5 cents a mile. An undated commuters' ticket book would annul the effect of a 10-cent fare on those lines on which commuters' rates apply, company officials state, since a large majority of passengers would ride on commuters' tickets. Under the present system of monthly tickets only those who make use of them every day buy them and all others pay single fares.

The commission's order reads in part:

The Connecticut Company is hereby ordered and directed to establish and put into effect on its entire system, excepting the New London Division, on and after Nov. 1, 1920, a flat 10-cent fare with fare limits based upon the original 5-cent fare areas, as per plan and schedule filed with the commission, entitled: 'Schedule of Fare Limits, Docket No. 3429,' with free transfers at all established transfer points; and the company is authorized to make such mutual adjustments of apparent inequitable fare terminals and lapovers as herein before referred to in this finding.

School tickets shall be issued at one-half the above regular rates.

The company shall issue commutation tickets good for round trip daily, between the traffic center of any incorporated city or borough having a population of 25,000 or more according to the latest authenticated census, or any designated point within such city or borough and points more than five miles distant therefrom, on all lines radiating from such traffic centers, for the number of days in any month, less Sundays and legal holidays; such commutation tickets to be sold at the rate of 2.5 cents per mile; to be issued to the individual commuter and be non-transferable and to expire at the end of each month.

All previous orders of this commission inconsistent herewith are hereby cancelled and annulled.

In granting the new rates the commission said in part:

It is apparent from all the facts connected with this case that the flat 10-cent fare proposed by the company is not excessive, viewed from the point of producing more revenue than the company is legally entitled to, and no logical maximum rate that the commission could establish would produce sufficient revenue under existing conditions and only partially restricted competition to wipe out, short of several years, the existing past due obligations of the company and to pay thereafter a fair return on the value of the property after the payment of proper operating expenses, fixed and overhead charges.

Assuming a return to the flat fare on the original fare limits, which seems to be generally desired, the question for the commission to consider and determine at this time is what the flat rate should be for such fare limits—whether 7, 8, 9 or 10 cents.

The interlocutory order issued July 30, 1920, was a temporary adjustment, and the commission feels that any order issued by it at this time should and will have to be of a temporary nature as to its duration and effect. The commission, under the direction of the Legislature, is making an investigation of street railway conditions in Connecticut, and will report to the next General Assembly, and expects to be able to make some recommendations which with legislative action will tend to solve or at least relieve the present street railway difficulties. Pending such investigation, report and legislative action, the adjudication and establishment of rates for street railway service will of necessity be of a temporary nature. . . .

As stated in the interlocutory order, the commission is of the opinion that the general public would prefer a return to substantially the old flat rate zones or fare limits and the establishment of a system of flat rates for such fare limits, although certain communities have expressed the desire for a distance tariff outside of the original city zone or fare limit.

The plan and schedule of zones or fare limits filed by the company in connection with its petition for a 10-cent flat fare, are substantially the same as the zones or fare limits established and maintained by the company under the original 5-cent flat fare. As previously expressed by the commission, those fare limits are not in all cases equitable, being in some cases unfair to the company and in others unfair to the traveling public, and any adoption at this time of the original fare limits should be with the understanding that certain inequalities and defects should as soon as convenient be adjusted and ironed out by the company in conference with the patrons involved, and when necessary under the order and direction of this commission. . . .

It is with extreme reluctance that the commission at this time contemplates the necessity of a further increase. We feel impelled, however, to the view that it is of vital importance . . . that the railway industry be preserved, even at the cost of a high rate of fare, pending a more final and permanent solution. . . .

Provided there had been no unfair burdens resting on the company, in the nature of paving and bridge obligations, and had it not for the past five years been confronted with the unregulated public service automobile, * * * we believe there would have been no need for a petition to increase the rate to 10 cents at this time. . . .

Taking into consideration all the facts connected with the case . . . we are of opinion that pending the final investigation and report of this commission to the Legislature, and possible legislative action thereon, the flat 10-cent fare asked for by the company, based on the original 5-cent fare limits, should be granted as just and reasonable maximum rates and charges at this time.

Commissioner Elwell's dissenting report reads in part as follows:

The Connecticut Company was warned by this commission not to adopt the distance tariff system before holding a public hearing, but the warning was unheeded, and after eight months' trial the experiment was pronounced a failure by President Storrs when he appeared before the commission asking for a change to the present rate, which was granted as a temporary measure, and since Aug. 9 the company has been operating under the 7-cent city area collection, with 3 cents per mile for suburban territory.

Figures furnished by the company showed that it received about 12 per cent more revenue between Aug. 9 and Sept. 30 than was collected for the corresponding period of the previous year. What it would have collected had there been no change from the old 6-cent rate is problematical. . . .

In less than three months this whole matter will be in the hands of the State Legislature for adjustment. In the meantime, I believe we should allow the company to re-establish the old 5-cent limits with the same lapovers and charge 7 cents where they originally collected 5 cents.

Full Jurisdiction Exercised

California Commission Defines Its Authority in Granting an Increase in Freight and Passenger Rates

Apprehensive of a construction being placed on its recent action in granting increased rates to the railroads to conform to those granted by the Interstate Commerce Commission as having been a concession of the powers of the State to the mandate of a national governing commission, the State Railroad Commission of California addressed a communication to the Interstate Commerce Commission clearly defining the legal position upon which it desires to stand.

The state commission declares that its decision in the matter of increasing the rates in California was to place them on a parity with the rates granted by the national commission and that its action was based on the policy and practical needs of the situation rather than what the commission construed to be a mandate of the law. The state commission firmly sets forth its opinion "that the powers of the state authority over intrastate rates have not been nullified or reduced by the transportation act."

Inclosed with the communication was a copy of the California Commission's rate decision in which the commission voiced its opinion that practical necessity demanded the adoption of the interstate commerce rates for intrastate business. The California Commission then says:

"We are now without challenge exercising full jurisdiction over state rates."

There are now pending before the Interstate Commerce Commission several cases involving the power of that body to increase state rates resulting from the failure or refusal of several state commissions to place state rates on a parity with the increased rates authorized by the Interstate Commerce Commission. The California Railroad Commission was asked to join with the other state commissions in a presentation of its views on the matter, but it did not do so as time and distance did not permit of the receipt and study of the proposed presentation by other states. On this point the California Commission says:

> However, to whatever extent the views of this commission may differ from the views of those state commissions which refused to adopt the increases granted by the Interstate Commerce Commission, we desire to emphasize complete agreement and accord with any and all state commissions in so far and to the extent that such commissions defend the legal right of state commissions to determine, fix and establish reasonable rates for intrastate business. To that extent it is this commission's desire to adopt and stand with all other state commissions entertaining similar views.

Wants More in Grand Rapids

To meet the demands of its employees for an increase in wages the Grand Rapids (Mich.) Railway has applied to the Grand Rapids City Commission for an advance in fare. The company has offered its carmen a maimum of 60 cents an hour, but will be unable to pay at this rate unless fares are raised. No specific fare is mentioned in the petition to the city authorities, who are asked to determine a just and reasonable rate. The present fare is 7 cents cash with sixteen tickets for $1.

The company submits figures to show that since April, 1918, a total deficit of $212,992 has accrued, with a total surplus of $8,878, making a net deficit of $204,112. In July, 1920, the deficit was $5,446. In August it was $2,455. The deficit for the month of September amounted to $8,982. This was in spite of the fact that receipts were the largest of any month in the company's history. The petition says in part:

> Our motormen and conductors in August made demands for a greatly increased wage as compared with the 51-cent maximum rate which was being paid them at the time we previously asked for the increased rate of fare. We offered them an increase of 9 cents per hour or a maximum of 60 cents per hour for employees who had been in the service one year or more. Part of our employees have accepted this rate but the majority have asked for an arbitration in the matter, claiming they should have a still higher scale.
>
> At the 60-cent maximum rates our operating expenses will be increased approximately $10,000 per month. We expect that during the ensuing year we will have to pay nearly, if not quite, this 60-cent maximum rate, and will have to have the revenue necessary to meet it. Had we been operating during the past month at the wage rate in effect previous to Sept. 1, our operating report, instead of showing a loss of $8,982, would have showed a gain of $1,266. For each 1 cent per hour of increase in wages our operating expenses are increased approximately $1,000 per month.
>
> You of course know that for the past two years we have not attempted to get a rate of fare which would yield us a profit, but one merely which would permit us to pay expenses. The last dividend payment on our preferred stock was made Oct. 31, 1918, and the last dividend payment on our common stock was made March 1, 1918.
>
> Under the existing conditions we feel that we must have an increase of fare to take care of the increase in wages already agreed to. . . .

Save Your Money—Use the Trolley

A handy timetable for patrons of the electric railway in Mount Vernon and New Rochelle, N. Y., is a booklet, entitled "Hello, Fred, How Is the Bus Running?" It is published by the Westchester Electric Railway. Passengers who ask for one and take it along with them on their ride to Tuckahoe or Pelham and read it will most certainly be playing the "glad game" thereafter.

The booklet is entertaining and instructive and points a moral, too. Especially will it be of value to the car rider who always complains about poor service. Let him read of the woes of Friend Fred, owner of an auto who, in an accommodating way, gave a lift to nine persons one morning all in a hurry to get to the railroad station; of the subsequent catastrophe to two "shoes" costing about $90 as contrasted with a cost of 45 cents on the trolley (even if he had been wildly extravagant and paid all nine fares); of Fred's resolve to give up his car and take advantage of the comfortable, fast and cheap electric railway service provided for him.

Then, too, the little book gives real information about automobile expenses that should be of value to the auto aspirant. As Fred says, "It's a Wise Guy Who Knows What Becomes of His Money."

Transportation News Notes

Suburban Rate Doubled.—The Idaho Public Utilities Commission has authorized the Boise Valley Traction Company, Boise, to raise the fare on its Hillcrest loop line from 5 cents to 10 cents. The company has applied to the commission for an increase in fare on two other lines.

City Will Run Buses—The City Council of Pottsville, Pa., has voted to establish a line of motor buses between Pottsville and Yorkville in competition with the line of the Eastern Pennsylvania Railways. A 5-cent fare will be charged. The railway charges a 10-cent fare between the two towns.

Want More in Tuscaloosa.—Officials of the Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., have announced that they will apply to the Alabama Public Service Commission for an increase in the fare charged on the company's railway line from 6 cents to 7 cents. The company will also ask for an advance in gas and power rates.

Would Raise Pittsfield Rate.—The Berkshire Street Railway, Pittsfield, Mass., has petitioned the State Department of Public Utilities for permission to raise its fare from 5 cents to 6 cents. The increase is made necessary by the advance in wages recently granted the company's employees as a means of ending the strike which tied up service on its lines some time ago.

Minimum Fare Eight Cents.—The Denver & Interurban Railroad and the Denver & Intermountain Railroad, Denver, Col., recently increased their rates for both passenger and freight service. Under their new schedule, the minimum fare on the lines of both companies is raised from 7 cents to 8 cents. The fare between Denver and Golden has been advanced from 28 cents to 48 cents.

Higher Freight Rates Asked.—An increase of approximately 40 per cent in express and freight rates is asked by the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., in a petition which the company recently filed with the State Public Service Commission. The petition asks that the new rates be 150 per cent of the first-class freight rates now in effect for electric railways in Indiana.

Court May Pass on Rate Powers.—The Illinois Public Utilities Commission has announced that if necessary, it will bring to the United States Supreme Court the issue of State jurisdiction over intrastate rates. The commission recently issued an order granting an increase of 33⅓ per cent in freight rates as against the increase allowed by the Interstate Commerce Commission. It has since amended this order so as to allow an increase of 35 per cent on intrastate traffic.

Buses for Abandoned Routes.—The Board of Estimate and Apportionment of New York City has directed Commissioner Grover A. Whalen of the Department of Plant and Structures to establish bus lines over routes of the Brooklyn Rapid Transit Company's surface lines which have not been in operation since the recent strike began. Operation of these lines, nine in all, was discontinued by the company at the direction of Federal Judge Julius M. Mayer.

City Fights Fare Rise.—Steps have been taken by the city of Reading, Pa., to prevent the Reading Transit & Light Company from raising its fare on its local line from 6 cents to 8 cents. The company recently announced that effective Oct. 27 it would begin charging 8-cent fares on its city lines and 9 cents in each zone on its suburban lines. The railway has since offered to compromise the dispute by selling four tickets for 30 cents. The city is still contesting the increase in fare from 5 cents to 6 cents two years ago.

Jitneys Prohibited in Denver.—The emergency jitney service in Denver, which has been in operation since Aug. 1 because of the strike of the employees of the Denver Tramway, was suspended on Oct. 5. Manager of Safety and Excise F. M. Downer declared that although many drivers had ceased to operate buses since the strike settlement there were between 200 and 300 jitneys in operation when the order was given. During the strike the jitney men were permitted to drive buses in Denver without license or restriction.

Seven Cents in Fort Worth.—The Northern Texas Traction Company, Fort Worth, Texas, recently announced that it would increase its fares in Fort Worth from 6 cents to 7 cents, effective Oct. 22. Fares were raised from 5 cents to 6 cents on May 1 of this year. The City Commission of Fort Worth has ordered an investigation of earnings to ascertain if the second increase is justified. The company's franchise does not limit the fares to be charged. If investigation shows that earnings are now adequate, injunction to restrain 7-cent fares will be sought.

Fare Increase Enjoined. — Judge George L. Bell has issued a temporary injunction restraining the Georgia Railway & Power Company, Atlanta, Ga., from raising the fare on its lines in College Park. The company had announced its intention of raising the fare from 5 cents to 7 cents, beginning Oct. 20. The city in asking an injunction, contended that the company's franchise limited the fare to 5 cents. The company was refused an increase on its lines in College Park and Decatur in the recent order of the State Railroad Commission in which an increase in fare from 5 cents to 7 cents on the Atlanta city lines was authorized.

City Favors One-man Cars.—W. C. Culkins, Street Railway Director of Cincinnati, Ohio, has arranged for a survey of the city's traction situation with a view to the adoption of one-man safety cars by the Cincinnati Traction Company. Mr. Culkins recently decleared that the one-man car "was the most important advance in electric traction development for a long time," and that the greatest obstacle to the use of such a car in Cincinnati was the double trolley system. This announcement was made in connection with the installation of several "safeties" by the Cincinnati, Milford & Blanchester Traction Company on its lines in the city.

City Must Make Complaint More Definite.—The Supreme Court of Wisconsin held on Oct. 19 that the city of Milwaukee must make more definite its complaint against the orders of the Wisconsin Railroad Commission granting the Milwaukee Electric Railway & Light Company an increase in its rates of fare. The Wisconsin Railroad Commission had permitted increases in fares in the city of Milwaukee. The city brought an action in the Circuit Court of Dane County for a review of this order. The railway then asked the court to compel the city to make its complaint more definite. This the court did and from this ruling the city appealed to the Supreme Court of the State. The Supreme Court held that the city could not appeal in this case.

Commission Lacks Rate Power.—The New York Court of Appeals has denied the motion made on behalf of Lindley M. Garrison, receiver of the Brooklyn Rapid Transit Company, for a re-argument concerning the right of the Public Service Commission to permit the company to raise the fare on its surface lines to 8 cents. The decision of the court stands, that the commission has no jurisdiction over the fare when the fare is stated in the franchises. The court held that the fare could not be increased without the consent of the Board of Estimate. The Appellate Division of the Supreme Court will listen early next month to arguments on the jurisdiction of the commission over fares on the rapid transit lines. An order by the commission states that it is without jurisdiction and the court action is to dispose of the question finally.

Eight Cents in Santa Barbara.—The Santa Barbara & Suburban Railway, Santa Barbara, Cal., has been authorized by the State Railroad Commission to raise its cash fare from 5 cents to 8 cents. The company has been directed to sell five tickets for 35 cents. The City Council recently made concessions in the matter of service furnished by the company, and the commission recommends that the latter take advantage of this permission to curtail its operating costs. The introduction of one-man safety cars on the Santa Barbara lines is also recommended by the commission, which holds that the system is efficiently operated. The railway has never paid a dividend, has been operating at a steady deficit since 1914, and since 1916 has failed to earn operating expenses. It is capitalized at $899,000.

Court Sustains Nickel Fare.—Interpreting the franchise of the Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, Common Pleas Judge William F. Duncan recently held that the twenty-five-year grant, obtained in 1915, limited fares to 5 cents for all purposes. Ten-cent charges in some instances had been collected by the company. A ruling also was handed down by Judge Duncan overturning a decision of the Council five years ago ordering the company to move its North Main Street tracks from the side to the center of the street. Judge Duncan held that the present Council has full authority to deal with the matter of tracks. The Council recently repealed an ordinance granting the company a 10-cent fare. The railway has applied to the State Public Utilities Commission for authority to cease operation.

Merchants Combat High Fares.—Merchants doing business in Quincy, Mass., have formed an organization to protest and possibly to take action against the present fares on the Eastern Massachusetts Street Railway. The movement is headed by Col. Henry L. Kincaide, who has declared that unless a cheaper rate can be given by the company he will advocate abolition of all car service in Quincy and the installation of jitneys. He believes the 5-cent zone system could be replaced. At present there is a 10-cent zone system in the city, the fare for a ride from one side of the city to the other being 20 cents. From Quincy Square it costs 20 cents to go to South Braintree, 15 cents to Braintree, 20 cents to East Weymouth and 30 cents to South Weymouth. The merchants who are now protesting declare the high fares are seriously affecting both the city and the suburban business.

Holds "Safeties" Violate Law.—The operation of one-man safety cars in Texas constitutes a violation of the State "Jim Crow" law requiring separate cars or separate sections of cars for negro passengers, according to Homer Stephenson, city prosecutor of the city of Houston. Mr. Stephenson, in moving to dismiss a case involving alleged violation of the "Jim Crow" law on the part of a passenger, explained that the State law provides that there can be no violation until the conductor of the train or car shall request the passenger to take a seat in the proper compartment or section and the passenger refuses to comply. Mr. Stephenson said there is no conductor on the one-man cars and hence there can be no violation of the "Jim Crow" law on such cars, and he concludes that the operation of such cars then constitutes a violation of the "Jim Crow" law. A number of "safeties" were recently placed in service on the lines of the Houston Traction Company. Additional cars will soon be in operation.

Legal Notes

FEDERAL COURTS—*Separate Coach Law Held Not Interference with Interstate Commerce as Applied to Particular Road.*

A Kentucky statute requiring railroads to furnish separate coaches for white and colored passengers is not an unconstitutional interference with interstate commerce, as applied to an interurban railway whose termini and stations are all in the State of Kentucky, though it is operated by another Kentucky corporation, whose lines extend into Ohio, and carries passengers for a single fare and without change from points on the first road into the State of Ohio. [South Covington & Cincinnati Street Railway Company vs. Commonwealth of Kentucky, 40 Supreme Court Rep. 378.]

INDIANA—*Company Held Liable to Trespasser for Defective Electric Wire.*

If an improperly insulated wire passing through the branches of a small tree on private property was obviously dangerous to persons coming in contact therewith, and if the electric company should reasonably have anticipated that children in their play would climb into the tree, then the company is liable for injuries to a child climbing into the tree, though the child was a trespasser. [Fort Wayne & Northern Indiana Traction Company vs. Stark, 127 Northeastern Rep., 460.]

LOUISIANA—*Last Clear Chance Does Not Apply to a Man Walking on Track*

Where a man in full possession of his faculties was walking on a railroad track and was struck and killed by a train, the doctrine of last clear chance does not apply, since his negligence continued up to the moment of the accident, and his chance of seeing the train and getting out of the way was as good as that of the motorman seeing him in time to avoid running him down. [Hudson vs. New Orleans Railway & Light Company, 84 Southern Rep., 492.]

MICHIGAN—*Legislature Cannot Divest Itself of Right to Fix Reasonable Rates.*

Rate Act, Sec. 2, fixing the rates which passenger carriers may charge, is not invalid because the rates prescribed by municipal franchises were increased without the consent of the municipality affected, since the Legislature cannot divest itself of the right to reassume and exercise powers granted it by the constitution, among which is the power to fix reasonable rates. [Groesbeck, Attorney General, vs. Detroit United Railway, 117 Northwestern Rep., 727.]

MISSISSIPPI—*City Held Not Liable for Death of Driver of Motorcycle from Collision with Guy Wire Posts.*

Where a municipal street was 37 ft. wide and 17.7 ft. of this width was in good condition for vehicles, and where an electric railway had been authorized to set poles between the travelway and the sidewalk about 3½ feet from the outer limits of the travelway, neither company nor city is liable for the death of the driver of a motorcycle who was killed while running his cycle at a high speed and collided with a pole. [Gulfport & Mississippi Coast Traction Company, et al., vs. Manuel, et al., 85 Southern Rep., 308.]

MISSOURI—*Risk of Falling Into Unlighted Pit Held Not Assumed by a Car Cleaner.*

A car cleaner working in a carhouse did not assume the risk of injury by falling into a pit which the master had negligently failed to light, although he knew of its presence and the failure to light. [Haggard vs. Southwest Missouri Railway, 220 Southwestern Rep., 22.]

NEW YORK—*Lessee of News-stands Held To Be Invitee and Not Mere Licensee.*

The lessee of a news-stand at an entrance of a rapid transit company's subway station and his employee, while on the station platform buying subway tickets in bulk to be resold to customers and others using the entrance, the resale being in fulfillment of the lessor's obligations to the company, were held to be invitees, as to whom the company was bound to exercise ordinary care, and not mere licensees. [Verdini vs. Interborough Rapid Transit Company, 182 New York Supp., 754.]

NEW YORK—*Detective Bureau's Employee, Guarding Cars, Held Not Railway's "Special Employee," Within Compensation Law.*

Where a detective bureau had a contract with a railroad during strike to furnish guards to protect passengers on cars, an employee of the bureau, injured in collision while serving as guard, without knowledge as to whether he was in the employ of the railroad or merely an employee of the bureau, was not a special employee of the railroad within Workmen's Compensation Law so as to prevent him from resorting to a common-law action against the railroad for negligence. [Murray vs. Union Railway of New York City, 127 Northeastern Rep., 907.]

NEW YORK—*Mortgage Provisions as to Sinking Fund Applicable to Bonds Not Issued to General Public.*

Where a tramway company issued bonds secured by deed of trust, stipulating for payments to the sinking fund, and certain of the bonds were delivered to the trustee as custodian, subject to the company's order, and the company on various occasions pledged such bonds as collateral, the sinking fund provisions applied to such bonds as bonds issued and outstanding, though they were not issued to the general public, and the loans for which they were pledged were from time to time paid. [Bankers Trust Company vs. Denver Tramway Company, 183 New York Supp., 326.]

OHIO—*Lessee of Interurban Railway Held Not "Owner in Fee of a Strip of Land by the Side of a Highway."*

The lessee of an interurban railway, which was the grantee by a board of county commissioners of a right-of-way upon and along the side of a public highway, does not thereby become the owner "in fee of a strip of land by the side of a highway" within the contemplation of Sec. 1209, General Code, so that the company becomes liable as abutting property owner for improvements to the street. [Dayton & Troy Electric Railway vs. Scott, treasurer, et al., 126 Northeastern Rep., 879.]

PENNSYLVANIA — *Pedestrian Contributorily Negligent in Stepping on Track Without Looking.*

A pedestrian's failure to look immediately before stepping on the track of a street railway is negligence per se and bars recovery, although he looked before stepping from the sidewalk to cross the street to take the approaching car and although the approaching car did not slow down according to law at the cross street and stop for passengers as was customary. Where there is no evidence upon the subject the presumption is that a pedestrian crossing a street railway track looked immediately before stepping upon the track to see whether a car was approaching. [Griffith vs. Philadelphia Rapid Transit Company, 110 Atlantic Rep., 76.]

TEXAS—*Derailment Raises Presumption of Carrier's Negligence.*

In a passenger's action for injuries sustained by exposure when compelled to walk four miles to a town after a derailment of the car wherein he was riding, where the allegations of negligence were general, the rule of the presumptive negligence from the fact of derailment obtained, and, to overcome such prima facie case of negligence, it was necessary for the company to show that the accident could not have been avoided by the exercise of the utmost care reasonably compatible with the prosecution of its business. [Dowdy vs. Southern Traction Company, 219 Southwestern Rep., 1092.]

WISCONSIN—*Surrender of Franchise and Acceptance of Indeterminate Permit Held Not to Relieve Company of Payment for Using Streets.*

An interurban railway surrendered its franchise for an indeterminate permit, as authorized by a State law, but this surrender was held not to relieve the company of an obligation under its former franchise to pay $1,000 a year for the use of the streets of the city which gave the original franchise. [City of Oshkosh vs. Eastern Wisconsin Electric Company, 178 Northwestern Rep., 308.]

Personal Mention

London's Motor Managers

Authors of Paper Before A. E. R. A. Convention Pioneers in Their Respective Fields

Frank C. Pick and George J. Shave, the authors of the paper "The Motor Bus in Urban Transportation," presented at the Atlantic City convention, modestly said of themselves in that paper by way of identification that they were "engaged in the management of motor omnibus service in Greater London." That was a typical British statement, but it does not satisfy the curiosity of the American reader of the paper, particularly when the magnitude is considered of the undertaking with which Messrs. Pick and Shave are connected and proper weight is given to the value of the information contained in their discourse.

F. C. PICK

Neither does the meager fact satisfy that was mentioned in the foot-note to the paper that Mr. Pick is commercial manager of the London General Omnibus Company, Ltd., and that Mr. Shave is manager of maintenance of that undertaking. It may be, as Messrs. Pick and Shave said, that the abstract problem of the place of the motor bus in transportation appears simple as A, B, C, but that is only because the authors have solved the problem. And a tremendous one it was, with a possible significant lesson for America.

If any man can be said truly to understand the meaning and application of the phrase "selling transportation" it is Frank Pick. His very title, commercial manager, is unique in the nomenclature of electric railway transportation. It is Mr. Pick who has been the moving spirit under his famous chief, Lord Ashfield, in developing means of attractive publicity and aids to the traveler that have made the fame of London's T. O. T. (Tube-Omnibus-Tram) journey around the world. Upon his return from government service in coal control, Mr. Pick at once plunged into a maze of official hearings on fares and the place of each class of transport facility in London; but his amazing knowledge of London's complex traffic has enabled him to run the gantlet of prolix parliamentary procedure without losing his good humor or his memory.

Particularly during the long-drawn-out years of the war did Mr. Shave have a most unenviable task. Early in the struggle the government took over hundreds of buses for war service and throughout the war Mr. Shave found himself with a personnel so diminished that it was a problem to keep the remaining buses going, let alone build new ones for enormously increased traffic. With the coming of peace, however, Mr. Shave and his confrères have turned their thoughts to the development of larger and still better buses, the first result being the new type, "K," a 46-seater and, more recently, a 57-seater significantly referred to by the public as the "Hush-Hush."

C. A. Semrad Heads Colorado Association

C. A. Semrad, general manager of the Western Light & Power Company, Boulder, Col., was elected president of the Colorado Electric Light, Power & Railway Association at the recent meeting of that body in Glenwood Springs.

Mr. Semrad was born on July 3, 1885, at Highland, Wis. He was graduated from the University of Wisconsin, College of Electrical Engineering, in June, 1908. In the following year he served as an instructor in hydraulics and water power at the same institution. He was then employed by the Union Light & Power Company, St. Louis, Mo., for about a year, at the end of which time he became a cadet engineer of the Northern Colorado Power Company. Four years later he was made general manager of the Cheyenne, Wyo., Light, Fuel & Power Company, a subsidiary of the Western Light & Power Company. He subsequenlty became general manager of the latter company.

Herbert Markle Re-elected

Herbert Markle, general manager of the Appalachian Power Company, Bluefield, W. Va., has been re-elected president of the Public Utilities Association of West Virginia. The association is made up of representatives of the electric railway, light and power, artificial gas, water and telephone companies of the State. Mr. Markle has been serving as its president for the past five years.

Mr. Markle is a native of Indiana. Graduating from the School of Electrical Engineering of Purdue University in 1895, he entered the employ of the Jenney Electric Company, Indianapolis. After serving with that organization for several years, he joined the Northern Electric Manufacturing Company as district sales manager, with headquarters at Chicago. For a few months he also served with the Fort Wayne Electric Company after the consolidation of that company with the Northern Electric properties. Eleven years ago he joined the Byllesby organization, and for three years was stationed at Stillwater, Minn., as manager of several properties of the Northern States Power Company. For the past eight years he has been general manager of the Appalachian Power Company, with headquarters in Bluefield. This company, in addition to operating large power installations, owns the electric railway system in Bluefield.

G. J. SHAVE

Bert Dunkin, auditor of the Albia Light & Railway Company, Albia, Iowa, has been appointed acting manager of the company to succeed Ralph W. Boyer, who has resigned to enter another line of business.

Ralph W. Boyer has resigned as general manager of the Albia Light & Railway Company, Albia, Iowa, to enter another line of business. Mr. Boyer has been connected with the company for the past eleven years.

Rolla Wells. receiver of the United Railways of St. Louis, Mo., has been elected president of the Employees' Mutual Benefit Association of the company. The by-laws of the association were amended by unanimous vote of the board of directors to permit of the election of Mr. Wells.

A. L. Gibson has been appointed superintendent of the Lawrence District of the Eastern Massachusetts Street Railway, Boston, Mass. Mr. Gibson started as a uniform man in the Chelsea District of the Bay State System and later became a car foreman. For several years he has been superintendent of the district which includes the lines in western Reading and Wakefield.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Demand for Paint Exceeds Production

Electric Railways Not Buying Heavily at Present—Deliveries Improving and Prices Seem Steady

Electric railways have not been buying a large amount of paint recently, according to a survey made among several of the large manufacturers. The general demand for paint on the other hand has all along been very good, with the result that in some cases manufacturers have been as much as four months behind on orders. Several producers are finding the general demand for paint slackening just now, and do not expect it to resume heavily again until spring. Others say that sales are picking up and should continue to increase, especially on behalf of electric traction companies which are repainting much of their old equipment. A feature of this demand is the growing use of enamel on cars.

BRIGHT PROSPECTS FOR 1921 SALES

Without exception paint makers give very optimistic opinions on the prospect for next year's business. Almost no cancellations, it is stated, have been received and great hopes are being based on the return of the building industry in 1921. Electric and steam railways are also expected to buy more heavily. The latter have already greatly increased their requirements since the advent of higher rates, it is said in some quarters.

Little prospect of lower prices in the near future is held out. One producer is shading prices a trifle, it is true, but not officially, and though virtually all the other paint makers think prices have reached their peak, the consensus of opinion seems to be that present levels will be maintained for some time to come. The reason for this is said to be the undersold condition of the market and because raw material in many cases has been contracted for in advance at the old prices. No reduction is noted in the high cost of pigments. On the other hand, turpentine and linseed oil have eased off in price, and one of the largest paint manufacturers thinks that if this trend of raw material should continue and labor costs be reduced lower prices will prevail.

Paint ingredients are in good supply but some complaint is heard of not being able to obtain sufficient quantities when needed. There is a scarcity of tin cans, according to one representative manufacturer, and this is said to be due to an inadequate tin plate supply. Stocks of the finished product in many cases are low owing to the heavy demand this year, though one or two manufacturers report a good supply. The next few months are counted on to replenish stocks so that all supplies should be in good shape to meet the spring demand. Production is very generally up to full capacity and the labor situation in the industry is favorable. As a result, deliveries are improving in several instances, and producers who have been far behind on filling orders are now catching up. One representative company is able to fill orders for paint from stock, but in general deliveries range from about two to six weeks.

Steady Prices for Trolley Rope Prevail

Good Demand Exists — Current Requirements Handled Readily Despite Inability of Factories to Accumulate Stocks—Opportunity for Standardization of Sizes Seen

Trolley rope continues in steady demand, according to representative manufacturers. A leading maker of this material recently reported to a representative of the ELECTRIC RAILWAY JOURNAL that his orders have shown a steady increase during the past half year. Another manufacturer stated that the volume of business is holding up exceedingly well, with no falling off in inquiries or purchases. The drop in the price of spot cotton in the general market has not been reflected in any changes in trolley rope quotations as yet.

Purchasers do not appear to expect an immediate downward movement in prices, but it is thought that if the present level of raw material prices is maintained lower quotations will follow after existing stocks of cotton are exhausted.

PRICE TREND NOT CLOSELY DEPENDENT UPON SPOT COTTON

The price of spot cotton, it was stated, is not an accurate barometer of trolley rope quotation possibilities. The long fibered cotton required in the production of this class of rope is very difficult to obtain at present. One leading manufacturer states that he is unable to secure definite delivery dates and prices on this commodity. This class of cotton sells for perhaps 40 to 50 per cent above the spot quotations, and it is pointed out that the number of bales changing hands is a better index of market conditions than the extreme quotations published daily. The minimum prices quoted lately on spot cotton are held by trolley rope manufacturers to be largely speculative. The two controlling factors in the maintenance of present prices appear to be the existence of raw material stocks purchased long ago and the sustained high wages received by labor. There appears to be no downward movement in wages in the rope factories as yet. Long-continued transportation difficulties and increased freight rates have also caused manufacturers considerable anxiety.

Night work is not necessary to meet the present demand, and a tendency toward increased production on the part of labor is noted. Deliveries of trolley rope in quantity are being made on a basis of eight to ten weeks from the receipt of order. There are virtually no factory stocks, although it is the custom in some plants to build up these and maintain them during normal times. Current prices for trolley rope range from about 90 cents to $1.25 per pound according to grade. Some talk of the desirability of cutting down the number of sizes specified by purchasers is heard, although it does not appear to be the plan of the manufacturers to reduce the variety. The ¼-in. size is commonly used, and though a good demand exists for the $\frac{9}{32}$ and $\frac{10}{32}$-in. sizes as well, there is a feeling in some quarters that an opportunity for standardization exists which might ultimately lead to quicker deliveries and lower prices.

Credit conditions are said to be fair only. Many orders are paid on a sixty to ninety-day basis notwithstanding their being billed for a thirty-day payment. Register cord is not in heavy demand at present and current quotations on the better grades run around $1.20 per pound. No difficulty is met in handling urgent needs for either trolley rope or bell cord.

Deliveries of Cars for St. Louis Not Much Delayed

St. Louis Car Company declares there is no foundation for the report that there may be six months' delay in the delivery of the cars which it is building for the United Railways of St. Louis because of the recent fire in the St. Louis Car plant. The delay at most will not exceed three months, according to the car company.

Friction Tape Deliveries Improving

Raw Material Plentiful and Production Has Increased, but Demand Is Less—Prices Seem Steady

Accumulation of raw material and increased production, coupled with a moderate falling off in orders has resulted in greatly improved delivery conditions in the friction tape market. A representative manufacturer informed the ELECTRIC RAILWAY JOURNAL a few days ago that he could easily handle orders as large as 50,000 lb. a week, quoting seven to ten days' delivery. Factory stocks are not being built up, however. The price question is the chief obstacle to larger business. The cost of cotton sheeting has eased off somewhat, but the mills are still heavily loaded with orders and no marked tendency toward a sharp decline can be seen in the present price of raw material.

One manufacturer pointed out that no very great price reduction on friction tape is to be expected before January. Wages are maintained at the high level attained some time since and the cost of coal purchased under a $5 contract has increased to $18 and $21 per ton in this plant within a few months. A very heavy demand for rubber hose has set in and tape manufacturers making diversified products are less affected by fluctuations in buying than are producers of a few very limited lines. Tape prices, it is said, are not figured upon the maximum price of cotton sheeting to the manufacturer, and for this reason quite a substantial decrease in raw material cost would be required to have much effect upon the quotations of tape producers. Current prices run from 60 to 70 cents per pound. Recent suggestions as to the desirability of using white and gray tapes have borne good fruit and less than 1 per cent of the tape sold by a large producer is now white. Labor conditions are good and so far it has not been necessary to lay off employees to any extent in this field. Few cancellations are being received.

Rail Bonds Decrease in Price

Softening copper prices are responsible for a reduction in rail bond prices which went into effect about the middle of this month, it is stated. The reduction is slight and corresponds to the price advance made about two months ago. The further trend of prices is uncertain, according to one of the leading factors in this line.

The supply of rail bonds at present is said to be adequate for all needs, especially as demand has lessened recently and raw material is plentiful, it is stated. Deliveries are encompassed within a range of two to three weeks. No cancellations have apparently been received and manufacturers hope for good business to develop from the prospects that are now seen for further electrification of roads. Foreign demand is slightly better at present than has been the case recently, one of the leading manufacturers states, and sales abroad should continue to increase.

At the date of going to press word has just been received of a further drop in rail bond prices. The amount of the reduction, which goes into effect on Oct. 30, is approximately the same as the cut mentioned above.

Sales of Electric Coin-Handling Machines Growing

Increase in Multiple Fares Aids Demand—Raw Material Supply Favorable and Deliveries Are Good

Electrically operated coin handling machines for sorting, counting and wrapping coins of various denominations are coming into increasing favor with electric traction companies. One of the factors promoting their use, besides the saving effected in time, is the elimination of additional employees to handle the money. Another reason for the stronger demand is that with the increased fares that many street railways are securing the number of additional coin denominations involved has brought greater problems in the handling of fares, with a consequent trend toward machine sorting, counting, etc.

With the increase in demand from electric railways and a favorable volume of orders from other interests, manufacturers are very generally finding it necessary to increase their production. Except for some complaint on the item of castings little trouble is being found with the supply of raw material. There is a scarcity of the wrappers used for wrapping coins, however, according to one of the large manufacturers. This is caused by inability to obtain paper. The small motors used in these machines are now said to be in plentiful supply.

Stocks are not usually accumulated, it is stated, except of partially assembled units. This is because the filling of orders depends upon the coin units that are to be handled in each case. Deliveries, however, are proceeding satisfactorily. One representative company is able to ship in about ten days. Another concern which specializes on a more complicated device for sorting, counting and wrapping coins in one operation can fill orders in about a month. The use of metal tokens by many lines has somewhat complicated the situation where machines for handling coins alone have been devised. This factor has already been provided for in some instances, and will be taken care of soon in others, it is stated.

Prices in this line have reached their peak and will probably hold steady for some time, according to a representative manufacturer. On the other hand, another producer announces an increase in price of about 9 per cent to become effective on its products Nov. 1. The reason for this is said to be the fact that no advances had previously been made covering the period of rising costs of labor and raw material. Labor conditions are improving.

Coal Situation Easing Up

With coal production running well over 12,000,000 tons weekly, and with indications pointing to a suspension of the lake priority order, it is believed that coal will be obtainable in ample quantities in the very near future. There is great congestion at lower lake ports, due to the fact that the saturation point seems to have been reached in the Northwest. This condition promises to make available within the next few days some four thousand additional cars of coal daily. Once this amount of coal is added to the distribution in the so-called lake territory and in the East it is believed that public utilities will have little further difficulty in securing their coal.

Since the new service order, it is reported by the national committee on gas and electric service, there has been no single case in which an emergency has been met with assigned cars. If a utility runs short of coal it must now first establish that it cannot secure the coal through ordinary commercial channels. If that is established this committee, through the cooperative agreement existing with the railroads and the National Coal Association, makes arrangements directly with the operator with whom the utility has a contract.

Rolling Stock

The Chicago Surface Lines, on Oct. 26, had received six of the ten standard safety cars ordered from the J. G. Brill Company about Sept. 15.

Puget Sound Power & Light Co., Bellingham, Wash., expects eight new safety cars for its lines to be shipped from St. Louis on Nov. 2, it is announced.

Berkshire Street Railway Company, Pittsfield, Mass., has secured delivery of nineteen safety cars, it is announced, and will operate on a one-man car basis except on some of the long interurban runs. A few safety cars have already been in operation on the Pittsfield lines for several months. The heavy double-truck cars will be taken off all city lines.

The Detroit (Mich.) Street Railway Commission has called for bids on twenty-five new trolley cars for use on the municipal lines now under construction. The cars specified are to be of the one-man safety type. It is the hope of the city to have the cars delivered before Jan. 1, 1921, so that they can be operated soon after that date if necessary.

Interstate Public Service Company, Indianapolis, Ind., expects completion of the seventeen new freight cars now under construction at the plant of the company at Indianapolis by Nov. 1, according to L. M. Brown, superintendent. The cars will be 39 ft. long, 8 ft. 4 in. wide and will have a capacity of 50,000 lb. The eight new all-steel passenger cars which were to have been delivered last June are now promised by the middle of November and may be in operation a month later, according to Mr. Brown.

Track and Roadway

Houston, Bay Shore & Texas City Traction Company, Houston, Tex.—The Houston, Bay Shore & Texas City Traction Company, incorporated recently with a capital stock of $300,000, has filed with the State Secretary an amendment to its articles of incorporation certifying to an increase in its stock to $1,000,000.

Interstate Public Service Company, Indianapolis, Ind.—The Interstate Public Service Company will make some extensive additions in the maintenance of way department in its plant at Scottsburg, Ind., in the early spring. Among the improvements will be a general shop building and new carhouses. The project will entail an expenditure of approximately $300,000.

Eastern Massachusetts Street Railway, Boston, Mass.—The Department of Public Utilities has notified Mayor Peters that it will authorize a city expenditure of not more than $300,000 for improvement and repair work on the Eastern Massachusetts Street Railway in the Hyde Park section now being operated by the Boston Elevated. The city created a loan fund this year for such expenditures and this will be the first draft.

Detroit (Mich.) Municipal Railway.—The Street Railway Commission of Detroit has awarded a contract for furnishing steel trolley poles to the National Tube Company, Pittsburgh. The company's price for supplying 1,700 30-ft. trolley poles (steel tubes) and 400 30-ft. heavy poles is $151,680.

Phillipsburg (N. J.) Transit Company.—The Phillipsburg Transit Company will place new special work across the Pennsylvania Railroad tracks in Union Square, Phillipsburg.

Phillipsburg (N. J.) Transit Company.—The Phillipsburg Transit Company will expend $20,000 for paving 3½ ft. alongside its tracks for a distance of 3,960 ft. along Main Street, Phillipsburg. The paving will consist of brick set on a concrete base and the contract has been awarded to Korp & Korp, Phillipsburg.

Public Service Railway Company, Trenton, N. J.—A plan to connect Camp Dix with Trenton and other nearby towns was recently discussed by Mayor Frederick W. Donnelly, of Trenton, and Major General Summerall, of the big army cantonment. The scheme under consideration is to build a spur from the camp to connect with the southern division of the Public Service Railway. The plan was suggested by M. D. Warren, traffic manager of the Trenton Chamber of Commerce, who will take up the matter further with the army officials at Camp Dix. Camp Dix is eighteen miles from Trenton.

Staten Island Midland Railway, New York, N. Y.—The property of the Staten Island Midland Railway, which the city will begin to operate on Dec. 1, will need general overhauling according to the Commissioner of Plant and Structures. Repairs will be made to the roadbed, wires and poles.

Power Houses, Shops and Buildings

Public Service Railway, Trenton, N. J.—The new terminal of the Public Service Railway at the Camden, N. J., ferries has been completed and cars are now running around the loops.

Boston (Mass.) Elevated Railway.—The Boston Elevated Railway has built a garage at Broadway and Washington Street, Boston, to house motor wrecking apparatus and emergency motor car and crew.

Trade Notes

G. E. Anderson, formerly assistant eastern sales manager of the Duff Manufacturing Company, Pittsburgh, Pa, has been promoted to southwestern sales manager and placed in charge of the company's new branch office located in the Railway Exchange Building, St. Louis, Mo.

C. W. Hunt Company, Inc., announces the formation of the C. W. Hunt Engineering Corporation, with offices at 143 Liberty Street, New York City, for the purpose of handling all sales entailing engineering in connection with the Hunt products and all engineering services previously performed by the company.

The Ajax Metal Company, Philadelphia, Pa., has issued a new export catalog in two editions, one English and one Spanish, covering all Ajax products from Babbitt metals to car brasses and castings and ingot metal. The text and illustrations are identical in both cases. Copies of either edition will be sent to interested persons.

A. L. Whipple, who was with the Curtain Supply Company, Chicago, as general sales agent, and later became sales manager for Forsyth Brothers Company, Chicago, in 1907, and in 1913 vice-president of the Standard Heating & Ventilating Company, has been appointed representative of the Locomotive Stoker Company, Pittsburgh, Pa., with offices at 50 Church Street, New York City. Mr. Whipple was for several years active on the entertainment committees of both the steam and electric railway annual conventions. Before his connection with the Locomotive Stoker Company he was vice-president and acting general manager of the Railway Improvement Company, New York City.

Hugh Pattison has joined the staff of the heavy traction department of the Westinghouse Electric & Manufacturing Company to make special engineering studies under the direction of F. H. Shepard, director of heavy traction. Mr. Pattison has been closely identified with the industry since completing the course in applied electricity at Johns Hopkins University in 1892. Since then he has been associated successively with Frank J. Sprague, Westinghouse, Church, Kerr & Company, George Gibbs and others. Mr. Pattison took an active part in the application of multiple-unit control in Boston and Brooklyn and in the electrification of the Long Island Railroad, the West Jersey & Seashore Railroad and the Pennsylvania Railroad. He is a member of the A. I. E. E., the A. S. C. E. and the A. S. M. E.

The Ackley Brake & Supply Corporation, 50 Church Street, New York, announces the appointment of the Power Equipment Company, Oliver Building, Pittsburgh, Pa., with Charles A. Saints, manager, as agent for the sale of Ackley brakes and G & B mineral oil paint in the territory covered by western Pennsylvania and West Virginia.

Shaw Crane Works, Muskegon, Mich., has made an interesting installation of two Shaw Overhead Wharf Cranes manufactured by them, at pier No. 6, East River, New York City, the N. Y. State Barge Canal Terminal. They are of the overhead type, traveling on tracks above the shed roof with the boom in a vertical position when changing location so that the pier is not obstructed. The cranes carry freight to and from inside the shed in a straight line without swiveling, the outer end of the boom extending 23 ft. 3 in. beyond the edge of the pier and 10 ft. inside the shed when in operation. A light trolley travels along the boom capable of supporting 3,000 lbs. when the latter is at any angle up to 45 degrees.

New Advertising Literature

Cable Joints.—The Standard Underground Cable Company, Pittsburgh, Pa., has issued bulletin No. 740-1, covering cable joints and jointing material.

Copperclad Wire.—Copper Clad Steel Company, Rankin, Pa., is distributing a twenty-three page booklet, entitled "Copperweld Wire," on copper-clad steel wire.

Portable Cranes and Hoists.—The Canton Foundry & Machine Company, Canton, Ohio, is distributing a thirty-four page booklet, covering its portable floor cranes and hoists.

Concrete Poles.—Massey Concrete Products Corporation, Chicago, Ill., is circulating catalog supplement No. 5, an eleven-page booklet which illustrates and describes Massey hollow reinforced concrete poles for telegraph, transmission and trolley lines. Copies may be had on request.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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This Week's Election and the Electric Railways

POLITICS is not the province of this paper. The result just recorded at the polls, however, touches intimately the affairs of every one of us. Whether the result pleases or displeases the individual, the decision just made marks the beginning rather than the end of a new order. The Republican party will be on trial. Not only that, but the whole system of two-party government will be on trial. Restlessness and discontent are abroad. The problems that will come before the new administration cannot be solved by the application of the comfortable formula of old-fashioned conservatism, however well intentioned. The return to "normalcy" must be to a "normalcy" that shall be tolerant, far sighted and not in the interest of any one class. The need is for wisdom, sympathy, vision, courage and progress, especially progress. And the way to progress is over the orderly road of evolution.

When Senator Harding was nominated in June, we commented on the breadth of vision which he possessed in regard to public utilities, as exemplified in his address at the midyear convention of the American Electric Railway Association last January. Under our system of government the electric railways must depend for relief far more on the state governments than on the national authorities. Nevertheless, the railways can well be pleased that the highest office in the land is to be filled by one well acquainted with their problems, and the increasing tendency for central control of various matters in which the railways are concerned is another reason why utilities need have no cause for worry over the political events of the present week.

The Meek No Longer Inherit the Earth

QUEER things are done in the name of arbitration. According to public accounts a body of this kind at Boston has reinstated with full pay back to last July a motorman who swore at his starter. Billingsgate is never elegant, but then we are told that strong men are prone to use strong language and that "motormen and conductors are not always selected for their linguistic purity." "Moreover," say the arbitrators, "the Eastern Massachusetts Street Railway is no religious organization." The new doctrine is further pronounced that "it is more important to the public that efficient and capable motormen be permitted to serve the public than that the sensitive ears of the officials should not be shocked by the rude language of angry employees." Thus, new ramifications, are apparent.

We do not like to appear too facetious, but, carried to its proper conclusion, may we not assume that the starter would have the right to swear at the division superintendent, the division superintendent to swear at the manager and the manager at the president? Perhaps the president could swear at his directors and the directors in turn swear at the stockholders. But at whom would the poor stockholders swear? At the politicians? We give it up. We are not arbitrators and our minds are finite. In this particular case the punishment may not have fitted the crime, but it is quite another thing to condone the crime, for such it was in a way. Silence no longer appears to be golden. The meek no longer inherit the earth.

Management, by Commission

THE recent fare change in Philadelphia is another example of what the JOURNAL in the past has called management by commission as contrasted with supervision and regulation, the legitimate function of public utility commissions. The electric railway industry and, in fact, all public utilities are vitally interested in the continuation and proper functioning of public utility commissions. They form the one great and real practicable means for the proper adjustment of relations between the public and the utilities—the one defender of the rights and privileges of both. What we have to say here is with the purpose of adding our bit toward strengthening the position of the commissions in the performance of their legitimate work.

As to the facts in Philadelphia, the JOURNAL commented in the issue of Oct. 23, and all data obtained since go to strengthen the belief that the commission made its own decision as to the kind of a fare scheme and the amount of the unit fare. There is no question here raised against the purpose of the commission. There was evident desire to provide the necessary revenue for the company. Our brief is that the determination of a fare scheme and the amount to be charged are primarily managerial functions, and that while a commission should protect the public against rates of fare which are notably too high or markedly discriminatory, it should be most careful about enforcing its ideas as to the kind of fare to be charged and the methods of collecting it. This is particularly true in the case of a company which admittedly needs relief and whose future may depend upon the success or failure of the new fares adopted. It is the company which must operate under the scheme and must bear the burden of failure if the plan is unsuccessful. Finally, it is natural to expect that a company, like an individual, will work harder to make things come out right if it follows a scheme of its own devising and in which it thoroughly believes than one imposed upon it and whose efficacy and justice it doubts.

A discussion of the relative desirability of the two fare schemes proposed is purposely avoided here. It isn't the question of fare schemes we desire to analyze at this time. What we would point out is the danger to commission regulation of the too-ready attitude of commissions to perform managerial functions.

Fares Cannot Recede Yet

BECAUSE of the present flurry in the prices of a few articles—chiefly luxuries or things whose purchase can be put off—there are suggestions in some quarters that the time has come for stopping increases in fare, limiting increases to periods as short as six months or even demanding a cut. Those familiar with the chief expense accounts of electric railways know how unjustified these suggestions are. So far from enjoying a reduction in operating expenses, all coal-using electric railways find that their second largest item of cost has taken to further skyrocketing—first in the permanent rise due to the new boost in freight rates; second, in the, let us pray, temporary rise due to worldwide bidding and consequent selling at the highest price to the neediest bidder. Coal, unhappily, is so ponderable that the freight increase alone is enough to offset any possible shadings in the prices of less bulky and longer-lived material.

If, then, King Coal is unassailable, can anything be done to King Platform? In all justice to the men, we think not. The papers may be full of price cuts here and price cuts there, but the motorman's wife hasn't noticed that the price of eggs, milk and bread—the everyday necessities—have hit the toboggan, although pongee silks and twin-six sedans are going a-begging. As for rent, what used to be one-sixth of a frugal family's budget is now one-third, while those who are their own landlords can fully appreciate their employers' coal difficulties.

These are the unadorned facts for those who are daydreaming about pre-war price standards in fares or other commodities. Even if the miracle of really lower prices did come to pass most of our electric railways would have to see many a month go by before they had wiped out war and post-war deficits. So don't let the amateurs jump to conclusions because there's a silk panic in Tokio and a sugar-cured moratorium in Havana. Just tell 'em to keep their eye on your coal bills and platform charges.

Mr. Graham's Address Should Be Read by the Automotive Industry

REGULARLY, and with consistently the same tenor of thought, publicity matter sent out over the name of one or another of several motor truck manufacturers comes to our attention proclaiming the doom of the electric railways and spreading broadcast propaganda which would have one believe that the electric railways are soon to be consigned to the scrap heap. This leads to the thought that it would be a fine thing if arrangements were made for distributing through the automotive field, particularly to the sales and publicity organizations, the recent address of George M. Graham, vice-president Pierce-Arrow Motor Car Company, before the convention of the American Electric Railway Association. Compare the character of the address mentioned to the broad glittering generalities and sweeping condemnation so frequently spoken and written and sent out for the consumption of newspapers and automotive salespeople by other representatives of that industry.

At one point in his address Mr. Graham says: "No motor vehicle manufacturer has ever said that electric trolleys could everywhere be supplanted by motor vehicles. The statistics of passenger traffic on electric railways prove the essentiality of their service." We regret to say that some of the literature which comes to our hands does say repeatedly the very thing that Mr. Graham denies. In another place this gentleman said: "I have conceded that the number of passengers in our great cities is too enormous to be handled by motor buses. . . ." Mr. Graham has taken the trouble to inform himself on the matter, but much of the publicity matter which emanates from the automotive field is written with a profound ignorance of the subject. That is why we should like to see this address receive wide circulation among automotive people.

We fail to take very seriously the rash statements about the doom of the trolley and are more inclined to smile when we read them. Yet they should really be watched and counteracted with the truth, for it is possible that enough of such propaganda may eventually cause a doubt in the minds of the investing public which will react to injure the electric railway industry. This is fairly remote, perhaps, for the matter seems to us so overdrawn, but it is a possibility.

We cannot avoid repeating at this point our opinion that the problem of applying the motor bus to urban passenger transportation is really one for the electric railways to solve. Electric railway managements have the transportation experience necessary. Automotive men will do well to give sober thought to this idea and to consider the benefits of co-operation which will permit their product to be used intelligently in this transportation business.

Shall We Turn the Freight Business Over to Motor Trucks?

IS NO one going to challenge the assertion of Mr. Graham in the address referred to above that "they [referring to electric railways] should not figure too hopefully on freight revenues; in this field they are handicapped, and sound business would dictate the withdrawal of their facilities where they cannot successfully compete with steam railways and motor trucks"? And in another place, "In long-distance movement of heavy tonnage they are surpassed by the steam roads; in short-distance transit of less than carload lots, up to 100 miles, they cannot compete with the motor truck." The sum total of these two statements is that we should turn over the electric railway freight business to the motor truck people and politely withdraw from that line of activity.

If Mr. Graham is right, then practically all forward looking persons in the electric railway industry, including the editors of this journal, have been dead wrong in encouraging and urging the interurbans to get into the freight end of the business, expand facilities and go after this revenue, particularly l.c.l. high-class commodity transportation where high rates for fast service are practicable. Is all of the headway that has been made along this line to be for naught? Is there to be no further expansion of the interurban freight facilities?

This is contrary to the judgment of all the industry and directly opposite to the very rapid expansion in this phase of the interurban business which has been noted nearly everywhere during the last two years. And we would ask Mr. Graham one or two questions.

The motor truck haulage costs are high now. What are these costs going to be under constantly increasing gasoline and oil costs? What will the rates have to be when the public makes its demand that the use of the highways, now furnished virtually free despite astounding destruction, shall be paid for; in other words, when the motor truck must pay a heavy maintenance-of-way expense? What about the net earnings when motor truck companies, established as common carriers, are required to give a regular freight service regardless of the amount of business ready to be hauled?

Just now the going is good for the truck companies, for they have the advantages indicated. There are, furthermore, many places where the motor truck can continue to give a more economic service than the interurban can supply, particularly on the very short hauls. But by and by we anticipate that the motor truck transportation companies will find going (at a profit) continually harder, largely because of the highway situation to which we referred at some length in our editorials on page 529 of the Sept. 18, 1920, issue.

Is the Time Ripe for the Employment of an Engineer of Research?

EVERY one who has followed the activities of the American Electric Railway Association has been impressed with the value and amount of statistical information which the secretary's office has compiled during the past two years. We believe that this is largely the result of the wise course pursued in attaching a special engineer to the office staff for the purpose of supervising that sort of work.

There is reason to believe that the addition to the staff of a special research engineer would also be a step in the right direction. Several of the reports of standing committees presented at the recent convention made reference to the need for first-hand investigation of problems which are national in scope and suggested that the industry as a whole should finance the studies.

Many of the problems which are presented to standing committees cannot be treated properly by these committees because the chief method of gathering informaton is confined to the dubious questionnaire. This is a cold proposition at best. It is almost impossible to prepare questions which clearly state the problem, and it is next to impossible to secure answers upon which to base a résumé of the information which may be obtained. Railway officials are busy, and unless a questionnaire has special appeal it is filed for answer later, and it seldom gets answered. On the other hand, personal visits to various properties in the course of the study of special subjects will always develop information which is worth while.

Most of the information which is contained in the reports of standing committees is the result of the personal efforts of some member or members of the committee who happen to be interested in the subjects at hand. It speaks well for their efforts that so much of their work is well received and is adopted by the associations.

The editors feel that the suggestion made by the chairman of the way committee on the convention floor that the executive committee of the Engineering Association consider the advisability of establishing the office of research engineer, and on a salary basis, is one which merits serious consideration. In this connection it should be remembered that the American Railway Engineering Association has an engineer of tests as a member of its staff, and the work of that association in its study of rail failures has been beneficially guided by the work of that engineer.

Another Step Forward in Standardization

THE last act of the Engineering Association at its Atlantic City meeting was to suggest to the incoming administration the appointment of a committee which would pass upon "anticipatory standards," especially in connection with the design of cars and car equipment. This, we hope, marks the beginning of a really intelligent and constructive effort to direct the design of all types of railway equipment in an engineering way along lines which will ultimately develop standards which will be adhered to and eliminate many small differences in construction.

When a railway official now decides to purchase new equipment or to draw up specifications for its purchase he does not first take down his Engineering Manual and decide on the standard parts to be used, but instead directs investigation along three principal lines. First he reviews the troubles that he has had with similar equipment in operation on his lines and makes certain that the new equipment to be purchased will have ample provision for the correction of these difficulties. Second, he endeavors to obtain information from other users of this type of equipment regarding any difficulties they have had which should be remedied in his design. Third, he aims to duplicate existing equipment on his lines that has proved satisfactory.

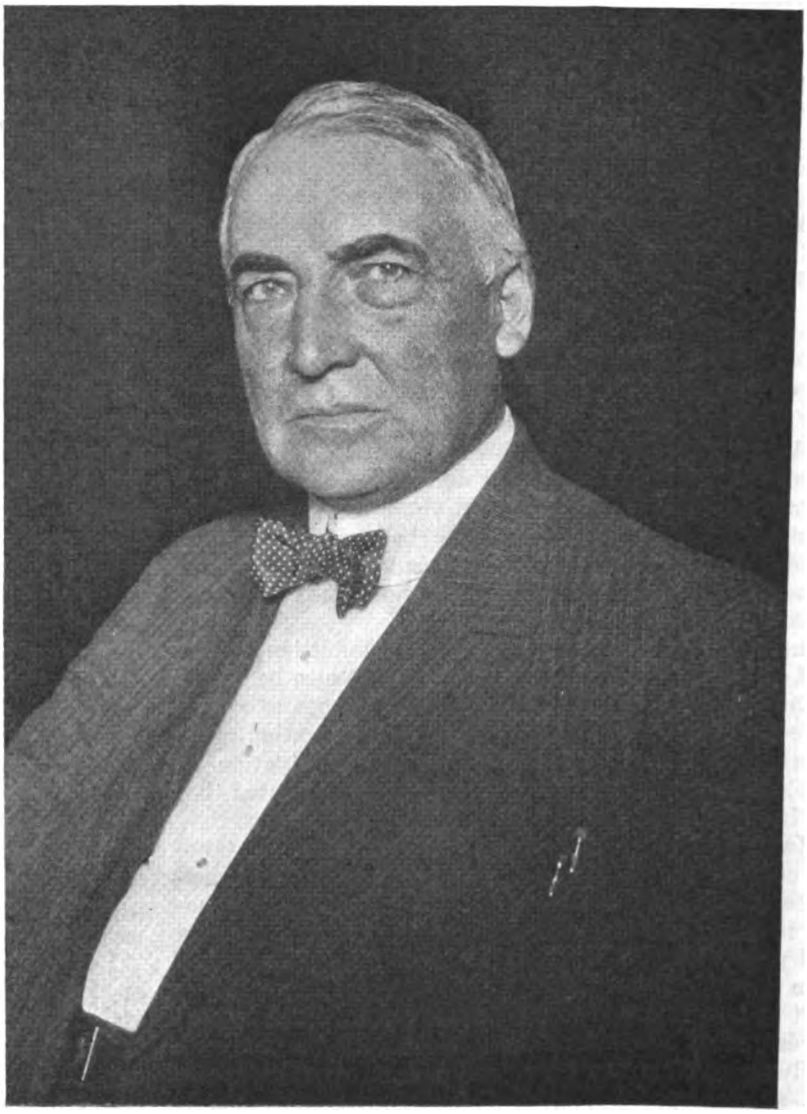
This committee would be of assistance to member companies in directing the above class of work and in collecting information from all parts of the country regarding troubles to cars and equipment that should be corrected to perfect design to such a state as would largely eliminate previous difficulties. With complete and accurate data on failures that should be corrected, the committee would be in a position to take up the necessary changes with manufacturers in an intelligent manner, and when the changes have been incorporated various railway officials would have positive assurance that, in adopting the proposed designs for their service, a multitude of unlooked for changes would not be necessary.

From the discussion of this subject that occurred at the meeting it appears that the term "anticipatory standardization" does not convey the broad scope of the work that is to be undertaken. In this work we understand that the committee will look forward in a broad way to the "anticipatory direction of design" so as to provide uniformity wherever possible without blocking advantageous development for the future. It was the sentiment of this meeting that the first efforts of the committee might properly be directed to car designs and particularly to safety car design.

Certainly the electric railway industry will benefit from the economy which is certain to result from more uniformity in design if it can feel certain that every endeavor has been made to eliminate weaknesses so that when a standard is ultimately decided upon satisfactory service can be assured. The association on this its first committee of this sort should have the co-operation of both railway officials and manufacturing engineers in its attempt to make progress along this line. If it is found feasible and practicable to obtain the active co-operation of manufacturers with representatives of the electric railways in the direction of design, this committee's work would have a place of equal standing with the standards committee. Certainly it is true that if more work can be done along this line the work of the standards committee will be considerably lightened.

The Next President and the Electric Railways

LAST JANUARY Senator Harding addressed the midyear convention of the American Electric Railway Association at Cleveland and offered certain suggestions for improvement in the electric railway situation. An extended report of this address was published in this paper at the time. Some excerpts are given below to recall the broad views expressed and the constructive attitude taken by the President-elect on this subject.



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There were some very severe and wholly undeserved penalties on patriotic service during the war period, and which are still applied in its feverish aftermath. But I know of none worse penalized than the electric railway lines of the country. We know they served with splendid zeal and sacrificing devotion. They were as necessary to the stupendous tasks of preparation for war as powder is to the loaded shell.

Let it be recorded that the electric railways responded with every ounce of energy and played the big part of a big factor in doing big things for the nation. The natural inference was that they shared in the award for service. They sustained the heavy burden, and not only have they had no reward, as was given so generously in many instances to big and little business, but were penalized worse than aliens suspected of aiding the enemy.

It is a curious phase of human nature that the people in the populous centers hail transportation lines as the supreme blessing, encourage their construction and celebrate their completion, and then growl about them ever after. Rarely does anybody utter appreciation, though genius and efficiency are nowhere more marked in good service, and no one seems to think of their essential character until traffic is suspended.

Let us not direct our criticism at the awards of the War Labor Board. That body yielded to the flood-tide of war demands which was irresistible. The shocking thing was that the federal government, with limitless assumption of power, should command doubled expense accounts and remain deaf to all appeals for the means of meeting them absolutely.

Let us not go back to the crimes of exploitation and frenzied finance. All that has been established and properly criticised and fully condemned. Here was a five-billion dollar public service enterprise, accommodating fifteen billions of passengers a year. Its continued operation was a necessity in peace or war but vitally necessary to war production. The government exercised the power to increase burdens, but had no power, or having had it, no inclination to help in meeting these burdens.

In effecting the restoration, we must wipe out the contributing causes and make sure from this time on that honest investment in honest public service shall receive an honest return for that public service. The capital which seeks to render a necessary public service merits a square deal and it must have it.

I believe in strictest regulation without conflicting authority, because all public utilities must yield to the voice of public interest. But the same power that protects the public must protect the public servant, whether that servant is capital or the workman who operates the utility.

Destroyed credits must be restored, and flexible scales of charges must be provided, so that a public may pay justly for that which it demands. The exploitation of ten or twenty years ago justifies no failure in good faith today. The public which is served has an obligation no less than that of those who serve it.

The men deserve to be well paid. I think it is fair to say that most of the increased awards the public has approved. But the public ought to pay precisely as it approves, because justice is not a favor to one, it is the right of all involved.

Rerouting Plan to Save $620,000

Sections VII and VIII of Beeler Report on Kansas City Railways Recommend Complete Rerouting of the System to Produce Substantial Economies and Improved Service — Kansas City, Kan., System Made Independent of Missouri System, with Trunk Line Interconnection

FIFTY less cars in the daily schedule requirements, 750 less car-hours per day, or $480,000 less expense annually in trainmen's wages, power costs and car maintenance items alone, are the savings which are expected to result from the installation of the rerouting recommendations for the Kansas City Railways in Kansas City, Mo., as worked out by John A. Beeler, electric railway consultant, after extended study. A similar rerouting of the lines in Kansas City, Kan., is expected to result in a saving of $140,000 a year, making a total for the whole system of $620,000. These rerouting plans form Section VII and VIII of Mr. Beeler's Kansas City report, these having been recently submitted to the Board of Control. The most interesting part of these proposed changes is that while so large an operating economy will be achieved, yet the service to the public will be improved. A substantial reduction in street congestion is also expected to accrue.

THE REROUTING PLAN

The report for Kansas City, Mo., states that this rerouting has been undertaken to improve service, to mimimize downtown congestion and to reduce operating expenses, but that many incidental benefits will accrue. The rerouting plan recommended will very largely reduce the turning movement of cars in the congested business district and will eliminate more than 1,000 car movements through the downtown intersections in the evening rush hour, or 20 per cent of the total. All street traffic will be accelerated, so that the general public will be benefited as well as the patrons of the company. The report also points out that while there is a reduction in the number of cars per hour which will pass through the business streets, it will be entirely in those which now run lightly loaded, as many of the cars will be able to discharge one load and pick up another. In fact the number of cars available to bring in and take out passengers will be greater than before.

Another advantage which is expected to accrue is that the rerouting plan will enable the maintenance of better regularity of service. The report points out that in some cases through-routing necessitates a greater length of route, but since lines terminating downtown have no chance to adjust their leaving time, the regularity of cars under the new plan will undoubtedly be better than before.

Referring to the problem of making the recommended change, in his letter of transmittal to President Philip J. Kealy, Mr. Beeler observes that "the achievements of your operating force in the past six months have been very noticeable, and I believe little difficulty will be encountered in making the changes."

CHARACTER OF STUDY MADE

The report goes on to say that at the outset of this investigation it was realized that there has been a profound change in the business district of the city. A discussion follows of the growth of the business district to the south, due to the river barrier on the north, and also of the development to the south which followed the construction of the new union station. The latter improvement was followed by the opening of such streets as Broadway, Southwest Boulevard and Main Street, with resulting construction of new business sections.

This movement of the center of the business district has naturally been accompanied by a corresponding change in the course and destination of large numbers of people, the older section of the business district having become devoted almost entirely to wholesale and manufacturing enterprises, so that the contiguous riding has become confined largely to the rush hours. It is pointed out in this connection that street car traffic has fallen off to a point where the service now given is no longer justified.

Another movement which has had a bearing on the desirability of rerouting is the establishment of a number of outside business sections, which have resulted in a considerable amount of community riding with a resultant shifting of the car loading.

A point is made of the fact that no radical changes in the routing have been made, since it is felt that the public objects to such innovations and abrupt changes. The proposed routes differ from the present ones as little as is consistent with obtaining the results sought after. The determination of what changes were desirable was made by a very careful checking of the traffic on all lines and covering all periods of the day at numerous points along each line and in both directions. Observers rode the cars at all periods of the day to determine the character of the territory, the trend of travel, the running time, transferring and other points having a bearing on the subject.

As to the results that will obtain from the rerouting installation, the report states that there will be much better service for the patrons because the lines will be more direct and the schedule speed faster. Routes from the same and adjoining outlying sections have been

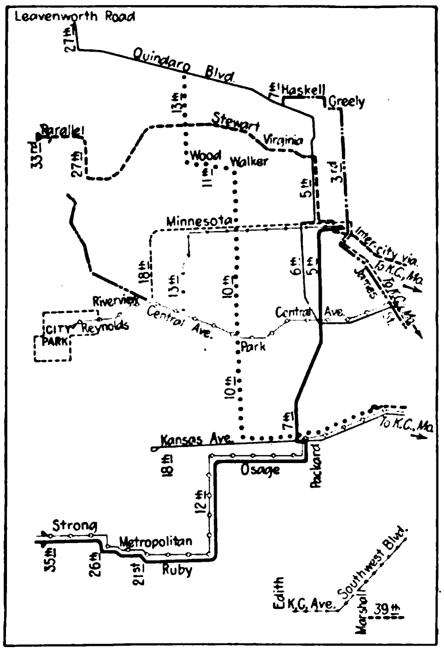
CARS THROUGH PRINCIPAL INTERSECTIONS BETWEEN 5 AND 6 P. M. PRESENT AND PROPOSED ROUTING

	McGee		Grand		Walnut		Main		Delaware		Wyandotte	
Street	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.	Pres.	Prop.
5th	...	...	129	47	99	45	37	30*	51	36	95	10
Indep	...	...	103	65	86	63	...	...	...	...	...	...
6th	...	...	...	...	...	...	...	...	41	36	109	10
7th	...	...	86	49	86	63	...	...	...	...	...	...
8th	131	118	234	174	234	158	...	...	...	...	145	88
9th	...	...	...	...	...	...	84	64	84	64	155	72
10th	156	112	190	138	174	98*	127	128	...	...	120	52
11th	...	...	...	...	...	...	...	...	...	...	53	35
12th	123	97*	189	205	197	195	164	227	...	...	115	128
13th	...	...	139	116	129	106	...	...	...	...	...	...
15th	135	118	184	182	111	134	100*	128	...	...	...	...
18th	...	...	118	118	89	66	95	110	...	...	...	...
19th	...	...	119	120	71	60	119	138	...	...	...	...
	545	445	1491	1214	1274	988	726	826	176	136	792	395

Total cars through all intersections:

Present	5,004
Proposed	4,004
Per cent decrease	20.0

*Not used as a street car intersection.


Leavenworth Road
27th
Quindaro Blvd.
13th
5th
Haskell
Greely
Parallel
33rd
27th
Stewart
Virginia
Wood
Walker
11th
3rd
5th
Minnesota
18th
13th
10th
6th
Inter-city via James St. to K.C. Mo.
Riverview
City Park
Reynolds
Central Ave.
Central Ave.
Park
10th
5th
Kansas Ave.
To K.C. Mo.
18th
Osage
Packard
12th
Strong
Metropolitan
35th
26th
21st
Ruby
Edith
K.C. Ave.
Southwest Blvd.
Marshall
39th

THE KANSAS CITY., KAN., FORMER ROUTING

(Note that this map is a continuation to the left of the map below)

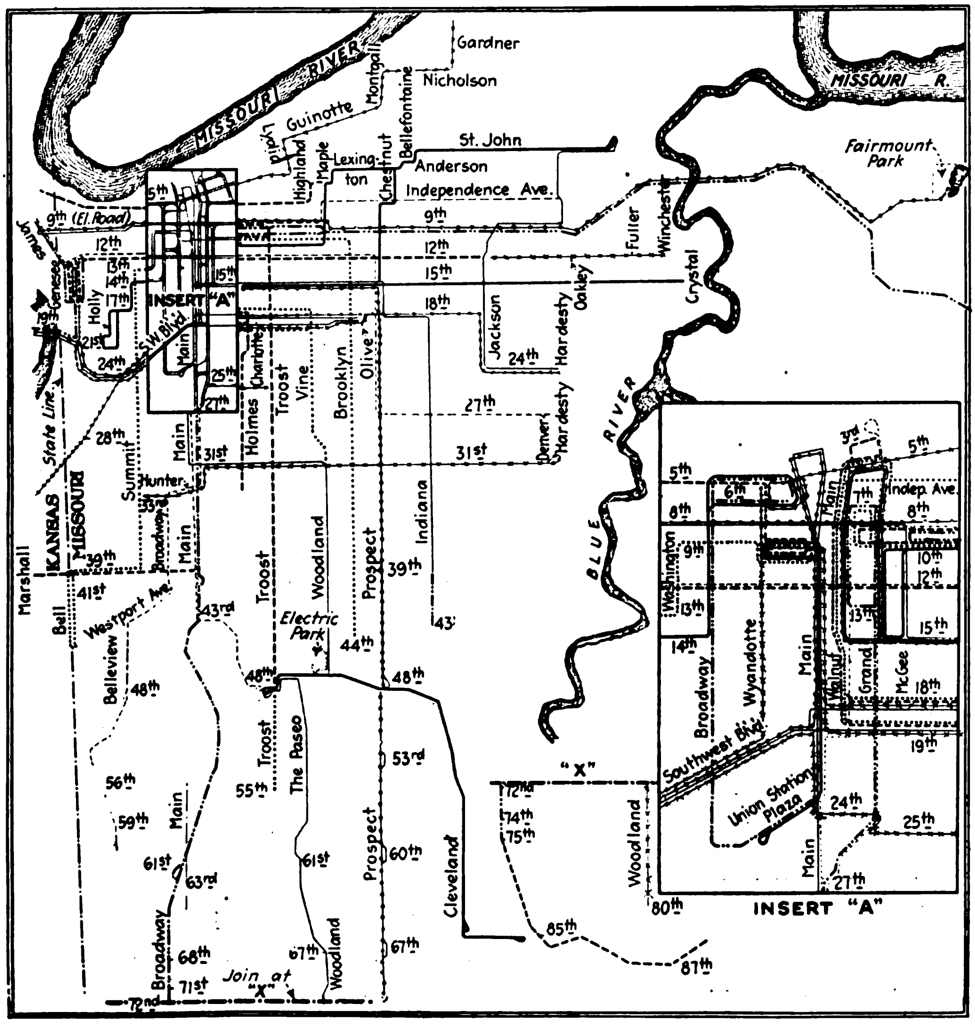
distributed over the principal north and south streets in the business district as evenly as possible. Every effort has been made to keep the street car traffic on the downtown streets balanced. Since many of the routes pass completely across the downtown district, more patrons will be taken to their destinations without transferring. At present about 125,000 people a day are transferred from one line to another, while under the new routing plan this will be reduced to 65,000. The need for multiple transfers will be nearly eliminated except on some suburban lines. The new routes will closely unite all sections of the city and make travel easier.

What is probably the greatest resulting benefit comes from the reduction of congestion in the downtown district. This is well illustrated in the table on page 957, which gives the number of cars per hour at each of the downtown intersections before and after the rerouting change, and by the corresponding pair of car flow diagrams.

SOME OF THE DETAIL CONSIDERATIONS

While it would not be very interesting to one unfamiliar with Kansas City and the present car routes to relate in detail the changes in routing that are recommended, yet it may be worth while to note a few of the explanatory statements as they appear in the report, after a statement of the detail routing, simply to show the line of reasoning.

The Jackson-Roanoke line is a through route, which it is proposed shall be formed by combining the present Jackson and Roanoke lines. The Jackson line as now operated passes through a district along Eighteenth and Nineteenth Streets that has little or nothing in common with the remainder of its territory. It should be run along Jackson Avenue and brought in by way of Twelfth Street. This will give a more direct line and carry the Jackson car through a more productive territory. The Roanoke line now comes in by a circuitous route and is terminated at Tenth and Main, on the edge of the business district. The rerouting will carry it straight across Twelfth Street, through the heart of the downtown business section, so that patrons may transfer from it to practically all lines. Service demands on the two lines are well balanced, so that economical operation will result. On each round trip twelve turns will be saved, and the distance in the congestion will be less. Delays now occurring at Eighteenth and Olive, at Nineteenth and Main and at Tenth and Main will be avoided. In the rush hours a portion of the service should be turned back at Thirty-ninth and Summit and at Twelfth and Jackson. Connecting curves must be installed at Twelfth and Jackson. Fifth Street-Fifteenth Street is another proposed combination of two lines for a through route. By operating the Fifth and Fifteenth Streets lines as a single route by way of Walnut Street in both directions patrons of the East Fifth Street line will be enabled to reach practically the entire business district without the use of a transfer. All trunk lines in the city will

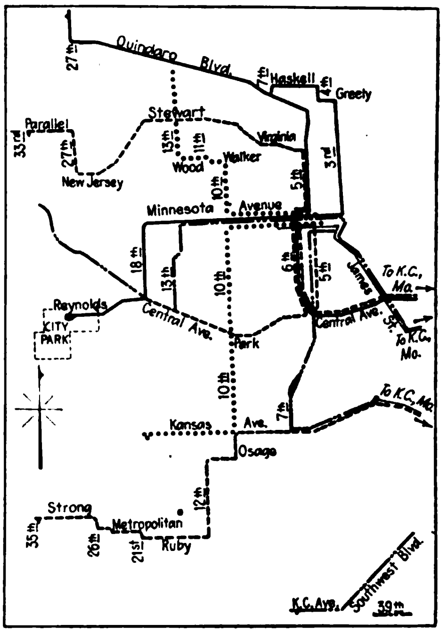

Missouri River
Missouri R.
Gardner
Nicholson
Montgall
Guinotte
Bellefontaine
St. John
Lydia
Highland
Maple
Lexington
Chestnut
Anderson
Independence Ave.
5th
9th (El. Road)
9th
James St.
12th
12th
13th
14th
15th
15th
17th
18th
19th
Genesee
Holly
Insert "A"
21st
24th
S.W. Blvd.
Main
Charlotte
25th
27th
Fuller
Winchester
Oakley
Crystal
Fairmount Park
Jackson
24th
Hardesty
Troost
Vine
Brooklyn
Olive
27th
Denver
Hardesty
28th
State Line
31st
Holmes
31st
Summit
Hunter
33rd
Indiana
Kansas
Missouri
Broadway
Main
Woodland
Prospect
39th
39th
Marshall
Bell
41st
Westport Ave.
43rd
Troost
Electric Park
44th
43
Belleview
48th
48th
48th
Blue River
53rd
Troost
The Paseo
"X"
56th
55th
Main
72nd
74th
75th
59th
Prospect
61st
61st
60th
Cleveland
Woodland
63rd
85th
Broadway
68th
67th
67th
87th
71st
Join at "X"
Woodland
72nd
80th
5th
3rd
5th
6th
7th
Indep. Ave.
8th
8th
9th
Washington
10th
12th
13th
13th
15th
14th
Broadway
Wyandotte
Main
Walnut
Grand
McGee
18th
Southwest Blvd.
19th
Union Station Plaza
24th
25th
Main
27th
INSERT "A"

MAP SHOWING FORMER ROUTES FOLLOWED BY VARIOUS LINES IN KANSAS CITY, MO.

be accessible by means of a single transfer. Transferring will thereby be reduced, particularly in the congested district. Four turning movements at downtown intersections will be eliminated, and the distance will be reduced three-fourths mile per round trip. The patrons of the Fifteenth Street line will continue to receive all the privileges heretofore enjoyed. As the proposed route is on the same street in both directions through the congested district, there will also be avoided much confusion heretofore experienced. In addition patrons will be provided with a more direct and rapid route to the industrial plants located in the extreme north end of the city. In the rush hours it will be desirable to turn a portion of the service at Fifteenth and Kensington and Fifth and Grand. Facilities for this purpose are now available.

The Eighteenth Street line, which now terminates at Eighteenth and Olive, should be extended to Eighteenth and Jackson to provide crosstown service for an enlarged territory and replace the service now given by the Jackson line. Patrons will be afforded direct service to the industrial plants in the stock yards and warehouse districts and points beyond. Observations show that the riding in this section is now very light. Half of the service should go to Twelfth and Genesee and the other half to Kansas. In this manner the entire business can be better handled.

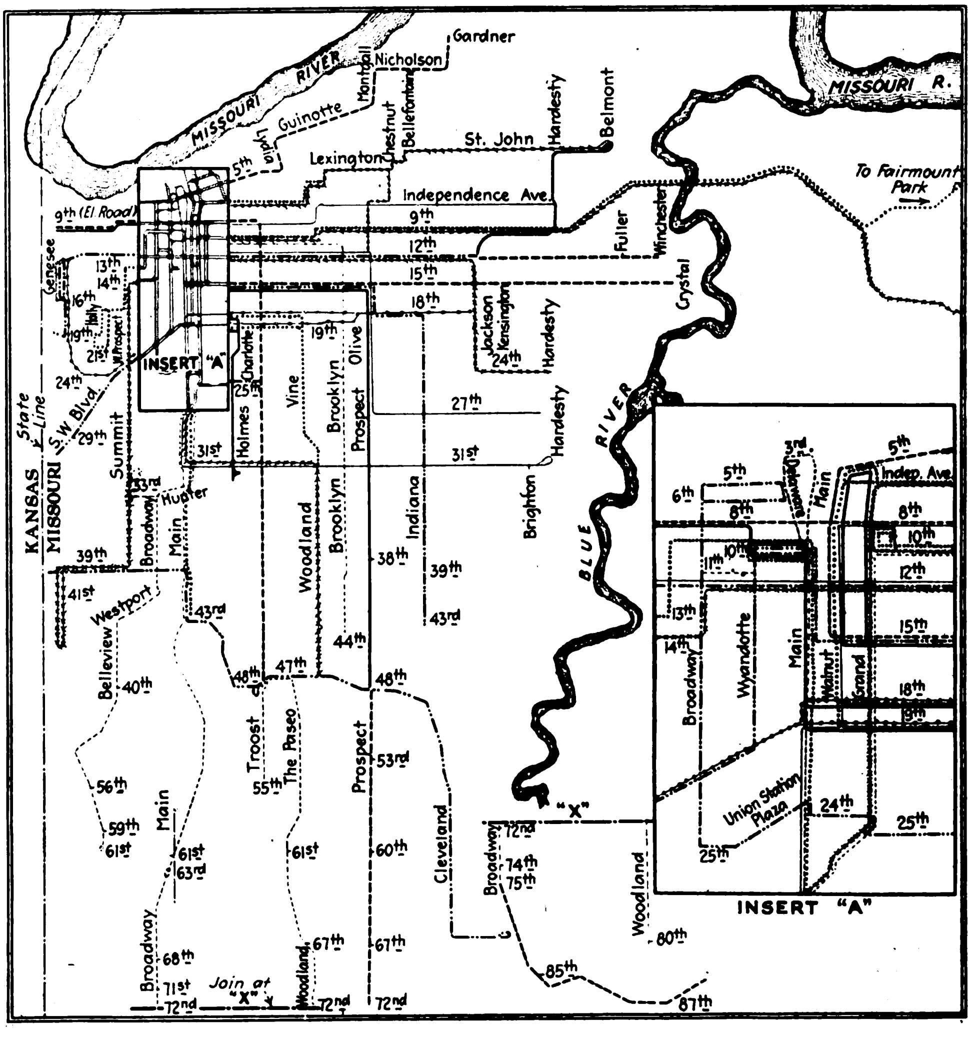
The Indiana and Rosedale lines are to be through-routed over a stated course. This route is the same as the present Rosedale line as far as Tenth and Wyandotte, at which point it will turn and pass through the part of the business district on Main Street. The Indiana Avenue patrons will be brought in direct on Fifteenth and Main Streets. Both ends of the line will thus have access to the center of downtown activity. This will be a much more independent route than the present Indiana-Quindaro and avoid the delays and curves in the west bottoms and through the Kansas City, Kan., business district and beyond. With the use of safety cars, more frequent service can be given and on account of the reduction of delays more regular headway should be afforded. The track on McGee Street between Tenth and Fifteenth will be uncovered by this change in routing, so that this street will be available for the use of automobiles. A reduction of vehicle congestion in the parallel streets in the business district should result. The Country Club line connects an outlying residential section in the extreme southern portion of the city with the downtown district. To reduce delays and minimize the running time it should be routed as direct as possible. It is therefore proposed to operate this line both north and south over Main Street. This routing will eliminate all turns in the congested district, and delays incurred by turning movements at such heavy traffic intersections as Thirteenth and Grand, Thirteenth and Walnut, Fifth and Grand and Fifth and Walnut cannot occur. It will furthermore provide patrons of this line with direct transportation to and from the Union Station.


Quindaro Blvd.
27th
Haskell
1st
Greeley
Stewart
Parallel
33rd
27th
13th
11th
Virginia
Walker
Wood
New Jersey
10th
5th
3rd
Minnesota
Avenue
18th
13th
10th
6th
5th
1st
James St.
To K.C., Mo.
Reynolds
CITY PARK
Central Ave.
Park
Central Ave.
To K.C. Mo.
10th
To K.C. Mo.
7th
Kansas
Ave.
Osage
12th
Strong
Metropolitan
35th
26th
21st
Ruby
Southwest Blvd.
K.C. Ave.
39th

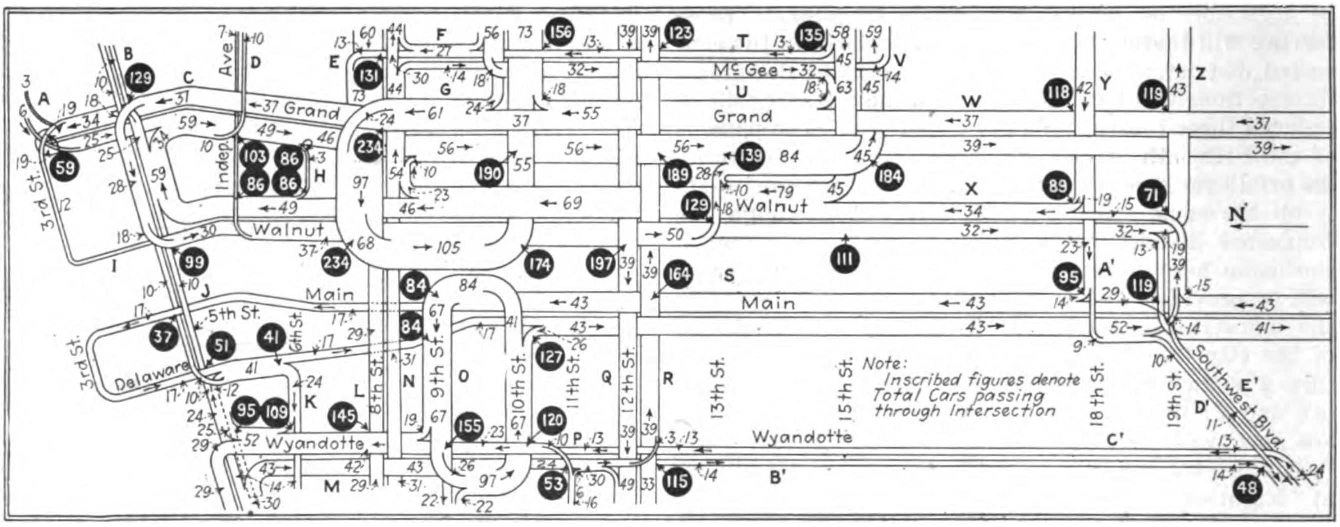
THE NEW ROUTING FOR KANSAS CITY, KAN.

(Note that this map is a continuation to the left of the map below)

The accompanying maps on pages 958 and 959 show the former routings and those proposed. In so far as


Gardner
Nicholson
MISSOURI RIVER
Guinotte
Montgall
Bellefontaine
Chestnut
St. John
Hardesty
Belmont
MISSOURI R.
Lydia
5th
Lexington
Independence Ave.
To Fairmount Park
9th (El Road)
9th
12th
15th
18th
Fuller
Winchester
Crystal
Genesee
13th
14th
16th
Holly
19th
Prospect
21st
INSERT "A"
Charlotte
19th
Olive
Jackson
Kensington
Hardesty
24th
24th
State Line
S.W. Blvd.
25th
Holmes
Vine
Brooklyn
Prospect
27th
Hardesty
29th
Summit
31st
31st
BLUE RIVER
KANSAS
MISSOURI
33rd
Broadway
Hunter
Main
Woodland
Brooklyn
Indiana
Brighton
39th
38th
39th
41st
Westport
43rd
43rd
44th
Belleview
40th
48th
47th
48th
Troost
The Paseo
Prospect
53rd
56th
55th
59th
Main
61st
61st
61st
60th
63rd
Cleveland
"X"
Broadway
72nd
74th
75th
Woodland
80th
Broadway
68th
67th
67th
71st
Join at "X"
Woodland
72nd
72nd
72nd
85th
87th
3rd
5th
5th
Indep. Ave.
6th
8th
8th
Delaware
Main
10th
11th
10th
12th
13th
15th
14th
Broadway
Wyandotte
Main
Walnut
Grand
18th
19th
Union Station Plaza
24th
25th
25th
INSERT "A"

MAP SHOWING NEW ROUTING OF CARS ON THE LINES IN KANSAS CITY, MO.



TRAFFIC FLOW IN THE CONGESTED DISTRICT UNDER THE FORMER ROUTING—NOTE SOME OF THE COMPLEXITIES OF THIS ARRANGEMENT

Reference Letter	Name of Line	No. of Cars
A	K. C. C. C. & St. J.	3
	North Kansas City	3
B	Fifth Street	10
C	Sunset Hill	19
	Country Club	18
D	Vine Street	7
	North Kansas City	3
E	Cent.-Fairmount	16
	Troost	31
	Indep.-Rock	13
F	Indep.-Mo	14
G	Brooklyn	24
H	K. C. C. C. & St. J	3
I	Holmes	12
J	Woodland	16
	K. C. L. & T	1
K	5th Street	10
	Observation Park	8
	Broadway-U. S	6
L	Cent.-Fairmount	16
	Indiana-Quindaro	13
M	Argentine	10
N	Cent.-Fairmount	17
	Indiana-Quindaro	14
O	Roanoke	22
	Jackson	14
	Chelsea	15
	Main St. U. S	12
	Leavenworth	2
	Kaw Valley	2
P	Argentine	10
Q	12th Street	11
	27th-Minnesota	28
R	12th Street	10
	27th-Minnesota	29
S	Woodland	16
	Main St. U. S	12
	Jackson	14
	K. C. L. & T.	1
T	Indiana Quindaro	13
U	Northeast	18
	Indiana Quindaro	14
V	Prospect	28
	15th Street	17
W	Sunset Hill	19
	Country Club	18
	Strang	2
X	Indep.-Rockhill	13
	Holmes	12
	Vine Street	7
	Strang	2
Y	Jackson	14
	Holmes	12
	Vine Street	7
	18th Street	9
Z	Jackson	14
	Holmes	12
	Vine Street	7
	18th Street	10
A′	Jackson	14
	18th Street	9
B′	Rosedale	14
C′	Rosedale	13
D′	18th Street	10
E′	(18th Street	9
	(K. C. L. & T	1

possible, the different routes have been distinguished by characteristic symbolic lines on the maps, but there is no relation between the same symbolic line on a former route and on a proposed route, as so many changes were made as to render this impossible.

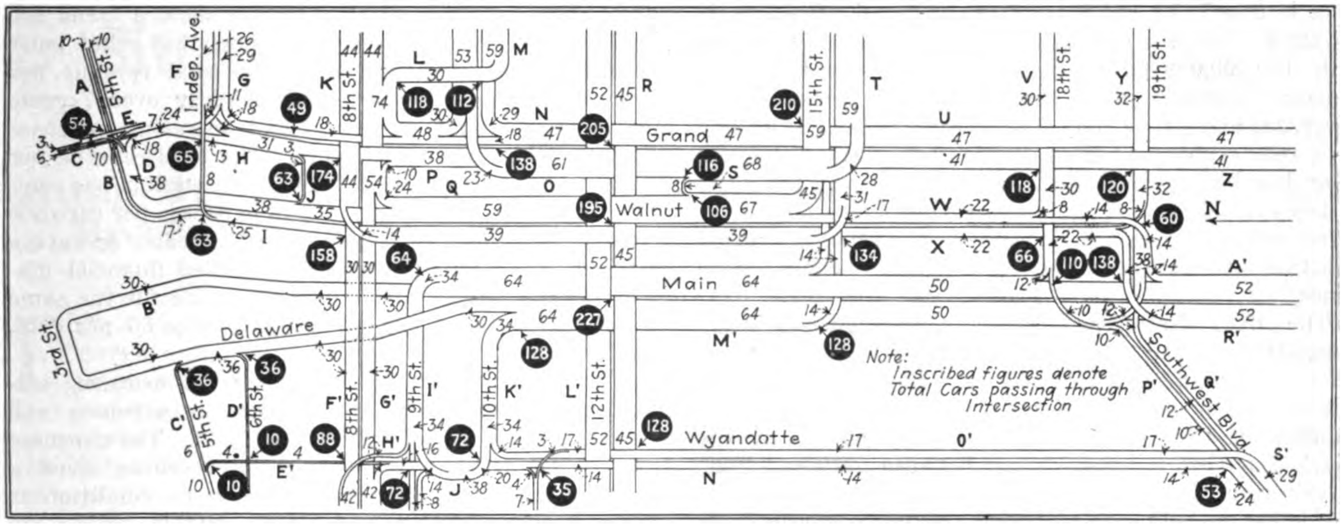
KANSAS CITY, KAN., REROUTING PLAN

Section VIII of Mr. Beeler's report, which covers the rerouting plan for the lines in Kansas City, Kan., states that in the past many complaints have been made by the public that the company was not properly meeting the local traffic requirements. On the other hand, the company has complained that the lines in this city have not been self-sustaining. The survey made has shown that there is justification for both of these claims and that it is plainly evident that the difficulties are caused by the present routings.

The need for rerouting is attributed largely to the fact that Kansas City, Kan., has had a very marked industrial growth during the last fifteen years and now has a population of more than 100,000. The importance of the city as a business center therefore requires the readjustment of the present street car routings, which were laid out primarily as feeder lines to the Missouri system. During the early development of the city residents were largely dependent upon industries located in the bottoms, or east of this district. It is only natural, therefore, that car routes should have been designed to carry the greater proportion of the patrons on through lines to points east of the Kansas River. These conditions, however, have changed to such an extent that the present routings do not serve the community as a whole. The through-riding between the two Kansas Cities is now confined largely to the rush hours, and on many of these through lines the traffic during the day is badly unbalanced and the service is neither required nor justified.

Consequently, with the constantly increasing importance of the city as a residential and industrial community, there has arisen a demand for more service between the business section and the residential districts of Kansas City, Kan., itself. Furthermore, the growth of the city has reached a point where additional railroad facilities are demanded. This has resulted in a proposed union station, to which adequate street car service from all sections of the city must be furnished. Since all lines cannot go directly to every important point in the city, the proposed system of street car routings has been laid out in a way to make the business district of Kansas City, Kan., the hub from which practically all lines will radiate. In other words, in working out the rerouting plan for the two cities, Kansas City, Kan., as well as Kansas City, Mo., has been considered as a separate system and the routing laid out to meet the requirements of traffic in this one city. Then to take care of the large amount of inter city travel the two city systems have been connected by intercity trunk lines so routed as to make direct connections with all of the main distributing lines in each of these cities. This will enable a passenger to go from any point in Kansas City, Kan., to any point in Kansas City, Mo., or vice versa, with not to exceed two transfers, and often only one.

The plan recommended for the Kansas City, Kan., local lines contemplates the establishment of a centrally located sheltered prepayment area through which



TRAFFIC FLOW UNDER NEW ROUTING SCHEME—NOTE DECREASED CONGESTION AT CROSSINGS AND REDUCED NUMBER OF TURNS

Reference Letter	Name of Line	No. of Cars	Reference Letter	Name of Line	No. of Cars	Reference Letter	Name of Line	No. of Cars	Reference Letter	Name of Line	No. of Cars
A	15th & 5th Streets	10	M	Fairmount Park	16	X	Indep.-31st Street	14	K'	Indiana-Rosedale	14
B	15th & 5th Streets	17		Indep. Mo.	14		Vine Street	8		Main St.-Observ. Park	8
C	K. C. C. C. & St. J.	3		Brooklyn-Sunset Hill	29	Y	Holmes-Quindaro	12		Holmes-Quindaro	12
	No. Kansas City	3	N	Brooklyn-Sunset Hill	29		Vine Street	8	L'	12th St.—Argentine	20
D	Prospect Street	10		Northeast-Woodland	18		18th Street	12		27th St.—Minnesota	10
	Vine Street	8	O	Brooklyn-Sunset Hill	23	Z	Brooklyn-Sunset Hill	23		Jackson-Roanoke	22
	K. C. C. C. & St. J.	3	P	Northeast Woodland	18		Northeast Woodland	18	M'	Main St.-Observ. Park	8
	15th & 5th Streets	17		Prospect Street	20	A'	Independence-31st	14		Holmes-Quindaro	12
E	15th & 5th Streets	7	Q	Indep.-31st	14		Main St.-Observ. Park	8		Indiana Rosedale	14
F	Vine Street	8		Prospect Street	10		Country Club	30		Country Club	30
	Northeast Woodland	18	R	12th Street-Argentine	20	B'	Country Club	30	N'	Indiana Rosedale	14
G	Northeast Woodland	18		27th St.-Minnesota	10	C'	Broadway-25th St	6	O'	Indiana-Rosedale	14
	Vine Street	8		Jackson-Roanoke	15	D'	Broadway-25th Street	6		Strang Line	2
	No. K. C.	3	S	Prospect Street	8	E'	Leavenworth	2		K. C. L. & T.	1
H	Northeast Woodland	18	T	Prospect Street	28		Kaw Valley	2	P'	18th Street	10
	Prospect Street	10		15th & 5th Streets	17	F'	Troost	30	Q'	18th Street	12
	K. C. C. C. & St. J.	3		Indiana-Rosedale	14	G'	Troost	30	R'	Indep.-31st Street	14
I	15th & 5th Streets	17	U	Brooklyn-Sunset Hill	29	H'	Holmes-Quindaro	12		Main St. Observ. Park	8
	Vine Street	8		Northeast Woodland	18	I'	Main St.-Observ. Park	8		Country Club	30
J	K. C. C. C. & St. J.	3	V	Holmes-Quindaro	12		Indiana-Rosedale	14	S'	18th St.	10
K	Indep.-31st	14		Vine Street	8		Holmes-Quindaro	12		Indiana-Rosedale	14
	Troost	30		18th Street	10	J'	Leavenworth	2		Strang	2
L	Fairmount Park	16	W	Indep.-31st Street	14		Kaw Valley	2		K. C. L. & T.	1
	Indep. Mo.	14		Vine Street	8		Strang Line	2			
							K. C. L. & T.	1			

all cars will be passed. Speaking of the advantages of this plan, the report states that it will greatly facilitate car movements, the riding public will be provided with the greatest convenience and safety obtainable, street congestion will be minimized, paper transfers practically eliminated, regularity of service maintained and rapid transit furnished between all points.

Under the new routing plan the citizens of Kansas City, Kan., will not be dependent upon Missouri lines for local transportation, and thus the irregularity of service due to long intercity lines will be eliminated.

All of the lines now entering the business district will continue to do so under the new routing plan, and in addition several other lines will be brought direct to the heart of the city. In order to place the maximum service where it is required and furnish the largest number of cars on that part of the route where riding is heaviest, it is recommended that a portion of the cars on certain lines be turned back before reaching the extreme end of the route. Cars which are to be turned back must always display designation signs plainly, indicating the point at which the trip ends.

[Editors' note: The two sections of the report by John A. Beeler, reported above, are Sections VII and VIII of an extended study in Kansas City. Sections I to V inclusive were reviewed in the JOURNAL, issues of Feb. 14, April 3 and Aug. 14. Section VI was a short report covering rerouting of interurban lines to eliminate them from the congested district.]

Instructive Analysis from Kansas City

Graphic Study of the Five-Year Period Reviewed in the Report of Robert P. Woods, City Member of the Board of Control, Kansas City Railways, Presents Interesting Results

THE final report of Robert P. Woods, city member of the Board of Control, Kansas City Railways, was printed in the JOURNAL on Oct. 9 and in the same issue was given a story of some of the financial events leading up to the recent receivership. The statistics presented in the Woods report seemed to lend themselves to an interesting analysis of certain transportation facts or tendencies on the property, which are presented herewith. Of particular interest is the sharp change in the characteristic or slope of most of the curves for the past year. It is impossible to say with any degree of certainty that this has all been due to the intensive efforts of the company to increase its efficiency, coupled with the work of John A. Beeler, most of whose reports on the Kansas City situation have already been reviewed in the JOURNAL. But doubtless this work has been instrumental in changing the course of events.

With approximately the same population and single-track mileage the railway carried 180,000,000 people in 1920* as compared with 192,000,000 in 1915, while the fare is now 7, 7½ and 8 cents as compared with 5 cents in 1915. For a lower fare in 1919 the railway carried only 160,000,000 passengers. The curve for total passengers carried shows the effect of strikes, fare increases and jitney competition from 1917 to 1919, and it is remarkable that the rapid increase during the past year has been gained with higher fares and the same jitney competition. This increase is probably due to the effect of better service, increased speed and the usual reaction and recovery noticed when fare changes are made.

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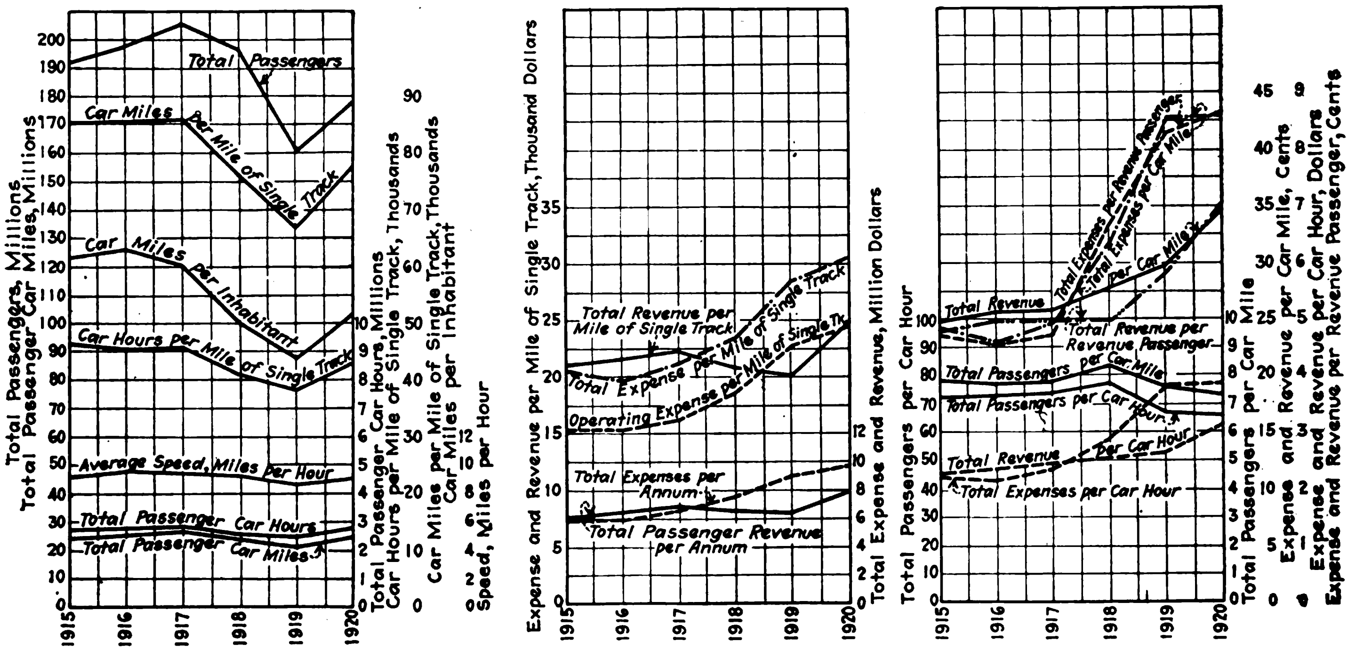
*1920 figures are for the fiscal year ended June 30, and are predicated on eleven months' actual data for the period ended May 31.—EDITORS.

The effect of strikes, increased congestion and jitney competition from 1917 to 1919 is very noticeable from an inspection of the car-miles per mile of single track, car-hours per mile of single track and car-miles per inhabitant, but the hopeful outlook is shown by the marked upward trend evidenced between 1919 and 1920. A criterion of the better operating efficiency now existing is shown by the fact that the car-miles per mile of single track increased 16.4 per cent between 1919 and 1920 as compared with only an 11.4 per cent increase in car-hours and an average speed of 12.3 per cent. At the same time the car-miles per inhabitant for the same period increased 17 per cent, showing that a great deal better service is given. These results were brought about by a revamping of routes, schedules and stops and in spite of the 500 jitneys now competing for traffic. The curves for total passenger car-miles and car-hours show that the 1920 conditions were superior to those of 1915 as regards service rendered.



Data for 1920 Based on Eleven Month Period Ending May 31, 1920

ANALYTICAL CURVES FROM DATA INCLUDED IN THE FINAL REPORT OF ROBERT P. WOODS, FORMERLY CITY MEMBER BOARD OF CONTROL. THESE CURVES SHOW UNIT FIGURES OF INTEREST AND ALSO GENERAL TENDENCIES ON THE PROPERTY

On a unit basis, the curves for total passengers per car-hour and per car-mile show a decrease from 1915 conditions which may be explained by decreased riding brought about by higher fares and jitney and automobile competition and by increased service offered. Although the curves show a downward trend the per cent decrease for 1919 to 1920 is far less than from 1918 to 1919, particularly as regards passengers per car-hour, which again shows the effect of the recent operating changes and improvements.

The data on service and operation show a trend for the better, but the financial data show that relief must be found in some way. When the total revenue per revenue passenger for 1920 was slightly over 7 cents total expenses were 8.6 cents, and operating expenses and taxes alone were 6.96 cents. The total revenue per car-mile between 1915 and 1920 increased 30.2 per cent, while for the same period the total expenses per car-mile increased 77.3 per cent, chiefly due to greater operating expenses, and this difference has spelled financial disaster for the company. The fare increase for the same period has been, on the other hand, only 50 per cent, approximately.

A hopeful outlook and an evidence of operating efficiency are afforded by the curves for expenses and revenue per car-hour from 1919 to 1920. The expenses seem to be at the peak, while the revenues show a decided tendency to increase. The same condition is shown for the same period by the curves giving the expenses and revenue per revenue passenger. The expenses increased only 3.6 per cent as compared to a revenue increase of 20.5 per cent. For the period from 1918 to 1919 the expenses increased at a much greater rate than the revenues per revenue passenger, showing again that the peak has been reached as regards expense increases. The revenue curves have not, however, gained enough to offset the increase in expenses.

On the unit basis of a mile of single track the curves for revenue, operating and total expenses offer food for thought. The expense curves for 1919-1920 show that the increase in total expense is due to an increase in operating expense and that the percentage increase in expenses is far less than the percentage in revenue. The curves showing total revenue and total expenses show the same tendency, but indicate that under existing fare and operating conditions many years will elapse before the revenues exceed the expenses. No company can operate for a long period when on a revenue of $7,800,000 there is an excess of expenses over revenue of $1,800,000.

Situation, from an Economic Viewpoint, of German Tramways*

Increasing Wages and Prices, Coupled with Extraordinary Decrease in Value of the Mark, Have Brought on a Real Crisis—By Crowding Passengers and Increasing Fares, This Condition Has Been Partly Met

The situation of the German tramways is full of interest with reference to the mounting prices of materials and wages and also the increases of fares which have characterized the business of the urban rail transportation systems.

The frightful depreciation of the mark, which has been especially accentuated since 1918, creates a situation which reproduces, but with considerably more seriousness, that which exists in the French and English tramway undertakings. One cannot avoid being interested in the numerous diagrams reproduced herewith, which portray with an eloquence much greater than words the gravity of the situation.

It is easy to understand that it is extremely difficult in these actual circumstances to comprehend clearly the situation and to gain a perspective of the transportation enterprises on account of the following reasons: (1) The uninterrupted and rapid increase of wages on the one part and of the prices of all merchandise and material on the other part makes it difficult to estimate or gain a real comprehension of expenses; (2) the extreme want of materials and the difficulty of finding labor have made it necessary to neglect maintenance; (3) construction materials are in general of much poorer quality than formerly and from this results a reduction in useful life of material; (4) the lack of maintenance perverts results.

It might be said that expenses have often increased in the proportion of 1 to 10, but on the other hand the receipts per car-mile have been equally increased: (1) On account of the increase, quite generally with overloading, and often with very heavy overloading, of passengers, as compared to pre-war conditions; (2) on account of the increase of rates of fare.

Now, the running expenses of a tramway business include:

Wages and salaries.

Running expenses: Pertaining to the permanent way, construction and maintenance; rolling stock, energy.

The increase of the income tax imposed by the state has been in force since July 1, 1919; it is a little different for labor and for managers or other employees, but the difference is inappreciable. The dot and dash line in Fig. 1 illustrates the average increase of wages which has taken place and this shows that at the end of 1919 the expenses under this heading are at least six times as much as they were in 1913. Besides, it must not be lost sight of, in considering salaries and wages, that a new increase has taken place since Jan. 1, 1920.

On this same Fig. 1 there is a curve of the variation of the general cost of living according to official figures. The comparison of this line and that which corresponds to the increase of wages shows that until 1918 the increase of wages was less than that of the cost of living, but that in 1918 the former passed the latter.

As the greater part of the necessaries of life in Germany are imported it is important, in order to understand the real change in costs, to show the curve representing the value of the mark established after communication with foreign money markets was resumed. This curve is shown in Fig. 1 by the dotted line. If everything used were imported, it is evident that the cost of living would be inversely proportional to the value of the mark. But the cost of living is made up of the average cost of imported materials and home products. The fact that its slope, as shown in Fig. 1, is relatively small shows that a large proportion of German products enters into the cost of living. Further, the considerable advances made by the state for the purchase abroad of products necessary to the people has effected a more gradual slope of this curve. The variation of price of supplies of direct concern to the railway business, such as coal and steel and castings, is easy to establish based on official information.

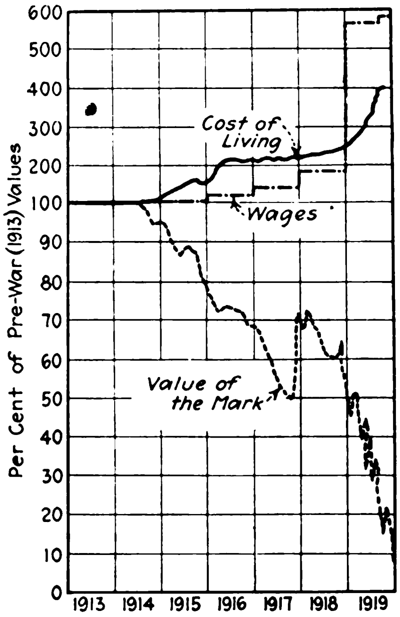


FIG. 1—GRAPHICAL ILLUSTRATION OF THE VARIATION IN COST OF LIVING, WAGES AND THE VALUE OF THE MARK FROM 1913 TO 1919

The first two curves of Fig. 2 give this variation for coal and for rails. For the other materials necessary to construction and to the carrying on of the business it is necessary to depend upon information furnished by the managements of the companies or by the contractors who have handled the construction work.

The other curves of Fig. 2 represent the variations of the cost of copper, electrical equipment and of electrical power, a price intimately connected with that of coal. The price of copper trebled during the war and remained stationary until the middle of 1919, since which the increase in the price has been very great until it finally attained in the beginning of 1920 sixteen times the pre-war figure. Expenses connected with electrical material and machinery in general have approximately followed the same law of variation. The price of trucks and motors, for example, has become 12.5 times as great

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*Abstracted from *L'Industrie des Tramways et Chemins de Fer,* which in turn takes its information from *Verkehrstechnik,* the original article being over the signature of Professor Helm, Eng. D., of Berlin.

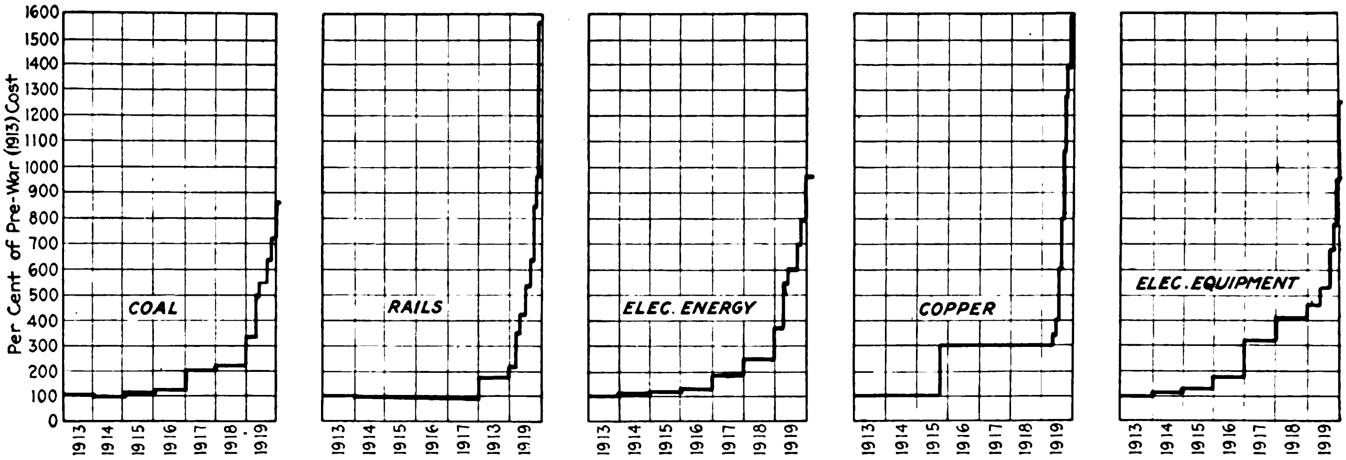


FIG. 2—CURVES SHOWING, IN PERCENTAGE OF COST IN MARKS, THE INCREASES IN COST OF VARIOUS ESSENTIALS TO TRAMWAY OPERATION

as previous prices, those of electrical equipment fourteen times greater, figured on the basis of Jan. 1, 1920.

In. Fig. 3 there is represented the curve of variation of the combination of all expenses (wages, expenses of maintenance, replacements and new installations, and price of electrical energy).

The total expenses thus analyzed attain 9.15 times the pre-war figure and it is predicted that they will become twelve times that figure by the end of 1920.

In the evaluation of receipts it is necessary to add to the increase of fares the better or greater utilization of available cars as stated above.

Fig. 4 shows a curve representing the increase in receipts due to a better utilization of rolling stock, this factor alone causing receipts about 2.1 times as great as pre-war figures. With the majority of the companies, this increase has already assumed such proportions that present conditions indicate an overloading which cannot be exceeded.

It was during the year 1917-18 that this increase was the greatest; it is still noticeable in 1919, but it does not seem possible to hope for new increases in receipts from this source. With reference to increases of fares, the Association of Tramways and Suburban Railways has established a municipal bureau which has made it possible to construct the curve in Fig. 5, indicating the average increase of fare modified in several cases to take into account the length of ride. In October, 1919 the mean fare was 2.1 times the pre-war fare; the calculation along this line for the first part of 1920 is not yet finished. One can safely predict, however, that the new tariff will be 2.5 times as much, in round figures, as that in 1916. For the purpose of comparison there is represented on the same figure the curves of variation of the fares for the passenger service of the Prussian state railways.

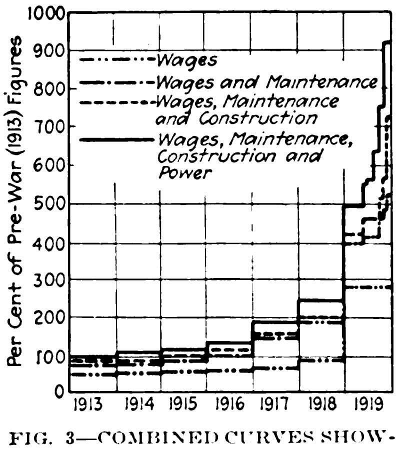


FIG. 3—COMBINED CURVES SHOWING TOTALIZED EFFECT OF VARIOUS INCREASES

The increase in total receipts is then 210 per cent on account of the better utilization of rolling stock available and 250 per cent on account of the increase in fares, making altogether 525 per cent above the pre-war figures.

From this it results, after being compared with expenses, at the end of 1919, that the fare should be 1.7 times the pre-war figure, and if one takes into account the expenses in the early part of 1920, 2.3 times those existing at the end of December, 1919.

If one would compare the increase to the pre-war base, fares should be multiplied by 2.5 times 1.7 (that is, should be raised in the proportion of 240 per cent) or even by 2.5 x 2.3 equals 575 per cent.

As a result of this, in tramway undertakings which charged in 1913 a fare based on 10 pfennigs, the fare ought to be 44 pfennigs, by the end of 1919, and 10 x 5.75 at the beginning of 1920, or 57.5 pfennigs.

Now, the fare currently in vogue is, for the year 1920, only 25 pfennigs; and the figure 40 pfennigs, adopted by some of the companies, is still much inferior to the 60 pfennigs established after the consideration given herewith.

The question now confronting the companies is to know how the tramway enterprises can arrive at any balance in their budgets in the presence of such great discrepancies between receipts and expenses. One must not lose sight of the two facts which were outlined above, namely:

On the one hand, the better utilization of available rolling stock, of which the influence has been very noticeable on the receipts up to recent months, has contributed much to re-establish the equilibrium, but this factor appears to have reached its maximum effect.

On the other hand, under the condition of the scarcity of labor and the lack of raw materials, maintenance has been neglected; this evidently does not constitute a real economy, but on the contrary, the corresponding expenses will have their effect upon subsequent budgets, and will be found then, in all probability, to be much increased.

In the annual statistics of industries and commerce in Germany the local railways and tramways show the least net profit. It is true that the profits of the tramways are not separated from those of the local railways. The figures in the table on page 965 give by themselves, however, an approximate idea of the proceeds or profits of the tramways from 1907 to 1915.

The economic crisis through which these companies are going is due chiefly to the opposition met at the hands of the authorities of the communities which are against raising the fare; however, that increase is necessary, not only on account of the interests of the companies themselves and of their stockholders but especially in the interests of the public, and the increase should be such as to permit these companies to meet the increase in expenses. During the war, and especially since the various communities have been laying plans to take over the private enterprises, a balanced budget has never been possible to realize.

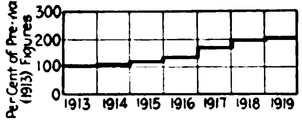


FIG. 4. INCREASE IN RECEIPTS DUE TO BETTER UTILIZATION OF FACILITIES

Such are the explanations that it is possible to give to the critical financial situation of the tramway business. It is impossible to foresee the time when the equilibrium can be re-established with the continual aggravation at the increases of prices for all sorts of goods.

DATA ON DIVIDENDS OF GERMAN TRAMWAYS AND LOCAL RAILWAYS. FIGURES INDICATE IN PERCENTAGE THE NUMBER OF COMPANIES GIVING DIVIDENDS IN THE VARIOUS CLASSIFICATIONS LISTED

1907-08	1908-09	1909-10	1910-11	1911-12	1912-13	1913-14	1914-15
No dividends							
21.30	19.83	18.30	17.78	17.71	15.34	18.15	27.96
Dividends less than 6 per cent							
47.60	51.26	49.41	46.56	46.36	52.46	49.58	55.68
Dividends from 6 per cent to 10 per cent							
29.90	80 07	31.59	34.70	34.66	30.96	31.87	16.26
Dividends greater than 10 per cent							
1.20	0.84	0.77	0.96	1 27	1.24	0.40	0.10

The important differences evident in the fare increases of the various companies (which all had as a base the fare of 10 pfennigs before the war) show that quite frequently certain businesses do not take into consideration the critical situation in which they find themselves from the financial point of view. It is possible to conclude from this analysis that the economic situation of the tramway businesses mentioned is extremely critical. With regard to wages actually paid and to the increase of expenses of all sorts, it will be necessary to multiply by six the pre-war fares and to double, at least, those in force at the end of 1919, and it is to be feared that other increases will be unavoidable in the near future. The figures and table given above must call forth interesting comments.

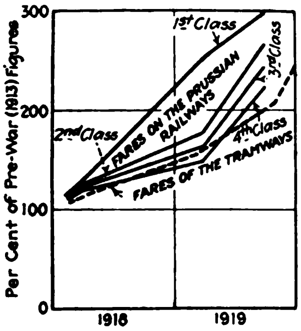


FIG. 5. AVERAGE INCREASE IN FARES ON TRAMWAYS AND RAILROADS

According to statements made by railway officials in Switzerland, their government contemplates spending a total of 52,000,000 francs on railway electrification. Up to Oct. 1 of this year the sum of 600,000 francs had been spent on this work and by 1922 they look forward to a complete electrification of all the main lines that run through tunnels and passes.

Australian Railway Experiences

P. J. Pringle of Ballarat, Victoria, Australia, Says That One-Man Cars Bring Good Results in His Country

THAT America is not alone in facing railway problems was made clear by P. J. Pringle, chief engineer and general manager the Electric Supply Company, Ballarat, Australia, in a recent paper read before the Tramways & Light Railways Association of Great Britain.

The Australian railway, he said, had reached a critical financial condition which could be met by: (1) Putting the loss on the shareholders; (2) raising the fares, or (3) reducing costs of operation. He stated that his company, which operates in Ballarat and Bendigo, Victoria, introduced one-man cars in May, 1913, on eight and one-half routes out of eleven, with the result that in many cases the company effected a 50 per cent saving in operating costs and about the same saving in platform costs. The one-man cars were used on approximately the same average schedule speed, or 8 m.p.h.

The one-man cars are all single deck with a fare box in the front entrance. There are hinged notice plates just above the dash, one side notifying "Pay as you enter," the other side "Pay as you leave." Cars traveling from suburbs to congested districts display the former, while cars loading in the congested districts display the latter.

The accidents were reduced to one-eighth of their previous value due to the use of the one-man cars. The trolleymen gave little trouble because of the use of one-man cars after the first few days and now press to take a one-man car route in order to get the extra dollar a week.

Mr. Pringle states that the coning of rail and wheel treads creates corrugation and increases rail wear, and that the subject is worthy of careful investigation, particularly as many object strongly to the proposed new standard increasing the present 1 to 20 coning. He suggests that a standards committee should investigate the extent of side swaying of cars on systems with heavily and lightly coned treads as compared with those using flat treads; that meter readings be taken in the foregoing tests and that, if any system is operating with flat rail tread and wheel tread originally, the resultant coning of the rails be carefully examined. The slipping effect on straight tracks may cause corrugation troubles and the coned wheel and inclined rail head surface, together with the large diameter wheel fillets, may intensify the effect. He stated that corrugations on the Melbourne Cable Tramways are non-existent on routes over which single-track cars operate, and that the coning on the Edinburgh Cable Tramways is eight times that of the Melbourne Cable Tramways with a greater annual rate of wear and a life loss of 23 per cent as against 6.2 per cent.

A national uniform wage system has been advocated for Australian railways, said Mr. Pringle, but he considers such a system ill advised. Scales of living and costs of living differ in city and country districts and the differential systems based on each local situation he believes to be the only just wage system.

The authorities in Australia have recognized the importance of depreciation and now grant 10 per cent for power station plant and 5 per cent for tramcars.

Rapid Transit Station Design

Relation of Platform, Entrance and Exit Arrangement to Passenger Interchange, with Appropriate Examples from Typical Subway and Elevated Stations for Rapid Transit Lines

IN THE issues of *Engineering News-Record* for Oct. 28 and Nov. 4 Olof A. Nilsson, designer, Transit Commission of New York City, gives a comprehensive analysis of the problems connected with the design of stations for rapid transit lines and illustrates present practice by means of appropriate examples. Some of the points made by Mr. Nilsson are outlined in the following paragraphs:

Two factors determine the passenger capacity of a railroad, the capacity of each train and the minimum headway on which it is possible to operate trains. The former, of course, depends on the capacity of each car and the number of cars in the train. The minimum operating headway is determined by one of two independent factors, the safe minimum distance between trains running at a certain speed between stations, "the running headway," and the time required by the train to pass through a station block, "the station headway." The station headway, again, is primarily determined by the length of the train stop at the station. As ordinarily constructed the stations are the points of slow train movement, and, in general, the station headway governs, and the minimum operating headway is fixed by the maximum station headway on the line.

When a station is planned the starting point should be the ultimate carrying capacity of the line and the ultimate traffic yield of the district tributary to the station. From these factors and from the general scheme of operation the size and capacity of the cars and the number of cars to the train, the train lengths and train capacity, are determined. The train length is the basis for the platform length, while the width of the platforms, the width and capacity of stairways and passages, etc., are fixed with reference to the anticipated maximum traffic flow through the station. This is seldom a simple problem.

Classified on the basis of platform type, all stations are of either the side-platform type, the island-platform type, or a combination of both. With reference to location relative to the line, stations may be classified as:

(a) Terminal stations, which may be either the loop-end type (Hudson & Manhattan downtown terminal in New York) or the dead-end type (Brooklyn Bridge terminal New York).

(b) Intermediate stations.

(c) Stations at junction points, where two or more lines meet, or where one main line divides into branches.

(d) Stations at crossing points, where two or more lines cross, either with or without track connections.

In planning entrance and exit stairways it makes a difference whether the station is elevated or underground. In crowds more people go up a stairway than down in a given period. A convenient and safe rule in figuring the capacity of a stairway is to allow for each lineal foot in width 1,000 people per hour for downward and 1,100 for upward movement when the movement is all in one direction. The capacities of unobstructed ramps and passages may be assumed as 2,000 per lin.ft. in width per hour. For an average walking speed of 5 ft. per second this allows 9 sq.ft. of floor space to each person. Where people move simultaneously in opposite directions under crowded conditions the capacity is less. No stairway planned for simultaneous movement in both directions should be less than 5 ft. wide. Sharp turns also seriously retard the movement and should be avoided wherever possible. The maximum grade for a ramp should be 11 per cent; 8 to 10 per cent is better. For stairways the pitch adopted in the New York subways—7 in. rise and 11 in. tread—is good; when conditions permit, it is desirable to reduce the height of the riser and correspondingly increase the width of the tread according to the rule that two times the height plus the width (both in inches) should equal twenty-five.

On a loading platform passengers waiting for a train naturally group themselves along the platform edge. Sufficient width should be allowed for these waiting passengers to permit a certain freedom of movement and to give unobstructed passage to incoming passengers. Moreover, behind these groups there should be enough width to permit people to move about between different parts of the platform and the platform stairways. Each station is an individual problem and no definite rule for platform width can be given, except the general statement that the more the conflicting passenger streams are separated into definite channels and the quicker the platform is cleared the better will be the result.

SOME EXAMPLES OF SUBWAY AND ELEVATED STATIONS ARE CITED

In the Paris rapid transit system the lines all have loop ends, permitting the trains to run continuously back and forth and around the loops without the use of switches and crossovers. For the most part these lines are built underground with stations as close to the surface as the method of construction and the topographic conditions allow. The standard platform length is 246 ft. and the width (of side platforms) about 13.5 ft. Intermediate stations are generally of the side-platform type, while most of the end stations have island platforms. The latter have also, in general, separate stopping places for loading and unloading, so that incoming and outgoing passengers are kept separate from train to street.

On one of the additions to the rapid-transit system of Berlin, the Schöneberg subway, a two-track line which was opened for traffic in December, 1910, the stations, of the island-platform type, have platforms 25 ft. wide and entrances at the ends through stairways 13 ft. wide to the middle part of the street. They were planned to be built in two stages, the first part of it only was designed to be completed at the opening of traffic, the second part to be added when necessitated by the growth of traffic. The first part of the station, with a platform length of 148 ft., accommodates a train of three cars; the completed station has a platform 312 ft. long and accommodates a seven-car train. The middle part of the platform is occupied by various stands and enclosures for station attendants, newspapers, etc.

In Boston the busiest station on the subway system is the Park Street underground station at the intersection of the Tremont Street subway and the Cambridge-Dorchester tunnel. Here the lower level station, for Cambridge-Dorchester trains, is 350 ft. long and has two side platforms for unloading and one island platform for loading. The former are 10 to 12 ft. wide, the width of the latter varies from 18 to 30 ft., tapering from the center toward the ends. The upper level—for the Tremont Street surface cars—has two island platforms. Each track has berths for eight cars along the straight portion of the platform. The east platform (exclusive of stairways) contains about 9,625 sq.ft. and the westerly one about 14.050 sq.ft. The entrance and exit stairways from the upper level to the surface are through structures on the Boston Common. The southerly entrance on the easterly platform has an intermediate lobby or mezzanine above the platform for the control; on the other entrances the control is on the platform. The lower level has an entrance lobby at its easterly end just east of the Park Street structure with stairways to the street and from the unloading platforms, ticket control and a wide stairway to the loading platform. From both unloading platforms there are escalators to the street surface. For direct transfer between the two stations there are six stairways, one from each platform on the lower level to each one on the upper.

An extensive rapid transit system including both subways and elevated roads has been planned and is being built in Philadelphia and the stations on this system are good examples of modern, well planned, rapid transit stations. In the Girard Avenue express station on the Broad Street subway the platform length is 550 ft., the width at the center 20 ft. 9 in., tapering toward the ends through a large radius curve on the outside platform edge. The platforms are accessible from the street through a mezzanine under Girard Avenue which has eight stairways from the street and three to each platform. In addition there are stairways for exit only, near the ends of both platforms.

A local side-platform station on the same line at Ridge Avenue has a similar arrangement with entrances and exits at the center and additional exits near the ends. The platforms, 12 ft. wide except at the ends, where the width is 10 ft., are unobstructed through their entire length, platform columns being eliminated and the stairways being built in recesses outside of the walls of the main structure. Another local station at Twelfth and Arch Streets on the "delivery loop subway" has entrances at or near the ends with additional exits at the center.

The Brooklyn Bridge station of the first subway in New York, opened for traffic in 1904, was built for eight-car express trains with platforms about 350 ft. long. The width of the express platform at the center is 20 ft., narrowing toward the ends. The stairways from the platforms are 8 ft. wide and the mezzanine platform or bridge spanning the tracks is 20 ft. wide. The two side platforms of the station have never been used. When the rapidly growing traffic made the train service originally adopted insufficient, the express platforms were lengthened to 480 ft. and ten-car express trains put in service. A ten-car train is 520 ft. long, so that the end doors of the first and last cars do not come within the platforms and are not used.

The Chambers Street station of the Seventh Avenue subway, opened in 1918, is located not far from the Brooklyn Bridge station and invites a comparison with the latter. The platforms are 18.5 ft. wide and 485 ft. long. Instead of a narrow bridge spanning the tracks there is a large mezzanine floor under the intersection of Greenwich and Chambers Streets with stairways to the four street corners. From each platform there are four stairways to the mezzanine. Should additional stairways and mezzanine area be required the mezzanine can be extended over the platform in both directions.

A station that by virtue of its location is destined to have a very heavy traffic is the Grand Central station of the Park Avenue-Lexington Avenue subway, opened for traffic in August, 1918. It is located diagonally across Forty-second Street between Park and Lexington Avenues, and is adjacent to and by means of underground passages connected with the New York terminus of the New York Central and the New York, New Haven & Hartford railroad systems and the Grand Central Terminal. Directly below the station and connected to it by means of a ramp, a stairway and three elevators is the Grand Central station of the Queensborough subway, which here runs under Forty-second Street. There is also a shuttle service under Forty-second Street from this station west to the Times Square station on the Seventh Avenue line. It is evident that in addition to the traffic originating in the neighborhood, rapidly being built up with large office structures and hotels, an unusually large transfer traffic will result from the meeting and intersection of these traffic lines. The station is of the ordinary type for four-track express stations with two island platforms of varying width about 485 ft. long. Each platform has, in addition to two stairways leading down to the passageway and ramp communicating with the Queensborough station below, six stairways leading to two mezzanine floors above the platform. From these mezzanine floors there are numerous passages and stairways leading through adjacent buildings to the street level and opening on Forty-second Street, on Park and Lexington Avenues and as far north as Forty-fifth Street. A short ramp connects the larger of the two mezzanine floors with an island platform serving the shuttle trains to the Times Square station.

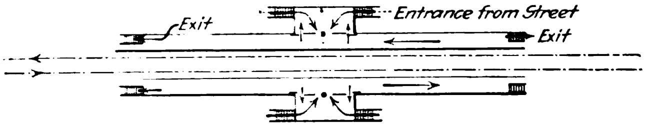


FIG. 1

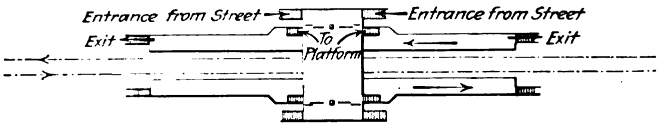


FIG. 2

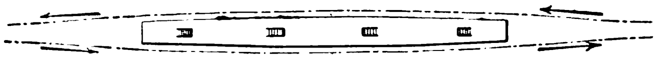


FIG. 3

FIG. 1—SIDE-PLATFORM STATION. FIG. 2—SIDE-PLATFORM STATION WITH MEZZANINE. FIG. 3—ISLAND PLATFORM STATION

The problem of locating entrances and exits is frequently a difficult one for the station designer. On a busy street the presence of an elevated stairway or a subway kiosk on the sidewalk is, as has been demonstrated in New York, a serious impediment to the movements of pedestrians. On the other hand a subway or elevated entrance located entirely inside the building lines of an adjacent business building not only has the virtue of not being a sidewalk encroachment but is also an actual asset to the owners of the building, increasing in value as the traffic increases. This has also been demonstrated in New York, where property owners in general are alive to the advantage of having a subway entrance on the premises, and are quite willing to grant the space for and pay the cost of an entrance without any other compensation than the resulting increment in rental value.

In the building of the Frankford elevated railroad it was aimed to avoid placing the station stairs on the sidewalks. At all stations on this line a building containing stairways, control, toilets and waiting room has been built within the building lines on property taken for the purpose under condemnation proceedings. At the platform level there is a bridge from the station building to the platform. Such a station is located at Ruan and Church Streets. It is a rectangular building and control may be at either the street level or at the platform level.

Electrification of Railways in Great Britain

Advisory Committee Presents "Interim Report" Favoring 1,500 Volts, Direct Current, for Contact System and 50 Cycles for Transmission

THE committee appointed by the Minister of Transport of Great Britain to inquire into the electrification of railways has presented an interim report, covering the progress made as a result of twenty-eight sittings held beginning on March 22. This committee comprises Sir Alexander Kennedy, chairman; S. G. Redman, secretary, and Sir John A. F. Aspinall, A. R. Cooper, Sir Philip Dawson, Sir Alexander Gibb, Charles H. Merz, Sir Philip Nash, Lightly Simpson, Roger T. Smith, Sir John Snell and Sir Henry Thornton.

This committee was asked to consider (1) whether any regulation should be made for the purpose of insuring that the future electrification of railways in the country be carried out to the best advantage in regard to the interchange of electric locomotives and rolling stock, uniformity of equipment, etc.; (2) if any such regulations are desirable, what matters should be dealt with and what regulations should be made, and (3) how far it is desirable, if at all, that railways or sections of railways already electrified should be altered so that they may form parts of a unified system.

The committee reported that evidence had been taken from witnesses representing a number of railways and that Ivan Ofverholm, chief electrical engineer Swedish State Railways, and Col. Huber-Stockar, consulting engineer Swiss Federal Railways, had come to England to give the committee the benefit of their advice.

The principal points raised in the report are covered in the following paragraphs:

It is considered that in order to insure that the future electrification of the railways shall be carried out to the best advantage, it is desirable that certain general regulations should be made for observance by the railway companies when electrifying their lines. These regulations should be directed especially to insuring standardization of those methods and appliances which are likely to prove most satisfactory under British conditions. They should put no avoidable difficulties in the way of the adoption in future of any improvements in methods or appliances which may from time to time become available with increasing knowledge and experience.

The committee recommended that regulations be issued to the effect that in the cases of those railways which have not as yet electrified any lines, as well as those which at present have electrified all or part of their lines on a direct-current system, electrification or extended electrification, as the case may be, should be carried out on the direct-current system.

It is further recommended that the standard pressure of the direct-current system at the substation busbars should be 1,500 volts, subject to the continuance of any existing 600-volt or 1,200-volt installation; also that half the standard voltage be adopted, where advantages would arise from the use of this lower pressure, and that higher pressures be adopted, limited to multiples of the standard pressure, where it can be shown to the satisfaction of the minister that sufficient advantage would accrue.

It is still further recommended that both overhead and rail conductor collection should be permitted, the position and general design of the conductors and structures to be in accordance with recommendations to be made later. In a subsequent report the committee will also suggest the requirement that locomotives or motor coaches be able, where necessary, to run at two different voltages and with either rail or overhead collection.

It is recommended also that the generation of current for direct current lines should be alternating, three-phase, at such voltage as may be desirable in each case; also that in the case of existing generating stations supplying at any frequency between 25 and 50 cycles it is unnecessary to make any change in frequency, but that it is desirable that where any one such frequency is in general use in a particular electricity district, any new power station put down in that district for supplying a railway should adopt the frequency which has been approved by the electricity commissioners or is in general use in that district. The committee states that, from evidence which has been put before it, as well as from the experience of its members, a desirable frequency is 50 cycles.

The committee excepts from its recommendations the electrified portion of the London, Brighton & South Coast Railway system which long ago adopted single-phase current for its suburban lines, and did so with a special view to the adoption of a system which at that time appeared the only one admitting of extension from London to Brighton, when this extension became feasible. The general manager of the company, Sir William Forbes, came before the committee to say that his company considers the extension to be now not only feasible, but urgently desirable. In view of the circumstances, the committee recommends that the electrical system of working at present in use, or actually under construction, on the Brighton company's suburban lines need not be changed and that in view of the recent proposals of the government as to the grouping of railway companies the question of the system on which the proposed extension of this railway line to the coast should be carried out is one for special consideration from the point of view of the requirements of through working and interchangeability of traffic with the other systems forming part of the proposed Southern group. Subject to these matters receiving the fullest consideration, and provided the completion of the proposed extension on the present system shows a substantial financial advantage, the committee is of the opinion that it should be allowed.

Three Fundamentals Govern at Richmond

IN A recent communication to the editors of ELECTRIC RAILWAY JOURNAL, Thomas S. Wheelwright, president Virginia Railway & Power Company, Richmond, Va., made the following comment on the general traction situation, which is worth special note:

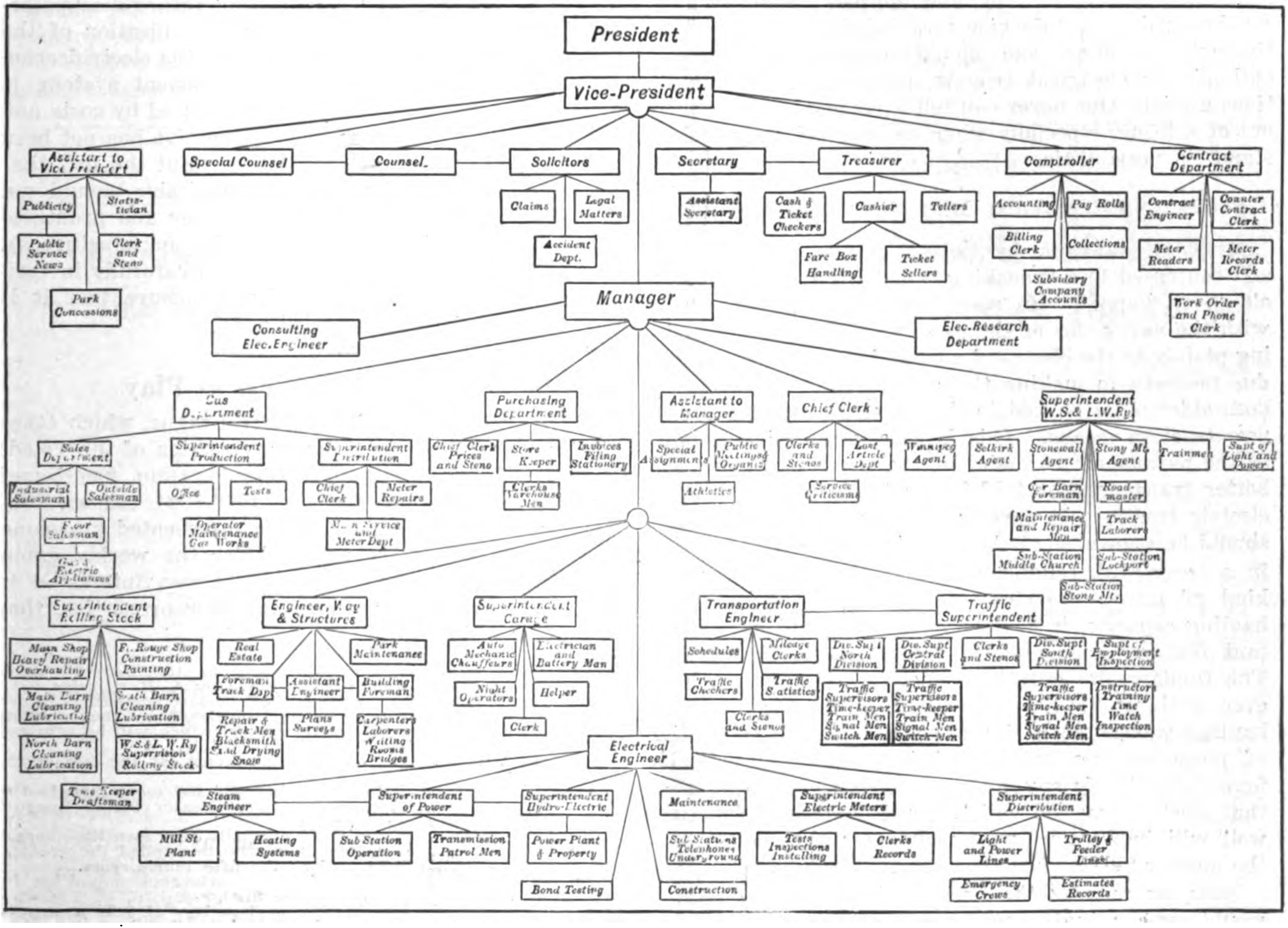
"I am firmly convinced that in order for the utility business to re-establish its much-needed credit it must first prove its willingness and ability to adhere to a few fundamental principles: First, it must establish its relations with its employees on the basis of the open shop, which I believe to be a concrete application of American independence. Of course, the rates of wages must be fair and equitable, and in this connection I firmly believe in the principle of profit sharing which we have put into effect. Second, that the old contractual relations with the municipalities which were initiated and have been continued on a 'jockeying' basis will have to be wiped out and replaced by contracts guaranteeing a just and inviting return on the fair value of the properties. Third, that the equipment or machines by which the public is served must be improved and made to conform to present-day conditions, especially by the wider adoption of the safety car and the use of trackless trolleys in the smooth-paved districts, with a view to the latter vehicle gradually replacing the present trolley as the streets are smooth-paved.

"With these principles in mind and persistently adhered to, I do not believe it is too much to hope or expect that the trolley business in the next generation will be an even greater factor in community growth than it has been in the past."

Staff Organization of Winnipeg Electric Railway

THE Winnipeg Electric Railway staff has recently been considerably reorganized, some of the changes being mentioned in the issue of this paper for Aug. 28, page 441.

As stated in that article, the managerial work has been turned over to Frank L. Butler, formerly general superintendent, who reports to A. W. McLimont, vice-president. The accompanying organization chart shows the way in which responsibility focuses in the several departments, and the chart also constitutes a general bird's-eye picture of the railway system as a whole. It comprises about 112 miles of track and 325 or more cars and seven buses are used. A large lighting and power business is conducted.


President
Vice-President
Assistant to Vice-President
Publicity
Statistician
Public Service News
Clerk and Steno
Park Concessions
Special Counsel
Counsel
Solicitors
Claims
Legal Matters
Accident Dept.
Secretary
Assistant Secretary
Treasurer
Cash & Ticket Checkers
Cashier
Tellers
Fare Box Handling
Ticket Sellers
Comptroller
Accounting
Pay Rolls
Billing Clerk
Collections
Subsidary Company Accounts
Contract Department
Contract Engineer
Counter Contract Clerk
Meter Readers
Meter Records Clerk
Work Order and Phone Clerk
Manager
Consulting Elec. Engineer
Elec. Research Department
Gas Department
Sales Department
Industrial Salesman
Outside Salesman
Floor Salesman
Gas & Electric Appliances
Superintendent Production
Office
Tests
Operator Maintenance Gas Works
Superintendent Distribution
Chief Clerk
Meter Repairs
Main Service and Meter Dept
Purchasing Department
Chief Clerk Prices and Steno
Store Keeper
Invoices Filing Stationery
Clerks Warehouse Men
Assistant to Manager
Special Assignments
Public Meetings & Organiz.
Athletics
Chief Clerk
Clerks and Stenos
Lost Article Dept
Service Criticisms
Superintendent W.S.& L.W.Ry.
Winnipeg Agent
Selkirk Agent
Stonewall Agent
Stony Mt. Agent
Trainmen
Supt of Light and Power
Car Barn Foreman
Roadmaster
Maintenance and Repair Men
Track Laborers
Sub-Station Middle Church
Sub-Station Lockport
Sub-Station Stony Mt.
Superintendent Rolling Stock
Main Shop Heavy Repair Overhauling
Ft. Rouge Shop Construction Painting
Main Barn Cleaning Lubrication
South Barn Cleaning Lubrication
North Barn Cleaning Lubrication
W.S.& L.W.Ry Supervision Rolling Stock
Time Keeper Draftsman
Engineer, Way & Structures
Real Estate
Park Maintenance
Foreman Track Dept
Assistant Engineer
Building Foreman
Repair & Track Men Blacksmith Sand Drying Snow
Plans Surveys
Carpenters Laborers Waiting Rooms Bridges
Superintendent Garage
Auto Mechanic Chauffeurs
Electrician and Battery Man
Night Operators
Helper
Clerk
Transportation Engineer
Schedules
Mileage Clerks
Traffic Checkers
Traffic Statistics
Clerks and Stenos
Traffic Superintendent
Div. Supt North Division
Div. Supt Central Division
Clerks and Stenos
Div. Supt South Division
Supt of Employment Inspection
Traffic Supervisors Time-keeper Train Men Signal Men Switch Men
Traffic Supervisors Time-keeper Train Men Signal Men Switch Men
Traffic Supervisors Time-keeper Train Men Signal Men Switch Men
Instructors Training Time Watch Inspection
Electrical Engineer
Steam Engineer
Mill St Plant
Heating Systems
Superintendent of Power
Sub Station Operation
Transmission Patrol Men
Superintendent Hydro-Electric
Power Plant & Property
Bond Testing
Maintenance
Sub Stations Telephones Underground
Construction
Superintendent Electric Meters
Tests Inspections Installing
Clerks Records
Superintendent Distribution
Light and Power Lines
Trolley & Feeder Lines
Emergency Crews
Estimates Records

NEW ORGANIZATION CHART FOR WINNIPEG ELECTRIC RAILWAY

Electrification Situation Summarized

At Joint A. S. M. E. and A. I. E. E. Section Meeting Held in New York City George Gibbs Presented a Comprehensive Picture of the Problem

IN THE issues of this paper for Oct. 23 and 30 the proceedings of a joint meeting of mechanical and electrical engineers held in New York City on Oct. 22 were covered in some detail. Space limitations last week precluded the inclusion in extenso of the closing remarks or summary of George Gibbs, chief engineer electric traction Long Island Railroad, but a longer abstract was promised. This follows:

Mr. Gibbs considered first the two types of power plant that are available for transportation work, the portable and the stationary. In steam service the plant is a part of the moving train; in electric it has both stationary and moving elements, *viz.*, a central power-generating plant, various connecting links to bring the power to the train and means of utilizing it there.

As regards simplicity, therefore, the self-contained steam locomotive has an inherent advantage over the combination of elements required for electric propulsion, and the latter must show some peculiar advantages in an operating rather than a structural sense if it is to supersede steam traction. Furthermore, the steam locomotive has been developed to a perfection of detail and a high degree of steam economy during the one hundred years of its use; it does wonderful work, and is in possession of the field, representing a heavy money investment, and can, therefore, be displaced (even by something better) only by slow degrees. Railway men can hence discuss this new rival of the steam locomotive with calmness and should co-operate with their enthusiastic electrical friends in giving their suggestions a trial. One never can tell what good may develop out of a thing, especially when he does not fully understand its possibilities.

STEAM AND ELECTRICAL MEN MUST GET TOGETHER

Mr. Gibbs said that he spoke as a steam railway man and confessed to a "sneaking" fondness for the reliable old "iron horse." He was, however, sufficiently "in" with the new order of things to warrant him in speaking plainly to the electrical men and suggesting to them due modesty in making their claims. Co-operation of both sides must be had in the development of a useful new traction means. This is especially desirable now, as the paramount necessity of the country is more and better transportation. If it can be furnished through electric traction, in particular cases as a starter, this should be known now. An electric system will function in a successful, reliable and efficient manner for any kind of railway service. It is capable of unlimited hauling capacity, is flexible as to speed and has important features conducing to safety in handling trains. The fundamental question affecting its adoption, however, is this: "Is the substitution of electric for steam haulage warranted by its advantages in the production of more transportation, and if so, is it practicable financially?" No sweeping generalization to the effect that electric traction will be used because it functions well will impress railway managers; they must have the answer to the above question.

Now, as regards the first portion of this query, it would appear that there are a number of important situations in which electric traction will produce results which cannot be had by the steam locomotive, notably in increasing existing track capacity, especially on lines having heavy grades, in yard shifting, in suburban and terminal services, and in locations (such as in tunnels) where the absence of combustion is necessary or desirable. Such installations should be undertaken if financially feasible, and feasibility can only be determined by a critical examination of each case. Assuming that the money can be raised for an improvement which will pay, it will be found that electric traction will pay, directly or indirectly, in the special cases to an extent depending upon the density of traffic and the difficulty of maintaining proper steam operation.

It must be admitted that an electric installation involves a higher first cost than steam; in fact, its adoption means that more or less existing investment must be scrapped. Therefore, the increase in fixed charges must be offset either by the direct operating savings produced or these plus the indirect savings and benefits. The latter may mean avoidance of permanent-way additions, permissible change in operating methods, greater traffic movement and production of new kinds of traffic. In spite of some differences in opinion, we cannot escape the conclusion that there is always a large saving in fuel with electric traction, generally some saving in maintenance cost of "power equipment" and often important savings in train crew costs, engine house expenses, minor supplies, etc.

In conclusion, Mr. Gibbs said that sometimes the "direct" savings will be sufficient to return a handsome profit over and above charges; if not, the indirect savings must be included. It will avoid future disappointment if the facts are faced. The electrification of the railways of the country as a whole, or the electrification of the whole of any extensive component system, is neither practicable nor desirable, measured by costs and results; the doom of the steam locomotive has not been sounded and will not be in our time. But the fact that electrification is not universally applicable should not discourage any one; it has a very large and profitable field (both for the railways and the manufacturers). These facts indicate the importance of carefully investigating each proposed application to insure that it is properly conceived and carried out.

Rail-Light Bowlers at Play

THE Doherty Men's Fraternity League, which takes the place of the joint company section of the Toledo Railways & Light Company, Toledo, Ohio, has issued its bowling schedule for the 1920-1921 season. All departments of the company are represented by teams, and sixteen alleys are required for the weekly game. As the rules may be suggestive to men interested in developing interest in sports on other properties, they are given below:

This bowling league shall be known as the Doherty Men's Fraternity League and shall be governed by A. B. C. rules.

The entrance fee for each team shall be $10, one-half of which is to be added to the prize money furnished by the company and one-half to be used as forfeit money, which will be returned in case the team finishes its bowling schedule.

All fines will be taken out of prize money at the end of the season.

Each team will be limited to eight men, not more than two of whom may be "A B C," "All-Star" or "Greater Toledo League" bowlers.

If a team appears on the alley with only four men the average of that absent member of the team who has rolled the greatest number of games shall be used as the fifth man's score.

All disputes shall be referred to the grievance committee for adjustment and its decision shall be final.

Regular games shall be bowled on Tuesdays at 8:30 p.m., one-half on the Colonnade and one-half on the Auditorium alleys.

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Further Suggestions as to Movies

SOME suggestions regarding the use of movies were printed in last week's issue of this paper, and the following additional communications are given to indicate the continued interest in this subject as a practical means of railway publicity.

F. W. Brooks, president Detroit United Railway, writes in regard to the suggested use of motion pictures in a broad way in the promotion of electric railway publicity work: "I think the suggestion well worth earnest consideration, keeping always in mind the fundamentals set forth in your article."

F. R. Coates, president Toledo Railways & Light Company, writes that he "fully concurs" with the ideas expressed in the editorial suggestion in the Sept. 25 issue of the JOURNAL.

A prominent general manager of a Western street railway writes the significant comment that "any statement emanating from a public utility as to the conditions confronting either the utilities as a whole or the particular utility must have the stamp of genuine 100 per cent truth upon it or it will do more harm than good."

A. E. Potter, general manager the Rhode Island Company, writes:

"I believe that with a proper person heading a publicity department much good can be done in creating a better understanding on the part of the public as to the problems which confront a street railway.

"I am not so strongly of the opinion that motion pictures would be particularly beneficial, but might feel differently if there was an opportunity to try the experiment."

Circulation Must Have First Consideration in Working Out Film Plan

ILLINOIS COMMITTEE ON PUBLIC UTILITY INFORMATION
CHICAGO, ILL., Oct. 26, 1920.

To the Editors:

No one can doubt the effectiveness of motion picture films intelligently conceived, adequately executed and consistently and extensively employed. At the same time I am not yet ready to admit that any means of publicity is better than the newspaper. It is true that a great many people patronize "the movies" and it is also true that the great numbers who do not are usually the kind of people who are susceptible to influence by educational publicity and who when duly influenced are of the most assistance to the utility business. It is also true that almost everybody reads the newspapers and our impressions and opinions are in very large measure, and without our always realizing it, based upon what we read in the newspapers.

Please do not misunderstand me as in any way decrying the advisability of using motion picture films. I believe in using all means of publicity and films are one of the best. But you will doubtless find, as I have whenever attempt has

Information Campaign in Newspaper Advertisements

Increase in Freight Rates Hits Local Utility Hard

$22,000 Added to Yearly Fuel Bill of the Pine Bluff Company

The increase in freight rates, which became effective yesterday, means an increase of $22,000 a year in the fuel bill of the Pine Bluff Company.

The railroads were entitled to the "raise," because the old rates were inadequate to meet the increased cost of the service, and pay a fair rate of interest on the money invested.

The increase in cost of fuel, labor and materials causing the average increase in operating expense of 76.2 per cent in the past two years over the year ending June 30, 1918, has been shown.

Figures on prices of commodities and other services demonstrate that the utilities and the newspapers are the only manufacturers or servants of the public whose pay has not advanced proportionately with increased costs.

With $22,000 added to its fuel bill, the greatly increased price of fuel itself, the higher costs of labor, material and money, and the contemplated further increase in the pay of street carmen, it is obvious that the Pine Bluff company is entitled to a "raise" in pay.

Everyone Prepare
To make Monday's Celebration the Greatest Labor Day Event in the State.

The Pine Bluff Company

FOR SALE Handsome brick veneer home; two stories, bath on each floor. Big lot, this property is very valuable; it is near street car line. Address "Owner," care this newspaper.

"This Property is Very Valuable"
"It Is Near Street Car Line"

How often you see this statement or its equivalent in a for sale or rent ad?

Many people think of street cars as of value only to those who use them.

These advertisements serve to emphasize what everyone knows: the street railway—like other public utilities is an asset, a big asset, to the community.

Everyone benefits through the operation of the street cars. They make property more valuable and promote the growth of the city. Take the street cars out of a city and see what happens. Real estate values slump; people move away; business goes on the blink; the town is like a deserted cemetery.

It is to the interest of the capitalist, as well as the salaried man, to see that the car lines prosper

The Pine Bluff Company

The Pine Bluff (Ark.) Company has been running a series of newspaper advertisements in its publicity campaign. Some of these are shown for the ideas they may suggest for use elsewhere.

Costs Go Higher; Wages the Same!

While wages of most workers have been increased, there's one class of servants whose pay has not been advanced in keeping with the higher cost of service. This is the public utilities.

"Fuel and Lighting Materials Increased in July 2 1-8 Per Cent," says The Bache Review of August 21, an authority on business conditions. The Bache Review reports that while there has been a decline in wholesale prices of some commodities, prices are still above those of July, 1919, "food articles having increased during the year 24.1 per cent. and **fuel and lighting 47.4 per cent."**

Than the Public Utilities there are no more loyal servants. They are ever at your command—furnishing transportation, light and power, or water at a wave of the hand, the turn of a switch or twist of a spigot. They are willing, but like children, they cannot thrive and grow and maintain maximum efficiency unless properly nourished.

Is Your Child Under Weight?
Feed him balanced rations, that you may prevent tuberculosis. Thousands of Arkansas children are undernourished.
Jefferson County Public Health Association.

The operating costs of public utilities have increased tremendously, you know you are paying them practically the same wages as five years ago.

The Pine Bluff Company

been made to get down to the concrete facts in relation to motion picture films, that the detail of getting the film shown—in other words, in getting the thing we call "circulation" in newspapers—is one to be considered first and always, instead of last as it usually is. The film that isn't shown doesn't do much educating.

BERNARD J. MULLANEY,
Director.

Film Publicity So Effective that Expense Should Be Secondary

CHICAGO SURFACE LINES

CHICAGO, ILL., Oct. 26, 1920.

To the Editors:

Accepting the invitation for criticism and suggestions on the "Next Step in Publicity Work" editorial suggestion in your issue of Sept. 25, page 604, I am pleased to outline my views on a subject which should be considered seriously by the industry.

There is no question in my mind but that the average citizen could be reached most surely and most effectively by the "movies," and if each electric railway company could afford to produce and circulate its own appeal by the far-reaching film story the results would be more than worth while. For many companies, of course, this means of publicity would prove too costly. The next proposition, then, is to have the industry "get behind" a national railway film.

As your editorial points out, "the success of any motion picture publicity will depend on the character of the film." Herein is the real problem. Can a scenario be prepared which will tell the story desired by the electric railways and at the same time prove interesting to the public and acceptable to the managers of the motion picture theaters? Upon first thought one might answer "yes," but when one thinks of the various sizes of railways to be suited and of the widely different classes of audiences to be reached the answer does not appear so easy.

I recall an interesting film of this character which I saw some years ago telling the story of progress in steam railroad transportation from the beginning up to the latest electrified locomotive. A similar story for electric railways would be easily prepared, but to my mind this would not reach the object desired, namely, a more sympathetic understanding of the electric railway problem. Another film which I saw was used in the campaign for a new franchise for a railway company. It pictured some of the improvements contemplated, including extensions to parts of the city which were urging better transportation. Another "movie" which suggested the value of this medium for reaching a large portion of the public was the film shown by the Kansas City Railways at Atlantic City recently. Many of your readers probably have seen the series of films issued in the name of the Ford Motor Company telling the story of various industries. These films appear to represent a high character of workmanship and they undoubtedly interest the average spectator. One noteworthy feature is that they tell their several stories briefly. This element should be borne in mind in any scenario issued on behalf of the electric railways. The "story" must not only be interesting, it should also not be dragged out. It is quite likely that the "national railway film" will in the end develop into a series of films—one series, perhaps, telling the story of the interurbans and another the story of the urban systems.

The difficulty will be in having leaders of the industry agree on the essentials of the story to be presented. If this can be done the new factor in publicity work is bound to be so effective that expense should be considered a secondary element. It might even be worth while for the Committee of One Hundred to offer a cash prize for the most satisfactory scenario presented.

J. V. SULLIVAN,
Assistant to the president.

Suggestions for a Series of Films Which Must Be Short to Succeed

WINNIPEG ELECTRIC RAILWAY

WINNIPEG, CANADA, Oct. 22, 1920.

To the Editors:

The "call to arms" in the interests of publicity for the street railway industry, sounded by the ELECTRIC RAILWAY JOURNAL in its Sept. 25 issue, is opportune. The success which has attended the inauguration of a policy of publicity, as various records of companies will show, should prompt all interested in the future of electric railways to give further thought to this phase. Further research in the question of "putting publicity over" is fully warranted by the results so far achieved, especially so when one considers that publicity for street railways is a comparatively new development.

In contemplating the future, the opportunity for development seems to be not so much in "what story to tell" as "what is the most effective medium of telling it." It does not appear that there is much left unsaid by the various publicity campaigns which have been carried on in all parts of the country. Certain it is that if these had only been 100 per cent effective there would be no further need of publicity. So, while the street railway "stories" can be told again and again in a variety of forms, there remains to be developed new and more effective avenues of telling these stories.

The suggestion of the JOURNAL that the motion picture field is worth considering as the next possible step in street railway publicity is worthy of the most serious consideration. To the questions as to whether the street railway story can be told in motion pictures, and if, when told, such pictures can be placed in motion picture theaters throughout the country, I would answer emphatically "Yes." It has been my experience that motion picture theaters are open for the exhibition of advertising films in return for free advertising on the street cars, such advertising to take the form of window or dashboard posters.

A brief reference might be made to the public market which the motion picture field offers. In a city of, say, 200,000 people there will be an average of twenty-five motion picture houses, showing to audiences aggregating,

Rhymes of the Underground

Adolphus Minns resides at Kew
And does what people ought to do.

In boarding trains his instincts are
To "let 'em first get off the car,"
Then "hurry up" himself to enter
And "pass along right down the center."

Though nigh his destination be,
No selfish "door obstructor" he;
Rather than bear such imputation
He'll travel on beyond his station.

His unexceptionable ways
E'en liftmen have been known to praise—
A folk censorious and, as such,
Not given to praising overmuch.

Small need have they to shout a grim
"No smoking in the lift" at him,
Or ask if he's the only one
For whom the lift is being run.

Adolphus Minns, who lives at Kew,
Does all that people ought to do—
Retires to bed before eleven,
Is up and shaved by half-past seven—
And, when he dies, he'll go to Heaven.

Perhaps he's gone; I've never met
His like at Kew or elsewhere yet.

—From *Punch*, London.

weekly, 250,000 people. Of these picture houses, six will be classed as "first run" houses, which will not show films as a "second run." This means that five of the twenty-five theaters will not show a film, but the remaining twenty will. A conservative estimate will place the number of people which these twenty theaters play to in one week at 150,000. In larger cities the figures are correspondingly increased.

In Canada one of the large steam railway companies has started a news film service, which is carried by a chain of vaudeville houses. A few interesting "news" views are shown, ending with views of scenery or holiday resorts and fishing retreats reached by the line of that railway, although the people are not told in the film that they have to take this line to reach the places shown. If a steam railway finds it profitable to put on a film of this nature for the purpose of increasing passenger traffic, surely the electric railway companies of this continent will find it a good investment to show a series of films designed to effect a more thorough understanding between the public and street railways regarding the problems confronting them. It would appear that if the motion picture field is to be fully developed it should be on a national basis, with pictures sent out by a national syndicate and with the costs of operating such a syndicate borne by a pro rata assessment on the various company members.

The next question and a most important one to be considered is the matter of the character of the films. The films must be acceptable to the public and acceptable to the motion picture manager. The story to be told of the street railways is a long one and should be divided into a series of small films averaging 750 or 1,000 ft. in length, each film to be definite and complete in itself. Just by way of suggestion as to what these films should be, I think that it might be well first to depict the construction of a street car, tracing the treatment given the wood, steel and other material from the time they enter the factory to the finished product, like "The Making of a Ford Car." Very few street car patrons have any conception of the intricate motors and massive machinery hidden by the floor of the street car on which they are traveling. This film would carry smart subtitles and would close with a bill summarizing the costs of construction. It might be advisable to contrast these costs with pre-war figures.

A second picture might very well deal with unique street car accidents. Every street railway has a record of some unusual accident which can be easily portrayed on film and such a film might show how such an accident might have been avoided. Exhibition of such a film would hold public interest and be of tremendous educational value.

A third film to be sent out from this "American Electric Railway Cinema Syndicate" might very well deal with the history of transportation—always an interesting story. The development of street cars, from the old horse cars with their inconveniences to the present-day cars with their "elegancies of travel" would be shown, with views of the new one-man cars.

The question of "service" might be dealt with in a fourth film. Views could be taken of the carhouses of some large system, showing the preparations made just prior to rush-hour time. Next view might show a factory with thousands of workers pouring out into the yard and the cars lined up in procession ready to deal with them. Here and there a view of queue formation might be shown, with a hint that this method of loading means quicker service. It occurs to me that the handling of crowds and the various methods adopted would almost occupy the length of a film itself, if all the various factors were to be depicted. Other views would show snow sweepers in action, while others would show the "dispatching" offices and other interior workings of some of the big systems. All these factors would have a cumulative effect in impressing the public with the amount of service they receive for their few cents.

A fifth film might be confined entirely to the inner workings of a street railway company. Views of the machinery which sorts out the nickels, the dimes, the pennies, and also the tickets might be shown; also the mass of pennies received in one day, and what becomes of them. Other interesting labor saving devices might well be shown with interest to the public and benefit to the companies. This film might also carry some views of how complaints are handled, and giving an insight into the trainmen's training school.

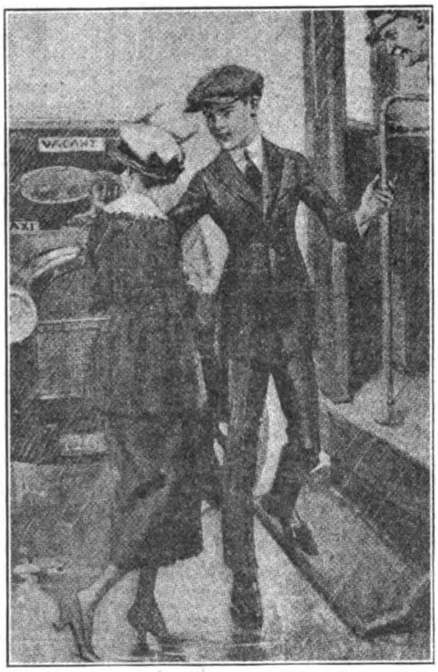
And so on. I should think that probably a dozen or more such films could be developed and sent out to the various cities. A reel or two would have to be devoted to the financing end of the street railway business. A story might be told along the lines of "Autobiography of a $100 note," representing the year's savings of a young man. He withdraws it from the savings bank, places it in a trust company, which in turn puts it with others to buy street railway securities. The interest which this $100 should rightly earn might be shown in the form of a cartoon. First we see, say, a $10 bill on the screen, representing the interest. Along comes a jitney and takes a slice of it. Then comes franchise taxes and impositions and takes another slice; a Ford car takes another slice, and finally along comes old man H.C.L. and swallows the remainder.

I believe any company which is able to place a series of, say, a dozen such films in several of the leading picture houses in the city in which it operates will find a wonderful return for the comparatively small amount of money required to have the films made.

I would close with a warning—don't attempt to make one long picture telling the street railway story. Motion picture houses positively will not show them. The only chance whereby it is possible to get industrial films shown is by limiting them to 500 or not more than 1,000 ft. I know several large concerns which have had long industrial films made for advertising purposes, at enormous expense, and then have been unable to get them exhibited. Theater managers will take short industrial pictures; They will not take long films.

HERBERT C. HOWARD,
Publicity Agent.

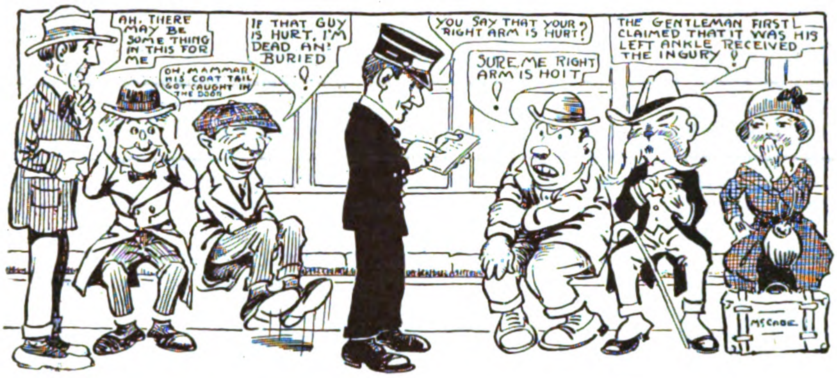
Merchants Can Help the Railways

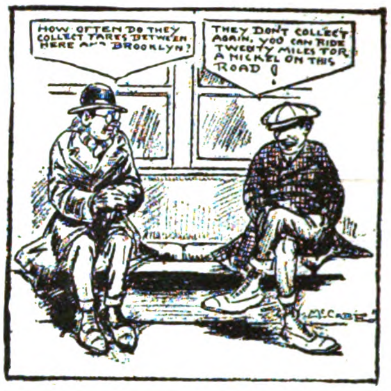


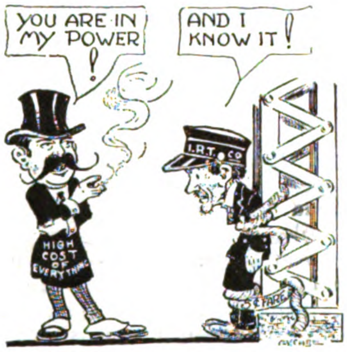
CLOTHING ADVERTISEMENT FEATURES ECONOMY OF CAR SERVICE

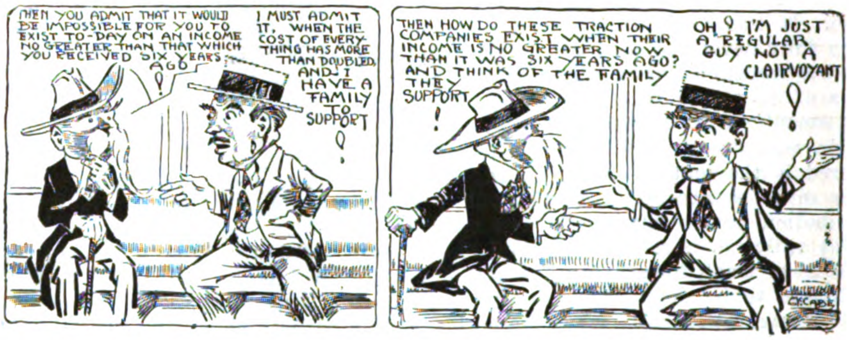
THE accompanying illustration is from an advertisement in the San Francisco *Examiner*. It is not a street railway ad either, but primarily features the clothing worn by the hero of the episode depicted, which are "Langham Clothes." While the young lady has her eye on the vacant taxi, her escort evidently prefers the car, in the interest of economy and safety. The comment made by the correspondent who sent in the clipping containing this advertisement was: "If the street car is to be featured with ready-made clothing as a modern thrift ideal, it may be said that electric railway publicity is at last beginning to produce results."

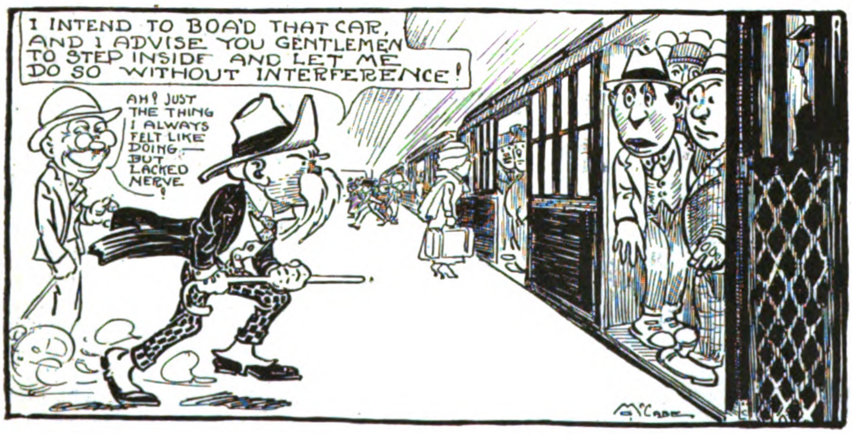
As Seen by the Cartoonist

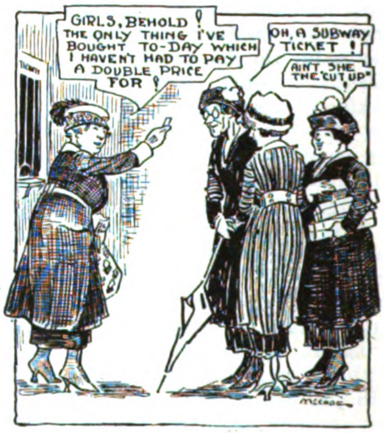

AH. THERE MAY BE SOME THING IN THIS FOR ME
OH, MAMMAR! HIS COAT TAIL GOT CAUGHT IN THE DOOR
IF THAT GUY IS HURT, I'M DEAD AN' BURIED!
YOU SAY THAT YOUR RIGHT ARM IS HURT?
SURE, ME RIGHT ARM IS HOIT!
THE GENTLEMAN FIRST CLAIMED THAT IT WAS HIS LEFT ANKLE RECEIVED THE INGURY!
McCABE

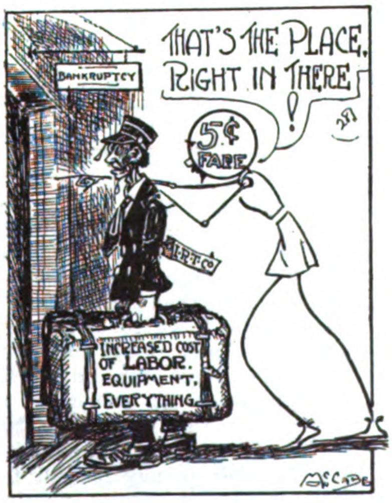

HOW OFTEN DO THEY COLLECT FARES BETWEEN HERE AND BROOKLYN?
THEY DON'T COLLECT AGAIN. YOU CAN RIDE TWENTY MILES FOR A NICKEL ON THIS ROAD!
McCABE

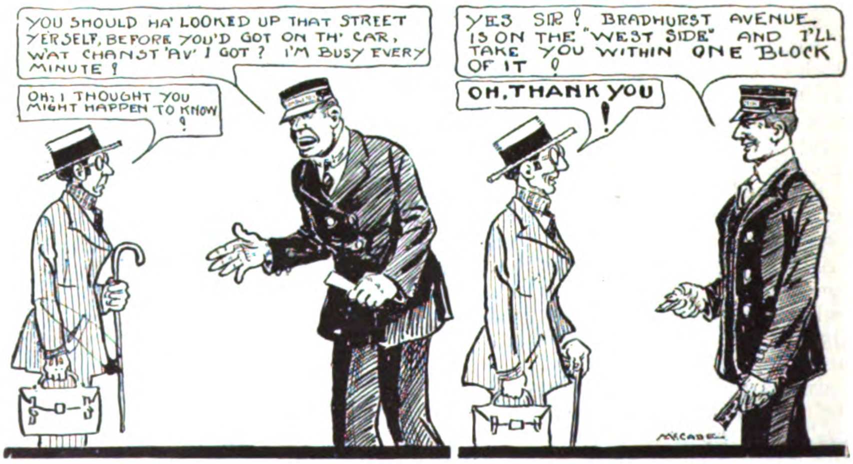

YOU ARE IN MY POWER!
AND I KNOW IT!
HIGH COST OF EVERYTHING
I.R.T. CO
5¢ FARE


THEN YOU ADMIT THAT IT WOULD BE IMPOSSIBLE FOR YOU TO EXIST TO-DAY ON AN INCOME NO GREATER THAN THAT WHICH YOU RECEIVED SIX YEARS AGO!
I MUST ADMIT IT. WHEN THE COST OF EVERYTHING HAS MORE THAN DOUBLED, AND I HAVE A FAMILY TO SUPPORT!
THEN HOW DO THESE TRACTION COMPANIES EXIST WHEN THEIR INCOME IS NO GREATER NOW THAN IT WAS SIX YEARS AGO? AND THINK OF THE FAMILY THEY SUPPORT!
OH! I'M JUST A "REGULAR GUY" NOT A CLAIRVOYANT!
McCABE


I INTEND TO BOA'D THAT CAR, AND I ADVISE YOU GENTLEMEN TO STEP INSIDE AND LET ME DO SO WITHOUT INTERFERENCE!
AH! JUST THE THING I ALWAYS FELT LIKE DOING— BUT LACKED NERVE!
McCABE


GIRLS, BEHOLD! THE ONLY THING I'VE BOUGHT TO-DAY WHICH I HAVEN'T HAD TO PAY A DOUBLE PRICE FOR!
OH, A SUBWAY TICKET!
AIN'T SHE THE "CUT UP"!
McCABE


THAT'S THE PLACE, RIGHT IN THERE!
BANKRUPTCY
5¢ FARE
I.R.T. CO
INCREASED COST OF LABOR. EQUIPMENT. EVERYTHING.
McCABE


YOU SHOULD HA' LOOKED UP THAT STREET YERSELF, BEFORE YOU'D GOT ON TH' CAR, WAT CHANST 'AV' I GOT? I'M BUSY EVERY MINUTE!
OH; I THOUGHT YOU MIGHT HAPPEN TO KNOW!
YES SIR! BRADHURST AVENUE IS ON THE "WEST SIDE" AND I'LL TAKE YOU WITHIN ONE BLOCK OF IT!
OH, THANK YOU!
McCABE

Mr. McCabe, who draws for the "Interborough Bulletin" and "New York Railways Employees' Magazine," has a happy way of picturing the needs for a higher fare on the New York transportation systems, as well as some of the foibles of the traveling public. This selection of some of his recent cartoons in these publications includes several of "Colonel Biff," who is always ready to say and to do the right thing in the right place at the right time.

The Job of a Public Relations Representative*

How a Newspaper Man for Twenty Years Analyzes the Problem of the Electric Railway in Getting Its Story Over to the Public—The One Big Rule to Follow Is to Know the Man to Be Reached and to Talk His Language

By FRED A. CUMMINGS
Public Relations Representative Eastern Massachusetts Street Railway, Boston, Mass.

I WISH to make it plain at the start that I am not a street railway man. I am fundamentally a newspaper man, having worked for twenty years on the territory of the old Bay State system, and as such I did everything possible, both as editor and reporter, to put the railway in wrong. I don't desire to take back anything I said about the old régime of the Bay State, however. I was one of the most hostile newspaper men in the region. I was strong for the proposals of organized labor on the system and felt that the people at the top were a bunch of "highbrows" and were unable to handle the "lowbrow" element which actually operated the property.

I have been with the Eastern Massachusetts Street Railway for about a year now and I wish to state that I am all over my hostility, for I have seen the other side. I wish to emphasize, though, that the hostility in the newspapers toward the street railway seems to me to be because the street railway has never attempted to maintain cordial relations and to obtain the viewpoint of the man who sits at the city editor's desk. The average street railway man thinks a newspaper man is excess baggage and has the aim in life to give the street railway the worst end. This emphatically is not so. The street railway man must study the problems of the man at the city editor's desk and make it possible for him to get the right slant on news of all sorts. In general, the reason why the public is so misinformed is that the street railway has not come half way in explaining its difficulties to the newspapers.

My first act upon joining the staff of the Eastern Massachusetts system was to take a ride over the entire system. I then expressed myself to the managers of the property that this railway is a public institution and any man in the district which the railway serves has a right to ask any question with reference to its operation. Full and complete publicity to the community served is by far the best policy. Further, the manager, when he is talking to newspaper men and when he is acting in charge of his property, should think "What would I do if I owned this property?" and then act in accordance with the answer to that question. Railway managers should get in close touch with newspaper men, who above all others probably have the feel of the pulse of a community, and the newspaper men are then only too glad to make sure that they get the right story on all street railway matters from the manager.

My own duties have to do with more than publicity in that I have a general undefined "department of public relations." Frankly, I started with the idea that the top man tried to scheme his best to put down the man underneath. As frankly I now admit my error, for, as I have investigated electric railway situations, I find that the man at the top comes more than half way in his treatment of the men on the property. But the fellow at the bottom is not so constituted as to come half way until the manager proves to him his integrity and honesty of purpose. The public relations man is an important factor in this last act. If I may cite one case of my own experience: I asked leave to speak to a large group of men who were contemplating making trouble on the property and was unanimously refused. When these men gathered the next day, however, I was there on a platform telling these men in their own language that they had the wrong dope and proved to them the good intentions of the management and showed them that the management was acting upon these good intentions.

One of our problems in Massachusetts has been the elimination of jitneys, and we rid ourselves of this type of competition by intelligent organizing of public information as to exactly what it meant if the jitneys were allowed to continue to operate. I went to each newspaper and put our entire analysis of receipts and expenditures on the table of the city editor. I told him I was ready to answer anything he desired to know; that the company was in a life and death struggle and asked for a fifty-fifty chance in treatment of its situation by his newspaper. We did not ask any favorable editorial treatment, but asked for fair play, and got it. There was, naturally, some strategy in the elimination of jitneys in some of the towns and it was necessary to take definite stands in order to impress upon the communities the actual facts of the situation and the seriousness of the condition of the company with continued jitney competition.

In this connection I would emphasize that no whiner gets any sympathy. It is necessary to send some one out who can and will say "liar" when it is necessary. This sometimes brings a charge of arrogance against the railway man, but our experience has been that the final result is an appreciation on the part of the public that we knew our business and were working for the good of the community, as well as for ourselves, and we finally came to an agreement with the community.

Now where do electric railways get off? We are hedged in on all sides by public utility commissions, but no commission in existence will be allowed by the public to make a street railway operate at a loss, if the street railway itself will spend a little money in the right kind of publicity. Electric railways in the past, however, have hired too many publicity men who thought only of the creases in their trousers and the flowers in their buttonholes. It is necessary to mingle with newspaper men and get in with them. Usually the best publicity men are lower down in the ranks; those who get the jobs, however, are generally better with their mouths than with the typewriters.

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*Abstract of address delivered before the joint meeting of the New England Street Railway Club and the Providence Section, American Electric Railway Association, Providence, R. I., Oct. 7, 1920.

The trouble with you electric railway men is that you don't know the psychology of the public mind. You don't let the whole story get out. If you electric railway men are thinking of publicity, don't hire a man in whom you don't have entire confidence. Get one who knows the psychology of the newspaper office and the city editor's desk. It is absolutely necessary to get the state of mind of the city editor for all publicity work. You can be confident that a city editor will not lie or misrepresent, and often a city editor makes the best publicity man the railway can get hold of when he is correctly informed. But most of them start wrong. In our own district all Boston newspapers were instinctively against the street railway—all boys in the business grow up in that attitude. This is typical of other situations, and the newspaper men must be educated.

Furthermore, give the public answers to the questions it is interested in. People in general don't care about our financial condition in the abstract. What the public really desires to know is, why aren't the cars on time? Why aren't the cars clean? Why aren't trainmen courteous? Poor rails and cars get on the nerves of the public. If this is what the public wants to know, tell the newspapers why and tell them in the right way, and they will help you out.

Now I want to point out that if any other industry had been abused—had been assassinated, it might be said—as has the electric railway industry it would be dead and buried. The only thing that has kept the electric railway alive to date is its absolutely intrinsic necessity. On account of the industrial and transportation situation, there is a big future for electric railways, if only each man connected with the railways will convince himself that this is so.

One of the most interesting phases of my own experience as a public relations representative has been how the public takes hold of the one-man car. We operate at present 200 of these and have fifty more coming. We also operate some double-truck one-man cars. There were some organization troubles, but 90 per cent of the people on the Bay State system are perfectly satisfied. W. D. Sullivan, managing editor of the Boston *Globe*, said recently that the one-man car was certainly a wonderful idea and was proving so, especially in his vicinity. He wondered why it took electric railway men till 1920 to knock one useless man off of the car in justice to both the public and the men. The cheaper operation resulting from the one-man car makes wages higher and fares lower.

[In the discussion which followed Mr. Cummings' address, abstracted above, he clarified his attitude toward organized labor by declaring that street railways would make a mistake to try to change present conditions. He said he knew the men were 90 per cent good and that it was better to take care of the other 10 per cent, regardless of some of their dissatisfaction. One man may be a terrible demoralizer, but he must be educated.

With reference to one-man cars he said that the company first put in 200 Birneys and then added thirty two-truck one-man cars. From this experience the company decided to convert other two-truck cars to save platform expense only, as these cars fitted the track and traffic conditions met on the eastern Massachusetts system. The system as a whole is largely a one-man car property and both Birneys and double-truck one-man cars can be used.—EDS.]

Repair Shop Facilities and Equipment

Suggestions for Providing Proper Shop Facilities for Maintenance and Overhauling of Railway Equipment of Electrified Steam Lines

AT THE annual convention of the Association of Railway Electrical Engineers held in Chicago, Oct. 19-22, the committee on electric repair shop facilities and equipment gave a proposed arrangement for a repair shop of an electrified railroad.

The plan assigns a space for a storeroom and the committee recommends that the supply of those parts used only for motor repairs be carried in a substore at the electrical shop rather than in the general storeroom. If this is done the foreman of the shop will know at all times what material is on hand, on order and in the shop being made up, and he can be made responsible for keeping a well-balanced stock. By this arrangement a great deal of time will be saved that necessarily would otherwise be spent going to and from the general store for material, and a considerable saving in material should be effected, as practically exact amounts needed would be used and could be accurately charged to the various jobs.

Suitable storage rack should be provided in the main shop for incoming equipment to be repaired as well as finished work. This applies particularly to armatures and motors. A low, heavy table is desirable on which defective motors can be placed, thereby raising them above the floor level so that the workmen can more readily inspect and test them. Power circuits should be convenient to this table for all voltages used in the shop or division of the railroad for which this shop makes motor repairs. The table should be sufficiently large to accommodate easily the various testing instruments used in diagnosing the trouble. After it has been decided what part of the motor is in need of repair it can be torn down on the testing bench. The part in need of repair should then be placed in a box where all dirt can be blown from it by compressed air. This box should be provided with an exhaust blower so that dust and dirt will be taken away and deposited at some convenient point.

Ample bench room should be provided along the wall under the outside windows, and at each vise there should be a drawer for taking care of mechanics' tools, a gas and air connection, also a test lamp in the lighting circuit with permanent portable points to be used for general testing.

Winding racks for handling armatures and rotors undergoing repairs are necessary. These should be designed to take care of any length of armature to be handled, and preferably one head should be adjustable in order to cut down the total number of racks required.

DIPPING AND BAKING ARMATURES

There is some difference of opinion as to whether or not it is desirable to dip and bake an armature after it has been repaired. If it is decided that dipping and baking is desirable the armature should first be dried in an oven for ten hours at a temperature of 100 deg. C., the commutator and bright metal parts should then be taped with friction tape and the armature immersed and allowed to soak in the insulating material until all signs of bubbling cease, which will be at the end of about twenty or thirty minutes. When bubbling ceases it indicates that practically all of the air and moisture has been driven out of the windings and it should then be placed in a carrier on wheels in such a manner that the shaft will be perpendicular and immediately placed in the oven, where it should remain until the varnish is dried and hard. The temperature of the oven should remain at not less than 100 deg. C. By standing the armature on end the excess compound will drain out in such a way as to not throw the armature out of balance, as would be the case if it were laid on its side.

The committee recommends that the impregnating tank be sufficiently large to immerse completely the largest armatures and that a suitable cover be provided to cover the tank when not in use. The oven should be amply large to handle a number of the largest armatures at one time and doors should be provided so the armature carrier can be wheeled in.

MACHINES, COIL WINDING AND TESTING APPLIANCES

Other equipment that should be furnished in the shop includes a small lathe, drill press, foot-power squaring shear, coil-winding machine, taping machine or taping attachment, commutator slotting machine, as well as a rack for storage of conduit from engines undergoing repairs in the shop, a pipe bench and vise, bench for repairing and testing headlight turbines and shelving for miscellaneous material coming into the shop for repairs.

For railroads located a considerable distance from the large electrical manufacturing concerns the committee recommends the winding of all armature, field and stator coils, since with a good winding machine these coils can be very quickly assembled by a first-class workman, and by following this arrangement a large reduction can be made in the amount of store stock. If the attempt is made to carry coils for the various types of motors a large stock is necessary, whereas when coils are made up as needed, because of the fact that a great number of these coils are wound with the same size wire, it is only necessary to carry a comparatively small amount to take care of repairs. For example, consider three motors using the same size of wire in the coils:

	Amount of Wire	No. of Coils
Motor No. 1	75 lb.	50
Motor No. 2	60 lb.	40
Motor No. 3	90 lb.	60
	225 lb.	150

In order to have a sufficient number of coils available to rewind completely any one of these motors it would be necessary to carry in the store 150 coils of approximately 225 lb. of wire. If coils are wound as needed a supply of 100 lb. of wire would be ample stock to carry, as this amount would be sufficient to make up a complete set of coils for any one of the motors. Obviously if this practice is extended a large saving will result.

The committee recommends in connection with any repair shop a liberal supply of portable ammeters and voltmeters for all the voltages in use. It also feels that a megger is a desirable addition to the equipment of such a shop. By making regular insulation tests of motors in service with this instrument a great many motor defects can be detected and corrected before serious trouble develops, thereby considerably reducing the number of armatures and motors requiring complete overhauling.

In a repair shop that takes care of motor repairs on the rest of the road or division to which usually the entire motor is sent when it fails the committee recommends the installation of a generator in the electrical shop for use in testing out these motors after they have been repaired. The motor to be tested should be belted to the generator and the generator loaded by means of a water rheostat. In this way the motor will have been tested thoroughly before being returned to its original location.

Electric Welding for Railway Shops

Requisites for Successful Welding Are Emphasized and Economies that Result Shown in Report of Committee

IN THE report of the committee on electric welding, presented at the annual convention of the Association of Railway Electrical Engineers held in Chicago, Oct. 19-22, some facts of interest to electric railways were given.

The report stated that by certain methods various jobs can be safely and economically welded, but attention should be directed to three prime requisites that must be completely and thoroughly met if the application of the process is to be a success. (1) Proper material for making the weld; (2) rules and methods for properly using these materials, and (3) intelligent application of the process to the various mechanical devices or articles that are to be welded.

It should be realized by all that in any autogenous weld the best that can be done is to obtain good cast iron, cast steel or alloy steel in the weld, the casting in this case being the added metal in the weld, or, in other words, the weld itself. No effort should be spared to secure the proper materials for welding. If high grade materials are to be joined, whether the joint be in truck frames or boiler steel, the proper materials for constituting the weld should first be secured.

No expense or pains should be spared in an unswerving endeavor thoroughly to train mechanics until they are capable of making first-class welds with a high average of efficiency and factor of safety.

To secure success (or, perhaps better still, lasting success) in electric arc welding the co-operation of all concerned is an absolute necessity, including the mechanical engineer, the engineer of tests, or metallurgist, the superintendents of motive power and rolling stock, the master mechanic, the foreman and the operators themselves. Fully 90 per cent of all welds that have failed in service have been due to the use of the wrong welding material or unfamiliar or unintelligent application in the design, or inexpert execution of the weld.

The requirements necessary for securing good welds vary broadly, first by group and then by detail member or class. Group arrangement is as follows: Plate material, shapes, forgings, cast iron, cast steel and malleable iron, and yet another (and one which is just now coming to be a very important one), *viz.*, track steel.

The plate group may be subdivided into two classes, first, where free or loose plate material is welded, and, second, when welded in structural or vessel form, which may in turn be again subdivided into non-pressure, low-pressure and high-pressure vessels. All non-ferrous metals are classed together in a second general classification.

In conclusion, the committee feels that it would not be advantageous to submit a report at this time, other than the progress report which has just been outlined, because the present developments are in the evolutionary stage and the test data and research matter gathered during the past three years are not in shape to present at this time.

Letters to the Editors

Suggestion for New Dimensions of Safety Car

THE WILKES-BARRE RAILWAY COMPANY

WILKES-BARRE, PA., Oct. 27, 1920.

To the Editors:

At the joint meeting of the Transportation & Traffic and Engineering Associations on safety car operation, held at the Atlantic City convention, the discussion brought forth the fact that, in one instance at least, the present standard safety car is not considered as being of sufficiently ample dimensions for the service it would be called on to perform.

To meet the demands which would be made on it would necessitate increasing the weight from 16,000 lb. to between 18,000 and 19,000 lb., with the result that the present standard two-motor equipment may prove inadequate. To increase the motor equipment rating under present methods of motor suspension and gearing means a considerable increase in weight.

In order to keep weights down and to increase the clearances between the motor cases and street crown, the writer suggests that, instead of adhering to the conventional method of suspension, the number of motors per car be restricted to one instead of two and that this single motor be hung longitudinally on the truck with the ends of the armature shaft coupled flexibly to transmission shafts carrying worms meshed to suitable gears on the car axles.

In this way a single high-speed motor of small weight and dimensions may be used with greater efficiency than could be attained by splitting the load between two low-speed motors, each of half the rating of the high speed unit.

It is interesting to observe the relation between the costs and weights of a single high-speed motor equipment and a double low-speed motor equipment each motor of which is of half the rated capacity of the single high-speed equpment. Assuming the ratio of a two-motor equipment armature speed to a single motor equipment armature speed to be as 1 : 2.8, then the weight of one-motor equipment is about 41 per cent and the cost about 48 per cent of a two-motor equipment aggregating the same horsepower.

With regard to the worm drive the writer has been in touch with a manufacturer of gears of this type for automobile trucks and is informed that gear ratios as low as 1: 5 can easily be obtained and that their efficiency is very high and ranges from 92 per cent when new to between 97 and 98 per cent when worn in. The worm drive is quite noiseless in operation and will not bind the motor when the car is coasting. Being located in the center of the car axle it is freer from water and dust accumulations than would be a gear placed close to the car wheel.

It may be argued against this method of drive that all the eggs are in one basket and that should the single motor for any reason become inoperative the car would have to be pulled in. This is, of course, true; however, with the frequent service made possible with safety cars, no great delay should be incurred by such a mishap, as the following car could quickly push the cripple to a switching point and clear the road.

As against this argument, it will readily be admitted that one motor is easier to maintain than are two and consequently there is less excuse for a defective one-motor equipment than there is for a faulty two-motor equipment. Further, with a single-unit equipment the car and controller wiring should be reduced and simplified, thus removing, in part at least, another possibility of trouble.

While the suggestion outlined above may appear radical, it must not be forgotten that the whole safety car idea is itself a radical departure from what has heretofore been considered as standard practice, and if the scheme here presented is feasible and offers certain advantages ultra-conservatism should not be permitted to prevent its consideration.

J. KENNEDY MANN, Electrical Engineer.

Pole Shifting Is Not as Simple as It Looks

BROOKLYN RAPID TRANSIT COMPANY

BROOKLYN, N. Y., Oct. 19, 1920.

To the Editors:

I read with much interest the article in the Sept. 25 issue of the ELECTRIC RAILWAY JOURNAL relating to labor-saving devices used in Cleveland for pole shifting. From the number of requests that are continually received by railway line departments for the shifting of trolley poles it might appear that most garages are located so that the entrance run will come just where a trolley pole will interfere with the ingress and egress of automobiles.

The amount of work that is necessary for shifting a pole surprises the uninitiated, who appear to think that it means merely the digging of a new hole and the lifting of the pole out of the old location and dropping it into the new one. A recent request asks, "Will you be kind enough to have one of your men remove this pole about 2 ft.?" The pole referred to was made of steel tubing and weighed approximately 1,000 lb., so that it would be quite a job for one man to move. Aside from the weight there were attachments of span wires, feeders and other equipment, all of which must be taken care of and proper permits obtained from city authorities for their change.

Another request which I have seen stated that the only wire attached to a pole which it was desired to have moved was a span wire and that the pole could be moved by the builder's own employees, if the railway would permit them to do so. Investigation showed that the pole also supported a side feed pipe leading from a manhole in the street, through which a tap was brought from the underground cable up to the trolley wire. This pipe had been entirely overlooked by the owner and the moving of the pole would have required a change in the route of the pipe which would have necessitated the opening of the street and the rerunning of the pipe, which was quite an expensive job.

The shifting of a pole seldom improves a line, in so far as the railway company is concerned, and frequently it weakens it if the new location is more than a few feet from the old one. The shifting usually lengthens the section on one side of the pole and shortens the one on the other, and also if a pole on one side of the street is moved and its mate across the street is left in place the result is a skew span, which may cause trouble if the angle between the span and the trolley wire is made too acute. In any case such a location is unsightly.

As the railway does not gain by the transfer of the poles to another location, it is usual to ask property owners to stand all of the expense of the work. It is usually very hard to convince owners of the justice of this claim and many appeals are made to aldermen or other city officials to try to have cost of transference borne by railways. In all cases that have come to the attention of the writer these appeals have been of little value, and eventually the company has been authorized by the owner to shift the pole at his expense.

On the railway with which I am most familiar the only time when poles are moved without charge to the person requesting the change is when the building is high enough to permit of the attachment of the span wire to an I-bolt set in the walls of the building and when the pole to be moved is not carrying any wires except those supporting trolley wire. In such a case the pole can be removed and used elsewhere by the railway company and the burden of painting and otherwise maintaining the pole counterbalances the cost of removal. In such cases it should be necessary, however, for the house or building owner to agree in writing to the attachment to the building and further to agree to reimburse the railroad company for the cost of putting the pole back in its original location if he should later insist on the removal of the attachments from the building.

Some railways have regular printed agreements covering all the points mentioned. In one of these the agreement asks the railway company to remove a pole and to attach the span wires to the building by means of an I-bolt or bolt fastened into the wall. In this case the property owner grants to the railroad company the right to attach and maintain during the life of the agreement its span wires attached to the I-bolt. This privilege is granted for the term of one year only, but continues in force thereafter until the owner secures from the city authorities the necessary permits for setting and maintaining trolley poles in substantially the same locations that are occupied by the poles which are removed, the expense of setting new poles and of transferring wires from the building to them being borne by the property owner.

The railway company agrees that the form and manner of attaching the span wire at the building shall at all times be subject to the approval of the property owner, that the railroad company will protect and idemnify the owner against any claims for damage or loss arising out of the use of walls of buildings as a support for its span wires, and that upon its abandonment of the use of the building the privilege of attaching shall cease.

Such agreements have been used in a large number of cases with entire satisfaction to both parties interested.

G. H. McKELWAY,
Engineer of Distribution.

Association News

October Compilations by Service Bureau

DURING October the bureau of information and service issued the following bulletins:

Jurisdiction of Public Utility Commissions Over Jitneys, a compilation of replies from secretaries of commissions, showing the extent of control, requirements for permission to operate and a brief summary of the regulations imposed in each case.

Methods of Fare Collection on Zone Systems, a tabulation of replies to Data Sheet 208 issued by the joint committee on collection and registration of fares of the Transportation & Traffic and Accountants' Associations.

Cost of Materials, a tabulation prepared by several manufacturers bringing up to date the information submitted by them before the Federal Electric Railways Commission.

Confidential Power-Cost Data, a tabulation of replies received to Data Sheet 197a issued by the power generation committee showing the following items for thirty-four power plants: output, peak capacity, load factor, pounds of coal and B.t.u. per kilowatt-hour, and segregated costs per kilowatt-hour covering fuel, labor, maintenance, etc., and in addition a brief description of equipment and facilities.

In addition to the above supplements have been issued to the bulletins on wages of trainmen, cost-of-living studies, cities which have increased rates of fare and lists of cities of over 25,000 having no fare increases.

New Zealand Railway Electrification

RECENTLY, according to the London *Electrician*, the English Electric Company was awarded the contract for the electrification of the section known as "Arthur's Pass" of the Midland Railway of New Zealand. At present all the railways in New Zealand are steam-operated, but it is proposed to electrify this connecting link between the government railway system of the east coast and west coast of South Island. The section to be electrified includes a tunnel more than 5 miles long and a 3 per cent grade to the summit, 2,400 ft. above sea level.

The system to be used is 1,500-volt direct current with overhead contact and the power will be generated directly by geared-turbine sets. It will be necessary to operate the boilers on dust fuel taken from neighboring mines whose product is too poor for ordinary consumption.

Transportation in Paris to Be Unified

THE Paris Municipal Council and the Conseil General of the Department of the Seine have acquired all surface transportation lines in Paris, France. These are to be paid for in annual installments. The transportation lines will not be operated directly by the municipality, but through the medium of an operating company, which will receive interest at 6 per cent, out of which the operating company must pay taxes. Provision is to be made, however, for a reward to the operating company for good management.

Recent Happenings in Great Britain

Meeting of Municipal Tramway Association Outstanding Event—London's New Fares in Effect

From Our Regular Correspondent

The nineteenth annual conference of the Municipal Tramways Association was held in Cardiff on Sept. 15 and 16. The meeting was occupied almost entirely with questions of finance—that being the dominant topic here as it is in America. Fares, working expenses, cost of renewals, depreciation funds and economics in operation all claimed attention. There was general agreement as to the troubles, but no sovereign remedy for them as a whole was forthcoming. The value of the conference lay rather in the exchange of views and in the detail suggestions put forward. The president was Sir John Courtis, chairman of the Cardiff tramways committee.

TRAMWAY fares were dealt with in two papers by Councillor Higham, chairman of Blackburn tramways committee, and P. Priestly, manager of Liverpool Corporation Tramways. The former contended that in most towns the time had arrived for the abolition of the penny fare and also for sweeping away cheap workmen's fare. Mr. Priestly pointed out that many towns had obtained powers to increase the statutory minimum charge from 1d. to 1½d. per mile. Every passenger should pay his share of the expenditure. The short distance passenger should pay more in proportion than the long distance passenger.

A. L. C. Fell, manager of the London County Council Tramways, dealt with power expenses. How to obtain economy with the poor quality of coal now available was one of his points. The better education of all employees in economical methods was another. He would like to see a scheme under which the staff and the employees would have a direct financial interest in the success of the undertaking. The employment of a fully qualified chemist to carry on tests of fuel, water, etc., at the power station, the payment of bonuses to motormen and conductors for reducing power consumption and the use of trail cars were other suggestions.

DEPRECIATION DISCUSSED

Two papers on repairs and depreciation in relation to capital and revenue were presented by James Dalrymple, manager of the Glasgow Corporation maintained intact. Mr. Horsfield also ager of Cardiff Corporation Tramways. The former insisted on the necessity of providing a full depreciation fund out of revenue for the purpose of paying for renewals, and also of keeping the undertaking in thorough repair. Otherwise capital could not be maintained intact. Mr. Horshfield also urged the need for a depreciation fund in addition to the ordinary sinking fund. The tendency of some authorities to borrow for renewals should be checked at its inception.

The future of capital expenditure was the subject taken by R. S. Pilcher, manager of Edinburgh Corporation Tramways. It was his view that the cost of permanent way had become so high renewals of tramway track where the traffic was light could not be carried out, but that motor omnibuses or the trackless trolley system should be substituted. Such vehicles also could be used for extensions.

MILKING THE MUNICIPAL COW

The various papers were discussed at length. On the question of fares it was pointed out that in the case of small undertakings, as the routes were short, if the fares were too high the people would walk. Other speakers complained that in many instances municipal tramways had been turned into "a milch cow" for the relief of the rates and consequently had become practically bankrupt. The necessity of educating the public to realize the depreciated value of the penny was also insisted on. An exhaustive analysis should be made of conditions so as to determine what each fare ought to be.

On the subject of working expenses, one gentleman who said that the tramcar was the cheapest vehicle to run was of the opinion that it could be made a good deal cheaper if as much scientific attention was devoted to its improvement as to the motor omnibus. In regard to depreciation funds, some members took the view that in cases where capital had been nearly paid off renewals should be carried out by means of new capital. One prominent manager thought that having regard to the present high cost of renewals the ideals of authors of the papers on depreciation would have to go, and that reborrowing would have to be considered.

G. W. Holford, manager of Salford Corporation Tramways, was elected president of association for the ensuing year.

LABOR DISPUTE SETTLED

In the middle of September a settlement was reached in a dispute which threatened to have a serious effect on many electric traction undertakings. A number of men, members of the Electrical Trades Union, employed in the works of Cammell Laird & Company at Penistone, Sheffield, had struck work on the ostensible ground that one of the foremen was not a member of their union. Many foremen, however, are not members of the men's unions, and the real reason for the suspension seems to have been that this foreman had engaged some men who were not members of the union. The employers refused to give way on a question of principle and as the strike was persisted in the Engineering Employers' Federation issued lock-out notices applicable to numerous works throughout the country. The men's union then threatened to call out their members employed in electric generating stations. The National Joint Industrial Council for the Electricity Supply Industry was called on to inquire into the subject, but after it had met the men's union withdrew objection to the Penistone foreman. Then the employers withdraw their lock-out notices and soon peace reigned.

SHORT-HAUL FARE REVIVED

The increased fares on the London underground railways, the London County Council Tramways and the London General Omnibus Company's 'buses came into operation on Sept. 26. In all cases the new fares are above a penny a mile for short distances, but under that rate when the distances get up to 4 or 5 miles or more. A novelty, or rather a revival, on the tramways is the 1½d. fare, but now it covers only 1.2 miles, or less than half of what it did in pre-war days. As the result of the failure to come to an agreement (to which reference was made last month) between the County Council and the Omnibus Company, the latter on Sept. 27 inaugurated a 2d. midday fare for any distance (above minimum) within the tramway area so as to compete with the corresponding fares on the cars. These fares are in force only during the slack hours (10 a.m. till 4 p.m.), and they do not apply on Saturdays, Sundays and holidays. The company promises to give them a trial, to publish figures giving the exact results, and to challenge the County Council to produce its figures for comparison. The minimum ordinary fare on the underground railways and the omnibuses is 1½d., and a suggestion has been made for minting a halfpenny coin.

FARE INCREASE RESULTS APPARENT

Some results of the increase of fares were issued early in October. They related to the first complete week after the increases came into operation. On the railways the increase in fares averages 30 per cent, while the increase in traffic receipts was 25 per cent. On the omnibuses the fares were increased 25 per cent and the receipts for the week were up by 14 per cent. The difference is ascribed to a slight falling off in the number of passengers and to the passengers riding shorter distances. In the case of the London County Council Tramways the average percentage increase of fare is not stated, but the traffic receipts rose by 29 per cent.

An interim report by the Electrification of Railways Advisory Committee was issued on Sept. 30. The report, which is dealt with elsewhere in this journal, makes important recommendations as to future electrification, among them being that methods and appliances should be standardized and that the direct-current system at a pressure of 1,500 volts should be used.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Mending Mexico's Muddle

Committee Representing Bondholders Confers with Mexican Authorities—Properties Returned to Owners

Many matters outstanding between the Mexico Tramways and its affiliated companies and the government of Mexico are now under discussion with a view to reaching a settlement as quickly as possible. The electric railway in Mexico City was returned to its owners by the government last May. When the lines were handed back no indemnity was paid for their occupation for the period of more than four years. The present negotiations, it is believed, have given rise to the rumor noted in the ELECTRIC RAILWAY JOURNAL for Oct. 2, page 685, that the government planned permanently to municipalize the roads.

Since the return of the tramways the lines have been operated by the company with the end in mind of restoring the tracks and cars to proper operating efficiency as rapidly as possible. No funds were available for this purpose except such as were received from the gross earnings, but already much has been done in the way of improvement.

MORE REVENUE NEEDED

Owing to the continuous rise in the cost of living, it was necessary on several occasions to advance the wages of the employees of both the tramway and the light and power companies. In the case of the tramway an advance was made in fares, but it has not been possible so far to complete arrangements to increase these sufficiently to compensate the company for the advance in wages and general rise in the cost of materials. If the company is to pay its way, therefore, it will be necessary to establish a new scale of fares. It is hoped that a solution of the difficulty will be reached before long. The taxation of the companies, the payment of large sums owing to them by the government and various other important matters are also under discussion.

It is hoped that early in the new year the committee which represents the bondholders of the several properties will be in a position to make a report to the security holders with full information as to the financial position of the companies and what funds will be available for meeting their obligations. The committee will at the same time make such recommendations to the bondholders as they think will best serve their interests. Meanwhile, a firm of chartered accountants is working on the accounts with a view to establishing the exact financial position of each company. The report of these accountants should be completed soon and will enable the committee to determine what terms of settlement can be recommended to the bondholders.

E. R. Peacock, chairman of the committee representing the bondholders, and H. Malcolm Hubbard of the committee visited Mexico City last spring immediately after the revolution. Declarations of policy made at that time by those in authority were taken to indicate an improvement in the attitude of the former government and would seem to justify the statement that things are better in Mexico.

$5,000,000 Improvement Program

A $5,000,000 extension program for 1921 has been announced by G. J. Kuhrts, general manager of the Los Angeles (Cal.) Railway. The expenditure will cover new cars, a new division carhouse, new substations and extensive reconstruction of tracks and pavement. Recommendations of the State Railroad Commission of California will be followed throughout.

Reconstruction of track and purchase of track equipment will involve $1,600,000. Renewal of overhead equipment will take $300,000. A substantial investment will be made in new cars, but the exact amount and number of cars have not been definitely decided upon.

Four new substations are to be constructed at a cost of $500,000. One of these substations is to be built in the district which will benefit by a tunnel, giving another outlet from the congested district at Second and Hill Streets. Half a million dollars is to be spent on a new carhouse.

In addition to the expenditure for bettering railway service, the Los Angeles Railway has under way a $200,000 home building program for employees. The construction of the first homes has been started.

The Los Angeles Railway has made three important moves in the year now nearing a close: First, the rerouting of all lines last May to give economies recommended by the State Railroad Commission. Second, the installation of safety car service. Third, the application for increased fare. Los Angeles held to a 5-cent fare to the last, but the application for increase finally became necessary to make revenue meet operating costs. At this writing the commission has not given a decision, although Richard Sachse, its chief engineer, recommended in favor of a 6-cent fare and continuation of the safety car program. The railway operates approximately 775 cars a day.

New Publicity Committees

Ohio and Missouri Utilities Organize Committee to Spread Information and Educate the Public

Committees on Public Utility Information, patterned after the Illinois plan, have been organized in Ohio and Missouri. The Ohio committee will have offices at 901 Illuminating Building, Cleveland. It has engaged as director Benjamin E. Ling, a newspaper man of wide experience. The chairman of the committee is W. W. Freeman, president of the Union Gas & Electric Company, Cincinnati.

Among the railway men on the committee are the following:

Walter A. Draper, vice-president of the Cincinnati Traction Company; Col. J. H. Alexander, vice-president of the Cleveland Railway; L. J. Wolf, vice-president of the Cleveland, Southwestern & Columbus Railway.

COMMITTEE IN MISSOURI, TOO

These, of course, are only the railway men on the committee. There are some ten other members serving on that body representing the electric light, gas and other utility interests, all these men being executives of important companies.

The Missouri Committee on Public Utility Information will be conducted under the direction of the Missouri Association of Public Utilities with headquarters at 3725 North Broadway, St. Louis, Mo. The personnel of this committee is as follows:

E. D. Bell, general superintendent of the Illinois Traction System (Missouri properties), chairman; F. G. Buffe, general manager of the Kansas City Railways; H. Wurdack, general manager of the Light & Development Company, St. Louis; J. H. Horgan, general manager of the Empire District Electric Company, Joplin; W. J. O'Connor, assistant to president of the Southwestern Bell Telephone Company, St. Louis, and Wiley F. Corl, general manager of the Mexico Light & Power Company.

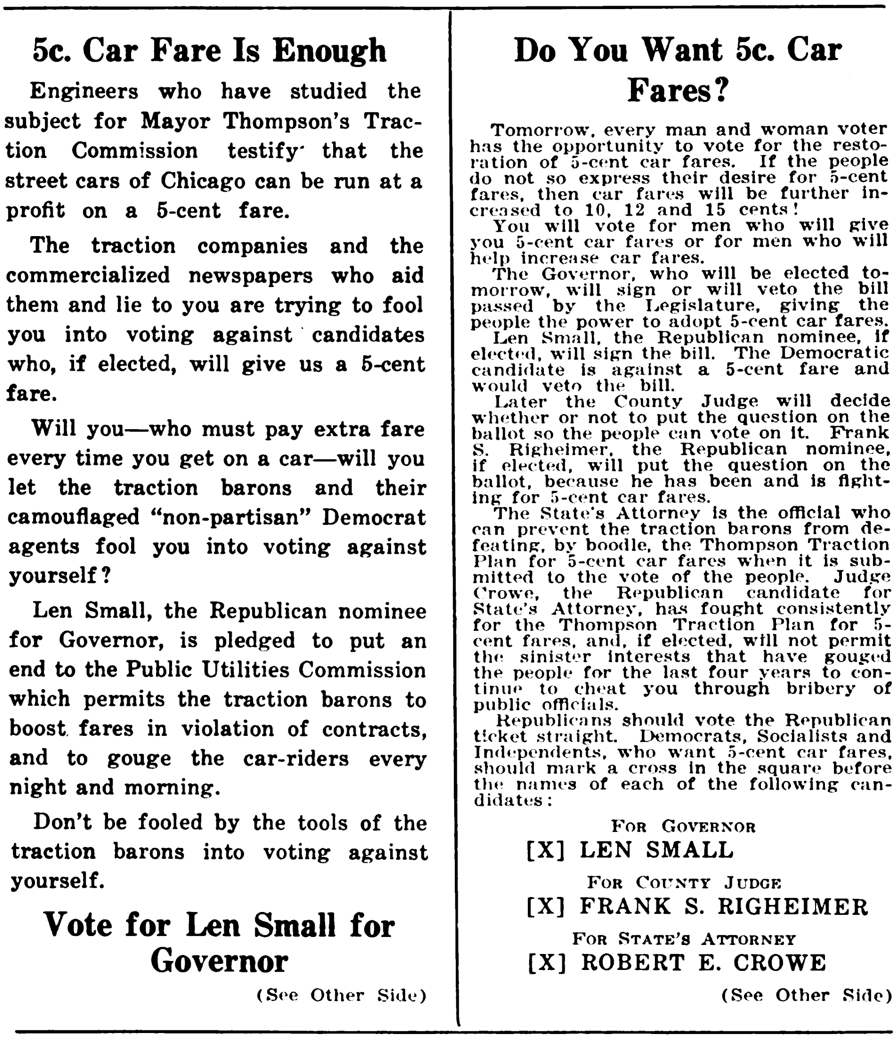
MANY SIMILAR BODIES

With the completion of these two new committees there are now organizations actively at work for the purpose of disseminating information about the utilities in Illinois, Indiana, Kentucky, Nebraska, Ohio, Oklahoma, Arkansas and Missouri. Wisconsin and Michigan have formed committees which expect to become active as soon as the election is over. In New York, Iowa, Texas and several other states definite steps have been taken looking toward similar action.

Utilities a Political Issue

They Are Dragged Into Campaign on One Pretext or Another in Many States

In only a few cases were railway issues involved directly in the results recorded at the polls on Nov. 2, but in a number of other instances the decisions made by the electors will probably have an important bearing on the future of public service properties. Perhaps the most important issue before the voters of a single community was the franchise proposal in Toledo, Ohio. Both service-at-cost and municipal ownership measures were submitted in that city. As noted at length elsewhere in this issue, the city adopted the Milner service-at-cost plan of settlement.



5c. Car Fare Is Enough

Engineers who have studied the subject for Mayor Thompson's Traction Commission testify that the street cars of Chicago can be run at a profit on a 5-cent fare.

The traction companies and the commercialized newspapers who aid them and lie to you are trying to fool you into voting against candidates who, if elected, will give us a 5-cent fare.

Will you—who must pay extra fare every time you get on a car—will you let the traction barons and their camouflaged "non-partisan" Democrat agents fool you into voting against yourself?

Len Small, the Republican nominee for Governor, is pledged to put an end to the Public Utilities Commission which permits the traction barons to boost fares in violation of contracts, and to gouge the car-riders every night and morning.

Don't be fooled by the tools of the traction barons into voting against yourself.

Vote for Len Small for Governor

(See Other Side)

Do You Want 5c. Car Fares?

Tomorrow, every man and woman voter has the opportunity to vote for the restoration of 5-cent car fares. If the people do not so express their desire for 5-cent fares, then car fares will be further increased to 10, 12 and 15 cents!

You will vote for men who will give you 5-cent car fares or for men who will help increase car fares.

The Governor, who will be elected tomorrow, will sign or will veto the bill passed by the Legislature, giving the people the power to adopt 5-cent car fares.

Len Small, the Republican nominee, if elected, will sign the bill. The Democratic candidate is against a 5-cent fare and would veto the bill.

Later the County Judge will decide whether or not to put the question on the ballot so the people can vote on it. Frank S. Righeimer, the Republican nominee, if elected, will put the question on the ballot, because he has been and is fighting for 5-cent car fares.

The State's Attorney is the official who can prevent the traction barons from defeating, by boodle, the Thompson Traction Plan for 5-cent car fares when it is submitted to the vote of the people. Judge Crowe, the Republican candidate for State's Attorney, has fought consistently for the Thompson Traction Plan for 5-cent fares, and, if elected, will not permit the sinister interests that have gouged the people for the last four years to continue to cheat you through bribery of public officials.

Republicans should vote the Republican ticket straight. Democrats, Socialists and Independents, who want 5-cent car fares, should mark a cross in the square before the names of each of the following candidates:

FOR GOVERNOR

[X] LEN SMALL

FOR COUNTY JUDGE

[X] FRANK S. RIGHEIMER

FOR STATE'S ATTORNEY

[X] ROBERT E. CROWE

(See Other Side)

ANTI-RAILWAY CAMPAIGN CIRCULARS DISTRIBUTED TO CHICAGO VOTERS

In Illinois candidates have been elected to office whose campaign pledges may result in conditions very detrimental to the best interests of the people of the State and particularly of Chicago. There was widespread objection to the methods and propaganda of the Mayor Thompson political machine, which in this election spread its activities from the city of Chicago to include the entire State. In consequence more than 300,000 people are said to have scratched their ballots and voted for democratic state and local candidates in order to defeat the Thompson republican candidates. Nevertheless, the avalanche has carried into office Len Small for Governor, and all of the other Thompson candidates.

The nomination and election campaign pledges of Mr. Small, working with the Thompson machine, were for the abolition of the Illinois Utilities Commission, the passage of laws making home rule and municipal ownership possible, and the restoration of 5-cent fares. So far as the activities of the Thompson machine were concerned, these three planks were the mainstays of the campaign platform. The accompanying illustration gives an idea of the spurious literature with which the people of Chicago have been flooded during the campaign. The Thompson machine candidates for County Judge of Cook County and State's Attorney in Chicago were also elected. The only success in the state against the Thompson machine was the nomination and election to the United States Senate of William B. McKinley, president Illinois Traction System and United States Congressman.

In New York State both the Republican and the Democratic parties had planks in their platforms dealing with the utilities. The Democratic platform put the party on record as opposed to legislation permitting state commissions to impair or modify contracts fixing rates of fare made between cities of the State and the railways. It was charged by the party that measures violating this principle were advocated by a Republican Speaker of the Assembly in 1919 and 1920. On the other hand the Republican platform proclaimed that there had been no efficient regulation of utilities; that the transit systems had disintegrated; that lines had been abandoned; that nothing had been accomplished for the public benefit, and that none of the pre-election promises of the Governor had been fulfilled.

In his speeches Governor Smith, elected by the Democrats two years ago, said that municipal ownership was the only solution of the transit problem and that such ownership was bound to come in New York and other large cities of the State. In the campaign taking points were made by the Republicans of the changes made in the Public Service Commission at the behest of Governor Smith, and by the Democrats of the alleged record of corporation activities of Judge Nathan L. Miller, Mr. Smith's Republican opponent. Judge Miller was elected over Mr. Smith by a small plurality.

REMOVAL OF COMMISSIONS REBUKED

In New Jersey the utilities were dragged into the campaign through the recent removal of the members of the Board of Public Utility Commissioners by Governor Edwards. There the election was a congressional one. Republicans captured all of the seats except one. Their victory is regarded as a rebuke to Governor Edwards, who campaigned for a Democratic legislative body to uphold him in his ousting of the members of the utility board. He is attempting to replace these members with a Democratic board. The Republican Senate has failed to confirm the new appointees. Mr. Edwards urged the voters to wrest the legislative control from the Republicans and give it to the Democrats. The bill was approved providing an appropriation for the vehicular tunnel under the Hudson River between New York and New Jersey.

In Rhode Island the Democratic candidate for Governor, Edward M. Sullivan, who was defeated, sought to make an issue out of the affairs of the Rhode Island Company He advocated the acquisition by the State of all the electric railways and their operation by the State through a special corporation chartered for that purpose.

Citizens of San Francisco had before them a charter amendment to provide an enabling act to make it possible to submit to the voters a proposition to acquire the United Railroads. It is believed that the amendment was approved. It required only a majority vote to carry the amendment, but in the matter of issuing bonds to finance any proposal for taking over the United Railroads a two-thirds vote will be necessary.

Residents of Pasadena, Cal., voted against building a municipal electric railway between Los Angeles and Pasadena to compete with the Pacific Electric Railway. This is the second time within a year that the plan has been defeated.

Increase Again Denied

Seattle's Mayor Again Points Out How Impossible It Is to Increase Municipal Railway Wages

Mayor Hugh M. Caldwell of Seattle, Wash., has advised the representatives of the trainmen of the Seattle Municipal Railway that he will not confer with them on the matter of wage increases. The request of the men, if granted, would cost the city $500,000 a year.

The representatives of the union recently requested the Mayor to confer with them on a proposed wage increase. In reply, Mayor Caldwell advised them that they had become civil service employees, and enjoyed no special rights as city employees by reason of their union membership. He also pointed out that the railway department has no power to enter into a contract with a union, and that requests for wage increases must go before the City Council.

SEVENTY-FIVE CENTS AN HOUR ASKED

Surprise was expressed by the Mayor at the men's request, in view of the fact that the railway is about $500,000 in the hole, aside from depreciation charges. Mayor Caldwell called attention to the fact that a letter addressed to the budget committee of the Council on July 20 of the present year requesting an increase in pay indicated that the trainmen recognized the fact that they were civil service employees, and subject to civil service regulations. The request of last July was denied. The Mayor reiterated the fact that no other officials of the city government have any authority to grant any increase of pay to city employees.

Mayor Caldwell referred the application for increase to D. W. Henderson, superintendent of railways, who submitted an estimate, based on figures for August of the present year, showing that expenses would amount to $496,615 annually if the city should grant the advance requested. An increase of pay to 75 cents an hour would amount to an advance of 11.7 per cent over the present scale.

Mr. Henderson pointed out that wages of trainmen have increased 64 per cent to 80 per cent over those paid on Jan. 1, 1918. The Mayor also called attention to the fact that trainmen are now receiving two weeks' vacation, with pay, a privilege not granted under private management. This alone is costing the municipal railway approximately $100,000 a year.

Voters Approve Service at Cost

City of Toledo and Railway Will Now Proceed to Put New Arrangement Into Effect

Toledo adopted the Milner service-at-cost plan of street railway settlement and turned down an anomalous municipal ownership proposition by a vote of nearly three to one at the election on Tuesday. There were 45,990 votes in favor of the service-at-cost measure and 18,029 against. This is the first time that a constructive street railway measure ever won out in Toledo and it is also the most decisive vote on any referendum ever submitted to the people.

THE election assumed national importance on account of the interest taken in the long years of struggle over the railway question in Toledo and because women were to express themselves for the first time on traction questions.

The returns by precincts show that the women are largely responsible for the tremendous majority given the Milner plan. In the Seventh Ward where women were registered in a larger percentage to men than any other, the franchise ordinance passed almost unanimously.

The municipal ownership twin bond ordinances were defeated by wider margins. The first one, ostensibly to provide $3,000,000 bonds for the purchase of buses for auxiliary service to the railway system, was defeated by a vote of 16,469 in favor and 46,369 against. The second municipal ownership ordinance, purporting to provide $4,000,000 through bonds for constructing lines, was defeated with 17,780 votes in favor and 43,125 against.

The drubbing handed to the *News-Bee*, a Scripps-McRae newspaper, was complete. It campaigned against the railway ordinances and individual candidates in the elections and was rebuked for its years of fighting against the Toledo Railways & Light Company.

Frank R. Coates, president of the Rail-Light, expressed satisfaction with the returns and declared that the company would proceed with improvements and additions to many other departments of its business.

The ordinance will probably accomplish its task of providing service-at-cost to the Toledo patrons within the next ninety days. That is the period allowed for the acceptance by the Toledo Railways & Light Company and the Community Traction Company, created by the measure.

This acceptance has been agreed upon by the directors of both companies and a written copy of it filed with Mayor Cornell Schreiber last August.

The matter of making the ordinance a binding contract on both the city and the railway is now only perfunctory.

A fare of 6 cents cash and 1 cent for a transfer is provided for in the ordinance. This will go into effect and reduce fares and transfers each a cent when the cost-of-service plan begins to operate. The fares will remain this way for six months, after which time they will be regulated by the amount in the stabilizing fund. The company will be asked to furnish $500,000 as working funds to put the measure into effect.

The next move will probably be the appointment of a board of control to consist of three members—one for two years, one for four years and one for six years. All others shall be appointed at the end of these terms for six years.

On recommendation of this board the Mayor will also appoint a railway commissioner who will represent the city in the operation of the system. The board will fix his salary and appointments of assistants will be subject to its approval.

One of the first duties of the board of control will be to study a plan for re-routing the present car lines and making plans for a crosstown line. The company has agreed to furnish an additional $1,500,000 for these changes.

The return to the Community Traction Company shall be based upon the valuation of $8,000,000 and the bonds representing this amount will draw 6 per cent return. All additional financing shall be by preferred stock which will yield 9 per cent.

The plans voted on Tuesday were prepared under a settlement plan brought forth by Judge John M. Killits of the federal court at Toledo following the bringing of the cars back to the city after the famous "ouster" of a year ago.

The progress made in educating the public of Toledo is indicated by the change from a favorable vote on eliminating of street cars a year ago next Tuesday to an overwhelming vote in favor of a franchise last Tuesday.

Both the city and the company will make active arrangements to put the plan to work.

Charter Amendment Probably Passed

Although final returns on charter amendment thirty at San Francisco, Cal., were not expected to be in until Nov. 4, it was the opinion on Nov. 3 that the amendment had carried, probably by a two to one majority. This amendment provides a simple method whereby city officials can agree with utility officials on the price and terms for taking over a property and then submit to popular vote for ratification any proposal for the purchase of a utility. Amendment thirty and the ratification procedure it proposes both require only majority votes to carry. At present San Francisco has no authority to agree with any utility on the purchase price of a utility except after a bond issue for the express purpose has been carried. Such bond issue requires a two-thirds vote. No direct proposal for the purchase of the United Railroads was voted upon.

News Notes

Advance for Sacramento Employees.—Platform men of the Pacific Gas & Electric Company, Sacramento, Cal., have been granted an increase of 4 cents an hour and shop employees have been given a rise of 9 cents flat. The motormen and conductors have been receiving 47, 49 and 51 cents an hour. This is the second wage advance by the company within a year. The last one took effect in May.

Voters Defeat M. O. Plan.—Residents of Pasadena, Cal., voted on Nov. 2 against building a municipal electric railway between Los Angeles and Pasadena to compete with the Pacific Electric Railway. This is the second time within a year that the plan has been defeated. The vote was practically five to one against the plan, returns from forty-five out of seventy precints giving 2,215 in favor of the proposal and 5,561 against it.

Order for Arbitration Ignored.—Gaylord Thompson, general manager of the New Jersey & Pennsylvania Traction Company, Trenton, N. J., has sent a communication to the City Commission of Trenton stating that his company will not arbitrate the recent trouble of the employees. The company says the motormen and conductors who went on strike have been discharged and that the city's order for arbitration at this late date will be ignored.

Receiver Plans Collective Bargaining.—Lindley M. Garrison, receiver of the Brooklyn (N. Y.) Rapid Transit Company, made public on Oct. 30, a letter received by him from Federal Judge Mayer urging that his promise to Mayor Hylan that the right of collective bargaining between the company and its employees be carefully safeguarded, and Mr. Garrison's reply to the effect that a plan of co-operation was being prepared and would shortly be submitted to the court. It has been reported that the employees are engaged in creating a brotherhood similar to that of the employees of the Interborough Rapid Transit Company.

Object to Rebuilt One-Man Cars.—The local of the Amalgamated Association at Boston has announced that a communication has been sent to William D. Mahon, president of the Amalgamated Association, urging him to come to Boston to discuss the friction between executives of railway systems and the unions over the double-truck one-man cars. Some time ago the wage conference board of the union of employees of the Eastern Massachusetts Street Railway sent a similar request to Detroit, the headquarters of the International, in which it was pointed out that the men of that system were in open revolt against the one-man cars in some of the cities and towns through which the Eastern Massachusetts Street Railway operated.

New Orleans Men Sign.—J. D. O'Keefe, receiver of the New Orleans Railway & Light Company, New Orleans, La., and James Rodgers, representing the local division of Amalgamated Association, on Oct. 21 signed a contract under which the men will be paid at the rate of 49, 52 and 55 cents an hour. The agreement is to stand until July 1, 1922, the wage scale being subject to further revision on July 1, 1921. By the terms of the contract the men are barred from striking to enforce demands for higher pay. The new wage scale represents an increase of 25 per cent over the former rates, and was recommended by the special masters who arbitrated the dispute between the company and its employees following the strike of last July. Payment of the new rates began on Oct. 21.

Housing Plan Progressing Satisfactorily.—Nearly 300 applications for participation in the housing plan of the Los Angeles (Cal.) Railway have been filed by employees. The majority ask the company to purchase a lot and build a house. The other proposals offered are that the company build a house on land owned by an employee or that the company finance the purchase of a house and lot selected by an employee, or that the employee rent a house built by the company. Twenty-five cases have already been handled and work on the first seven bungalows has been started. To guard against speculators offering to help an employee complete the payment on a home and then re-sell it to some one outside the company, it is stipulated that the deed shall not pass from the company to the employee within five years. Payments for houses are arranged like rent. The maximum period for buying a house is fourteen years.

Favor Illinois Utilities Commission.—The Illinois Committee on Public Utility Information has just printed an interesting page containing thirty-eight excerpts from various Illinois newspapers on so-called "Home Rule" in Illinois. Editors have given much space in their papers of late to the proposal recently discussed in the large cities of Illinois that all public utilities should be ruled by individuals and not governed by Public Utilities Commission. From the tenor of the editorial comment on this reprint sheet it would appear that the Illinois Public Utilities Commission has the backing of the public. An editorial from the Rockford *Star* pertinently sums up the situation. It says, "The apostle of 'Home Rule' does not say that the public utility commission idea, which he now denounces, came into force because 'Home Rule' failed." The page also contains seven editorials from Iowa newspapers which voice the sentiment that Iowa needs a Public Utilities Commission to bring about the necessary adjustment in the present utility field in that State.

Programs of Meetings

Association of Terminal Engineers

At a meeting to be held in New York City on Nov. 9, at the United Engineering Society's Building, Col. J. C. Bonner, inventor of the "Bonner Rail-Wagon System," described in the issue of this paper for Oct. 12, 1918, will speak on "Twentieth Century Freight Handling."

National Municipal League

At the twenty-sixth annual meeting of the National Municipal League, which will be held in Indianapolis Nov. 17-19, the session on the morning of Friday, Nov. 19, will be given up to the topic "Service-at-Cost for Street Railways—Panacea or Nostrum?" This meeting will be a joint session with the Municipal League of Indiana. The program for this meeting follows:

Cincinnati—"Service-at-Cost and the Sliding Scale."

Cleveland—"Service-at-Cost and Efficient Management," Fielder Saunders, Street Railroad Commissioner, Cleveland, Ohio.

Boston—"The State Trustee Plan," James F. Jackson, chairman of the Public Trustees of the Boston Elevated Railway.

Indianapolis—"Indianapolis and the Five-Cent Fare," E. T. Lewis, chairman Public Service Commission of Indiana.

"Service-at-Cost or Municipal Ownership?—Seattle's Experience," Charles M. Fassett, ex-Mayor of Spokane, staff member of American City Consultants.

Central Electric Railway Association

The fall meeting of the Central Electric Railway Association will be held at the Claypool, Indianapolis, on Dec. 2 and 3. There will be a meeting of the executive committee at 9 a.m. on Dec. 2. The business session will convene at 10 a.m. Reports of committees will be presented. There will be an address by James P. Barnes, president of the Louisville Railway. No formal subject for the address has been assigned. The association will reconvene at 2 p.m. The following papers will then be presented:

"Publicity," Bernard J. Mullaney, manager of the Public Relations Department of the People's Gas, Light & Coke Company, Chicago, Ill.

"Co-operation," W. L. Goodwin of the General Electric Company, Schenectady, N. Y.

On Dec. 3 the association will convene at 9.30 a.m. The following papers will be presented:

"Public Relations," Martin J. Insull, president of the National Electric Light Association, Chicago, Ill.

"Accident Prevention," Charles B. Scott, general manager of the Bureau of Safety, Chicago, Ill.

There will be general oral discussion on all papers by the members of the association. On the night of Dec. 2 it is planned to hold a theater party.

Financial and Corporate

Changes at Youngstown

Financial Readjustment Disclosed by Announcement of Offering of $13,000,000 of New Securities

Announcement made by the banking syndicate handling the $13,000,000 issue of Pennsylvania-Ohio Power & Light Company's first and refunding mortgage 7½ per cent sinking fund gold bonds discloses changes in the scheme of organization of the public utilities properties centering at Youngstown, Ohio. The proceeds of the bonds now being offered together with the proceeds of $4,050,000 of junior securities will provide for the retirement of $12,522,000 of first and consolidated mortgage bonds of the Mahoning & Shenango Railway & Light Company due on Nov. 1, 1920; will provide for the retirement of floating and guaranteed debts, and will furnish sufficient working capital for the new company. Upon completion of the financing the Pennsylvania-Ohio Power & Light Company will have no debt other than the funded debt shown in the accompanying table of capitalization.

NEW COMPANY FORMED

The Pennsylvania-Ohio Power & Light Company has been incorporated to take over the electric power and light business of the Pennsylvania-Ohio Electric Company. The latter company owns the entire common stock of the Pennsylvania-Ohio Power & Light Company except the directors' qualifying shares. The territory served is within an area of about 600 square miles in Pennsylvania and Ohio midway between Pittsburgh and Cleveland. There are twenty-five municipalities in this territory, including the cities of Youngstown, Warren and Niles in Ohio and Sharon in Pennsylvania. The population served is in excess of 300,000.

The electric railways comprise 59.13 miles of single track. Of this mileage 49.35 miles is interurban, of which approximately 40 miles is on private right-of-way. There are 218.5 miles of new high voltage electric power transmission lines and extensive distribution lines in Youngstown, Gerard and Struthers, Ohio; Sharpsville, Farrell, Ellwood City and Sharon, Pa., and the vicinity.

CAPITALIZATION

(Upon Completion of Present Financing)

Funded Debt		
Underlying divisional 5 per cent bonds (closed mortgages)	$1,989,000	
First and refunding mortgage 7½ per cent sinking fund gold bonds (this issue)	13,000,000	
		$14,989,000
Ten year 8 per cent secured gold notes, due Nov. 1, 1930†		2,250,000
Capital Stock:		
Preferred stock, 8 per cent cumulative		1,800,000
Common stock		6,000,000*

* Application for the issuance of $4,000,000 additional common stock is pending before the Public Utilities Commission of Ohio.

† To be secured by $3,375,000 general mortgage bonds, due Nov. 1, 1930 (junior to the first and refunding mortgage bonds).

Upon the completion of the present financing the capitalization will be arranged as indicated in the accompanying table.

The bonds now being offered will be part of an authorized issue of $75,000,000 dated Nov. 1, 1920, due Nov. 1, 1940, of which in addition to the $13,000,000 present issue $1,989,000 will be reserved to be issued to retire outstanding underlying bonds, par for par, and the remainder will be issued for not more than 75 per cent of the cost of additional property and of future additions, extensions, or improvements to the properties of the Pennsylvania-Ohio Electric Company or its subsidiaries under well defined restrictions as to earnings. The bonds will be issued in series bearing interest at such rate or rates as the board of directors may determine. The bonds of the present issue will be designated as series A and bear interest at the rate of 7½ per cent per annum. An annual sinking fund will be provided for the first and refunding mortgage bonds accruing from Nov. 1, 1921, payable semi-annually, of 1 per cent per annum to Nov. 1, 1930, of the total amount of first and refunding mortgage bonds issued and 1½ per cent per annum thereafter to maturity. Bonds so acquired for the sinking fund are to be canceled and not reissued.

EARNINGS FOR YEAR ENDED AUG. 31

Gross earnings	$4,682,852
Operating expenses and taxes	2,705,789
Net earnings	$1,977,063
Annual interest charges on first and refunding mortgage sinking fund bonds now offered and underlying divisional mortgage bonds	1,074,450
Balance	$902,613

The bankers include in their summary of the activities of the company the accompanying statement of earnings of the property to be owned or controlled by the Pennsylvania-Ohio Power & Light Company for the year ended Aug. 31, including the total present annual interest charges, interest on the first and refunding mortgage sinking fund bonds now offered and underlying divisional mortgage bonds.

$10,604,268 Original Cost

Commission Reporting to the Tennessee Body Agrees Upon This Amount as Value of Railway Property

The joint report on the appraisal of the property of the Nashville Railway & Light Company, Nashville, Tenn., made for the Railroad & Public Utilities Commission of the state by Ross Harris, representing the city, Robert M. Feustel, representing the company, and Albert S. Richey, representing the commission, was submitted to the commission on Oct. 28. The appraisers definitely agreed upon every matter.

FINDINGS REVIEWED

The engineers found that on the original or historical cost basis the amount invested in the property of the company, including superseded property, was $14,828,536, of which $10,604,268 was in the railway department and $4,224,268 was in the light department and subject to the treatment of superseded property. They believe this the amount entitled to a reasonable return. Exclusive of superseded property the investment was $11,672,886, of which $8,101,413 was in the railway department and $3,571,473 in the light department. On the reproduction cost basis, using prices current during the first six months of 1920, the amount was $19,936,593, of which $13,672,679 was in the railway department and $6,263,914 was in the light department.

The amount of cash paid in by the security holders of the present company for stock and bonds issued at the formation of the company on July 1, 1903, was estimated at $4,316,776. At the same time the company assumed underlying securities to the amount of $2,577,000. Property additions, as shown by the books of the company, between the formation of the present company on July 1, 1903, and up to April 1, 1920, the date of the present appraisal, amounted to $7,225,023. The total of these three amounts, $14,118,798, therefore, very closely approximates the actual cash investment of the present owners and bondholders.

TWO BASES USED IN APPRAISAL

In accordance with the expressed wishes of the members of the commission appraisals were made on two bases, described as follows:

1. An original or historical cost appraisal. This was on the same basis as the 1919 appraisal of the property of the Memphis Street Railway. Wherever it was possible to ascertain the actual costs of parts of the property such amounts were used. Wherever the records of the company failed to show the actual costs of any parts of the property, estimates were made of the costs of such parts as of the dates of installation, in so far as such dates could be determined or approximated. This appraisal includes allowances for superseded property, which has not been amortized through income, and other uncompensated losses or costs incurred in building up the business.

2. A reproduction cost appraisal, using prices current during the first six months of 1920. This appraisal does not include superseded property, but makes a deduction for accrued depreciation, or "lack of newness," and an addition for going value.

Each of the appraisals was made on an inventory of property as existing on April 1, 1920. In both cases the value of the property was separated as between that used for the conduct of the railway business and that used in the lighting and electric power business.

Ten years, practically covering the electrification and the immediate subsequent rebuilding which was made necessary by the very rapid progress in the art, was taken as representing the development period. The accumulated deficit for the first ten years shown amounted to $502,406. That amount, therefore, was included as part of the investment. Seven per cent was used in the calculation of the deficit, in the belief that such was a fair rate of return on money invested in electric railway property during the development period. It is expected to review the findings of the appraisers in detail in an early issue of this paper.

Receivers in Charge in Kansas City

Messrs. Fleming and Wilson Qualify for Office and Continue Previous Management—Colonel Kealy Tenders Resignation

Colonel Fred W. Fleming and Francis M. Wilson, appointed receivers for the Kansas City (Mo.) Railways, on Oct. 26, took charge of the property Thursday morning, Oct. 28. The receivers had qualified Wednesday. Their first official act was to issue an announcement stating that all employees of the company would continue in their present duties. P. J. Kealy, president of the company, tendered his resignation. The receivers did not act on the resignation and it is in abeyance. Colonel Kealy is continuing to perform practically the same duties as before, with the receivers functioning as operators of the property. F. G. Buffe continues as general manager, and the other officials in their respective positions.

THE board of control—formerly consisting of President Kealy, representing the company, and E. M. Stayton, representing the city—ceased to exist as a functioning entity with the appointment of the receivers. Judge Stone said in court that this board seemed to be eliminated, since the authority of the court could not be delegated. The receivers are now of the opinion that the office and engineering facilities and machinery of the board of control, as well as the personal services of Colonel Stayton, will be essential to them in the operation of the property. It is said that Colonel Stayton will therefore be retained, in some capacity.

SPECIAL COUNSEL NAMED

James E. Goodrich has been appointed by the court to be counsel for the receivers. Judge Goodrich is especially prominent as counsel for banks and corporations. He is attorney for the Federal Reserve Bank of this district. The appointment of Mr. Goodrich had special interest locally, as offsetting intimations that the receivership had political color. Mr. Wilson and Colonel Fleming are both Democrats. They both are friends of Senator James A. Reed. Mr. Goodrich is a Republican.

The announcement by Judge Stone of his selections for the receivership caused surprise among the attorneys and interested parties. Several nominations had been made, the nominators explicitly denying any purpose to seek to conserve any special interest. Attorneys present had also spoken in behalf of the appointment of a local man or local men to the work. It was known in various circles that certain men were being urged for receivers. There was the usual amount of gossip as to the probabilities. The name of Francis M. Wilson had been mentioned in these prophecies, but Colonel Fleming's name had not.

Judge Stone, opening the Tuesday session with the announcement of his selections, said:

> Men should be put here that the court thinks are eminently fitted for the responsibilities and qualified to meet the problems of this company. Those problems are both business and legal. The court has tried therefore to select a business man of successful experience, and an attorney of wide experience.

Colonel Fleming was named first. In his selection the court as well as the parties in interest recognized the need of business experience in the receivership. Mr. Wilson was added in the creation of the receivership to provide intimate assistance and co-operation, incidentally of a legal nature, to Mr. Fleming.

A few hours after their appointment, the receivers issued a statement to the public, prepared by Colonel Fleming, as follows:

> The court has been compelled to take charge of the street railway property because the company cannot pay its debts and because the railways system must be maintained to protect the property and assure these cities a necessary means of transportation. In a matter of such great importance to the property owners and to the public, the receivers invite and should receive the cordial co-operation of every public spirited citizen. While the unfortunate financial condition of business will necessarily limit what the receivers can do, it is their purpose to furnish the best service possible to the public under these circumstances.
>
> As soon as they have had opportunity to familiarize themselves with the situation, the problems which involve the property and which involve the public will be fairly and carefully considered and determined.
>
> The appointment as receivers came without solicitation, directly or indirectly, and the receivers consider their selection as a call to public service. They are both disinterested, except as officers of the court, performing a public service, and are so situated at this time that they can give their undivided attention to the discharge of these duties so highly important to the welfare of Greater Kansas City.
>
> They are both sincerely grateful for the confidence reposed in them by Judge Stone, and their sole purpose will be to aid him in the proper administration of this sacred trust.

Following the appointment, various matters were taken up with the court, by parties having interests. One of these concerned taxes due and unpaid, or soon to become due, or in controversy. Nearly $500,000 in taxes must be paid this year, it was stated. The status of the tax claims was debated.

SETTLEMENT OF BILLS BEFORE COURT

It was pointed out that personal taxes unpaid do not become a lien until after judgment; that some of the unpaid taxes are in controversy, and even if not paid will not involve a penalty. The volume of taxes yet to be paid for this year was of interest because their amount had a bearing on the time within which bills unpaid or accruing could be met by the receivers.

At the previous hearing, Oct. 21, William C. Michaels of the law firm of Haff, Meservey, German & Michaels, representing specifically the General Electric Company, had presented the matter of setting a period back to which supply bills should be paid. The effort of Mr. Michaels was, of course, in the interest of all creditors whose bills for operating materials and equipment have not been paid in the past few months. The order of Sept. 9 appointing the temporary receiver has set Aug. 1 as the date to which the receiver should revert in the payment of current supply accounts. Mr. Michaels urged that claims for necessary supplies dating back to Jan. 1, 1920, should be paid, as the setting of this date would include practically all such bills. These, he said, should be paid without necessity for intervention or special hearing to disclose preferential character.

Edward Russell Platt, representing the bondholders' committee, suggested that the payment of back debts of this nature under receiverships was only a custom, and had almost always resulted from agreement, and not from a declaration of a principle. He suggested that all parties with such interests ought to have a day in court, and outlined a plan for quick action on such bills. His plan was for the receivers to make a list of bills contracted in the past four to six months, make recommendations as to bills which were entitled to preference, and present the lists and recommendations in court. At such hearing, creditors could state objections, and additions or subtractions might be made. Such plan, he urged, would avoid putting a heavy burden upon the court, in hearing individual claims separately; the mass of claims could be got out of the way promptly.

$366,000 IN CLAIMS PENDING

Judge Stone read from the bench a statement secured by him from the board of control, indicating the total of claims pending, unpaid since Jan. 1. Incidentally it was stated by Colonel Kealy that all supply bills had been met since Aug. 1 The statement read by the judge showed a total of about

$366,000; in this was $184,000 for supplies, $44,000 for street cleaning, and minor items.

On Wednesday the court issued the formal order establishing the receivers. This order set no date as the beginning of any period of priority for supply creditors. The matter was left, therefore, in the position suggested by Mr. Platt. The receivers are expected shortly to prepare a list of claims, so that the bulk of supply bills pending can be disposed of promptly. It is said that all current bills were paid by the company as deliveries of supplies were made, up to about June of this year; and since the temporary receiver paid bills dating back to Aug. 1, the unpaid bills have dates within a short period.

The matter of contracts for bridges and viaducts, and payments thereon, has come up at each session. The Twenty-third Street viaduct matter has occupied much time. Wyandotte County, Kansas, has completed the Kansas end of this viaduct; and the part of the cost which the railway was to pay is part of the $800,000 claimed as owing Wyandotte County on various bridges and viaducts, most of this having been reduced to judgments. Kansas City, Mo., entered into a contract with the railway and railroads, under which the electric railway was to pay about $250,000 toward the building of the Missouri end of the viaduct. The contract for erection was let, and work is in progress. The city of Kansas City, Mo., and the contractor intervened in the receivership proceedings and have sought to secure establishment of the contract under the receivership. Decision was postponed at the first two recent sessions concerning the receivership, until the receivers might have opportunity to examine the subject.

CITIES INTERVENE

On Oct. 30, the attorney for the city again brought up the matter, urging that immediate action be taken, so that the contractor would know his status. At this time, the first intimation was heard of opposition to the adoption of the contract immediately by the receivers. Blatchford Downing, attorney representing the second mortgage bondholders, and incidentally, first mortgage interests also, suggested the advisability of a hearing, and receipt of testimony before conclusion could be reached as to the necessity for this viaduct in the present operation of the property. He pointed out that the viaduct is designed to serve chiefly Kansas City, Kan.; and that the Kansas City, Kan., section of the property is now not making money. Counsel for Kansas City responded that it was a franchise obligation, and whether the Kansas end of the system or the viaduct itself was profitable to the company was not a factor. He added that the viaduct was to be a benefit to the company, as well as to the city.

Judge Stone directed that the opposition to the adoption of the contract by the receivers be made formal in pleadings to be filed on Nov. 1 and Nov. 3 was tentatively set for hearing.

At this juncture Judge Stone mentioned the prospect of appointment of special master. He said that he wished to hear the viaduct matter himself, but that many subjects were likely to be presented which it would not be feasible for him to hear in person. He suggested that attorneys advise him in advance when a mass of testimony is to be presented in any of the incidental controversies, so that a special master could be appointed.

Mr. Downing, representing the individual trustee under the second mortgage, suggested that he was not at present in a position to file a cross bill asking for foreclosure of the second mortgage and possibly would not be until the New York Trust Company comes into the present proceedings. Second mortgage interests, he said, are parties to these proceedings because defendants to the intervention of the parties to the first mortgage.

So far as the company is concerned there are very many business men in the city who have tried to help restore the company in the good esteem of the public. It is only fair to these men, as well as to the company and its officials, to say that the company stands higher now in public esteem than any other railway ever did in Kansas City.

There are two elements of the public that feel real sympathy for the company in its difficulties. One element is the business men, who realize the insuperable obstacles the company has encountered to successful operation—one of these obstacles being the rise of the jitney. This element feels that there is no way to get service without paying what it is fully worth, paying now or later, in some way.

The other sympathetic element has grown largely in the past few months. It is of car riders. They realize the importance of service to the city and themselves. They are somewhat indignant at the jitney—not finding fault with the men who run jitneys, but deploring the course of events which has made the jitney so sharp a competitor of the railway, but deploring most the development of this jitney service, which is to a degree irresponsible, unreliable, without regulation, so largely without resources to meet liability.

The receivers therefore take hold of the company under conditions far more propitious than are often found in similar circumstances. There are few complaints as to service; there are few accidents. The trainmen are courteous, and perform their work well.

The employees are contented now. They have their own brotherhood, with machinery for handling grievances, machinery which has been effective. They hope for the same facility of intercourse with the receivers and under the receivers that they have enjoyed heretofore. They hope that no opportunity will be presented to union agitators to promote disruption.

OUTSIDE LABOR ACTIVE

On the other hand union labor circles in Kansas City have hoped to find in the receivership an opportunity for reestablishing their policies and methods in the railways. That the unions are thus disposed is indicated in a letter sent to Judge Stone, before his appointment of permanent receivers. This letter recommended the immediate discharge of the present officers of the company, and urged the appointment of a single receiver, especially recommending F. C. Niles, the temporary receiver.

Deficit Continues on Chicago "L"

The first full month's operation under the 10-cent cash fare, with four tickets for 35 cents, on the Chicago Elevated Railways showed for September a net deficit of $25,361. This rate of fare was authorized on Aug. 4, but did not become fully effective until Aug. 9, so that August figures reflect the increase but do not show the full effect. A summary statement for the last three months follows:

	July	Aug.	Sept.
Total earnings	$1,401,065	$1,458,708	$1,434,377
Total expenses	1,254,520	1,411,253	1,254,331
Net earnings	$146,545	$47,455	$180,046
Interest charges	206,160	205,682	205,407
Net deficit	$59,615	$158,227	$25,361
Number of passengers (1920)	17,024,667	15,025,599	14,698,167
Number of passengers (1919)	13,990,060*	13,578,959*	14,169,071
Increase	3,034,604*	1,446,640	529,096

*A strike of three days in July and one day in August makes these figures abnormally low and the comparison with 1920 for both July and August not fair. Also, the traffic in July, 1920 was abnormally high, due to several events which brought a great many people to Chicago during that month.

It should be explained in connection with the large operating expense in August that this includes $145,336 of back pay accumulated in June and July, resulting from the last wage increase which was made retroactive to June 1.

Syracuse Valuation Wins Praise

The valuation of the city lines of the New York State Railways in Syracuse, made recently by Ford, Bacon & Davis, New York, and mentioned on p. 610 of the issue of this paper for Sept. 25, has received favorable comment in the Syracuse paper, and its acceptance has been recommended by the City Street Railway Commission. In referring to the appraisal in an editorial, the Syracuse Herald praises the thoroughness with which the work was done and speaks of the "judicial impartiality" of James C. Emery, who was in charge of it for the appraising engineers.

Cincinnati Deficit Increasing

The report of the Cincinnati (Ohio) Traction Company to W. C. Culkins, Street Railway Director, shows a deficit of $68 954 in September. The total operating expense for the month was $559,898. Taxes and other deductions amounted to $274,854. Detailed accounting of the operating expenses shows that $61,749 was spent on ways and structures. Equipment last month cost $70,968 and power $108,600. The item conducting transportation consumed $274,907. One thousand and twenty-seven dollars was spent on traffic and $42,646 for general and miscellaneous. The number of revenue passengers during the month was 9,561,608. The deficit is said to be due to the increased cost of coal and wages and the falling off of travel. The fare in Cincinnati is 8 cents cash. The figures of operation are included in the accompanying statement.

	September	
	1920	1919
Operating expenses:		
Ways and structures	$61,749	$70,240
Equipment	70,968	43,489
Power	108,600	75,379
Conducting transportation	274,907	232,389
Traffic	1,027	812,54
General and miscellaneous	42,646	38,174
Total	$559,898	$460,487
Taxes and other deductions	274,854	242,818
Total cost of service	$834 753	$703,305
Total revenue and income	$765,798	$672,052
Total deficit	$68 954	$31,252
Fare	8 cents cash or ticket	7 cents cash 6½-cent ticket
Revenue passengers	9,561,608	9,972,289
Density of traffic	5.50	5.64

Some B. R. T. Lines Restored

Shuttle service has been installed on three of the nine trolley lines on which service was temporarily abandoned recently by the Nassau Electric Railroad and the Brooklyn, Queens County & Suburban Company of the Brooklyn Rapid Transit System because the operating revenues of the lines failed to meet actual operating expenses by $500,000 a year.

The Metropolitan Avenue Line, with a mileage of 9.336, has been replaced by a shuttle service from Flushing Avenue to Dry Harbor Road, a distance of 2½ miles. The Ocean Avenue line, with a mileage of 10.038, has been replaced by a shuttle service from Flatbush Avenue and Avenue F to Ocean Avenue and Avenue W. The shuttle line is about one-third the mileage of the old route.

The Thirty-ninth Street-Coney Island line, with a distance of approximately 8 miles, has been replaced by a shuttle line operating about 2 miles from Fifth Avenue and Eighty-sixth Street to Bath Avenue and Bay Nineteenth Street.

All three shuttle services were installed at the request of residents of the territories traversed by the lines who stated at hearings before the Public Service Commission that they were primarily interested in securing service and were willing to pay whatever it cost to provide service. Representatives of civic bodies stated they were not opposed to an increased fare if it actually cost more than 5 cents to provide service and the alternative to the increased fare was no service at all.

Proceedings are still pending before the commission for the restoration of service on the Church Avenue line, with a mileage of 6.419, without the necessity to give or receive transfers to and from the dozen intersecting and connecting lines. Investigators for the commission reported that inquiries along the route of this line failed to disclose a single resident who was opposed to the abolishment of the transfer privilege.

Financial News Notes

Discontinuance Asked.—The Dover, Somersworth & Rochester Street Railway, Dover, N. H., has petitioned the Public Service Commission for permission to discontinue its tracks in Rochester on North Main Street, from the Central Square to Strafford Square.

750,000 of Bonds Planned.—The Cincinnati (Ohio) Traction Company has petitioned W. C. Culkins, Director of Street Railways, to be allowed to issue $750,000 par value of bonds to reimburse the company for extensions and improvements. Application also will be made to the State Public Utilities Commission to determine the terms under which the bonds shall be issued.

Road at Abilene May Resume Operation.—An ordinance has been passed by the local authorities at Abilene, Tex., amending the franchise of the Abilene Street Railway. In consequence it is expected that the line will resume operation. Some four or five months ago the American Public Service Company, Dallas, Tex., agreed to take over the railway and to spend about $60,000 in repairs to track and equipment.

Application to Issue Notes Granted.—The Wisconsin Railroad Commission on Oct. 25, 1920, granted the Milwaukee Electric Railway & Light Company permission to guarantee as to principal and dividends $1,090,000 of ten-year 8 per cent sinking fund equipment trust gold certificates. The proceeds from the sale of these notes will be used to finance the purchase of the railway cars ordered to be installed by the commission. The company's application was referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 23, 1920, page 893.

Steam Road Seeks to Purchase Electric Line.—Negotiations have been in progress for some time for the sale of the Sacramento Northern Railroad, Chico, Cal., formerly the Northern Electric Railway, to the owners of the Western Pacific Railroad. The matter has been placed before the New York office of the Western Pacific Railroad and it is said that John S. Drum, president of the Mercantile Trust Company and a director of the electric road, and G. F. Detrick, president of the electric line, have been handling the negotiations with the railroad. The electric railway extends northward from Sacramento through the valley as far as Chico.

$1,750,285 Net for Monongahela Company.—Net earnings of the Monongahela Valley Traction Company, Morgantown, W. Va., for the twelve months ended Sept. 30 last, are practically double the annual bond interest charges of the company. The report of the period shows: Gross earnings, $5,538,110; operating expenses, taxes, depreciation and sinking funds, $3,787,824; net earnings, $1,750,285; annual interest charges on $15,237,000 bonds, $883,590; balance, $866,695. Net earnings are stated after depreciation sinking fund requirements, which for the twelve-month period amounted to more than $170,000. If these were excluded the ratio of net earnings to annual bond interest charges would be nearly 2.2 times.

Tax Liability Fixed.—By a decision recently handed down by Judge Clay Allen in the Superior Court at Washington, D. C., the Puget Sound Traction, Light & Power Company must pay delinquent taxes aggregating the sum of $401,017. The suit of the company against King County sought last June to enjoin the county from collecting taxes on the railway for the year 1919. The company will appeal the decision. The actual transfer of the lines from the company to the city of Seattle took place on March 31, 1919. During 1919 the company was in possession of the lines for three months and the city for the remaining nine. This means that the city will pay three-fourths of the taxes and the company one-fourth.

St. Louis Traffic Increasing.—With a daily average of eight fewer cars in operation the United Railways, St. Louis, Mo., in the quarter ended Sept. 30 last, carried 143,388 more passengers than in the preceding quarter, according to the quarterly report filed with the City Register of St. Louis. The report shows that during the quarter 69,756,328 passengers were carried as compared with 69,612,940 in the preceding period. The average number of cars in operation on weekdays during the last quarter was 1,310; on Saturdays, 1,220, and on Sundays 760, an average of 1,208. In the preceding quarter the average was 1.216. Col. A. T. Perkins, general manager for the company, said that every effort was being made to get more cars into service. The first of fifty cars being built in the company's shops are being assembled and will be ready for service soon. Ten one-man cars being built by the American Car Company are to be delivered Dec. 1.

Traffic and Transportation

Jitney Bill Defeated

Seattle Voters Reject Proposal to Give Bus Operators Control Over Service and Fares

At a referendum held in connection with the general election on Nov. 2 the voters of Seattle, Wash., decisively rejected an ordinance which, if approved, would have given bus operators authority to select routes and to regulate fares without interference from the city government. The bill had been sponsored by the bus interests in an effort to nullify the terms of a local ordinance ruling the jitneys off the streets served by the Seattle Municipal Street Railway.

The judiciary committee of the City Council, after extended conference with representatives of the jitney interests, has adopted the jitney bus routes drafted by Carl H. Reeves, superintendent of the utilities department. The action was taken after Mayor Hugh M. Caldwell had called for a "showdown" with the jitney men, who objected to regulation not of their choosing. The Mayor said:

> If the jitney operators won't accept anything but their own terms, and we must have a showdown, let's have a showdown. If they won't accept reasonable regulation, let's pass the regulations as we see fit, and let them accept or quit. I concede that when 9,000 persons use the buses in a day, they should be given some consideration, but neither they nor the operators have any right to insist on the terms on which they are to run. Let us effect a compromise with the jitney drivers or any other we can agree with, and let the others take the regulations or leave them. The operators can't keep the city tied up indefinitely on this court litigation.

WOULD LIMIT PASSENGERS

The regulations provided in the recommendations made by Mr. Reeves and adopted by the committee provide for limiting passengers carried to two more than the seating capacity of the jitney, except on cars where standing room is available—to permit the present 10-cent fare to stand except on long drives, such as the Alki line, where a 15-cent fare will be favored, and to allow a 25-cent fare after 1 a.m.

If the Council passes the amendments and adopts the routes outlined, the jitney men must then file new applications for permits, as all but a few were refused permits by the Council after the passage of the present ordinance.

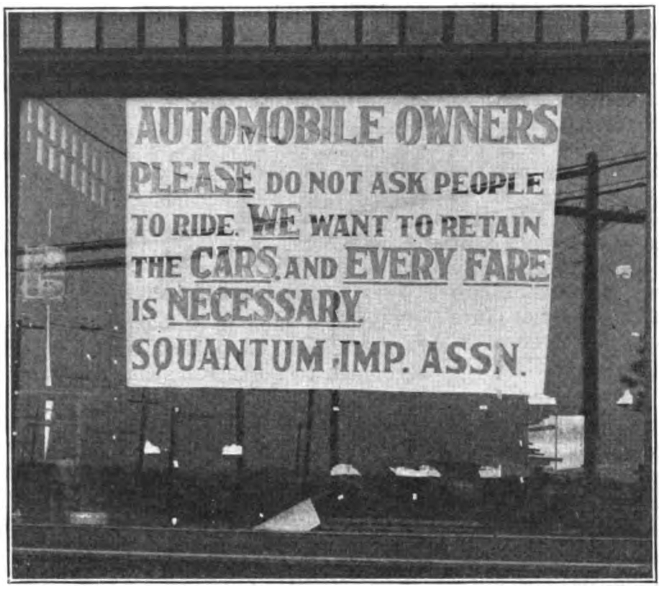
Another problem still pending is the one of time schedules. It is expected more difficulty will develop in this matter than on the question of routes. The drafting of the schedule was to be speeded, as the stand of the jitney men on the jitney referendum bill depended on whether satisfactory regulations are adopted by the city before the special election.

In a communication to the Mayor and the City Council, D. W. Henderson, general superintendent of railways, stated that jitney buses are costing the municipal railway $160,000 or more a year, and that unless strict regulation is effected, 500 to 600 buses will be running the streets taking the cream of the traffic, and cutting still further into the railway revenues.

Mr. Henderson recommends that the jitneys be forced to give regular and reliable service, staying on their respective routes, and operating daily for the convenience of their patrons.

An Appeal to Save a Railroad

Two years ago the Eastern Massachusetts Street Railway discontinued the Squantum line as the receipts were not paying operating costs. When the operation of jitneys was discontinued about three months ago, the Board of Trade asked Mayor Whiton of Quincy to request the Eastern Massachusetts Street Railway to restore service on the Squantum line. The company found that it would cost $25,000 to rehabilitate the property and stated that if the city of Quincy would post $25,000 to insure against the company's loss, service would be restored. The company reconstructed the line and soon after the operation started.



HOW SQUANTUM AIDS THE TROLLEYS

Since then another factor has entered the field to hinder the operation of this line at a profit. Automobiles entering and leaving Squantum have picked up prospective patrons of the street cars along the road and transported them free to Quincy or Squantum. The Squantum Improvement Association was formed to combat this practice. It erected a very novel sign to appeal to the automobilists and had it set in a very prominent location.

P. R. T. Charges 7 Cents

Company Raises Fare at Direction of Public Service Commission—Four Tickets for a Quarter

Nickel fares became a memory on Nov. 1 as far as the Philadelphia Rapid Transit Company is concerned. On that date the company placed in effect the 7-cent cash fare previously ordered by the State Public Service Commission. Under the new plan four tickets are sold for 25 cents. Payment of fare in the form of cash or tickets entitles riders to free transfers or 3-cent "exchanges" as under the 5-cent fare.

A feature of the new rate system is the method of computing the fare to be paid by children. Heretofore age has been the determining factor in allowing children to ride free. Under the new arrangement payment of fares depends upon height, all children more than thirty-one inches tall being required to pay full fare. A line has been marked in each car near the conductor's station by which children will be measured as they enter the car.

The new rates are to continue in effect for a period of six months. Company officials estimate that the 7-cent cash fare with reduced rate tickets will yield less in revenue than the straight 5-cent fare without transfers or exchanges, as proposed by Thomas E. Mitten, president of the company.

Simultaneously with the advance in fares the company began paying its employees at the rate of 72.5 cents an hour, an increase of 7.5 cents over the former scale. Under the wage agreement between the company and its men the latter were entitled to this increase beginning May 16 and June 1. At the urgent request of Mr. Mitten the carmen agreed to forego the wage increase pending the granting of a higher fare.

Mr. Mitten has announced that the company will immediately begin the accumulation of a reserve fund so that the men can be given the back pay now due them at as early a date as possible. By this means the management hopes to be able to turn over this back pay to each man in a lump sum, if possible before Jan. 1. Mr. Mitten has urged the men to place this money with their savings in anticipation of an ultimate reduction of wages to 65 cents an hour. Mr. Mitten some time ago warned the men that the new wage scale was only temporary and that, with the return of a lower level of prices, the men must expect a reduction in pay.

Fare Advance an Issue

Labor Opposed to Rate of Seven Cents Put Into Effect at Fort Worth Recently

An injunction looms up as probable to restrain the Northern Texas Traction Company of Fort Worth, Texas, from continuing in effect the 7-cent fare started on Oct. 22 in the city of Fort Worth. Organized labor has taken up the fight and the City Commission has also expressed opposition. In response to a formal request from the City Commission for data showing the necessity for the fare increase, George H. Clifford, general manager, explained the grounds on which the recent advance in the rate was made.

Mr. Clifford explained that contracts had expired under which the company had been purchasing fuel oil for 90 cents a barrel and that since Oct. 1 the company had been paying $3.50 a barrel for fuel oil in the open market. Mr. Clifford also pointed out the improvements now under way and pledged called for an outlay of more than $1,000,000. These include the purchase of thirty-five new one-man cars.

Protestants against the fare increase point out that these improvements were pledged by the company in return for the recent increase in fares from 5 cents to 6 cents, and that the company cannot again advance the matter of improvements as grounds for another fare increase.

The City Commission has advised those protesting against the fare increase that the only recourse is in the courts. The franchise under which the company operates authorizes it to charge a fare that will make adequate return, and the company is judge of the fairness of the return. The only recourse, once the new fare is put into effect, is to restrain the higher fare through the courts.

Eight Cents in New Orleans

The New Orleans Railway & Light Company, New Orleans, La., on Oct. 22 raised its fare from 6 cents to 8 cents by authority of the Commission Council. The Council approved the fare advance on Oct. 19 as a means of averting a second strike of the railway's employees. The new fare will continue for a period of six months. Free transfers are retained.

The increase in fare was recommended in the report of the special masters who heard the men's demands for higher pay following the strike which tied up electric railway service in New Orleans last July. The local Association of Commerce was largely responsible for bringing about an agreement between the city and the company on the fare question. Danger of another strike was removed on Oct. 21 when J. D. O'Keefe, receiver of the company, and James Rodgers, representing the carmen, signed a contract under which the men will be paid at the rate of 49, 52 and 55 cents an hour.

Futile efforts have been made by groups of citizens hostile to the company to compel it to abandon the 8-cent fare. Criminal charges were brought against Mayor Behrman, Mr. O'Keefe and other officials of the city and the company, on the ground that they had violated the law in permitting the fare increase. These charges were dismissed by the court on Oct. 27. Petitions have also been circulated calling upon the Commission Council to submit to popular vote the question of reducing the fare to the original 5-cent basis.

Ten-Cent Fare in Effect

A straight 10-cent fare went into effect on Nov. 1 on the lines of the Connecticut Company, New Haven, Conn. There was a noticeable falling off in patronage on many of the lines in Hartford and in other larger cities of the State on the first day under the new fare régime. However, the railway officials take the stand that as winter comes on there will be the usual patronage of the trolleys.

Jitneys were running in Hartford as usual on Nov. 1 despite the city ordinance which ruled them off the main highways when the 10-cent fare went into operation. This continuance of bus service was due to an agreement by counsel for the jitneys and the railway that both sides would await the decision of the Superior Court on the pending injunction which, if granted, would bar the railway from forcing the jitneys off the main thoroughfares. The buses did not do a heavy business on the first day because of the 10-cent trolley fare.

"Knocking" Safety Cars Forbidden

Platform men in the employ of the Los Angeles (Cal.) Railway have been forbidden to make remarks "tending to bring the safety car into ridicule" under penalty of severe discipline. George B. Anderson, manager of service of the railway, has issued an order instructing every carman to "speak of the advantages of this car, if he refers to it at all in conversation with the public." The order, which is addressed "to all trainmen, especially motormen," reads:

> Your attention is especially directed to bulletin No. 389, issued Sept. 27 by R. B. Hill, superintendent of operation, which states that any trainman unnecessarily ringing his gong when he finds a safety car on the track ahead of him or any trainman who makes remarks tending to bring the safety car into ridicule will be subjected to severe discipline.
>
> Violations of this rule will be interpreted as exhibitions of disloyalty to the company, actuated by a desire to incite the public against a car which experience shows is better adapted for quick and safe street railway service than any other type of car.
>
> Every trainman who is interested in safe and successful operation will speak of the advantages of this car, if he refers to it at all, in conversation with the public. If a man's attitude toward the safety car is unfriendly it will be taken for granted that he is not interested in safe and successful operation and he will be treated accordingly.
>
> We do not desire in our service any man who, by word or deed, stirs up public antagonism to the service which we are endeavoring to render.

Transportation News Notes

City Grants 8-Cent Fare.—The Board of Aldermen of Concord, N. C., recently authorized the North Carolina Public Service Company, Greensboro, to charge an 8-cent cash fare on its lines in Concord. The new rate took effect on Oct. 1. Four tickets are sold for 30 cents.

Higher Freight Rates Sought.—The Pittsburgh (Pa.) Railways has filed with the State Public Service Commission notice of an advance in local freight tariffs, under which it proposes to raise class rates 40 per cent. The company also seeks a minimum rate of 50 cents on each shipment.

Fares Raised on Interurban.—Fares on the lines of the Kentucky Traction & Terminal Company, Lexington, Ky., have been advanced to a basis of 3.6 a mile. The company formerly charged at the rate of 3 cents a mile. The company has also raised its freight rates. The minimum fare remains at 7 cents.

Will Raise Glen Cove Fare.—The Glen Cove (N. Y.) Railroad has been authorized by the State Public Service Commission, Second District, to raise its fare from 5 cents to 7 cents. The company is a subsidiary of the Long Island Railroad and is capitalized at $10,000.

Ticket Sale Discontinued.—The Wisconsin Railroad Commission has granted the petition of the Milwaukee Northern Railway, Cedarburg, to discontinue the sale of six tickets for 25 cents good on the company's line within the city of Milwaukee. A straight 5-cent fare became effective on Aug. 15.

Ten Cents in Adrian.—The Adrian (Mich.) Street Railway has raised its fare from 5 cents to 10 cents. The company has been in financial straits for several months. A committee of Adrian citizens has been negotiating with the railway management with a view to the municipal operation of the system.

Eight Cents Asked in Auburn.—The Auburn & Syracuse Electric Railroad, Auburn, N. Y., has applied to the Public Service Commission for the Second District for permission to charge an 8-cent cash fare on its Auburn city lines. The Auburn City Council recently passed an ordinance waiving the city's right to oppose the increase.

Would Raise Augusta Fare.—The Georgia Railroad Commission will hold a hearing on Nov. 23 on the application of the Augusta-Aiken Railway & Electric Company, Augusta, for authority to make a general increase in its rate. The present fare in Augusta is 7 cents. The company has not stated the amount of the increase to be asked.

Six Cents in Huntington.—The West Virginia Public Service Commission has authorized the Ohio Valley Electric Railway, Huntington, to raise the fare on its Huntington lines from 5 cents to 6 cents beginning Nov. 8. The commission has directed the company to complete within sixty days track improvements now under way.

Would Abolish Tickets.—The Butte (Mont.) Electric Railway has applied to the State Public Service Commission for authority to discontinue the sale of reduced-rate tickets. The commission last June allowed the company to raise its cash fare to 8 cents provided that tickets be sold at the rate of 7 cents each. The company's petition has been taken under advisement.

Commission Hears Rate Plea.—Hearing was held on Oct. 21 by the Public Utilities Commission of Utah on the application of the Utah-Idaho Central Railroad, Ogden, Utah, for permission to increase its minimum fare from 5 to 10 cents, one way, and from 10 to 20 cents, round trip. This fare affects trips of a distance up to about 2½ miles. No protests were filed with the commission.

Check on All Transfers.—Orders have been issued to conductors of the Los Angeles (Cal.) Railway not to throw away or destroy any transfers punched and not issued. Such transfers must be turned in to a division clerk with a report. The order is part of a campaign being made by the railway to have conductors punch all transfers correctly and accept them only at the proper transfer points.

Postpones Reading Increase.—The Reading Transit & Light Company, Reading, Pa., has announced that, pending action by the State Public Service Commission, it will take no steps to raise its fare from 7 cents to 8 cents. The company originally proposed to advance its rate beginning Oct. 27. A number of complaints have been filed with the commission opposing fare advance. The commission will hold a hearing on the matter on Nov. 19.

Street Collection in Los Angeles.—To speed up the loading of cars in the congested zone during rush hours, extra conductors of the Los Angeles (Cal.) Railway are being stationed at the street intersections to collect fares and permit passengers to enter at the front gate, which is ordinarily used as an exit only. Mail carriers bearing full sacks of mail are now permitted to enter by the front gate at all hours of the day. This plan has been approved to present delay and congestion on the rear end of the car.

Louisville Settlement Soon.—Settlement of the fare difficulties of the Louisville (Ky.) Railway is expected at an early date, according to city officials and representatives of the company. The railway has been seeking an increase in fare from 5 cents to 7 cents under a cost-of-service plan. A member of the City Council recently stated that action on the fare question would be deferred until after the general election on Nov. 2. In the meantime the company is continuing its campaign of education by the use of advertisements in the Louisville newspapers.

Survey of Railway at Memphis Completed.—The main points of the survey by Ross W. Harris of the Memphis (Tenn.) Street Railway were outlined at a recent meeting of the Engineers Club. Numerous charts and maps were submitted showing the lines, location of population, etc. Mr. Ross is of the opinion that distribution of traffic is so unequal that better railway service is impossible under present conditions. The reasonable capacity of cars during rush hours is exceeded 50 per cent, the report states. Rerouting is recommended to take the burden of traffic off Main Street.

Telephone Dispatching Abolished.—Telephone dispatching of all cars has been abolished by the Los Angeles (Cal.) Railway. Car crews now follow their established schedules and telephone to headquarters only in case of serious delay or other trouble. The new plan relieves the conductors of telephoning from the terminal at every trip and gives the railway a saving in switchboard equipment and dispatchers. With the change, a number of new supervisors have been appointed to assist the car crews on the streets. Turn-backs or diversions from the regular route are recorded on a mileage card kept by the conductor and later submitted for inspection.

Seeks Curb on Jitneys.—The towns of Braintree and Holbrook, Mass., will be deprived of electric railway service at an early date unless they take steps to curb the operation of jitney buses within their borders. Homer Loring, chairman of the public trustees of the Eastern Massachusetts Street Railway, Boston, has informed the Boards of Selectmen of the two towns that the company will discontinue serving Braintree and Holbrook, unless the municipal authorities take steps to bar the buses. Mr. Loring contends that jitney competition makes it impossible to operate the lines in question in accordance with the provision of the Public Control Act.

Merchants Asked to Aid.—Use of co-operative tickets, good for rides on the Quincy Division of the Eastern Massachusetts Street Railway, to be furnished to suburban patrons, has been suggested by Forrest I. Neal, chairman of the home rule committee in charge of the division. Mr. Neal made the suggestion in replying to an attack by Col. Henry L. Kincaide, a former member of the committee, who claimed that merchants were losing suburban business because of high fares. Chairman Neal admitted the high fares were responsible to some extent, but blamed the cessation of war work for the greater part of the reduction of business. He declared that the Quincy Division was not on a paying basis at present, but was improving and in six months fares probably would be reduced.

Would Speed Up Service.—A readjustment in the running time of the cars of the Cincinnati (Ohio) Traction Company is urged by William C. Culkins, City Street Railway Director, now that the pay-as-you-leave plan has been tested thoroughly. Mr. Culkins in a recent letter to the company calls attention to the opportunity of improving the running time on many, if not on all lines. He points out that on many lines the cars crawl through the downtown district to avoid arriving at the terminal ahead of time. He states that he has received complaints that cars stop for as long as five minutes just outside of the "delivery" district. By readjusting the schedules so as to have the cars pass a given point on schedule on the out-bound trip, it is his belief that car service would be improved. He suggests further that car service could be reduced during the day, thereby saving a large sum of money for the company.

Ask More in Alton.—W. H. Sawyer and Fred E. Allen, temporary receivers for the Alton, Granite & St. Louis Traction Company, Alton, Ill., have filed a petition with Federal Judge English at Danville, Ill., for a 10-cent fare on the Alton city lines. The present fare in Alton is 8 cents. A report showing the receipts and disbursements since the railway was placed in receivership was also filed with Judge English. The receivers state that the men have been given an increase of 6 cents an hour. Motormen and conductors employed on limited trains are receiving 60 cents an hour, men employed on local interurban cars 59 cents an hour and Alton city line employees 57 cents an hour. This increase, which was granted by the receivers, has not been officially accepted by the men. The men, prior to the receivership, had made demands for an increase to 90 cents an hour. The naming of the receivers halted the arbitration of the wage demands and the 6-cent increase followed.

City Fights Fare Increase.—A brief has been filed with the California Railroad Commission by the City Attorney of Los Angeles opposing the granting of an increase in fare to the Los Angeles Railway. The company some time ago applied to the commission for permission to raise its rates, but failed to mention a specific increase. At subsequent hearings before the commission it was intimated that a 6-cent fare would be authorized. The city contends that business and financial conditions at the present time do not justify increased prices in any commodities. It also holds that under a 6-cent fare the company would accumulate a surplus of $500,000. H. Z. Osborne, Jr., chief engineer of the Los Angeles Department of Public Utilities, has presented a report to the commission favoring 6-cent fares on Los Angeles lines. Mr. Osborne maintains that the fare increase is necessary to permit the company to obtain additional equipment to give adequate service.

Interurban Rise Approved.—The Public Utilities Commission of Utah has granted an increase in passenger fares to the Salt Lake, Garfield & Western Railway, Salt Lake City, the electric railway known as the "Saltair Route." The company is granted permission to increase one-way passenger rates between Salt Lake City and Saltair Beach from 30 cents to 35 cents, or on a fare basis of slightly less than 2½ cents a mile. Petition for the increase was heard on Oct. 20, at which time the petitioner alleged that during the winter months the line was operated at a loss, and that traffic in the summer season was not sufficient to make up the excess of expense over cost of operation. The petitioner stated that the increase would not affect regular patrons of the road, provided they desire to avail themselves of the commutation rates, in which no increase was sought. The sale of coupon books will be continued at the price of $2.50 for ten one-way trips.

Six Cents Not Enough.—Richard Meriwether, vice-president and general manager of the Dallas (Texas) Railway, has announced that the company may be compelled to apply to the city authorities for a further increase in fare. The railway raised its fare from 5 cents to 6 cents several months ago. The financial results of the fare advance have not been satisfactory. Mr. Meriwether states that a 7-cent fare would be inadequate and that to meet operating expenses and to make needed improvements an 8-cent fare with two tickets for 15 cents would be required. The company's financial report for the month of September shows that the rate on the property valuation for that month was 3.4 per cent. The authorized monthly return is 7 per cent. Nine months ago, under a 5-cent fare, an average of 4.5 per cent was being earned. Gross earnings for the month of September amounted to $279,057, with operatng expenses of $210,973. The operating income, after caring for authorized reserve funds, is given at $25,853.

Fare Increase Hearing Held. — A hearing was held by the Railroad Commission of Wisconsin on Oct. 18 at Kenosha, Wis., to consider the recommendation of the State Board of Conciliation that the wages of trainmen employed on the lines of the Wisconsin Gas & Electric Company in Kenosha be advanced to the same scale that is now being paid in Racine and Milwaukee. The company indicated that an increase in fare of 1 cent would have to be granted in order to meet the proposed increase in wages. The fare which is at present 6 cents would thus be increased to 7 cents. Reduced rate tickets might, however, be sold. The case was taken under advisement by the commission. At the hearing it is reported to have been brought out that for the first time in three or four years it was now possible to get abundant help in Kenosha and that men were willing to go to work as trainmen at the present wage schedule. Representatives of the company therefore opposed the proposed wage schedule.

Personal Mention

I. L. Ward Leaves P. E.

General Purchasing Agent Joins Manufacturing Concern—Messrs. Thorburn and Fenimore Step Up

I. L. Ward resigned on Nov. 1 as general purchasing agent of the Pacific Electric Railway, Los Angeles, Cal., to accept a position as general manager of the Steel Mill & Foundry Supply Company, a newly organized corporation doing business in Los Angeles.

C. Thorburn, general storekeeper of the Pacific Electric, has been appointed purchasing agent to succeed Mr. Ward.

C. C. Fenimore, who has been serving as chief clerk to the purchasing agent, has been advanced to the position of general storekeeper, to succeed Mr. Thorburn. Mr. Fenimore has been connected with the company since 1909, his work for the most part having to do with the stores department.

I. L. WARD

Mr. Ward became general purchasing agent of the system in 1917. He was previously connected with the Southern Pacific Company, with headquarters in San Francisco. As purchasing agent of the P. E. lines he succeeded F. W. Taylor, who left the Pacific Electric to become purchasing agent of the Southern Pacific's System in the territory from El Paso to Portland.

Mr. Ward gained his early railroad experience with the Chicago, Rock Island & Pacific Railway, in the maintenance of way, mechanical and stores departments. Ten years ago he joined the Southern Pacific Company, serving first as chief clerk to the general storekeeper and later as storekeeper, general stores, and chief clerk of the purchasing department.

Mr. Thorburn, by taking over the purchasing department of the Pacific Electric, becomes one of the largest purchasers of materials in southern California. He entered the service of the company in May, 1909, as stores department accountant in the office of the auditor. Like Mr. Ward, he had previously been connected with the stores deparment of the Southern Pacific. In December, 1909, he was made chief clerk to the general storekeeper of the Pacific Electric, and three months thereafter was promoted to general storekeeper, continuing in that position until receiving his new appointment.

Donald F. Hine has joined the staff of the ELECTRIC RAILWAY JOURNAL as an editorial representative and will devote his attention to the preparation of articles of an engineering nature. Mr. Hine is a native of Fisher's Island, N. Y. After completing the regular course in electrical engineering at the Sheffield Scientific School of Yale University he spent a year at the same institution doing special engineering work in the graduate school.

A. L. Gibson has been appointed superintendent of the Lawrence District of the Eastern Massachusetts Street Railway, Boston, Mass. Mr. Gibson has been connected with the railway for a number of years, starting in the Chelsea District as a platform man. Later he became car house foreman in Revere and for the last several years has served as superintendent of the district including Woburn, Reading, Wakefield and contiguous towns.

Charles Gordon has been appointed engineer of equipment of the Chicago Surface Lines, reporting to H. H. Adams, superintendent of equipment. Mr. Gordon was connected with the Surface Lines from the time of his graduation from the railway electrical engineering department of the University of Illinois in 1912 until December, 1917, when he resigned to enter the United States Army as air service engineer officer of the 276th Aero Squadron with the rank of second lieutenant. Since his discharge from military service in April, 1919, he has been with the sales and service department of the Vacuum Oil Company.

G. Dieden, managing director of the street railways of Gothenburg, Sweden, is spending a few weeks in this country, studying the operation of safety and other modern types of cars. Mr. Dieden was an observing attendant at the recent Atlantic City convention, where he laid plans for visits to Montreal, Buffalo, Philadelphia, Baltimore, Newark and a few other cities with railway conditions comparable with those in Gothenburg, which although of smaller population than any of those mentioned is the second city in Sweden in population. Mr. Dieden also hoped to spend a couple of weeks in Florida, by way of a vacation before sailing for home.

Dual Receivership in Kansas City

Col. Frederick Fleming and Francis M. Wilson Appointed Permanent Receivers—Aim to Secure Good Will of Public

Col. Frederick Fleming and Francis M. Wilson, long active in the business and professional life of Kansas City, Mo., were appointed on Oct. 26 the permanent receivers of the Kansas City Railways. The appointments were made by Judge Kimbrough Stone of the United States District Court, before whom the receivership proceedings were brought last August. Judge Stone on Oct. 30 designated James E. Goodrich counsel for the permanent receivers. Messrs. Fleming and Wilson have announced that they will devote their entire attention to their new duties. Colonel Fleming several years ago retired from direct participation in the affairs of the various corporations in which he is interested. Mr. Wilson resigned as Federal District Attorney immediately after his appointment to the receivership board, his resignation being accepted by Attorney General Palmer on the same day.

THE receivers have spent most of their time since appointment in making themselves familiar with all phases of the operation of the property. They have not yet established offices, but will do so shortly in the railways building. They are also painstakingly studying the problem of building up public good will. This they consider one of their most important duties. Just what this work of "building good will" implies may be differently explained by different factions in Kansas City.

COL. FRED W. FLEMING

The most commonly heard explanation of the company's financial predicament is the jitney. The jitney began to flourish and seriously to detract from the railway's revenues after the strike of 1918. It is asserted by some critics that the public was unfavorable to the company, and therefore patronized the jitneys operated by former employees. That much of the propaganda favoring patronage of jitneys, and encouraging to the operation of jitneys, sprang from opposition to the company is well known.

Colonel Fleming will serve as the "business man" on the receivership board. He is pre-eminently qualified for his new work both by training and experience. He was appointed to the directorate of the Federal Reserve Bank of the Tenth District, shortly after the bank was established, to represent large financial and business interests of the district. At that time he was chairman of the board and business manager of the Kansas City Life Insurance Company.

COLONEL FLEMING A CANADIAN

Colonel Fleming was born in New Brunswick, Canada, on Aug. 9, 1866. He was graduated from Ricker Classical Institute, Houlton, Maine. In 1885 he went to Atchison, Kans., where he taught school for two years. He then entered business in Kansas City, where he has since resided. Joining a real estate, insurance and investment concern as a clerk, he later opened his own office. He subsequently established and operated a printing office. This plant was later bought by Col. Cusil Lechtman, and is now one of the largest in the West.

In 1904 Colonel Fleming and his associates bought the Kansas City Life Insurance Company, Colonel Fleming personally holding the controlling interest. He was secretary and general manager of the company for several years, and was then made chairman of the board. He retired from the company in 1918 because of impaired health. He is now fully recovered and seems as vigorous as ever. He was one of the leading figures in the various "drives" staged in Kansas City during the war. He served as director for the Middle Western Division in the War Savings Certificate campaign.

The title of "Colonel" resulted from his war and National Guard service. He was one of the organizers and major of the "Marmaduke Guards," which served as a unit of the Third Regiment from Kansas City in the Spanish-American War. At the end of the war he reorganized the regiment and became its colonel. Colonel Fleming was formerly active in local and state politics.

MR. WILSON A MISSOURIAN

Mr. Wilson, co-receiver with Colonel Fleming, is an avowed friend of the railway. Shortly after his appointment he stated that ever since coming to Kansas City he had patronized the trolleys as a matter of principle. "I use my motor car for other purposes," he said; "but I have felt that a citizen should use the utilities provided for specific purposes, as in the case of the street railway, so I ride to and from work on the cars."

Mr. Wilson is a native Missourian. He was born on June 13, 1867, in Platte City, in the county adjoining Kansas City, Kans., on the north. He has always lived in Platte County and in Kansas City, Mo. He was educated at Vanderbilt University, Nashville, Tenn., and Centre College, Danville, Ky. In 1889 he was married to a daughter of Senator Francis M. Cockrell. He was prosecuting attorney of Platte County for two terms; member of the Missouri State Senate in 1899, and chairman of the Senate and House joint committee on revision of statutes. He was again a member of the Senate in 1911 and in 1913, being president pro tem. in the latter year. He resigned from the Senate in August, 1913, to accept from President Wilson the appointment of United States District Attorney for the Western District of Missouri. He was reappointed on July 23, 1917, for a term ending Aug. 4, 1921.

James E. Goodrich, appointed counsel for the receivers, was born at Cameron, Mo., on Sept. 20, 1871. He removed to Kansas City twenty years ago. He sat on the Circuit bench in Jackson County, Mo., for six years, retiring to private practice in 1913. He has been attorney for the Federal Reserve Bank of the Tenth District since the bank's organization, and is also attorney for the National Bank of Commerce. He represents many other banks and corporations as special counsel. He is a Republican in politics, and was a delegate to the Republican National Convention in 1900. However, he has been employed as counsel irrespective of his political affiliations, having represented a Democratic police board, for instance, in proceedings to compel the granting of an appropriation for the city's police department. His present appointment was made by Judge Stone with the approval of the receivers.

F. M. WILSON

Judge Goodrich is a member of the board of curators of the University of Missouri and is a member of the executive committee. He is one of the few local attorneys who have been active for several years in the Kansas City Chamber of Commerce.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER,
SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Transformer Market Steady

Prices Hold Firm, as Production Continues from Stocks of High-Priced Raw Materials

Power and distribution transformers continue in good demand. A leading manufacturer is considering increasing his facilities, so great is the faith of the sales force in the future market. Inquiries and orders show little evidence of the business recession apparent in some fields. A representative of the ELECTRIC RAILWAY JOURNAL found one of the largest plants in the country working full time a few days ago, with several months' orders on the books. Deliveries are quoted around five months on medium-sized power transformers and three months or less on distribution transformers. Both classes of transformers are in about the same demand.

Prices hold firm and raw material is in good supply, barring a shortage of tank iron and some scarcity in Egyptian cotton. It is doubtful if the shortage of cotton experienced earlier in the year can be made up before January. Large stocks of copper and sheet steel must be worked up by the manufacturers before the buying of raw material at reduced prices can be reflected in factory costs, it is said. Wages have not been reduced to any extent as yet, nor layoff of men required; in fact, employees are still being taken on in one of the large eastern factories.

The importance of purchasing transformers with more regard to all-day efficiency is being emphasized in some circles. The high price of coal and the continuous core and line losses involved in scattered installations especially are leading the progressive buyer of transformers to study more carefully than hitherto the engineering characteristics of this class of equipment. In some cases, it is pointed out, the purchaser can afford to pay 15 to 25 per cent more in transformer first cost for higher all-day efficiency.

Winding Tape Slightly Lower in Price

Cost of Yarn Still High Despite Lower Cotton—Deliveries Improving, with Raw Material Plentiful

A reduction averaging about 15 per cent in the price of the high-grade cotton tapes used in generator and motor windings went into effect in several recent readjustments of quotations by leading producers. Delivery conditions are now considerably improved. Shipments can be made in from six to ten weeks, compared with about twelve to fourteen weeks in the early summer.

The supply of raw material in the hands of the tape manufacturers is on the whole excellent, but the cost of yarn continues high, notwithstanding the slump of cheap grades of cotton in the open market. Leading grades of yarn cost the tape manufacturer around $1.50 to $1.75 per pound today. Wages are not being reduced as yet, and the amount of business on the books of some concerns bids fair to keep the plants going on substantially full time for many weeks. A fair average cost for sizes commonly used would be from $2 to $3 per gross yard, and it is said on good authority that prices will probably not change much until the end of the year, at least. One of the leading manufacturers points out that should prices fall materially before 1921, buyers would be fairly treated as to readjustment.

Cotton sleeving is in heavy demand now, and in order to fill orders night work is being done. One concern is running three daily shifts on this class of production. Eight to ten weeks' delivery is offered. Prices average about $2 per pound, net, with 50 cents per pound extra for colors. Raw material is in good supply and the outlook for the rest of the year is excellent.

Trolley Wheels in Good Demand

Stocks in General Are Not Large, but Deliveries Are Improving—Price Peak Thought Reached, Though Producers Say They Expect No Reduction Soon

Most manufacturers of trolley wheels report a good volume of sales the past year and are finding demand holding up well. In fact, more than one company is booked ahead with a volume of business that will tax capacity for some time to come, it is stated. According to one of the leading interests there has been a trend toward the use of trolley shoes on the part of small lines during the past two years in some parts of the country, notably in the central district. This tendency has not as yet made itself felt appreciably in the trolley wheel business, however, it is stated. On the other hand there are a few manufacturers who claim that electric railways are making their wheels run a longer time without replacements and that buying has consequently not been heavy. Sales in these cases, however, are expected to be larger this month, on behalf of winter equipment.

Conditions vary considerably with regard to the ability of manufacturers to supply the demand. Some producers have been unable to accumulate any surplus supplies of the finished product and are being retarded in their production by non-delivery of raw material which, though plentiful, is not always obtainable when needed. Recently a large maker received a car of metal which had been en route six months. Other trolley wheel producers report favorable stocks on hand, however, and are finding no especial trouble with their raw material supply. One company is short of high class labor, but in general this condition is very greatly improved. More work per man is also being accomplished in some instances.

Deliveries in several representative instances are ranging from about one to three months. In some quarters the time in which orders can be filled is lessening and hope is expressed of eventually cutting it down to two weeks. In rare instances deliveries can be made in normal time. Production in general appears to be favorable. One large maker of trolley wheels increased production 100 per cent last year over 1918, and expects the output to show a further increase during 1920. No recent change in prices is reported. On all sides the opinion is expressed that prices in this line have reached their peak, yet most producers say they expect no reduction in the near future. One company, however, states that as prices are largely governed by the metal market and copper is now at a comparatively low level, the tendency seems to be toward a decline. Others point to the non-ferrous metal prices as comparing favorably with the pre-war level and do not look for any further reductions on that account.

Renewal of Assigned Car Privilege Refused

Despite the lifting of the lake priority order on coal the gas and electric public utilities continue to be very uneasy concerning their coal supply. This is a general condition as indicated by the communications reaching the National Committee on Gas and Electric Service at Washington. In view of the widespread difficulties in obtaining fuel the Interstate Commerce Commission again has been asked to allow the utilities the use of assigned cars. The commission has declined to take that action at present on the ground that the situation throughout the country is not such as to warrant it so doing.

Since the utilities were denied assigned cars the tendency on the part of some of the coal operators has been to give preference to the loading of coal which is to be sold at spot prices rather than delivered on low-priced contracts. With 80 or 90 per cent of their coal requirements under contract, the public utilities are receiving less than 50 per cent of their daily requirements.

Electric Lines Using More Fire Extinguishers

Complete Installations Made on Cars of Some Roads—Deliveries Improved and Production Increasing

More and more are electric railways coming to regard fire extinguishers as a necessary part of their rolling stock equipment, according to large manufacturers of this equipment. Demand from traction companies has been steadily picking up and at present is said to be better than ever before. Recent large orders reported by one manufacturer included the equipping of cars on important electric lines in Albany, Boston and Chicago.

The types most generally used by electric railways are said to be those employing tetrachloride, as this chemical rapidly evaporates and will not harm electrical machinery. One company has recently developed an automatic extinguisher charged with this agent under 120 pounds of air pressure, which it is claimed is meeting with considerable favor. In some instances manufacturers have been behind on filling orders but this condition is now improving. The labor supply is better though some complaint is still heard of insufficiency of skilled workmen. Difficulty in getting brass was formerly experienced but no trouble is now met, it is stated, in securing plenty of brass, copper and chemicals. No cancellations have apparently been received but on the contrary some producers are increasing production. One representative company was recently three months behind in filling orders, but is now caught up to within three or four weeks. Rush orders in this instance can be filled in about two or three days, though in general the time ranges from two to three weeks at present. Another manufacturer is able to make deliveries of extinguishers varying from stock up to one week.

Prices, it is felt, have probably reached their peak, but no reductions may be expected for some time, it is stated, especially while labor costs remain at their present level. Some producers sell on a yearly contract basis, thus further preventing any fluctuation. Prices quoted by one manufacturer of a pump-action refillable fire extinguisher quite largely carried on street cars are $10 for the 1 qt. size, $12 for 1¼ qt., and $14 for the 1½ qt. size, with special discounts from these prices to railways.

Rolling Stock

Muskegon (Mich.) Traction & Lighting Company expected shipment of the safety cars ordered by the company several months ago for service on the Ottawa and Pine Street lines around the first of this month.

Columbus (Ga.) Railroad has received the nine new safety cars mentioned in the issue of May 22, it is announced. They will be put in operation on the Rose Hill line in place of some of the older two-man cars.

The Pacific Electric Railway, Los Angeles, Cal., owing to the amount of freight now being handled, has had to secure two more electric locomotives, according to F. L. Annable, general superintendent. The new locomotives, which make a total of seventeen now operated by the company, are of the 1601 class and are expected to arrive from the shops some time this month.

Pittsburgh (Pa.) Railways, mentioned in the Oct. 23 issue as petitioning the United States District Court through its receivers for permission to purchase 150 double-truck steel cars among other equipment, has been granted permission by the court to purchase a first installment of twenty-five new double-truck, low-floor cars at a cost of $375,000, it is reported. The court order stipulates that the receivers are to pay for the new cars "out of the income of the system."

Track and Roadway

Los Angeles (Cal.) Railway.—The Los Angeles Railway expects to reconstruct its track and improve its pavement at a cost of $1,600,000. Renewal of overhead equipment will cost $300,000.

American Public Service Company, Chicago, Ill.—The property of the Abilene (Tex.) Street Railway, recently purchased by the American Public Service Company, will be completely rehabilitated, including new transmission lines, extensions of existing lines, ballasting of all roadbed and new equipment.

South Covington & Cincinnati Street Railway, Covington, Ky.—The City Commissioners of Newport, Ky., have been notified that a check for $6,718

NEW YORK METAL MARKET PRICES

	Oct. 1, 1920	Nov. 3, 1920
Copper ingots, cents per lb	18.50 to 18.75	15.00
Copper wire base, cents per lb	21.50 to 22.00	17.50 to 18.00
Lead, cents per lb	7.75	7.25
Nickel, cents per lb	43.00	43.00
Zinc, cents per lb	7.70 to 7.80	7.40
Tin, cents per lb	42.75	39.50
Aluminum, 98 to 99 per cent, cents per lb	35.10	33.10

OLD METAL PRICES—NEW YORK

	Oct. 1, 1920	Nov. 3, 1920
Heavy copper, cents per lb	15.25 to 15.50	12.00 to 13.00
Light copper, cents per lb	13.00 to 13.25	10.00 to 10.50
Heavy brass, cents per lb	8.50 to 9.00	6.50 to 7.00
Zinc, cents per lb	4.50 to 5.00	4.00 to 4.50
Yellow brass, cents per lb	6.50 to 7.00	5.00 to 5.50
Lead, heavy, cents per lb	6.50 to 6.75	5.25 to 5.50
Steel car axles, Chicago, per net ton	33.00 to 34.00	31.00 to 32.00
Old carwheels, Chicago, per gross ton	37.00 to 38.00	33.00 to 34.00
Steel rails (scrap) Chicago, per gross ton	27.50 to 28.00	22.50 to 23.50
Steel rails (relaying), Chicago, gross ton	37.50 to 38.50	30.00 to 31.00
Machine shop turnings, Chicago, net ton	9.00 to 9.50	8.00 to 8.50

ELECTRIC RAILWAY MATERIAL PRICES

	Oct. 1, 1920	Nov. 3, 1920
Rubber-covered wire base, New York, cents per lb	28.00	23.00
Weatherproof wire (100 lb. lots), cents per lb	29.00	23.00
Standard Bessemer Steel Rails, per gross ton	45.00 to 63.00	45.00 to 63.00
Standard open hearth rails, per gross ton	47.00 to 65.00	47.00 to 65.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	Nominal	73.00
Rails, girder (grooved), per gross ton, f.o.b. mill	Nominal	88.00
Wire nails, Pittsburgh, cents per lb	4.25	3.25 to 4.50
Railroad spikes, drive, Pittsburgh base, cents per lb	4.50 to 6.00	4.25 to 5.25
Tie plates (flat type), cents per lb	4.00	4.00 to 5.00
Tie plates (brace type), cents per lb	4.00	4.00 to 5.00
Tie rods, Pittsburgh base, cents per lb	7.00	6.50 to 7.00
Fish plates, cents per lb	4.00 to 5.00	4.00 to 5.00
Angle bars, cents per lb	4.00 to 5.00	4.00 to 5.00
Rail bolts and nuts, Pittsburgh base, cents per lb	6.00 to 7.00	6.00 to 7.00
Steel bars, Pittsburgh, cents per lb	2.35 to 4.00	2.35 to 3.25
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20 to 7.35	4.20 to 6.85
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.25 to 8.30	5.25 to 8.05
Galvanized barbed wire, Pittsburgh, cents per lb	4.45	4.45

	Oct. 1, 1920	Nov. 3, 1920
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.70 to 4.70	3.95 to 4.70
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, AA quality) New York, discount	79%	79%
Waste, wool (according to grade), cents per lb	17 to 23	15 to 21
Waste, cotton (100 lb. bale), cents per lb.	15 to 17½	15 to 17½
Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	42.50	42.50
Asphalt, filler, per ton	40.00	40.00
Cement, New York, per bbl	5.10	5.10
Linseed oil (raw, 5 bbl lots), New York, per gal	1.22	1.05 to 1.07
Linseed oil (boiled, 5 bbl. lots), New York, per gal	1.24	1.07 to 1.09
White lead (100 lb. keg), New York, cents per lb	15½	15½
Turpentine (bbl. lots), New York, per gal.	1.46	1.17

*These prices are f.o.b. works, with boxing charges extra.

has been drawn by the South Covington & Cincinnati Street Railway as the company's portion of the improvements made on Tenth Avenue. An agreement as to the amount was reached between the commissioners and the representatives of the railway company two weeks ago.

Blue Ridge Development Company, Hickory, N. C.—The engineers of the Blue Ridge Development Company, a recent incorporation, have recently made a report of their survey for an electric railway between Mount Holly and Blowing Rock. W. T. Shipp, general manager of the company, tells the stockholders that the project is well under way and that the possibilities for the road are very promising.

City Electric Company, Albuquerque, N. M.—The City Electric Company plans to construct an interurban electric railway from Albuquerque north along the Albuquerque-Alameda road. The company was incorporated under the laws of Arizona, but having recently filed a foreign corporation statement, it will be permitted to operate in New Mexico.

Public Service Railway, Trenton, N. J.—The Public Service Railway has been requested by the Board of Freeholders of Middlesex County to remove all the trolley poles at Fords, N. J., so that the main street can be paved.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The City Commission of Trenton, N. J., will request the Trenton & Mercer County Traction Corporation to build a spur on North Broad Street, near the Battle Monument, to switch suburban cars for the return trip instead of using the streets in the centre of the city. This action was taken because of the street congestion.

Hamilton (Ont.) Street Railway.—There will be no further railway improvements in the city of Hamilton, Ont., this year, according to the railway commission. It is said there is no chance that the Wentworth Street tracks will be relaid because the municipality is not ready to go ahead with the work of new paving.

Seattle (Wash.) Municipal Railway.—Mayor Caldwell recently vetoed a second Council ordinance on the extension of the Ravenna car line, charging that the change in plan, adding $9,500 to the expense of the extension, was "throwing away so much of the railway bond money." The Mayor vetoed an ordinance recently voting $3,500 to complete the extension on 30th Avenue Northeast to 35th Avenue Northeast, instead of along East 55th Street to 35th Avenue Northeast, but the Council passed the measure over his veto. The bill last vetoed amends the ordinance under which the work originally was taken up, being intended to remove legal difficulties accompanying the change of plan. The Mayor's action has little effect on the general controversy as the work is being halted by litigation on the part of residents along the line.

Power Houses, Shops and Buildings

Los Angeles (Cal.) Railway.—The Los Angeles Railway is planning an extensive construction program. Four new substations will be erected at a cost of $500,000 and one new carhouse which will cost $500,000.

Niagara, St. Catharines & Toronto Railway, St. Catharines, Ont. — The Niagara, St. Catharines & Toronto Railway is building an addition to its car houses and shops in Welland Avenue. The addition is 100 ft. x 200 ft. The whole carhouse when complete will be 200 ft. x 400 ft. It is of brick and steel with concrete flooring. The machine shop will be in the center of the building.

Trade Notes

American Steam Conveyor Corporation, Chicago, Ill., manufacturer of equipment for handling ashes, soot, coal siftings, etc., announces that C. C. Brinley has joined the company as eastern manager of the trolley carrier department, attached to the New York office.

J. F. Ohmer, president of the Ohmer Fare Register Company of Dayton, Ohio, announces that he has purchased the U. S. Navy Arsenal plant at Dayton, which will eventually be taken over to increase the output of Ohmer registers. The plant covers approximately three acres of ground and includes a power plant of 600-hp. capacity. The main building is of brick construction, five stories high, and 335 x 110 ft.

The Van Dorn Electric Tool Company, Cleveland, Ohio, is marketing in Ohio a new issue of 8 per cent cumulative preferred stock. This company, which makes portable electrically driven tools, was organized in 1913 to take over the tool-making department of the Van Dorn & Dutton Company. Its sales for the last four years ended June 30 were: 1917, $445,997; 1918, $714,705; 1919, $1,031,513; 1920, $1,190,815.

Ford, Bacon & Davis, engineers, at 115 Broadway, New York City, has added to the organization Page Golson, formerly assistant to the president of the Great Western Power Company, and consulting engineer for the Fleishhacker interests and of the western office of C. B. Peters Company, Inc., it is announced. G. R. Kenny, until recently statistician and valuation engineer for the San Joaquin Light & Power Corporation, has also joined the firm in valuation and report and special investigation work. Mr. Kenny was formerly assistant engineer for the Railroad Commission of California.

The Roller-Smith Company, New York City, announces the appointment of L. Brandenburger, 59 West Broadway, Salt Lake City, Utah, as its representative in Utah and parts of Idaho, Wyoming and Montana. Mr. Brandenburger will handle the company's entire line of instruments, meters and circuit breakers in that territory in addition to representing the Wagner Electric Manufacturing Company, the Cutler-Hammer Manufacturing Company, the Delta Star Electric Company, the American Insulated Wire & Cable Company and the Esterline Company. Mr. Brandenburger was formerly with the Telluride Power Company and later its successor, the Utah Power & Light Company. Since 1916 he has been located in Salt Lake City as a manufacturers' agent specializing in electrical apparatus.

Page & Hill Company, Minneapolis, Minn., producer of Northern white and Western red cedar poles, posts, etc., announces that E. C. Stockdale has returned to the company as general sales manager with headquarters in Chicago. Mr. Stockdale previously came to the company in 1914 from Stone & Webster, with whom he was associated as purchasing agent in the construction of power stations and distributing systems for the Minneapolis General Electric Company, and the hydro-electric development at Keokuk, Iowa, for the Mississippi River Power Company. During the war he attained the rank of lieutenant-colonel, being engaged first in the construction division of the army and later in the purchase and supply division. Since the armistice Colonel Stockdale has been representing the army in deliberations with the War Industry Board and the Department of Labor on suspensions and cancellations of existing contracts.

New Advertising Literature

Insulated Wire and Cable. — The Okonite Company, Passaic, N. J., has just published an attractive 104-page illustrated handbook, covering insulated wire and cable.

Splicing Material.—The Okonite Company, Passaic, N. J., has issued a folder entitled "Spliced for Life," on insulating tape, cement and Manson friction tape.

Power Plant.—Dwight P. Robinson & Company, Inc., New York City, have prepared a poster circular containing excellent halftone reproductions of typical power plants designed and constructed by the organization.

Lamp Guards.—Electric Service Supplies Company, Philadelphia, Pa., has issued a new eleven-page bulletin, No. 169, on its portable and stationary types of Keystone lamp guards suitable for railway service.

Commutator Stones.—The Martindale Electric Company, Cleveland, Ohio, has issued a folder describing its "Handy" natural stones and new "Imperial" artificial stones for grinding commutators.

Engineering Service.—Ford, Bacon & Davis, engineers at 115 Broadway, New York City, is distributing pamphlet No. 28 dated Oct. 1, 1920, dealing with the "Service at Cost Plan" for electric railways and offering the services of the company for valuation work.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL. Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

Volume 56 New York, Saturday, November 13, 1920 *Number* 20

Patrons Take Advantage of Convenience of Dime Fare

ON a rate of 10 cents cash, with four tickets for 35 cents, on the Chicago Elevated Railways, more than 32 per cent of the passengers paid cash the first month, while on the former rate of 8 cents cash and two tickets for 15 cents only 25 per cent of the riders paid cash. On the new higher rate the saving per ride to the passengers by buying tickets is 1¼ cents, while it was ½ cent on the former rate. In other words, 621,765 more passengers paid a dime cash fare in August than paid an 8-cent cash fare in July, although 1,999,068 more passengers were carried in July than in August. Or, stated another way, 32 per cent of the passengers failed to avail themselves of a saving of 1¼ cents, while only 25 per cent failed to take advantage of a saving of ½ cent.

This seems to emphasize the value and convenience of the unit coin fare. People in large numbers have laid down a dime and walked through the gate rather than be bothered with change-making and the consequent delay for the sake of the cheaper ticket rate. It would also seem to show that when the fare gets up to 8 cents or 9 cents it might as well be 10 cents so far as there is any aversion on the part of the public to paying it, and apparently it might better be 10 cents from the standpoint of the public convenience.

Analyze Your Freight Possibilities Carefully

THAT the transportation facilities of the country have not kept pace with the growth of traffic is common knowledge among business men. This to a certain extent is a direct result of the World War, and in the case of the steam roads government operation is undoubtedly partly to blame. In the case of the electric lines this condition is partly a result of short-sighted regulation which has imposed such restrictions and burdens upon the properties as to prevent a sufficient revenue. This has very naturally caused a stagnation of development and extension and has resulted even in inadequate maintenance of existing property and equipment.

One very important reason for the lack of development of electric railway freight handling may, however, be found in the management itself. Those who have not studied the subject carefully allow themselves to believe that insurmountable obstacles lie in the path of such development. As a matter of fact the obstacles are not there in most cases, as proper investigation will generally prove. In all probability the business is available, and the greatest obstacle to the development of this business is the matter of obtaining the money to purchase sufficient equipment to handle it properly. This obstacle is not insurmountable by any means. If a thorough investigation and analysis indicate that an investment in the necessary rolling stock and station facilities will pay a handsome dividend, surely there are those from whom such funds can be obtained.

We hope that the paper by Mr. Budd and the report of the committee on express and freight traffic presented at the Atlantic City convention will stimulate other companies to develop what Mr. Budd calls a "merchandise" business. The whole country is crying for the service, and surely no time is more propitious than the present moment, for the rates on the steam lines have now been largely advanced, thus giving the electric lines a greater margin for increase in rates for a service which warrants such an increase.

San Diego's Encouraging Experience with the Zone Fare

AMERICAN electric railway operators throughout the land will be gratified, we believe, to read in this issue of the success which the San Diego Electric Railway has attained with the zone fare since its inauguration on the first day of this year. The feeling has been growing that the zone fare, by which is meant some form of measured service, has much to support it as the logical fare, at least as an economically just fare, and one which, commercially considered, has the advantage of attracting and serving the short-haul riders. But it is not to be denied that the disheartening experiences of the Public Service Railway and the Connecticut Company have put a damper on the enthusiasm of many operators. Permanent discouragement, however, would not be justified without further trial in view of the fact that there must be some very advantageous features or the zone fare railways in this and other countries would change to the flat fare.

San Diego, fortunately, was able to begin under happier auspices than either of the companies just mentioned. The California Railroad Commission recognized that its chief function was to determine whether the railway needed relief and not to tell the railway exactly how it should try to get relief. Once the company had established its case, the commission did not hesitate long in approving the plan worked out and submitted by the railway management. That plan, fundamentally, was to secure the needed revenue without losing any profitable short-haul traffic, and yet, at the same time, to make the increase to the long-haul rider as little as practicable. San Diego's sound reasoning was that if the short-haul rider could be retained the tax on the other riders would be less than if every one of a smaller number of riders was expected to pay a higher unit fare. The event has justified all hopes, for how many other companies can show a 40 per cent increase in revenue and 12 per cent increase in traffic despite diminished local activities?

If we look closely into the reasons for San Diego's splendid start we may set them down as follows:

First, public understanding and co-operation, for there was no doubt in the minds of either the public or the commission that the company had been rendering a

great service without adequate return. Second, patient and resourceful publicity in a campaign where the officials of the company did not hesitate to explain the needs of the company face to face with every element in the city, from the scared real estate men to the worker in store and factory. Third, straightforward co-operation with the transportation personnel, including a bonus plan that has made the selling of rides and the collection and auditing of fares a matter of abiding interest to conductors and motormen. The success of the bonus plan, let it be added, must have been promoted in large measure by the fact that the management had already proved liberal with its men in sharing the savings from accidents and other items subject to economy. Fourth, a system of fare charging and fare procedure that indicates a feeling of civic responsibility, of fairness to those who have to ride and of willingness to learn from the experience of other zone-fare operators. It is truly amazing that fate should have reserved to so diffused a city as San Diego the chance to demonstrate successfully that there are means of getting more revenue other than the expedient of an ever-rising unit fare.

The Pendulum Is Always Swinging

A CONDUCTOR joshed a plumber riding on his car about being late for work. The plumber came back with the reply, "What do I care, they've got to have us and there's no one to take our places."

If you inquire of the carpenters, plumbers, masons, machinists, painters, plasterers, etc., you will find that apprentices are almost unknown these days. Immigration has almost stopped, and for the past ten years the native American boy has been after the "white collar" jobs.

What has been the result? Today the tradesman commands wages in excess of many "white collar" men; today there is a dearth of skilled workers and a deluge of clerks. Production has gone down and overhead has gone up.

What is now going on?

The pendulum is swinging again toward the economic balance. The trades offer an increasing economic inducement to the worker, while the "white collar" job offers an economic handicap. The law of supply and demand operates slowly but surely. Let us hope that each swing of the pendulum will increase the economic and social worth of civilization.

Adroitness a Factor in Good Advertising

MUCH advertising matter that is foisted on the reading public is dull and heavy because it lacks a certain quality which may, for want of a better term, be called adroitness. An example of what is meant by this is furnished by a recent car card which calls attention to a well known shaving soap in these words: "If ———'s cost you a dollar a tube, a shave would cost you less than one cent." Such a phrase not only induces mental arithmetic but it sticks in the memory.

The same idea is applicable in regard to electric railway fares, and it has of course been used many times. For example we can say: "If your carfare is raised one cent, or 20 per cent, the increase will cost you less than one 15-cent 'movie' ticket a week." Or: "You can ride on this line for half a cent a mile? Do you wonder that we are asking for an increase?" The purpose of such phrases, which need be only suggestive, is to get the reader to make comparisons and thus gain a better appreciation of the thing or service advertised. The trick consists largely in changing the system of units in which the thing or service is evaluated. To illustrate further, it is obviously much better to say that "this incandescent lamp can be burned forty hours for a cent," rather than to explain that its power consumption is 25 watts. It's worth a considerable brain effort to put facts in such homely terms.

Politics Now Has Full Sway in Illinois

ABOLITION of the Illinois Public Utilities Commission and restoration of "home rule," the promise of a law making possible "people's ownership and operation" of the utilities and 5-cent carfares are the reactionary mainstays of the platform on which the political campaign just closed was waged in Illinois. While we seriously doubt that it was these issues which won for the Mayor Thompson-of-Chicago state, county and city tickets, and rather feel it was the Republican landslide that turned the trick, yet the reality must be faced that these candidates won. It certainly is significant, however, that 400,000 people who voted for Harding rebelled against the anti-utility campaign of the Thompson ticket and scratched their ballots to vote against Len Small, Republican Governor-elect. With a Governor pledged as above, what may be expected in Illinois during the next year or two?

Of course it is one thing to say that the utilities commission shall be abolished and quite another to secure the repeal of the act creating it. Also, it is one thing to pass a law permitting municipal ownership and quite another to have m.o. But undoubtedly these things will be put up to the next session of the State Legislature, and if they fail of passage, then the Thompson machine will have a fine excuse to go before the people in succeeding campaigns and declare wherein responsibility lies for the failure of past pledges and to ask for a Thompson Legislature. It wins votes. Mayor Thompson knows as well as we do, or should, that a 5-cent carfare in Chicago is impossible unless the losses are made up by taxation, but the idea of restoring nickel carfare, has a wide appeal, and the local companies have done little in the way of educational publicity to counteract it.

It is not likely that the pledges made involving legislative action can be carried out. But there is still a serious possibility applying particularly to the urban railways of Chicago. The members of the utilities commission are appointed by the Governor. The present commissioners have been actuated in their orders by the highest motives and have had the strength to increase fares against the provisions of existing contracts between the city and the surface railways and against the unthinking popular will made keenly reproachful by the agitation of the city hall. It is obvious, then, that it would be quite in keeping with the campaign methods for the new Governor to appoint men to the commission, as the terms of the present members expire, who will be actuated by the primary motive of popular appeal, with what disaster to the utilities it is hard to say. Grave as this move would be, it is the least the new Governor can do in carrying out his platform, for it is entirely within his present powers. This is assuming what is hard to believe, namely, that he will seriously try to carry out his anti-utility pledges, for that would be contrary to the best interests of the public, and he must know it.

For Contrast, See New York

IN CONTRAST to the situation in Illinois outlined above, it is a pleasure to note the election to the Governorship in New York of ex-Judge Nathan L. Miller, who ran on a platform one of whose principal planks was a pledge to work out a constructive policy toward public utilities. Particular mention was given in the platform and in Judge Miller's speeches to the seriousness of the traction situation where, it was stated, a solution was necessary for the good of the public. Heaven knows that this is so. Mayor Hylan in New York rides the 5-cent fare hobby at least as consistently as Mayor Thompson of Chicago.

As to how the new Governor will proceed, no one now knows. He has announced that he favors a sufficient centralization of authority that there may result specific responsibility which can be located. From this there should proceed a constructive and not a destructive program. The only interpretation which apparently can be placed on this is that, among other things, the hands of the public service commissions will be strengthened enough to allow them to perform their legitimate duties. This we hope will be the case. It is further to be hoped that Judge Miller will keep the New York solution as free from politics as Illinois seems to be full of politics and that he will, as he appears to promise, base his constructive program on what the Federal Electric Railways Commission was pleased to call "the principles of ordinary economic and business common sense."

This Broker Should Wake Up

WE RECENTLY noticed the following advertisement over the name of a New York brokerage house:

> *The Term Public Utility*
>
> too often confuses the investor who does not take time to discriminate. The many electrical power properties whose financial structures are sound and whose earnings show good increases from year to year should not be discriminated against because of the peculiar situation surrounding street railways. May we send you data and statistics on several electric issues which we believe are particularly attractive at this time.

The advertisement tells its own story. There is no doubt that for a number of years there has been a feeling, and justly, by investors against electric railways as an investment. These properties have been held down to an unprofitable fare while industrial corporations have increased their prices at will. We believe now, however, that conditions have changed. The right of the utility to a reasonable return is being recognized generally, and the idea that the fare must remain fixed, irrespective of the cost of operation, is now discredited. We anticipate that it will not be long before electric railways will again be accepted as presenting the soundest opportunities for investment, as they supply a necessity. People have to ride, and bad times have been found to affect the business done by the street railways less than almost any other trade.

The broker is behind the times. He should wake up.

Let's Get at All of the Facts Regarding Electrification

IN DISCUSSING the electrification of steam railroads we are looking to the future. It is true that the length of track electrified to date is a small part of the whole, and also that the war caused a cessation of activity. It is true also that in the past the proponents have not been able to agree on the best system for adoption. It is true again that the steam locomotive has been improved greatly in recent years. But in spite of all this we cannot escape the conviction that electric power possesses certain inherent characteristics which will make it more attractive economically as the years go by; in other words, that time favors its wider adoption, in transportation as elsewhere.

In the meantime the underlying facts must be brought out and agreed upon and a spirit of co-operation among railroad men, consulting engineers and manufacturers must be fostered. Meetings of such a nature as that held by mechanical and electrical engineers in New York on Oct. 22 are a factor in such fostering. We have given a great deal of space to the report of this meeting because it reflected thought and experience on electrification from so many angles. In this week's issue appears the contribution by A. W. Gibbs, who occupies a position which gives his opinion unusual weight. The Pennsylvania Railroad, of which he is chief mechanical engineer, has been one of the most consistent, though conservative, advocates of judicious electrification. It has had experience, directly and indirectly, with several types of equipment. Its 600-volt direct-current locomotives at the New York terminal have made an honorable record. At Philadelphia the single-phase system with multiple-unit cars has done well, also. The Long Island and West Jersey & Seashore Railroads were pioneers in heavy direct-current multiple-unit operation. The Norfolk & Western, in which the Pennsylvania is heavily interested, was, of course, the pioneer in the application of the single-phase, three-phase locomotive, with which the Pennsylvania itself is experimenting on its main line with a view to adoption on the division operating over the Alleghany Mountains. This forms the background for Mr. Gibbs' comments on the papers presented by the respective advocates of steam and electric propulsion at the aforesaid meeting.

The New York meeting has been criticized because it was alleged not to have reached any conclusions and because the speakers did not make the most of their opportunity to crystallize the information which they supplied. While this criticism may be justified in part, we believe that the meeting served an important purpose in bringing out facts regarding both steam and electric locomotive operation. It will, however, be a more encouraging sign when steam railroad men, particularly those who are connected with the engineering departments, exert greater initiative in bringing out such facts. At present there is too much antagonism between the mechanical and the electrical divisions of the engineering group. Railroad managers really seem to be more interested in electrification prospects than railroad engineers. The engineers need to get closer together; the best way for them to do this is to keep on discussing the subject at engineering meetings. It will be the duty of the technical press to digest the proceedings of these meetings, without bias, and to interpret them with reference to the over-all advancement of economical transportation.

New York Utility Commission at Work

The First District Commission of New York Approves Issue of $26,000,000 of Securities During 1919 and Regulates Public Utilities Capitalized at Nearly $2,000,000,000

THE regulation of more than a hundred large utilities, capitalized at $1,716,162,100 in the year 1919, in Greater New York is no small task. Their capitalization has very nearly doubled since July 1, 1907, when the First District Public Service Commission was organized in accordance with an act of the New York Legislature. Seventy-five per cent of this present capital represents the securities of common carriers, the ratio being relatively high because of the fact that telephone and telegraph corporations, even in Greater New York, are regulated by the Second District Commission.

The organization of the commissions of New York State is unique. The acts placing the railroads of the state under commission control date back as far as 1851 and 1875. In 1891, however, the so-called "rapid transit act" was enacted by the Legislature. This act, as its name implies, established a special commission having jurisdiction over the plans, contracts, construction and operation of the rapid transit lines, and particularly the new subways. It was far removed from the public utility laws as they are now generally known. In fact, it was an amendment to the steam railroad acts of 1851 and 1875.

In the year 1907 the Legislature passed the "public service commission law," which, with slight amendment, was in effect until 1919. This law established two commissions, one for the "First District," consisting of Greater New York, and the other for the "Second District," which had jurisdiction over the remainder of the state utilities and the telephone and telegraph corporations within Greater New York.

The organization and activities of the Second District Commission were described in detail in the ELECTRIC RAILWAY JOURNAL, Dec. 30, 1916, page 1330, and Feb. 3, 1917, page 196.

Under the public service commissions law of 1907, the Public Service Commission of the First District not only regulated the public service corporations within its district but it planned and supervised the construction and operation of the rapid transit railroads. In accordance with the so-called "Foley laws" of 1919, however, the work of the commission was divided. The Public Service Commission of the First District now performs the customary commission duties within its territory, while a Transit Construction Commissioner, quite independent of the commission of both districts, is appointed by the Governor to take over the rapid transit construction work. This change involved considerable confusion at first, as many subordinate clerks and the records, files, etc., formerly more or less common to the two lines of activity, were segregated with difficulty. The year 1919 was therefore one of transition. On May 26, 1919, Hon. John H. Delaney of Brooklyn was appointed by Governor Smith to the position of Transit Construction Commissioner, at a salary of $15,000 per annum.

LEWIS NIXON
Retiring Commissioner

The First District Commission is now a one-man organization, Hon. Lewis Nixon having been appointed by the Governor to the office of Commissioner at a salary of $15,000 per annum for a term of five years. He assumed office May 3, 1919, the new plan going into effect July, 1919. In accordance with the new law, Commissioner Nixon appointed the following Deputy Commissioners: Hon. Alfred M. Barrett, Borough of Queens, appointed June 19, 1919; Hon. Morgan T. Donnelly, Borough of Brooklyn, appointed Dec. 30, 1919; Hon. Charles V. Halley, Jr., Borough of Bronx, appointed April 26, 1920. The salary of a Deputy Commissioner is $7,500. Provision is made for a secretary for the Commissioner at a salary of $4,200 and one for each Deputy Commissioner at a salary of $3,000. The secretary of the commission, James B. Walker, under whose direction are found a number of bureaus, fills a position of large responsibility. The counsel, in charge of the legal department, is Terrance Farley.

FUNCTIONS OF COMMISSION

Originally the commission had placed upon it by legislative enactment the usual regulatory duties in connection with issuance of securities, establishment of rates, checking of service conditions, accidents, etc., of railroads, both steam and electric; light, power, and gas corporations, etc. A later amendment placed the baggage, terminal railroad, stage coach and bus lines, electric conduit and steam distributing corporations under the authority of the commission. In spite of this fact the municipal government of New York City continuously and consistently resisted commission control of bus line activities. This feature of utility regulation is of particular interest at present, for the jurisdiction of commissions over such lines is subject to investigation and controversy throughout the country.

Another unique feature of the early New York act provided that of the expenses of the commission only the salaries of the commissioners, counsel and secretary, amounting to approximately $91,000 for the First District, should be borne by the State. The remainder was to have been paid by the city of New York. The legislative enactments of 1916, however, provided that expenses incurred in regulatory work should be paid in the future by the State, the remainder by the city. Thus, in 1917 the State paid the largest amount ($252,389) ever expended up to that time as its share of the commission expense for this district. The share of the city was, during this year, more than $3,000,000. It should be remembered, however, that much of this expense in connection with the new subway construction, paid under the rapid transit act, was charged to the rapid transit lines and will eventually be paid back to the city through earnings set aside in an amortization fund.

During the first decade from 1907 to 1917 this commission, in its regular routine of activities, held 2,200 formal hearings, settled 15,000 complaints and supervised the issue of securities to the extent of $700,000,000. Electric meters have been tested, upon complaint only, to the extent of 6,000, while a rather more exacting policy with regard to gas meter testing has involved more than 4,000,000 laboratory calibrations.

As far as the supervision of rapid transit construction was concerned, the greatest amount of work accomplished was in the year 1916, although the commission employees, numbering 11,000 in that year, represented about one-half the force necessary in 1914 to 1915.

ALFRED M. BARRETT
Just Appointed Commissioner

The widely varying work of the commission is carried on by seven departments and bureaus, designated as follows:

1. Statistics and Accounts—Dr. A. F. Webber, chief statistician.
2. Equipment and Electrical Engineering—R. H. Nexsen, electrical engineer.
3. Gas—William Merrifield, chief gas engineer.
4. Grade Crossings—W. L. Selmar, assistant division engineer.
5. Transit Bureau—Alexander Bassett, assistant chief inspector of stations.
6. Secretary's Department.
7. Legal—Terrance Farley.

The organization chart, reproduced herewith, gives a good idea of the relations of the various departments and the number of employees required by each.

DEPARTMENT OF STATISTICS AND ACCOUNTS

The analysis, tabulation and publication of capitalization, operating costs and other statistical data reported by the utilities of the district are undertaken by this department. This work naturally divides itself into four classes:

1. Preparation of charted data and statistics for public consumption.
2. Investigations and reports to the commission in connection with hearings.
3. Study by accountants of books of utilities to determine financial status for decisions of the commission upon the issues of securities.
4. Replies to inquiries from outside regarding specific cases.

Aside from the voluminous record of operating statistics of the utilities published in the annual report of the commission, there is prepared by this department a series of quarterly pamphlet reports of each of the street railway companies of the city. These reports, which may be had for the asking by any one interested in railway operating conditions, set forth the following information for the quarter immediately preceding the date of issue of the report:

1. Operating revenue, subdivided by roads; transfer and fare passengers: increase over previous quarter, etc.
2. Revenue car-miles.
3. Operating expenses and taxes; total and detailed items, including maintenance, depreciation reserves, injuries, general expense, etc.
4. Gross and net income.
5. Balance sheet.
6. Traffic statistics, including miles of track, passenger cars operated, car-hours, car-miles, seat-miles, revenue car-miles, etc.
7. Operating revenue for twelve months.
8. Operating expenses and taxes for twelve months.
9. Gross and net income for twelve months.

"Monthly Broadsides," similar to that reproduced herewith, indicating traffic and financial conditions, month by month, are found to be in great favor by banks, bond houses, real estate agents and the daily press.

PROBLEM OF PREPARING DETAILED STATISTICS IS A DIFFICULT ONE

The problem of preparing such detailed statistics for the thirty-six operating and twenty-three lessor railway companies of New York is a difficult one. In no other city is the railway industry so subdivided and interconnected. The monthly report, for example, combines fifteen subordinate companies' reports of the Third Avenue Railway alone into a single record.

The accountants of this department do not check up regularly the accounts of the utilities as is done in some states, but make special investigations of their books pending rate or security hearings. In order to establish, for example, the correct status of proposed and early bond issues in one recent case which attracted considerable attention, *i.e.*, the New York & Richmond Gas case, it was necessary to trace accounts back through the books of the parent organizations to the year 1860.

A great deal of pioneer work was necessarily done in connection with utility accounting by this department. With the exception of Massachusetts, no state had undertaken such investigations at the time this work was begun in New York. It is still difficult to arrive at a satisfactory and equitable basis for security issues for utilities in terms of either "book values" or "appraised values," but much has been accomplished by making the best decision practicable, submitting it to the acid test of litigation and profiting by the resulting court decision to establish mileposts for future work.

JAMES B. WALKER
Secretary of First District Commission

With the salary limitations under which this work must be carried on, together with the civil service examination policy which applies to such positions, it is not possible at present to do as much as in some other states in proportion to the magnitude of the utilities involved. Boys starting in the office at $50 per month are advanced, by promotion examinations, to statistical clerks at $90 a month. Clerks' salaries vary from $60 to $90 and stenographers from $75 to $125 a month, The accountants range from the junior grade at an annual salary of $1,380 to the more responsible positions paying $4,000 per annum. Statisticians are paid by this department from $1,380 for the junior grade to $5,000 for the chief of division of accountants or assistant chief statistician. The payroll for the accountants and statisticians, excluding clerks and stenographers, for this department is to be $79,701 for the year 1920, in effect July 1.

DEPARTMENT OF EQUIPMENT AND ELECTRICAL ENGINEERING

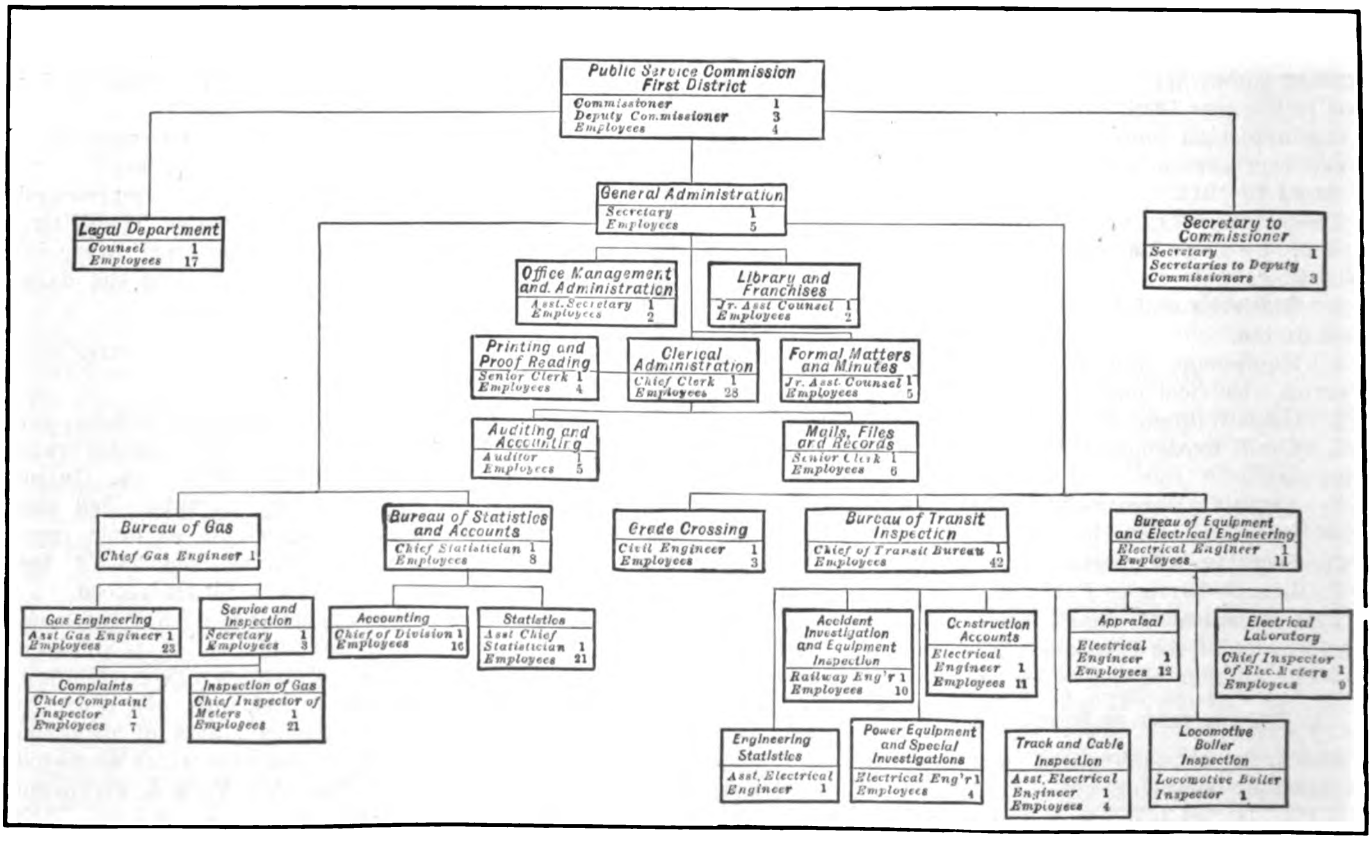
This department, under the direction of the electrical engineer of the commission, R. H. Nexsen, is really the technical or engineering section of the organization. The work is classified into eight divisions:

1. Electrical testing laboratory.
2. Appraisal.
3. Accident investigation and equipment inspection.
4. Construction accounts.
5. Engineering statistics.
6. Power equipment and special investigations.
7. Track and cable inspection.
8. Locomotive boiler inspection.

Electrical Testing Laboratory.—An electrical testing and calibrating laboratory was installed by the commission in 1908 for the purpose of calibrating consumers' watt-hour meters upon complaint and the primary standards of the utilities. At first the standards of the commission were checked by outside testing laboratories, but in 1910 precision instruments, checked regularly by the United States Bureau of Standards at Washington, were adopted.

One interesting feature of the work of this laboratory, in co-operation with the National Board of Fire Underwriters, is the testing and approval of all new types of watt-hour meters, auxiliary devices used in connection therewith, transformers, switches, electrical fittings, etc., before such can be placed in use by the utility. Between 5,000 and 6,000 such devices have already been tested and approved for use.

In connection with these tests and inspections of

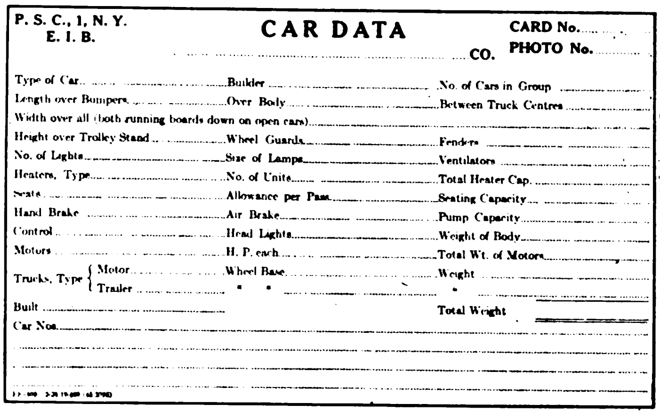

Public Service Commission First District
Commissioner 1
Deputy Commissioner 3
Employees 4
Legal Department
Counsel 1
Employees 17
General Administration
Secretary 1
Employees 5
Secretary to Commissioner
Secretary 1
Secretaries to Deputy Commissioners 3
Office Management and Administration
Asst. Secretary 1
Employees 2
Library and Franchises
Jr. Asst Counsel 1
Employees 2
Printing and Proof Reading
Senior Clerk 1
Employees 4
Clerical Administration
Chief Clerk 1
Employees 28
Formal Matters and Minutes
Jr. Asst. Counsel 1
Employees 5
Auditing and Accounting
Auditor 1
Employees 5
Mails, Files and Records
Senior Clerk 1
Employees 6
Bureau of Gas
Chief Gas Engineer 1
Bureau of Statistics and Accounts
Chief Statistician 1
Employees 8
Grade Crossing
Civil Engineer 1
Employees 3
Bureau of Transit Inspection
Chief of Transit Bureau 1
Employees 42
Bureau of Equipment and Electrical Engineering
Electrical Engineer 1
Employees 11
Gas Engineering
Asst Gas Engineer 1
Employees 23
Service and Inspection
Secretary 1
Employees 3
Complaints
Chief Complaint Inspector 1
Employees 7
Inspection of Gas
Chief Inspector of Meters 1
Employees 21
Accounting
Chief of Division 1
Employees 16
Statistics
Asst Chief Statistician 1
Employees 21
Accident Investigation and Equipment Inspection
Railway Eng'r 1
Employees 10
Construction Accounts
Electrical Engineer 1
Employees 11
Appraisal
Electrical Engineer 1
Employees 12
Electrical Laboratory
Chief Inspector of Elec. Meters 1
Employees 9
Engineering Statistics
Asst. Electrical Engineer 1
Power Equipment and Special Investigations
Electrical Eng'r 1
Employees 4
Track and Cable Inspection
Asst. Electrical Engineer 1
Employees 4
Locomotive Boiler Inspection
Locomotive Boiler Inspector 1

ORGANIZATION CHART OF FIRST DISTRICT PUBLIC SERVICE COMMISSION OF NEW YORK utility construction there is practically no overlapping with the inspection work of the Department of Water Supply, Gas and Electricity of New York City, which maintains a large inspection organization. The latter confines its activities, however, to the customers' wiring and appliances inside the meter connection, while the commission is interested in the distribution system as far as the service switch. For example, recording voltmeters are installed by this division from time to time in various sections of the city to make sure that proper voltage is being maintained, and both construction and service standards are insisted upon.

Appraisal.—The work of inventory and appraisal, always a very important feature of commission work, is no exception to the rule in the case of the first district. During the past ten years this staff has varied from eight to fifty employees and has completed valuations upon $300,000,000 worth of property. It has been impossible in many cases to make detailed appraisals because of inability to secure technical assistance sufficient for the task. Valuations made by outside engineering firms have been "spot checked" by commission representatives. It is hoped that a continuous inventory may be established and kept up to date in the near future for the large utilities. This is done with the small corporations only at present. With regard to depreciation reserves, often a controversial problem, this commission has consistently maintained the equity and justice of so-called "straight-line" method of setting aside a depreciation fund.

Accident Investigation and Equipment Inspection.—The public service commissions law definitely places upon the commission the duty of investigating the causes of all accidents which have resulted in loss of life, injury to persons or damage to property through the operation of public utilities under its jurisdiction and which, in its judgment, require investigation. Under this ruling utilities are required to report by telephone to the commission such accidents immediately after they occur, and to follow this up with a written report upon prescribed forms. The office is kept open twenty-four hours a day for the purpose of receiving the telephone reports. A monthly summary form used by the commission for the railway accidents is reproduced herewith. In this form the totals of accidents of each type reported for the ten months ended Oct. 31, 1919, have been filled in for reference purposes. This department handles an average of 3,500 reports per month, including those for light and power utilities, suitable but separate report forms being provided.

Car inspection, as carried on by this department, is accomplished by two inspectors for the railways of each of the large boroughs and one inspector for the Borough of Richmond. One office inspector in addition analyzes the reports as they are filed in the office and recommends necessary informal suggestions through the head of the department to the railway engineers and foremen. A portion of his time is devoted to the Long Island, the New York Central and the N. Y., N. H. & H. Railroads. These inspectors must necessarily have been engineers, assistant engineers of equipment or carhouse foremen with some large railway company before appointment to such a position.



P. S. C., 1, N. Y.
E. I. B.

CAR DATA

CARD No.
PHOTO No.

CO.

Type of Car	Builder	No. of Cars in Group
Length over Bumpers	Over Body	Between Truck Centres
Width over all (both running boards down on open cars)		
Height over Trolley Stand	Wheel Guards	Fenders
No. of Lights	Size of Lamps	Ventilators
Heaters, Type	No. of Units	Total Heater Cap.
Seats	Allowance per Pass.	Seating Capacity
Hand Brake	Air Brake	Pump Capacity
Control	Head Lights	Weight of Body
Motors	H. P. each	Total Wt. of Motors
Trucks, Type { Motor	Wheel Base	Weight
Trailer		
Built		Total Weight
Car Nos.		

RECORDS OF EQUIPMENT ARE KEPT ON "CAR DATA" CARD

The field of the inspector is purposely limited to such local equipment as he may understand thoroughly in order that he may readily and intelligently pass upon the adequacy of repairs and the value of proposed improvements.

The inspection of rolling stock is carried on independently of any company inspection, although the schedule of the company with respect to frequency of inspections is followed as closely as possible. Normally each carhouse is visited for this purpose about once every three weeks. Records of car equipment are kept by inspectors on "Car Data" cards, illustrated herewith.

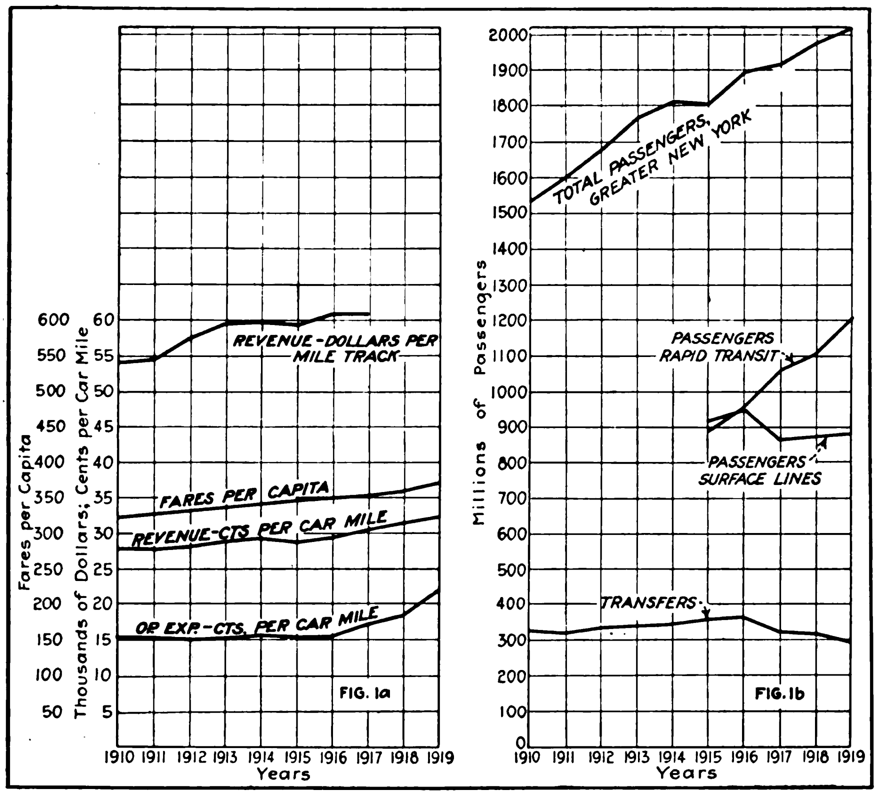
With the exception of serious conditions of equip-

MONTHLY "BROADSIDE" STATEMENT OF ELECTRIC RAILROADS OF GREATER NEW YORK

(March 1920)

				Street Railway Operating			
Company	Number of Revenue Passengers	Free Transfers Collected	Revenue Car Mileage	Revenue	Expenses	Taxes	Income
Rapid transit lines:							
Interborough — Subway Division	56,777,391	N. R.	8,112,403	$3,039,539.62	$1,659,070.85	$37,372.84	$1,343,095.93
Interborough — Elevated Division	34,519,945	N. R.	6,296,997	1,837,021.73	1,170,642.36	191,438.85	474,939.52
New York Consolidated, Receiver (B.R.T.)	36,032,153	41,208	4,926,075	1,859,980.57	1,333,958.44	81,720.27	444,301.86
Total "Dual system"	127,329,489	41,208	19,335,475	$6,736,541.92	$4,163,671.65	$310,532.96	$2,262,337.31
Hudson & Manhattan	9,104,140	....	847,123	594,845.65	312,148.66	34,386.20	248,310.79
Total rapid transit	136,433,629	41,208	20,182,598	$7,331,387.57	$4,475,820.31	$344,919.16	$2,510,648.10
Street surface lines:							
Manhattan and the Bronx	33,364,116	3,622,030	3,492,842	$1,771,585.17	$1,783,285.76	$153,267.52	*D* $164,968.11
Richmond							
Richmond Light & Railroad	922,914	128,448	126,172	46,448.98	55,527.39	2,652.54	*D* 11,730.95
Total surface lines	73,164,325	8,130,003	8,631,003	$3,805,124.52	$3,833,033.90	$276,061.74	*D* $303,971.12
Grand total	209,597,954	8,171,211	28,813,601	$11,136,512.09	$8,308,854.21	$620,980.90	$2,706,676.98
Total, March, 1919	186,121,558	24,689,217	30,583,968	$9,704,202.01	$6,712,035.21	$600,259.64	$2,391,907.61
Increase or (*D*) decrease	23,476,396	*D* 16,518,006	*D* 1,770,367	$1,432,310.08	1,596,819.00	20,721.26	*D* 185,230.81
Per cent	12.61	*D* 66.90	*D* 5.79	14.76	23.79	3.45	*D* 7.74

"*D*" designates a deficit or decrease from corresponding month of preceding year.



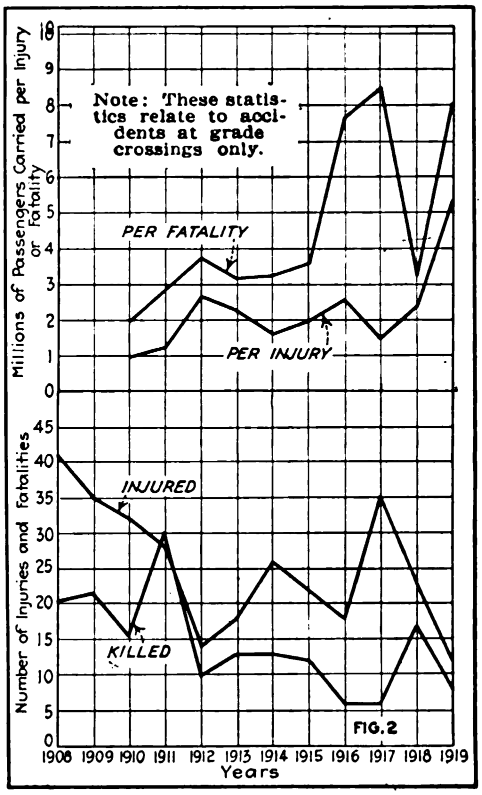


FIG. 1. THE DEPARTMENT OF STATISTICS AND ACCOUNTS PREPARES A REPORT OF ALL RAILWAYS IN NEW YORK CITY. FIG. 2. ACCIDENTS DUE TO GRADE CROSSINGS HAVE BEEN GREATLY REDUCED WHILE TRAFFIC HAS BEEN INCREASING

ment which may be immediately brought to the attention of the carhouse foremen by the inspector of the commission, the reports of such inspector are filed with the commission's departmental office for analysis. If, as a result of such a study of a series of either inspectors' or accident and service interruption reports, an epidemic of failures or accidents seems to be in evidence, the matter is informally taken up with the foreman or superintendent in charge. Only upon rare occasions of serious faults in equipment or of continued failure to correct weaknesses after informal suggestions have been made is a formal order issued by the commission. The policy is therefore one of co-operation, looking toward better service in which both commission and railway corporation are interested, rather than the declaration of many iron-clad rules to be arbitrarily enforced.

Complaints coming from outside sources regarding the condition or adequacy of the equipment are also followed up as special investigations by inspectors in addition to their routine duties.

The Division of Construction Accounts, within this department, investigates past, present and estimated future expenditures for construction work of the utility corporations for special reports to the department of statistics and accounts or direct to the commission. These reports are used in determining the amount of capitalization to be approved.

Engineering Statistics.—Quite apart from the work of the department of statistics and accounts, but acting in co-operation therewith, is the division of engineering statistics. In this division of the department of electrical equipment and inspection data and unit costs of materials and labor for all types of utility construction are determined, classified and tabulated. These are used principally in making appraisals. Costs of materials and labor are made up from the actual vouchers of the utilities as well as from market quotations. A historical record of unit and trend prices extending back to the organization of the commission in 1907 and in many instances to original values recorded by the corporation is maintained.

The Division of Power Equipment and Special Investigations has to do with special technical problems arising from complaints or questions of operation. It is, from a regulatory standpoint, one of the most important of the commission. Graduate engineers having had considerable general experience are necessary for the proper carrying out of the work. On account of the comparatively low salaries available from the State and with the great demand for engineers everywhere it has been impossible fully to man this division.

All new rate schedules, and riders to rate schedules which may affect rates, which are submitted to the commission for approval are referred to the electrical engineer. As the fundamental principles of such schedules are engineering problems, they are naturally worked out by this division.

Regulation and safety rules for the protection of employees in power plants are prepared. Inspections and studies leading to recommendations for emergency exits, telephone lines, signals and speed control, particularly upon subway and elevated roads, are carried on and problems of braking trains, brake-rigging and lubrication are investigated. Emergency lighting in cars by means of storage batteries, in the event of interruption of power supply, represents another important study. Recommendations are made leading to the provision of fire extinguishers in cars, the elimination of wooden cars and inflammable material from the subways, rearrangement of cables, etc.

Many engineering problems in connection with power plants and substations are involved in the work of this division, such as suggested changes in type, arrangement and rehabilitation of equipment, available capacity of generating and feeder systems and particularly the coal supply.

Attention of the Interstate Commerce Commission was called, as far back as March 30 of this year, to the impending shortage of coal this past summer. At the time the investigation was made, weekly shipments to New York utilities were 50,000 tons behind schedule and no start had been made during July upon the 480,000-ton coal reserve usually on hand at that time for winter. Car shipments were therefore traced and the commission informed from week to week regarding the fuel status.

Car studies made by this division, although considered as details by the traveling public, involve long and painstaking investigations. These include such matters as the relocation of bumpers and changes of draftgear to permit cars of one system to assist those of another in cases of emergency, improvements in motor suspension to avoid failure and delay of traffic, types of platform, gates, height of car steps, forms of wheel guards, fenders, etc.

Stations and other railway structures are examined with respect to their proper lighting, arrangement of platforms, exits, signs, locations of cables with respect to platforms and bridges, obstructions to traffic such as pillars, narrow clearances, etc.

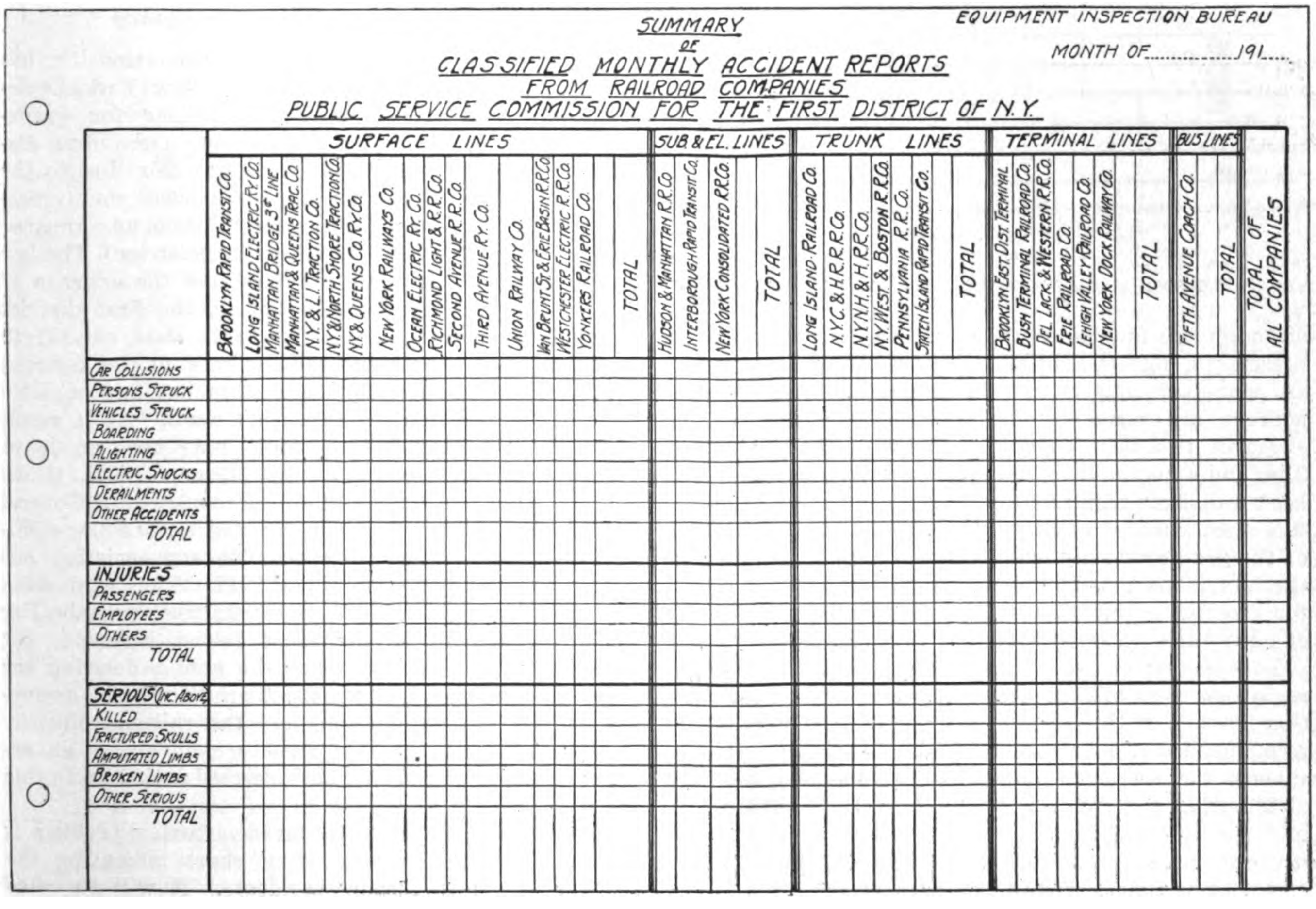
Track and Cable Inspection Division.—Two thousand miles of surface tracks and pavement are inspected and recommendations and estimates covering proposed rebuilding and maintenance are prepared by this division. Complaints, approximating 100 in number during the year 1919, relating to track conditions, speed of trains, signal conditions, stations, smoke nuisance, ventilation of trains, etc., were investigated and reported upon. Seventy-four route-miles of subway and nearly 1,100 elevated and subway stations were inspected during the year with respect to regular operating conditions and maintenance.

Division of Locomotive Boiler Inspection.—Inspectors of this division have reported upon the conditions of locomotive boilers within the district, analyzed in detail and classified the faults found therein. Reports are made to the railroad officials recommending repairs of these conditions.

DEPARTMENT OF GAS

This department operates in co-operation with the Department of Equipment and Electrical Engineering with respect to tests upon customers' electric watt-hour meters. Technical electrical problems are referred to the latter department, while routine tests resulting from complaints are carried on by Mr. Merrifield's organization.

In the case of gas meters, every meter is tested in the laboratory and sealed before it goes into service. A variation of plus or minus 2 per cent is allowed on gas meters and a possible error of plus or minus 4 per cent on electric meters. It is of interest to learn that of the electric meters tested last year the weighted average was found to be 1.5 per cent fast. In the case of the gas meters tested the weighted average was from 2.5 to 3 per cent slow. During the past year 3,100 gas complaints were handled, of which 1,250 involved meter tests. Only 242 electric meters were tested during this period. Nearly 300,000 gas meters were tested in 1919.



EQUIPMENT INSPECTION BUREAU

SUMMARY
OF
CLASSIFIED MONTHLY ACCIDENT REPORTS
FROM RAILROAD COMPANIES
PUBLIC SERVICE COMMISSION FOR THE FIRST DISTRICT OF N.Y.

MONTH OF..................191.....

	SURFACE LINES																	
	Brooklyn Rapid Transit Co.	Long Island Electric Ry. Co.	Manhattan Bridge 3¢ Line	Manhattan & Queens Trac. Co.	N.Y. & L.I. Traction Co.	N.Y. & North Shore Traction Co.	N.Y. & Queens Co. Ry. Co.	New York Railways Co.	Ocean Electric Ry. Co.	Richmond Light & R.R. Co.	Second Avenue R.R. Co.	Third Avenue Ry. Co.	Union Railway Co.	Van Brunt St. & Erie Basin R.R. Co.	Westchester Electric R.R. Co.	Yonkers Railroad Co.		TOTAL
Car Collisions																		
Persons Struck																		
Vehicles Struck																		
Boarding																		
Alighting																		
Electric Shocks																		
Derailments																		
Other Accidents																		
TOTAL																		
INJURIES																		
Passengers																		
Employees																		
Others																		
TOTAL																		
SERIOUS (Inc. Above)																		
Killed																		
Fractured Skulls																		
Amputated Limbs																		
Broken Limbs																		
Other Serious																		
TOTAL																		

	SUB & EL. LINES					TRUNK LINES							
	Hudson & Manhattan R.R. Co.	Interborough Rapid Transit Co.	New York Consolidated R.R. Co.		TOTAL	Long Island Railroad Co.	N.Y.C. & H.R.R.R. Co.	N.Y.N.H. & H.R.R. Co.	N.Y. West. & Boston R.R. Co.	Pennsylvania R.R. Co.	Staten Island Rapid Transit Co.		TOTAL
Car Collisions													
Persons Struck													
Vehicles Struck													
Boarding													
Alighting													
Electric Shocks													
Derailments													
Other Accidents													
TOTAL													
INJURIES													
Passengers													
Employees													
Others													
TOTAL													
SERIOUS (Inc. Above)													
Killed													
Fractured Skulls													
Amputated Limbs													
Broken Limbs													
Other Serious													
TOTAL													

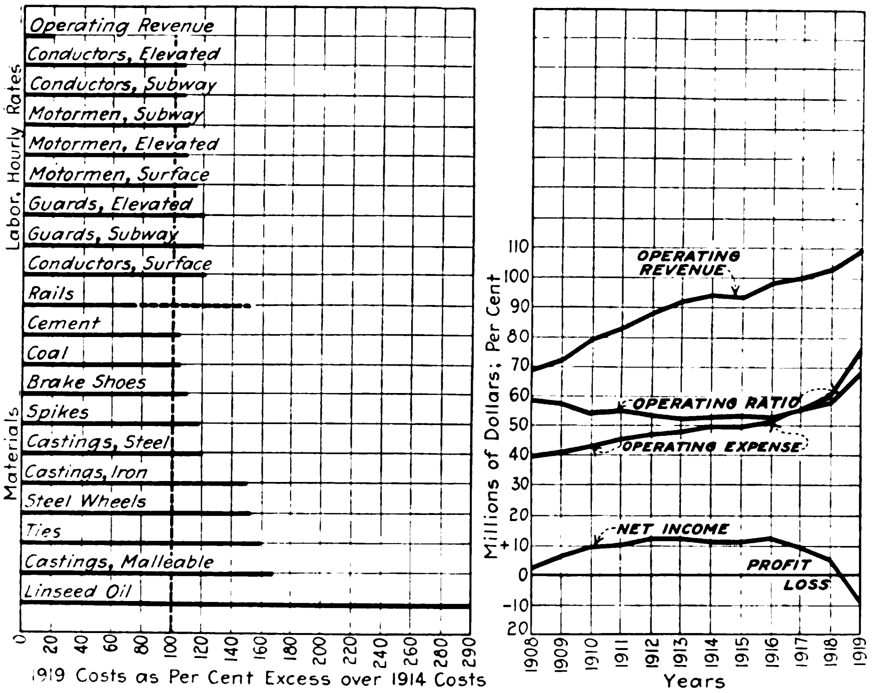
	TERMINAL LINES								BUS LINES			TOTAL OF ALL COMPANIES
	Brooklyn East. Dist. Terminal	Bush Terminal Railroad Co.	Del. Lack. & Western R.R. Co.	Erie Railroad Co.	Lehigh Valley Railroad Co.	New York Dock Railway Co.		TOTAL	Fifth Avenue Coach Co.		TOTAL	
Car Collisions												
Persons Struck												
Vehicles Struck												
Boarding												
Alighting												
Electric Shocks												
Derailments												
Other Accidents												
TOTAL												
INJURIES												
Passengers												
Employees												
Others												
TOTAL												
SERIOUS (Inc. Above)												
Killed												
Fractured Skulls												
Amputated Limbs												
Broken Limbs												
Other Serious												
TOTAL												

ACCIDENT REPORTS FOR THE MONTH ARE SUMMARIZED UPON THIS FORM

It is generally true that the gas complaints are far in excess of those upon the electric system. Such gas complaints are always greater in number during a period of general publicity in connection with a gas case before the commission, and reports from the second district indicate an interesting psychological effect manifested in a flood of 90 per cent of the total complaints located in the suburban district surrounding New York City when a rate case was being heard in the city itself.

In contrast to the policies of most other commissions, the fee, ranging from 50 cents to $2.50, depending upon the size of the meter, is returned to the consumer in a complaint case if the gas meter is found to be more than 2 per cent in error, while if the meter is within the permissible error the commission keeps the fee. In neither case does any portion of the fee revert to the utility.

The commission has not exercised its right to make tests of the quality of gas furnished by the utilities, although this is done by the city. No B.t.u. standard is prescribed, but the original candle-power basis using an open-flame burner is still in vogue. Gas pressure surveys are made by the commission's staff in an endeavor to assure a pressure between a minimum of 2 in. and a maximum of 6 in. of water. Recently it has been a difficult problem for the gas companies to maintain a satisfactory quality of gas. With a large portion of the gas necessarily manufactured from crude oil and the larger amounts of the gas-producing oil used either for gasoline or lubricants, the inflammable gas content of good quality has been greatly reduced.



"THE REASON WHY" INCREASED FARES ARE NEEDED IN NEW YORK

This department also handles complaints of consumers regarding their bills rendered by the utility. Investigation is made of the company's books and an adjustment recommended if an error is found. Application of consumers for extension of service beyond the existing distribution system are referred to this bureau for informal investigation. Formal petitions covering such matters are prepared later by the legal department.

Not to be confused with the work of the transit construction commissioner, previously outlined, is the transit bureau of the First District Commission. The organization of the latter includes an assistant chief inspector of stations, a supervising inspector, assistant supervising inspector and transit inspector.

Complaints regarding railway service involving the operation of trains and cars upon the surface, elevated and subway systems of the First District are referred for investigation to this transit bureau. Its functions also include the making of traffic surveys, the study of the adequate heating and ventilation of cars, station and terminal facilities, transfers, rates of fare, express and freight charges, etc.

During the year 1919 this bureau inspected the operating conditions upon thirty-eight lines of rapid transit railroads and 166 lines operated by the surface railway companies. It has investigated a total of 687 complaints regarding service and facilities upon these lines. This is a smaller number than has been filed in any previous year since the commission was created. The manner of handling these complaints and the policy of the commission with regard to the issuance of a minimum number of formal orders to remedy operating faults is the same as that described in connection with the inspection of rolling stock. In fact, the inspectors of the transit bureau and the division of accident investigation and equipment inspection work in co-operation on many of these problems before any report is made to the commission or to the railway corporation involved.

GRADE CROSSINGS

Until recently little attention has been given by the New York Legislature to appropriations for grade-crossing elimination in the first district. This was probably due to the fact that there are 8,000 such crossings in the second district as compared with 400 in the first district. The law of 1907 provides that the expense of such elimination in the first district should be apportioned one-fourth to the state, one-fourth to the city of New York and one-half to the railroad involved. Since that time the state has appropriated $950,000 as its share toward this work. As a result some badly needed improvements have been made in Flushing and Queens, L. I., and on Staten Island. Other work was held up under order of the Director-General of Railroads during the war, directed toward the elimination of capital expenditures. No appropriation has been made for this work since 1917. The commission has recommended some necessary changes upon the Far Rockaway branch of the Long Island Railroad, but differences of opinion between the public, desiring the depressed grade, costing more than $2,000,000, recommended by the commission, and the railroad officials, recommending an elevated structure, involving an expense of about $1,250,000, have delayed action up to this time.

The serious nature of the grade-crossing problem is evident from the accompanying chart indicating the number of grade-crossing accidents. It will be noted that the number of passengers transported per accident has been greatly increased during the last decade upon the road having the greatest number of grade crossings. The total accidents upon all the roads of the district have been greatly reduced as well. However, the increase of the injuries from eighteen to thirty-five in the year 1917 and the fatal accidents from six to seventeen upon one road in 1918, when large numbers of soldiers were being handled, indicate that further attention to this matter is necessary.

This commission, particularly through the interest and activity of its secretary, J. B. Walker, was largely responsible for the recommendation made by the National Association of Railroad and Utility Commissioners concerning the national adoption of uniform grade crossing gates, warning signs and watchmen's signals. The committee of this association, of which Mr. Walker was chairman in 1917, to which was assigned the duty of studying grade-crossing elimination and protection, in conference with a similar committee of the American Railroad Association, agreed upon the standard protective devices reproduced herewith, which have since been adopted by twenty of the forty-seven states having public service commissions. They include striped gates, watchmen's "Stop Signals," red lights, universally indicating "danger," at night and standard warning signs to be installed 300 ft. upon either side of all grade crossings.

These safety devices are provided by the railroads and delivered to the city, county or state authorities having control of the crossings, who are expected to install and maintain them. They are becoming well known already in New England, New York and Chicago districts.

SECRETARY'S DEPARTMENT

The secretary of the commission, James B. Walker, and Frank N. Robinson, assistant secretary, are the intermediary officials acting between the commission and the public. In the secretary's office reports of the various departments and rulings of the commission are given to the press and the annual report of the work of the commission is prepared.

Reporting to the secretary's office are to be found the following bureaus:

1. Calendar, minutes and proceedings.
2. Chief clerk.
3. Library and franchise records.
4. Printing and proofreading.
5. Filing.
6. Mailing.
7. Storeroom.

The bureau of calendar, minutes and proceedings, under the direction of Harry B. Mintz, junior assistant counsel, prepares a weekly calendar of the pending hearings scheduled for the commission. Emergency and very important hearings may be given special attention and notification to the public. Abstracts of the important decisions are made after a hearing in mimeograph form for the press, heads of departments and other interested parties. The complete minutes of the meeting are also written up for a permanent record. In addition a "document book" is prepared in narrative form covering the dates and features of interest.

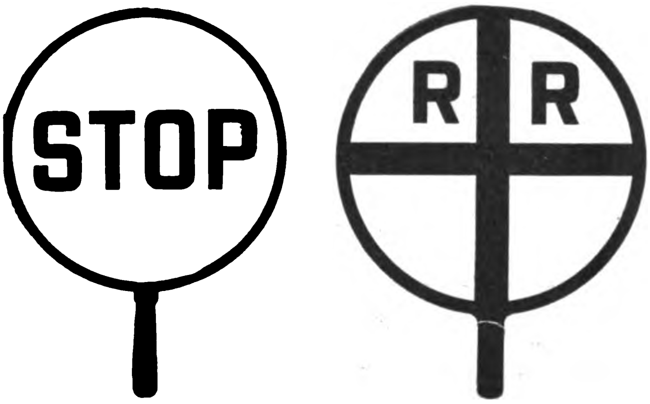
The chief clerk's office, under the direction of Joseph Higman, in co-operation with the auditor, is responsible for the bookkeeping, accounting, voucher system, etc., of the commission.

The bureau of library and franchise records, directed by Ralph R. Munroe, junior assistant counsel, established and for many years maintained a very complete library, comprising court and official commission decisions, corporation franchises, etc., for the combined regulatory and rapid transit construction activities. Recently an attempt has been made with some difficulty to separate the records of the two commissions. The files in this department contain some 10,000 documents of the corporations, together with a very valuable collection of track franchise maps indicating the ownership of the rights-of-way and track in the entire district. Accurate records of utility corporate names and lists of officials are also included in this department. An information bureau, carrying on research work looking toward franchise decisions, technical papers and reports, is also maintained.

The proofreading, filing, mailing and storeroom bureaus are self-explanatory, corresponding to departments bearing similar titles in other large offices.

RAILWAY PROBLEMS MOST ACUTE

The commission evidently recognizes the seriousness of the traction problem in New York City. This is clearly indicated in the following statement, which appears in its annual report for 1919:



STANDARD STOP SIGNS, ADOPTED LARGELY THROUGH THE EFFORTS OF MR. WALKER

> The year just closed has been a crucial one in the annals of street railroad operation throughout the country, and perhaps in no other place has the problem of continuing satisfactory operation in the face of steadily rising costs been so acute as it has been and is now in the city of New York. This is necessarily true from the nature of the local conditions. Greater New York has a population approaching 6,000,000 and an area of approximately 315 square miles, equivalent to a tract of 202,068 acres. With its unusual topographical conditions, a daily movement of nearly 3,000,000 people toward a common center in the morning and away from it in the evening is required, so that the industrial life of the metropolis is absolutely dependent upon the normal functioning of the transit systems. . . .
>
> For many years the street car fare in New York City has been constant at 5 cents. The people have been educated to a flat fare, irrespective of the distance covered. They cheerfully pay 5 cents for a ride of three blocks, and as cheerfully accept a ride of 21 miles for the same amount. Since the World War began, in 1914, the cost of operating these lines has been very considerably advanced. The companies pay more—in many cases 100 per cent more—for materials, for labor and for all other elements entering into the maintenance and operation of the street railroad system than they did five years ago. A subway motor car which cost $12,500 five years ago now costs $25,000. A double-truck trolley car, which could then be bought for $6,000, now costs $14,000. The ordinary laborer, who formerly received 20 cents an hour, is now getting upward of 40 cents, and skilled labor of all kinds demands and re-

> ceives a corresponding increase in pay. Hence, the cost of maintaining, in good condition, every mile of track, every power house, every underground conduit and overhead trolley wire, every car in operation, has more than doubled in the last five years. Yet, notwithstanding the increased cost of operation, the revenues of the street railroads, generally speaking, have remained the same as they were before the war, except for additional income derived from the normal increase in traffic, which of course demanded additional expense for the extra facilities and equipment required to handle such increase. Efforts which the street railroads have made to obtain increased revenue by increasing fares have generally proved abortive. The reason for this is, on the one hand, the ruling of the Court of Appeals of this State in holding that the Public Service Commission had not been given power by the Legislature to permit increases in fares fixed by municipal franchises based on constitutional consents and, on the other hand, the reluctance of the present municipal administration of New York City to discuss changes in any existing contract which might entail an increase in fare.
>
> Generally speaking, there is no question that the street railroads of the city need relief. Such relief, under present conditions, should come from such rates as would meet the cost of service, provided the companies make corresponding concessions to the public. Investigations of the situation have been sufficiently thorough to justify this statement. The measure of relief is a matter which can be determined only by a detailed investigation into each particular case.

Such an investigation was made by the commission upon request of the 1920 session of the Legislature and was reported upon in considerable detail on March 1, 1920. Some of the results depicted in curves reproduced herewith are very significant. In brief, the conclusion of the investigation is summed up by Commissioner Nixon as follows:

> It is not possible for all the traction companies to give adequate service at the present fare if present conditions continue.
>
> My recommendation in brief is that a flexible fare, based upon the cost of service, be established.

On Nov. 5 Mr. Nixon resigned and Governor Smith appointed Alfred M. Barrett, Deputy Commissioner, as his successor for the unexpired term.

Although the work of the commission is seen to be very diversified, comprising as it does many different types of utilities, the railway problem requires most of its attention. In second place, with respect to its serious financial condition, will be found the gas corporations. The electric light and power utilities, in general, are embarrassed during this period of reconstruction to a less extent.

Cornell Society of Engineers

IN LINE with the combining of all the colleges of engineering at Cornell University into one college of engineering, the Cornell Society of Civil Engineers has changed its name to the Cornell Society of Engineers and has amended the constitution to make all Cornell engineers eligible for membership.

The Cornell Society of Civil Engineers was started in 1905. Civil engineers only were eligible for membership. From its inception it has had the support of Cornell civil engineers and now has a membership list of 1,025. The executive committee has been enlarged to include the following graduates from the Sibley College of Mechanical Engineering: E. B. Katté, S. B. Whinery, W. W. Macon, S. C. Finch and R. W. Weed, Jr. I. W. McConnell, Dwight P. Robinson & Company, 125 East Forty-sixth Street, New York, is president. C. R. Harding, Southern Pacific Company, 165 Broadway, is secretary-treasurer.

The society holds occasional meetings and an annual banquet in January and has an employment committee.

Massachusetts Policies Considered

Commissioner Jackson and Manager Hood Talk About Present Needs Before New England Street Railway Club

THE Hon. James F. Jackson, chairman of the board of trustees of the Boston (Mass.) Elevated Railway, gave an encouraging address upon the electric railway outlook before the New England Street Railway Club Nov. 4. He touched upon his long and favorable opportunities for study of the electric traction situation as former chairman of the old Massachusetts Railroad Commission, later as counsel for the Eastern Massachusetts Street Railway and now associated with the direction of the Boston company. This experience led the speaker to conclude that today, as never before, the usefulness of the street railway is known and acknowledged. The public is now willing to help every honest effort to improve service. Patience must be exercised, however, as these betterments are worked out.

Mr. Jackson urged giving out more official statements explaining causes of service interruption, whether avoidable or not. "The struggle for the 5-cent fare is over," said the speaker, "and the industry is on its way upward. The climb will be long and hard, but the attainment of a new plane of finance and service is assured." He pointed out that if the bankers have all the facts, operating companies will find it much less difficult to obtain their needed credits. Employees also should be kept informed as to the facts and plans of their properties and have an opportunity to share in the advancement and problems of the organizations for which they work. The personal character of the platform man's skilled service was emphasized. Unless the men are courteous and alert, the wisdom of managers and executives will be of little avail. The speaker paid a high tribute to the growing spirit of co-operation among the employees of the Boston company and closed with an earnest plea for legislation to remove unjust paving and other burdens from operating companies. The public should be charged for service at proper cost.

Ralph D. Hood, general manager Massachusetts Northeastern Street Railway, addressed the club earlier in the day upon the early development of electric railways and their creative and executive personnel in New England. Coming to present-day problems, he urged the adoption of "a broad and comprehensive service-at-cost plan, that will apply to all companies in the state and apply in the same way in each of the states, with provisions enabling the state authorities to assess on each municipal community its share of the required income in locations where the service-at-cost plan will not function to the extent needed to make the plan a success. In the cases where the public authorities do not consider the line necessary from the standpoint of public necessity, then that line should be discontinued, thus lessening the burden to the company and the community and enabling the routes most needed to continue to function."

The Ontario Safety League has just issued, as special bulletin No. 62, a 17-in. x 22-in. poster, carrying in large letters this slogan: "Safety for all—All for safety." This legend is so simple, but so suggestive, that the poster is sure to attract attention to the safety movement throughout Ontario. Undoubtedly copies could be secured for use in the United States by addressing the league at Toronto.

How the Zone Fare Has Made Good at San Diego

In the Face of Low Density of Population, High Mileage of Track, an Amazing Number of Private Automobiles and a Decrease in Military and Naval Population, the Company Shows 40 per Cent More Revenue and 12 per Cent More Passengers for the First Nine Months of 1920 Against the Same Period of 1919

THAT the success of the zone fare on American electric railways is largely a matter of careful preparation and correct manufacturing and selling principles in determining the rates of fare appears to be proved by the happy experiences of the San Diego Electric Railway since its inauguration of a zone system Jan. 1, 1920.

Like many another modern American city, San Diego has a long way to go before the population will crowd its boundaries! It is a city of magnificent distances, being 4 miles wide by 24 miles long for a population just within 100,000. Furthermore, the terrain is broken up by several deep canyons which will make uniform development financially impracticable for years to come. Those who have had the good fortune to visit this beautiful city within the last three or four years will recall their astonishment at the large amount of vacant land between the railway station, the hotels and the business district—a condition which means that much of the so-called "close-in" territory is unproductive from a transportation standpoint.

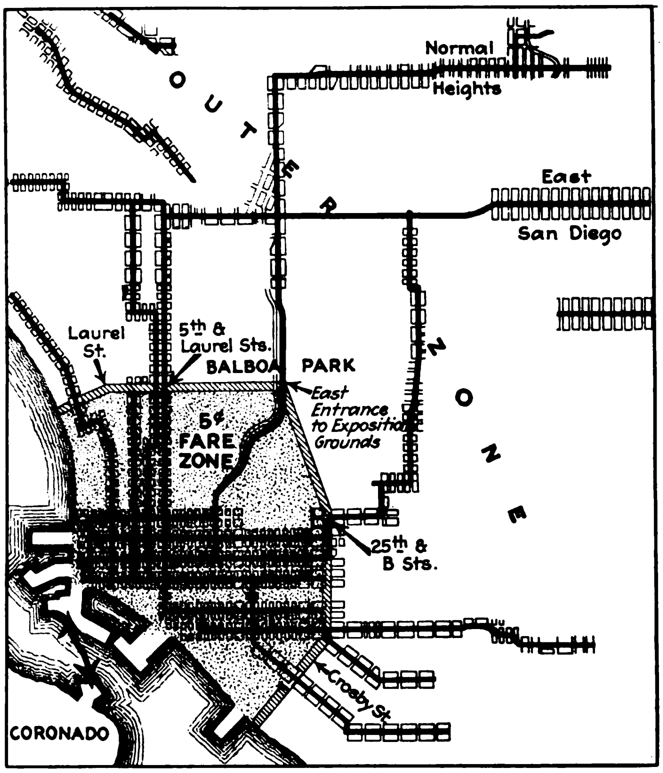
To aggravate the situation, the 1,400 acres of Balboa City Park (the home of the Panama-California Exposition) are plumped down in what is practically the center of San Diego. Hence all of the car service in this section of the city must circle the park in order to reach the outlying populated districts, thus increasing the length of haul through much intermediate, unproductive territory. To summarize the topographical situation in figures, Table I is presented, above.

TABLE I—TERRITORY SERVED BY SAN DIEGO ELECTRIC RAILWAY HAVING A TOTAL POPULATION OF APPROXIMATELY 100,000

Item:	Acres	Square Miles
Inhabited territory	7,527.80	11.76
Commercial and business district	518.80	0.81
Park and cemeteries	1,795.50	2.80
Larger vacant tracts	18,077.80	28.25
Water	10,707.20	16.73
Railroad and industrial yards	634.74	0.99
Total	39,261.84	61.34

RAILWAY SERVICE HAS BEEN LONG TOO LIBERAL

The financial history of the San Diego Electric Railway was presented in the ELECTRIC RAILWAY JOURNAL, Feb. 8, 1919, under the heading "Application No. 3808," which was the docket number given by the California Railroad Commission to the brief that formed the basis for permitting the zone fare system hereinafter described. It is enough to note here that this brief proved that the faith of the Spreckels interests in the transportation future of San Diego had not materialized in hard cold dollars; that few years had shown even a modest return on the investment and that over all there was a deficit that would require a long time to extinguish even under the most favorable conditions. To add to the irony of the situation, the railway was not permitted to serve all of the traffic offered, for the jitney was allowed to take thousands of dollars away from the San Diego company from July, 1914, to December, 1915. The company, for example, went to enormous expense to handle the anticipated rush of travel to the Panama-California Exposition of 1914 and then found that it had spent the money in vain. What the zone fare promises to do may therefore be gaged by the fact that July, 1920, was the first month "in the black" since 1913.



THIS MAP SHOWS THE WAY IN WHICH SAN DIEGO HAS BEEN DIVIDED INTO TWO FARE ZONES

Altogether the company has 95 miles of track for 100,000 people or approximately one mile per 1,050 persons, a pretty fair indication of ample provision for transportation, and the possession of some 160 passenger cars argues that such transportation actually is provided.

When the company made its application to the California commission for a fare increase, it expressed a preference for the zone system because of its advantage in appealing to the short-distance riders. The commission granted this request and established a two-zone system with a fare of 5 cents for a ride in either zone.

The 5-cent fare within the inner zone of San Diego includes free transfer privilege between any two points within this zone, provided that the journey does not involve travel into the outer zone. The boundaries of the inner zone are approximately 1 mile from Fifth Street and Broadway, the controlling center of street railway traffic in San Diego. This limit was not chosen arbitrarily, but was the result of an exhaustive traffic investigation which indicated that 1 mile or so was the proper boundary line for the inner-zone short haul. Departure from the 1-mile rule was made when a natural traffic dividing line intersected another line, or when a heavy loading point fell short or beyond the 1-mile measurement from the zero point.

The maximum length of ride possible within the inner zone is 3.5 miles, and the average actual distance traveled per passenger is approximately 1.3 miles.

The outer zone of the San Diego City Division extends from the boundary line of the inner zone to the ends of the respective routes. Here, too, the fare is 5 cents, with the privilege of a free transfer between any two points of the outer zone provided that no part of the journey is made within the inner zone. The maximum length of ride possible within the outer zone on the 5-cent fare is 7 miles, and the average actual distance traveled per passenger is approximately 3 miles.

Three reasons may be assigned for favoring the suburban riders: First, most of them pay also the shorter-ride fare of the inner zone in any event; second, there is plenty of room for any outer-zone traffic that may be created by retaining the 5-cent fare; third, undue hardship in changing from flat to zone fares is avoided.

TABLE II

Showing Number of Cash Fare and Revenue Ticket Passengers, Transfer Passengers, Total Revenue Passengers, Revenue from Transportation of Passengers, and Car-Miles Operated for the Six-Month Period, January-June, Inclusive, for the Years 1911-1920 inclusive.
All Numbers in Thousands

Year	Cash Fare Revenue Ticket Passengers	Transfer Passengers	Total Revenue Passengers	Revenue From Transportation of Passengers	Car-Miles Operated
1911	6,528	1,510	8,038	$298	1,213
1912	8,642	2,088	10,681	399	1,437
1913	10,853	2,704	13,558	503	1,749
1914	10,120	2,638	12,759	467	1,781
1915	10,680	2,955	13,636	490	1,971
1916	9,974	2,308	12,282	462	1,769
1917	8,948	1,730	10,679	428	1,784
1918	10,970	1,572	12,543	527	1,838
1919	10,189	1,634	11,823	486	1,768
1920	10,144	1,813	11,958	643	1,873
Average 1911-19	9,656	2,121	11,778	$451	1,701
Increase 1920 Over Average					
Amount	487	307*	180	$191	171
Per Cent	5.05	14.51*	1.53	42.49	10.08

*Decrease.

The rates for a journey originating in one zone and ending in the other are as follows:

1. 10 cents cash, including transfer privileges, on the San Diego City Division. It is a very casual passenger indeed who pays a 10-cent cash fare, for, in the six months Jan. 1-June 30, 1920, under review, this class constituted but 4.67 per cent of the traffic and provided only 7.36 per cent of the revenue from transportation.

2. 7½-cent tickets, sold by all conductors and throughout the city, four tickets to a strip, including the same privileges as the 10-cent cash fare. This was the fare paid by 39.13 per cent of the two-zone passengers in the period named and was responsible for 46.26 per cent of the transportation revenue. On the sale of this ticket, the platform men receive a commission of 3 per cent—a stimulus which has proved so effective that more than 95 per cent of all 7½-cent tickets are sold by the conductors. This 3 per cent goes into a fund in which the men share monthly on the basis of the numbers of hours worked. The platform men are charged with so many books of tickets as received, and accounting is simple, since each man is responsible for either the return of the tickets or cash corresponding to the number sold. The sale of four tickets at a time, it is thought, will induce four-times-a-day instead of twice-a-day riding.

TABLE III

Showing Increase or Decrease of Total Revenue Passengers Carried During the First Six Months, January-June, 1920, as Compared with the Corresponding Periods for the Years 1911-1919, Inclusive

1920 Compared with	Number Increase or Decrease	Per Cent Increase or Decrease	Amount Increase	Per Cent Increase
1911	3,919,191	48.75	$345,211	115.70
1912	1,276,883	11.95	243,937	61.04
1913	1,599,871*	11.80*	139,787	27.75
1914	801,397*	6.28*	176,170	37.69
1915	1,678,146*	12.31*	153,008	31.19
1916	324,483*	2.64*	180,738	39.05
1917	1,279,082	11.98	215,521	50.35
1918	585,178*	4.67*	115,809	21.94
1919	134,265	1.14	157,090	32.29
Average 1911-1919	180,038	1.53	191,919	42.49

*Decrease.

3. Calendar-month commutation book, good for two rides on each day of the calendar month on date printed thereon, sold at $4, or 6½ cents per ride if all tickets are used, and including full transfer privileges as in the case of the 10-cent cash and 7½-cent ticket fares. The San Diego commutation book varies from most steam railroad books in at least three important aspects: The book is good for the calendar month only; it is not limited to the original purchaser and the individual tickets are good only on the day specified. The first condition avoids complex bookkeeping; the second avoids friction with the public, for even on the comparatively few trains of a steam railroad it is impracticable to check fraudulent presentation of commutation tickets and it would be hopeless to do so on a street railway with its greater frequency of operating units; the third condition definitely implies that any holder of the ticket is entitled to two rides taken on the same day. Considering the practical fact that most commuters would miss out several times a month, as on holidays, the difference in cost between this ticket and the 7½-cent ticket is really trifling. Commutation books are sold only at the ticket office, and the total of both 6½-cent and 6⅓-cent (school, etc.) kinds accounted for only 3.55 per cent of the traffic and 3.93 per cent of the transportation revenue in the six months Jan. 1-June 30, 1920.

TABLE IV

Showing Revenue Passengers Carried per Car-Mile, Revenue per Car-Mile, Revenue per Cash Fare and Revenue Ticket Passenger and Revenue per Total Revenue Passenger During the Six-Month Period, January-June, Inclusive, for the Years 1911-1920 Inclusive

Year	Revenue Passenger per Car-Mile	Revenue per Car-Mile (Cents)	Revenue per Cash Fare and Revenue Ticket Passenger (Cents)	Revenue per Total Revenue Passenger (Cents)
1911	6.62	24.58	4.57	3.71
1912	7.43	27.80	4.62	3.74
1913	7.75	28.80	4.64	3.72
1914	7.16	26.24	4.62	3.66
1915	6.92	24.88	4.58	3.60
1916	6.94	26.16	4.64	3.77
1917	5.98	23.98	4.78	4.01
1918	6.82	28.70	4.81	4.21
1919	6.69	27.51	4.77	4.11
1920	6.38	34.34	6.34	5.38
Average 1911-1919	6.92	26.52	4.67	3.84
Increase 1920 Over Average				
Amount	0.54*	7.82	1.67	1.54
Per Cent	7.80*	29.49	35.76	40.10

*Decrease.

Special zone fares are in use on the other divisions based on the same general principles.

Between the period 1892-1919 inclusive, a universal fare of 5 cents was charged between points on San Diego City lines, except certain special fares, such as school tickets, and joint rates to and from the Coronado, National City and Point Loma Division points. Indeed, in some cases the 5-cent area extended beyond the generous limits of San Diego.

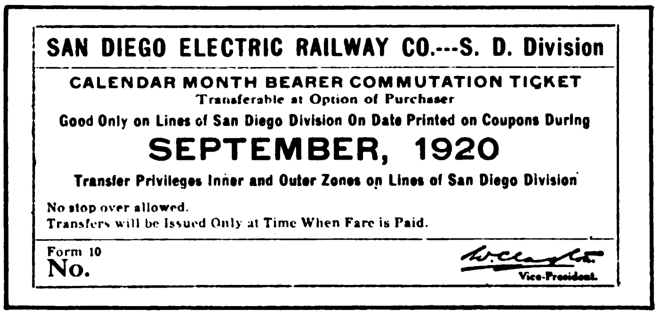
The principal features of "Selling the Zone Fare Idea" were related quite fully in the ELECTRIC RAILWAY JOURNAL for Aug. 7, 1920, page 269, some of the methods employed being most unique. The way in which the fare is collected is described in one of the advertisements of the company as follows:

Inbound—Pay-as-You-Enter

Inbound, from outlying terminals into town and through to downtown terminals, all fares will be collected and transfers issued as passengers board cars. While cars are operating inbound in the outer zone, passenger's identification check punched to show destination to which fare is paid (either "Outer Zone Only" or "Inner and Outer Zone") will be issued to each passenger.

At designated points on different lines and just before arriving at inner zone, conductors will go through cars and take up all of the passengers' identification checks.

Where the passenger has paid only an outer zone fare and expects to ride into the inner zone, the balance of fare will be collected by conductors.


SAN DIEGO ELECTRIC RAILWAY CO.---S. D. Division

CALENDAR MONTH BEARER COMMUTATION TICKET

Transferable at Option of Purchaser

Good Only on Lines of San Diego Division On Date Printed on Coupons During

SEPTEMBER, 1920

Transfer Privileges Inner and Outer Zones on Lines of San Diego Division

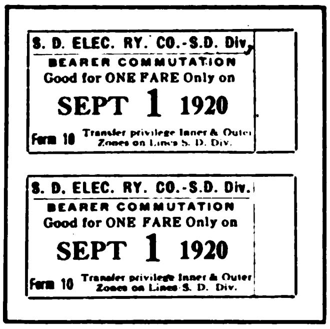
No stop over allowed.

Transfers will be Issued Only at Time When Fare is Paid.

Form 10

No.

Vice-President.


S. D. ELEC. RY. CO.-S.D. Div.

BEARER COMMUTATION

Good for ONE FARE Only on

SEPT 1 1920

Form 10 Transfer privilege Inner & Outer Zones on Lines S. D. Div.

S. D. ELEC. RY. CO.-S.D. Div.

BEARER COMMUTATION

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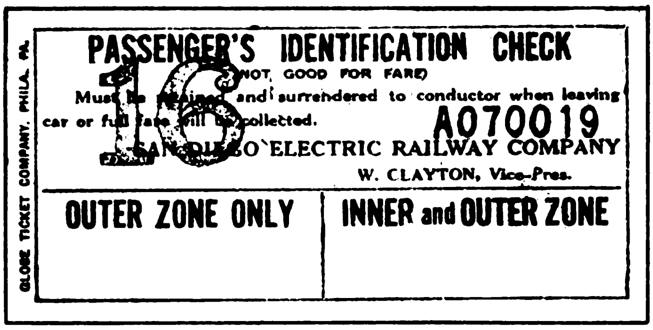
Form 10 Transfer privilege Inner & Outer Zones on Lines S. D. Div.


GLOBE TICKET COMPANY. PHILA. PA.

PASSENGER'S IDENTIFICATION CHECK

(NOT GOOD FOR FARE)

Must be retained and surrendered to conductor when leaving car or full fare will be collected.

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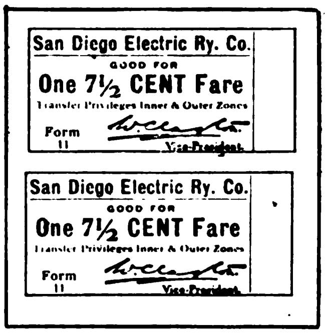
SAN DIEGO ELECTRIC RAILWAY COMPANY

W. CLAYTON, Vice-Pres.

OUTER ZONE ONLY	INNER and OUTER ZONE


San Diego Electric Ry. Co.

GOOD FOR

One 7½ CENT Fare

Transfer Privileges Inner & Outer Zones

Form 11

Vice-President.

San Diego Electric Ry. Co.

GOOD FOR

One 7½ CENT Fare

Transfer Privileges Inner & Outer Zones

Form 11

Vice-President.

LOWER ROW—COMMUTATION COUPONS, IDENTIFICATION CHECK ISSUED IN OUTER ZONE TO INBOUND PASSENGERS, 7½-CENT TICKET SOLD IN STRIPS OF FOUR. UPPER ROW—COVER OF COMMUTATION BOOK

While car is operating in the inner zone, the use of passengers' identification checks will not be necessary. Fare collections on routes numbers 6, 9 and 10 operating exclusively in inner zone will be the same as at present. Passengers are earnestly requested to retain identification checks, without crumpling them up or folding, until surrendering same to conductor. This applies also to transfers, and the co-operation of patrons will avoid delay or inconvenience to fellow passengers.

Outbound—Pay-as-You-Leave

Outbound, all passengers will pay as they leave cars from downtown terminals to ends of all city lines. At downtown points where any number of passengers are to board cars and none to alight, they will be permitted to board cars at both center entrance and exit gates as well as motorman's exit gate, in order to avoid delay and permit prompt handling of heavy travel.

All passengers when ready to alight will leave via the center-entrance gate, where conductor will collect fares. (Exit gate will be closed.)

Patrons boarding cars in the inner zone will not require identification checks, but will pay the 5-cent fare, inner zone ticket or transfer as they alight in the inner zone, or full fare or ticket as they alight in outer zone.

All passengers who board cars after leaving inner zone will receive identification checks punched "Outer Zone Only" as they enter car, and only a 5-cent fare will be collected when they surrender identification check on leaving car.

In the plan of fare collection adopted there will be but one fare collection per passenger per trip.

In connection with the foregoing procedure it will be observed that it is the duty of the conductor to go through the car at the zone boundary to take up identification slips and collect excess fare. In practice the conductor has no trouble in doing this, because the space from three to four blocks, when the inner zone is approached inbound, is a walking zone with practically no passengers leaving or boarding the car.

Another interesting point in the San Diego procedure is that the pay-leave scheme for outbound passengers makes it possible to fill up outbound cars almost instantaneously.

No fare boxes are used at present. Fare registers, however, show 5-cent fares on one side and tickets and transfers on the other. The comparatively few 10-cent cash fares are rung up on a neck register. In the new scheme, the Johnson fare box will count 5- and 10-cent cash fares and 7½-cent and school metal tokens, while pennies will be locked up and all paper transfers will be canceled as they are dropped in the box by the passengers. The transfers used are issued in three colors, which are sufficient to prevent looping under San Diego routing conditions. Rose is used for the inner zone, manila is used for the outer zone, and buff for both zones.

THE RESULTS IN MONEY AND TRAFFIC

The management knows no local conditions during the last twelve months which would tend to stimulate traffic. In fact, there was a decrease during the first six months of 1920 as compared with the first six months of 1919 just after the war in the number of young, freely riding men, who were stationed at Camp Kearney, North Island, and other military points. Nevertheless, during the first three months of the present fare system there was a decrease of only 2 per cent in riding; in April there was an increase of 1 per cent and in May of 5 per cent. For the entire six months to June 30, 1920, the passengers increased 134,265, or 1.14 per cent over the corresponding six months of 1919. Rough estimates for the periods ended Sept. 30 are for an increase of approximately 12 per cent in the passengers and 40 per cent increase in revenue from transportation.

The accompanying tables give in some detail various other statistics. It is interesting to note in Table IV that the average receipt in cash fares and tickets per revenue passenger was 6.34 cents in 1920, as compared with 4.77 cents in 1917, an increase of 33.12 per cent. It is also interesting to note, when the 1920 figure is compared with the average of previous years, that these previous years have all been fairly close to the average. On the other hand, each of the six months of 1920 has been pretty close to the average of the whole six months.

TABLE V

Showing Total Revenue Passengers Carried (Exclusive of Transfers) by Classes and Revenue Received from Transportation of Each Class for the Six-Month Period, January-June, 1920.

Rate of Fare	Passengers Carried Number	Passengers Carried Per Cent	Revenue Collected Amount	Revenue Collected Per Cent
1¾ to 2½ cent fares	426,268	4.20	$11,209	1.74
3¾ cent fares	778,367	7.67	29,188	4.53
5 cent fares	3,849,783	37.95	192,510	29.91
6¼ to 6½ cent fares	359,964	3.55	25,290	3.93
7½ cent fares	3,969,429	39.13	297,707	46.26
10 cent fares	473,632	4.67	47,363	7.36
12½ to 15 cent fares	225,145	2.22	28,808	4.47
17½ to 25 cent fares	61,819	0.61	11,587	1.80
Total	10,144,407	100.00	$643,665	100.00
Passengers carried at fares from 1¾ cents to 5 cents, inclusive	5,054,418 =	49.83% or	$232,906 =	36.18
Passengers carried at fares over 5 cents	5,089,989 =	50.17% or	410,759 =	63.82
Total	10,144,407 =	100.00%	643,665 =	100.00
Average fare per passenger 5 cents and under	4.60			
Average fare over 5 cents	8.07			
Average fare per passenger	6.35			

NOTE—Fares below 5 cents are school tickets.

TABLE VI

Showing Income, Outgo, Net Available for Fixed Charges, Fixed Charges and Net Income to Profit and Loss of the San Diego Electric Railway Company for the First Six Months, January-June, 1920, Compared with the Average of the Corresponding Period for the Years 1916-1919, Inclusive

Item	First Six Months January-June, 1920 Amount	%	Avg. First Six Mos. January-June, 1916-1919 Amount	%	Increase or Decrease Amount	%
Income						
Revenue from transp. of passengers	$643,583	94.75	$476,295	93.40	$167,290	35.12
Other rev. from transp.	521	0.09	1,168	0.23	646	55.38
Revenue from other ry. operation	28,455	4.20	26,201	5.14	2,253	8.60
Non-operating income	6,399	0.96	6,277	1.23	121	1.94
Total income	$678,958	100.00	$509,940	100.00	$169,018	33.14
Outgo						
Way and structures	31,527	4.64	$29,275	5.74	$2,252	7.69
Equipment	32,020	4.72	22,386	4.39	9,635	43.03
Power	92,951	13.69	63,775	12.50	29,176	45.74
Conducting transportation	208,385	30.69	146,495	28.73	61,890	42.25
Traffic	11,059	1.63	7,633	1.50	3,425	44.87
General and miscellaneous	82,458	12.15	64,047	12.56	18,411	28.75
Transportation for inv., cr.	*426	†0.06	*160	*0.03	*265	166.80*
Operating expenses	$457,976	67.46	$333,453	65.39	$124,523	37.34
Depreciation	136,960	20.17	150,649	29.54	13,689*	9.09*
Taxes	43,057	6.34	35,990	7.06	7,066	19.63
Total outgo	$637,993	93.97	$520,093	101.99	$117,900	22.67
Net available for fixed charges	$40,964	6.03	$10,153*	1.99*	$51,118	503.43
Fixed Charges						
Interest on funded debt	$93,100	13.71	$95,806	18.78	$2,706*	2.82*
Interest on unfunded debt	..	....	5	......	5*	100.00*
Amort. of disc't on funded debt	7,161	1.05	7,369	1.45	208*	2.83*
Sinking fund (bond retirement)	29,400	4.33	19,600	3.84	9,800	50.00
Miscellaneous	25	..	60	0.02	35*	58.77*
Total fixed charges	$129,686	19.10	$122,841	24.00	$6,844	5.57
Net income to profit and loss	†$88,721	†13.07	†$132,994	†26.08	$44,273	33.29

* Credit † Deficit.

The analysis in Table V brings out the striking point that 50 per cent of the total passengers were carried on a fare from 1¾ cents to 5 cents, an average of 4.6 cents, and that this fare constituted 36.18 per cent of the total revenue. This table also shows what a large percentage of the fares were nickels, dimes and tickets, and consequently how little time was probably consumed by the conductors in making change. Table VI gives the complete financial statement for the period mentioned. During July, 1920, for which figures in detail are not yet available, the earnings for the first time since 1914 met every proper financial requirement. Other interesting features of the financial report for the first four months of 1920 will be found in the ELECTRIC RAILWAY JOURNAL for Aug. 7, 1920, page 270.

CONCLUSION

According to advices from E. J. Burns, who has had a large share in working out the new method, the zone system as adopted and in operation in San Diego has not affected the population or disturbed real estate values. From the date of its inauguration there has been no complaint or opposition from the public. As stated above, it is considered by the traveling public to be a workable and dependable system. The public does not consider the zone system complicated, but one collection of fare per passenger per trip on all lines is made, and, due to the efforts of the company to advise the public in advance as to the reason of the system, the method of fare collection, etc., there has been practically no confusion at any time since the system was installed.

Edward Dana on Boston Traction Problems

EDWARD DANA, general manager Boston Elevated Railway, has an article in the October issue of *American Business & National Acceptance Journal* entitled "The Street Railway Problem Must Be Solved Correctly if Cities Are to Prosper." After reciting the steps under which the fare in Boston has gradually been increased from 5 cents to 10 cents, Mr. Dana declared that while a property might derive sufficient revenue at a high flat fare out of necessity riding to meet the cost of service, the street railway under such conditions has been diverted from its primary function, namely, that of developing community growth and intercourse for the greatest number of its inhabitants and has become a commodity which can be purchased only by those who can afford it or to whom at any price it is indispensable.

Continuing, Mr. Dana said that on the Boston Elevated Railway the 10-cent fare became effective in July, 1919. During the following twelve months, or those ended June 30, 1920, there was a 25 per cent increase in wages and a winter of unparalleled severity, entailing a direct outlay for snow removal of $600,000, with other indirect expenses. The car-miles run were 1,704,292 less than during the previous year and the balance sheet at the end of the year on a $32,671,000 income was $17,000 on the right side. But wages have again been increased by a board of arbitration, this time 16⅔ per cent, and prices of coal and other supplies are steadily increasing, so that the outcome for the present year cannot be foretold.

In Mr. Dana's opinion, the high flat fare is not the final solution, even if thereby the street railway becomes self-supporting, if it becomes less the public servant. Permanent results can be obtained in such a case only by the proper distribution of the burden between the car rider and the taxpayer, with a fair and safe return to those who provide the capital and with management entirely removed from politics and held to a proper degree of skill and economy.

Utility Commissioners Hold Spirited Convention

National Association of Railroad & Utility Commissioners Discusses Vital Problems of Rates, Public Relations and Valuation, Devotes Particular Attention to Electric Railways, Favors Liberal Rates, Encourages Publicity and Calls on Local Bankers to Appear Publicly at Hearings to Prevent Socialism

THAT utilities commissioners throughout the country have come to recognize that public corporations are entitled to more sympathetic consideration of their problems became very evident during the sessions of the annual convention of the National Association of Railway & Utility Commissioners, which was held in Washington this week. It also developed at the round table discussion on street railways that it was very generally agreed among the commissioners in attendance that such railways are entitled to a higher rate of fare and that utility rates generally must be revised upward in the public interest.

A flat-footed declaration against government ownership of railroads by P. J. Lucey of the Illinois commission brought forth such expressions of approval that it may be stated that much more than a majority of those present regard the trial of government operation as discrediting any plan of public ownership of railroads. This display of sentiment against government ownership is greatly in contrast with the opinions held by many of the commissioners five years ago.

The convention adhered to its established policy of making the annual meeting a clearing house for the views of the members of the organization. Numerous reports were submitted and discussed, but as usual the convention does not adopt or pass upon these reports in any way. The sessions this year, according to James B. Walker, the secretary of the association, were of unprecedented interest, reflecting the unusually large number of important problems which face all types of railway and utility operations.

The address of Commissioner Clyde B. Aitchison on car distribution aroused an animated discussion, in which Commissioner Frank H. Funk of Illinois, Judge Clyde M. Reed of Kansas and Commissioner Charles Webster of Iowa took clear-cut issue with the car distribution policies of the Interstate Commerce Commission. It was alleged that this policy had led to great losses in the wheat-producing sections of the country.

Officers for the coming year were elected as follows: James A. Perry of the Georgia commission, president; Carl D. Jackson of the Wisconsin commission, first vice-president; Dwight N. Lewis of the Iowa commission, second vice-president. James B. Walker of the First District New York commission was re-elected secretary of the association. Le Roy S. Boyd, librarian of the Interstate Commerce Commission, was re-elected assistant secretary.

Next year's convention is to be held in Atlanta, Ga., commencing the second Tuesday in October.

ADDRESS OF PRESIDENT SHAW

The address of President Walter A. Shaw of Illinois at the opening session of the National Association of Railway & Utility Commissioners was devoted largely to a discussion of the relations between the utilities and the commissions and to those between the state commissions and the Interstate Commerce Commission. In Mr. Shaw's opinion the acceptance by the public of the large increases in railroad rates recently granted by the Interstate Commerce Commission is evidence that the public is convinced that substantial relief is necessary to the carriers to permit them properly to serve the country. These colossal increases, which before the war would have spelled political defeat to any commission advocating them, show vividly how times have changed. Other excerpts from Mr. Shaw's address follow:

Within the past two or three years there have been considerable demands upon state commissions to increase all classes of rates coming within their jurisdiction, and many substantial increases have been authorized. In most instances, especially as to street railway fares, the increases authorized have exceeded those prescribed by so-called contract ordinances or franchises granted prior to the creation of the state commissions. The abrogation of many of these franchise provisions has been seized upon by self-seeking politicians with the idea of furthering their own selfish ends by making the commissions unpopular because the rates have been increased. The utility corporations are pictured as contract breakers which prospered unduly before the war and are now unwilling to share their part of the burdens brought on by it, and that if it were not for the state commissions these contracts would be binding and the public would not be required to pay the increased rates. These individuals conveniently forget to tell the public that in the absence of commissions utility corporations have the right to resort to the courts, which would fix the rates under provisions in the federal and state constitutions that prohibit the confiscation of property without due process of law. Such procedure has been adopted by certain carriers in obtaining increased passenger rates in Illinois and other states.

Apparently sight was also entirely lost of the fact that the state commissions were created for the very purpose of breaking so-called ordinance contracts. In the pre-war period the public believed that many of these rates were excessive and necessarily, if the state commission was to give any relief, the rates prescribed by ordinances or otherwise must be disregarded. In the pre-war period the test applied to determine the popularity of the commission was the extent to which it lowered rates and broke so-called contracts.

In the speaker's judgment, among the many enemies of regulation three are of principal importance, and of these the greatest is politics. Complete changes in the personnel of a commission with the advent of a new governor means, in the long run, defeat to regulatory efficiency, and the speaker recommended that the association give this matter special attention either by a resolution adopted at the convention or by creating a committee to consider it, and then take appropriate action upon its report. The second most powerful enemy of regulation listed was the group which believes that all utilities should be owned and operated by the federal or state government or their duly authorized agents. The third principal enemy of regulation is the improper attitude of many utilities toward the public. In the speaker's opinion, unless the public shall receive at least as good service and as low a rate through a regulated monopoly as it would receive under the whip of competition regulation will fail and some form of government ownership will prevail. In this connection the speaker said that he had in mind the position taken by many companies in rate proceedings during the war, and even at this time that for rate making purposes value should be determined by the use of the present inflated war prices, and he quoted former Justice Charles E. Hughes, when acting as referee in the case of Brooklyn Borough Gas Company vs. Public Service Commission, as follows:

> This would result in allowing a public service corporation to take advantage of a public calamity by increasing its rates above what would be a liberal return not only on actual investment but upon a normal reproduction cost, in the view that unless it could make an essentially exorbitant demand upon the public it would be deprived of its property without due process of law.

There is also a responsibility on those who direct the financial policies of our utility corporations and financial institutions. The latter have important interests in the future success of the utilities in the way of protecting the securities now owned or held by them, and they might well greatly profit by a campaign of education, assuming their just portion of the burden and risk and educating the public to that fact.

The speaker then discussed the conflict between federal and state authorities in regard to rate supervision, but expressed the belief that it would be possible to iron out much of the troubles if both federal and state commissions made an honest endeavor to carry out the spirit and intent of the co-operative provision in the transportation act of 1920. But he added that if the carriers insisted on continuing warfare against state authority the association should use every honorable means to protect the rights to which each state is entitled under the constitution. He then suggested a committee on litigation to deal with such matters and that proper attention be given to possible clarifying amendments to the interstate commerce commission act, particularly as to land values in valuations.

SOME COMMITTEE REPORTS

The conclusion of the committee on public ownership and operation was that the "present system of private ownership and private ownership with public regulation, as is now the custom in this country, is the proper, logical, and, indeed, the only just and honest manner of conducting the public utility business of this country." The report pointed out a number of the weaknesses of government ownership of utilities, which, it said, were advocated by two classes. One is made up of the communists, the anarchists, and all others who follow the divers and various governmental vagaries with which they seek to supplant our constitutional government. The other general class is the dreamer, the visionary, the professor who deals in ideals but not facts and is opposed to private ownership and governmental regulation, because they both feel that should this project fail nothing will remain but public ownership and public operation.

The report of the committee on safety of operation of public utility companies declared that thirty-one of the forty-eight state commissions have more or less jurisdiction over the safety of operation of public utility companies, eleven have no control, and six have not yet reported. Brief mention is made of some of the safety regulations in force in the different states, as well as of the safety rules for electrical properties developed by the Bureau of Standards in co-operation with national engineering associations and others. The report says that within the past nine years forty-two states have adopted workmen's compensation laws and thirty-seven states have established accident boards or industrial commissions. In some states all matters pertaining to safety regulations of steam power or electric generating plants are under the industrial commission or safety board, while in others the public utilities commission has entire charge of all utility operation. The report suggests that ordinarily all of this supervision might well be under the direction of a state safety board, so that the protection against the common dangers may be everywhere the same, as in the case of boilers, pulleys, shaftings, etc., whether found in utility plants or elsewhere.

Round Table Conference on the Electric Railway Problem

Commissioners Recognize the Necessity for Increased Rates and Question the Ultimate Satisfaction of Service-at-Cost Franchises

THE afternoon session on Nov. 10 was devoted largely to a round table discussion of the electric railway problem and service by public utilities, the former subject occupying most of the afternoon. E. I. Lewis, chairman of the Indiana commission, presided.

Prompted by the fact that Miss Mabel Boardman, one of the newly appointed commissioners for the District of Columbia, was present, Mr. Lewis stated that it was unusual at meetings of the National Association of Railroad & Utilities Commissioners to address an audience as "ladies and gentlemen," but that he took much pleasure in doing it on this occasion. This led him to call attention to the fact that the interests of women must be considered, since they travel on street cars the same as men, and from the fact that women are those most directly interested in gas and other utility products. In this connection he pointed out that attendance upon motion picture shows had become an important factor in street railway traffic. He also mentioned that the feminine factor doubtless would be making its influence felt in the near future in memberships of public utilities commissions.

Continuing, Mr. Lewis pointed out that in the administration of electric railway affairs it is quite evident that the problem in one locality differs materially from that in another locality and that it is not fair to use a solution in one place and call it at all applicable to another situation. In Indiana, for instance, the commission found it advisable to give a 6-cent fare in Evansville, but a different situation caused 7 cents in Fort Wayne, and then in Indianapolis it has been possible to maintain a 5-cent fare. This latter rate in Indianapolis was due to several reasons, namely, that it was possible to find a very conservative value for the property and it was possible to reduce security issues against the property, but perhaps more than anything this was on account of the fact that

Indianapolis is out of the strip of high wages, which runs all the way from Boston through Buffalo, Cleveland, Toledo and especially Chicago. In other words, Indianapolis is a community with its individual solution. It is also interesting to note in Indianapolis that the company feels that it should maintain 5 cents if possible, for short haul passengers, and the commissioners are in favor of that policy. While recognizing the necessity for increases to 6 cents, 7 cents, etc., the commissioners also believe that a change to 6 cents encourages a later change to 7 cents, then to 8 cents and then to 10 cents, which they wish to avoid.

He said that last April the city of Indianapolis realized the railway needed credit and funds and petitioned for a service-at-cost franchise plan instead of the rate granted by the commission for relief. Nothing was done at that time except that a study was made, and last week the city of Indianapolis filed a petition withdrawing the service-at-cost franchise petition of last April. Fundamentally, the reason was that after a study of the situation the commission was unable to find any incentive for efficiency of private operation under service-at-cost provisions.

Mr. Lewis then opened the meeting to general discussion, calling specifically upon Edward Flad of Missouri. Mr. Flad said that the policy of the Missouri commission was to endeavor to give sufficient income to pay operating and necessary capital expenses and give additional return upon the investment. The commission, in its procedure, had tried to arrive at tentative temporary valuations, and so far its experience has been that the figures used were about half the capitalization of the companies investigated.

In connection with capital and rates of fare, Mr. Flad said that the general public believes that it has been exploited by the electric railways in the past, but that on the contrary the facts as he saw them were that it was the investing public which had been exploited and the riding public had had full value or more than full value for the fares it had paid. It is now the duty of commissions to protect investors. In the past traction magnates speculated and fleeced investors, but they were both merely playing the game and the former won. Commission regulation has taken away speculation and should guarantee a return on legitimate investment.

The Missouri commission has authorized 8-cent fares in St. Louis and Kansas City, but really believes in the zone fare in principle, with 5 cents as a base. Mr. Flad said he recognized the objections, but thought this to be the rational solution. The Missouri commission refused, however, to assume the rights of management and hesitates to put a zone scheme into effect against the will of a company, in the belief that the company and the public should agree upon a fare scheme. In St. Louis neither the public nor company wished the zone system, so the commission authorized a flat fare, which seemed to be desired.

Commissioner Henry A. Trumbower of Wisconsin said he thought the decision on rates was a two-part problem. The first part is simple, although it might involve a good deal of work, this being to determine what the total revenue of the company should be. The second part, how to arrive at methods to secure this revenue, is where the difficulty comes in. Theoretically, he would like to treat the electric railways the same as electrical power companies, telephone companies and gas companies and make a constant readiness-to-serve charge plus a charge for service rendered, and place this readiness-to-serve charge on automobile users and others who use the railways in bad weather and other emergencies, but don't take advantage of its service and thereby give the constant support the rest of the year. The wholesale ticket rate takes care of this to only a very minor degree, but monthly tickets might help.

In answer to a question from the floor as to what experience various commissioners had had in the change in traffic as a function of a change of fare, several commissioners offered their experience. Chairman Carl D. Jackson of the Wisconsin commission gave an analysis, which was seconded by many others, that fare increases first came in the fall of 1918, but the "flu" immediately decreased riding; that in January, 1919, when the soldiers started to come back, traffic came back and even increased, and that since then, so far as he was able to determine, if there had been any variation of traffic from what would normally be expected with a continuation of the 5-cent fare, it had been very slight. As a matter of fact, traffic in Wisconsin was larger under the increased fares than it was before.

Walter A. Shaw of Illinois gave data on Joliet and Elgin in which he indicated that the first increase in fare caused a slight decrease in traffic, but that this was regained and that subsequent increases in fare apparently caused no change in traffic. In answer to a question on the effect of tickets, he pointed out that in Springfield, a non-industrial community, the fare had been raised from 5 cents to 7 cents, four tickets for a quarter, and 65 per cent of the people used tickets, but that in Rockford, an industrial community, where the same fare change had been made, only 40 per cent used tickets.

Chairman W. D. B. Ainey of the Pennsylvania commission argued that the commissioners should not get off into bypaths of details but should come to the fundamental problem of trying to fix their responsibility and to have it understood by both companies and public. He said many companies are trying to throw the responsibility for the present condition of railways on the commissions, whereas many of the elements in the present railway situation were certainly beyond the control of any commission. Personally he did not want to throw anything else on the shoulders of the Pennsylvania commission.

He made the point that it is impossible to make any formulation of what might be called the electric railway problem; it is a combination of various circumstances stressed with different emphasis in different places. The commission has in any case the problems to consider of the managerial situation, corporate history, psychology of the community and the various obligations, some of which may be very old and utterly untenable. He quoted one contract which called for the railway to pave from curb to curb, which would take 90 per cent of the gross income of the company to pay. He pointed out that commission regulation could do nothing here and urged that the commissioners show the railways that there are many problems which are not regulation problems. He further emphasized the point made by Mr. Lewis that solutions differ in many places and emphasized that what pertains in Philadelphia cannot pertain in Pittsburgh.

As a basis for judgment, he argued the commissioners should not get the gross number of riders or gross revenue or the net return, but they should determine the number of car rides per inhabitant per year.

Then, even with this as a standard, he showed how difficult it was to make a solution as to fare change which might apply to the 150 rides per inhabitant per year in Pittsburgh be of any use to the solution of the Philadelphia problem, where formerly 288 rides per capita per year, now increased to 468 rides per capita per year, were found to be the facts.

Principally, Mr. Ainey emphasized that only as railway managers meet the problems themselves can they succeed. Upon question from Mr. Lewis as to his opinion of service at cost, Mr. Ainey pointed out that in Pennsylvania the commission felt that the organic law of the commission empowered it to administer the utilities under its jurisdiction on what is fundamentally a service-at-cost basis. He said he feels that they have every good feature of the service-at-cost principle and are free from some of the objectionable features. For instance, service-at-cost franchises cannot cure labor troubles and, more important, service-at-cost franchises do bring street railway operating problems so close to political control as to hinder proper operation and the maintenance of proper public relations.

One of the Ohio commissioners pointed out that his commission had no trouble with street railways, for, he said, "in 1911, when our law was passed, the street railways were able to write into the law a sentence which excepted them from jurisdiction by the commission where all their trackage was within the corporate limits of the city. During the last three years they wished they had not done this, but we are now glad we don't have to deal with their troubles."

William M. Smith, chairman of the Michigan commission, said that that commission had jurisdiction over the railways only by agreement between railway and city and that they had only three medium sized communities under their jurisdiction on this basis. He said that Detroit was not under their jurisdiction, but, being asked about the Detroit situation, he said that Detroit has had an electric railway problem for forty years and further that he thought the politicians would like to have this problem continue for another forty years in order to continue to make political capital.

One of the Georgia commissioners urged that utilities be encouraged to put all their cards on the table and drew a contrast between a five-day hearing which was a continual fight between lawyers and representatives of the municipality and railway and a one-day hearing on a much larger property where there was cordial co-operation, with sentences such as "Here, Bill, see this exhibit," and "Come over to my office and I'll show you all we have." From Georgia experience, he inferred that the public accepts a change of rate if shown that it is right and that the railway will continue to furnish the service which is more important to the community than the rate.

Mr. Lewis said in closing that there is no real analysis in fares versus traffic, and when the "flu" was considered, the increased riding due to returning soldiers was considered and when, subsequent to that, money took on an entirely different value, it was not fair to oneself to try to make a judgment upon reasons for any changes in traffic subsequent to changes in fare.

Mr. Lewis called attention to the slogan of "let the people rule" with the resultant primary laws, now somewhat discredited; he mentioned the "cost-plus" slogan of the war contracts, now entirely discredited, and he believed the "service-at-cost" slogan would be found two years hence not to have many of the advantageous elements now claimed for it.

As commissioners, he urged the gathering to carry away the recommendation that laws be so enacted and construed that commissions themselves could really regulate upon the good principles of the service-at-cost basis with the benefits of regulated private operation without the difficulties of local contact. Service-at-cost allows a railway to "pass the buck" on high charges. For instance, said Mr. Lewis, "why should a railway manager make any particular effort to buy $4 coal when a half dozen coal dealers are in his office wanting to sell it to him for $5 or $6 and he knows that the service-at-cost franchise provisions will allow him to collect whatever he spends." Don't allow the railways to get away from keeping the responsibility for good, clean operation under private management.

Mr. Lewis called attention to the terrible situation in New York and Chicago, which were shining examples of electric railways in politics. He said that every one knows that if a 5-cent fare was just before the war, it will not pay since the war, and no politician can ever operate a railway at less than cost.

Public Relations Round Table Discussion

Public Is Unreasonable and Should Be Treated on that Basis—Courtesy Called Cheapest and Most Valuable Commodity—Commissioners Call on Bankers to Appear and Save Country from Socialism

AT THE afternoon session on Thursday the most absorbing topic of the round table discussion was that of public relations. Upon invitation of the convention M. H. Aylesworth, secretary National Electric Light Association, told the assembled commissioners of the publicity work of the association on its own part and its co-operation with other public utilities in establishing bureaus or committees of public information in each of the various states of the Union. He also outlined the plans of the National Electric Light Association to start a campaign of service information by means of inclosures with electric light bills each month. He estimated that the first month would see 2,000,000 consumers receiving the identical literature and expected 4,000,000 to receive it within a few months.

The most interesting talk of the afternoon was given by Judge Clyde M. Reed of the Court of Industrial Relations of the State of Kansas. Judge Reed said that his own business was the newspaper business, he being the owner of one of the largest newspaper properties in southeastern Kansas, and as he had tried since his appointment to the court to analyze the public utility business, the principal question which arose in his mind had been whether the present unpopularity of public utilities as a whole was inherent to the public utility business or was due to the way in which the business has been conducted. He pointed out that public utility commissions themselves are in disrepute today because public utilities are not understood by the public nor does the public understand its relations to the public utilities. The commissions are commencing to be placed in the same class as the public utilities.

In discussing the relation of the public utility to the public, Judge Reed pointed out at what low cost the public was actually getting public utility service.

Excepting, possibly, the 2-cent stamp on a first-class letter, Judge Reed said that the cheapest thing which could be purchased or had ever been purchased in the way of service was a street car ride for 5 cents. And yet the public has never had brought to it a realization of how great this service was. He said that, in discussing this question with leading electric railway men, namely, how cheap electric railway riding really was, the electric railway men told him that the street car business has been built on cheap labor, but that, on the other hand, the public had demanded cheap service—in other words, it had demanded a service which could be given for 5 cents. This was possible only by means of cheap labor and it satisfied the public. The important point today, in the eyes of Judge Reed, is to educate the public to the value of service, but when the public is educated to the value of service, it is up to the public utilities to furnish this service. There must be a co-ordinated campaign in the offices of the public utilities with a campaign of courtesy and good service throughout the rank and file of the utility.

Judge Reed said that he thought the newspaper business was more nearly equivalent to the public utility business than any kind of private business because it dealt directly and in a personal way with more people than any other business except public utility. Judge Reed said if he ran his newspaper like most public utilities run their business, he would have been "broke" long ago. He prided himself on having the best newspaper in his town on account of the best service, and likened the complaints received when the daily newspaper failed to be delivered by his carrier to the same sort of human nature complaint given in connection with various features of public utility service. He also pointed out that the newspaper carrier boy with whom he had to deal in rendering his ultimate service and upon whom he had to depend for his service was likely to be of as irresponsible a nature as any character of employee of a public utility.

Judge Reed said that there is another point which seems to be entirely overlooked by public utilities. This is that on the whole the public is unreasonable rather than reasonable, "but," said Judge Reed, "I deal with the public on the basis that it is unreasonable." To make his point clear, Judge Reed said that the public utilities assume that the public has as much information as the public utility has itself, and usually the local manager of a public utility operates on this same basis. This, he says, is not the fact, and since it is not so the public exercises its normal human nature and takes out its various ill feelings on the public utility.

To meet this characteristic unreasonableness on the part of the public, the public utility must exercise a courtesy and a forbearance, and at the same time educate the public in enough of the facts of the public utility business that it can have something of an understanding of the problems. He made the point that "courtesy is the cheapest and most valuable commodity in the world." He thought utilities should supplement courtesy by education of employees in their conduct with the public and with an appreciation of the fact that the public is unreasonable. There is a mass mood of the public, and it is absolutely necessary that the public utility gets this mass psychology.

Judge Reed's remarks were received with great appreciation by the other commissioners, and Commissioner E. I. Lewis of Indiana, who followed Judge Reed, said that the trouble was that public psychology is not included in the curriculum of the education of utility personnel.

Mr. Lewis called attention to one public utility in his state which, he said, gives the best service of any public utility of its kind or size, but it was absolutely "in bad" with the public because it had no conception of its duty in connection with public relations. He analyzed public relations as being based upon two foundations: (1) Service, and (2) a full understanding of the utility by the public. He said he was interested in the program outlined by Mr. Aylesworth and hoped that it would accomplish two things: First, that the public understand what service is, and, second, that the public understand that public utilities are not under the stain of control by Wall Street. It is necessary that the public understand the relation of the financing of public utilities through the large investing institutions, such as banks, insurance companies, and last, but not least, the large number of small security holders all over the country. He agreed with Judge Reed that in all states there is a reaction to public service commissions on account of the reaction against public utilities in general.

Commissioner W. C. Bliss of Rhode Island urged that the bankers should appear before public service commissions to present the interests of the community in the investment of public utility property. He pointed out that much of the investment had been made, and that many investors had placed their money in public utility securities, at the behest of or following the advice of bankers. It now rests upon those who advised these people to invest their money to stand up publicly and say to how great an extent the interests of the whole community depend upon the continued prosperity of public utilities.

Public utilities have a bad standing at present due to past history, which of course should not enter now, but which can hardly be eliminated on account of human nature where every one, from childhood up, has been told of the manipulation in public utility financing. The public utilities have tried to tell their story, but the public doesn't want to hear. The public service commission cannot do it all on its own initiative, but the banker who has the respect and confidence of the public can stand up and tell the public a few things.

Mr. Bliss said that this is absolutely the only thing which stands between the American people and absolute socialism. If private institutions cannot continue a public utility, it means the beginning of breaking down of the American institutions, the next move being government ownership of public utilities, and this would only be followed by other steps resulting in absolute socialism. It is most important now to hold up the public service commissions which have followed the public utilities into disfavor. College presidents, local bankers, and men of similar respect and confidence in the community must appear before the commissions on their own initiative to save the situation. Mr. Bliss said he did not mean by this the large banking institutions in the metropolitan centers, but the local bankers in the individual communities who knew the local situation first hand and could present the facts in such light as to be understood by their neighbors.

[The foregoing report of the convention of the National Association of Railroad & Utility Commissioners does not attempt to cover the entire proceedings, but to present the story of the convention in so far as it pertains to electric railways. As the convention was not closed at press time further reports will appear in later issues.—EDS.]

N. Lawson, Arthur Power-Saving Recorder Company, might be expected to be found in the company of H. B. Flowers, general manager, and L. H. Palmer, assistant to the president, United Railways & Electric Company, Baltimore.

There's real action in the cane carried by A. Gaboury, superintendent Montreal Tramways, whose keen interest has won him reelection to the executive committee of the T. & T. Association. H. R. Mallison accompanies him.

Here is T. A. Ferneding of Dayton, Ohio, demonstrating his versatility by the way he holds his cane. With him are H. C. DeCamp, Westinghouse Electric & Manufacturing Company, and in the center, W. A. Keyes, Dayton Street Railway.

Boardwalk Glimpses of the Recent Atlantic City Convention

Genial, democratic, far-seeing—a guiding genius whose abilities have served so well the A. E. R. A.—this is John H. Pardee. In his company is S. W Trawick of the General Electric Company.

It must have been something good that John Stanley was putting into the near ear of W. Caryl Ely, vice-president Barron G. Collier, Inc., while the latter was trying to prevent it from escaping from the far one.

These two interurban general managers, H. A. Nicholl of Anderson, Ind., and F. W. Coen of Cleveland, are making headway (here toward the pier), which is characteristic of them during the rest of the year.

Three good fellows from the land of corn pone and 'lasses, Mardi Gras and lassies—L. C. Datz of Birmingham J R. McGivney and W. H. Renaud, Jr., of the New Orleans Railway & Light Company.

W. P. Butler, Johnson Fare Box Company, had a cane too, but ventured forth without it to lean on his comrades, T. A. Cross of Baltimore, J. N. Shannahan of Hampton and C. C. Castle of New York.

Here are, respectively, the progenitor, promoter and worthy ally of the safety car—C. O. Birney, Stone & Webster; C. H. Beck, Westinghouse Traction Brake Company; E. H. Ginn, General Electic Company.

Photos by Atlantic Photo Service

Relative Advantages of Modern Steam and Electric Locomotives[*]

A Railroad Man's Analysis of Statements Made in Papers Presented by A. H. Armstrong and J. E. Muhlfeld Before Joint A. S. M. E. and A. I. E. E. Meeting in New York on Oct. 22

BY A. W. GIBBS
Chief Mechanical Engineer Pennsylvania System, Philadelphia, Pa.

A NOTABLE gathering of mechanical and electrical engineers interested in railroading was held in New York City on Oct. 22, under the joint auspices of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers, to hear discussed the relative merits of the steam and the electric locomotive in modern heavy traction work. The principal papers presented, respectively by John E. Muhlfeld (steam) and F. H. Shepard and A. H. Armstrong (electric), were abstracted in the issue of this paper for Oct. 23, page 866. The discussion was largely covered in the issue for Oct. 30, page 923, and in that for Nov. 6, page 970, the closing remarks of George Gibbs were printed. A. W. Gibbs requested that the report of his remarks be withheld pending an amplification that he desired to make. This is now complete and we are able to publish a summary this week. As this paper gives the point of view of a railroad man who has had much experience with electric locomotives, it will be of value both to steam and electrical locomotive enthusiasts.—EDS.

THE papers by John E. Muhlfeld and A. H. Armstrong indicate that both of the writers have been a bit too enthusiastic. Both steam and electric methods of operating have their advantages and both have decided limitations.

COMMENT ON MR. ARMSTRONG'S PAPER

Mr. Armstrong's data are largely derived from mountain electrifications, where the electric locomotive is undoubtedly at its best and the steam at its worst, and he has compared with the electric a type of steam locomotive whose coal and water rates are more than double those of locomotives especially designed for such service. Then on the basis of this mountain performance he reasons from the particular to the general application of electric motive power. It is not at all certain that the speed advantage claimed is obtained where the steam locomotive is designed for the work.

Mr. Armstrong gives a comparative statement of the performance of two steam and one electric locomotive. (See ELECTRIC RAILWAY JOURNAL, Oct. 23, page 872.) To this exception can be taken because the steam locomotives do not represent the last word as to those available and the electric locomotive is on paper.

The accompanying table gives data for a 2-10-0 type steam locomotive, of which more than 100 are in regular service and of which fortunately very full information is available from the locomotive testing plant. These locomotives were expressly designed to do all of their work within the economical range of steam distribution, the required power being obtained by increases in size of cylinders and steam pressure. While I have given the power at nearly the speed mentioned by Mr. Armstrong, the performance is excellent at double the speeds given, but the sacrifice in drawbar pull—from nearly 60,000 lb. at 14.7 m.p.h. to about 43,000 lb. at 25.3 m.p.h.—would not be justified. The figures given are within the range where stoker firing is as economical as expert hand firing. The additional advantage of the stoker is that it does not get tired.

The Mallet performance given in Mr. Armstrong's paper is evidently that of one of the large compound locomotives. In all of these locomotives there is a tendency to choke up with increases of speed, due to increase of back pressure.

DATA FOR 2-10-0 TYPE STEAM LOCOMOTIVE

Weight in working order, lb	371,000
Weight on drivers, lb	342,050
Weight on engine and tender, lb	523,000
Drawbar effort at 14.7 m.p.h., 45 per cent cut-off, lb	58,900
Gross tons (2 per cent grade)	1,280
Trailing tons	1,019
Coal per developed horsepower at this speed and cut-off, lb	2.8
Tractive effort at 22 m.p.h., 40 per cent cut-off, lb	43,500
Gross tons	923
Trailing tons	662
Coal per d.hp., lb	3.2
Tractive effort at 25.4 m.p.h., 45 per cent cut-off, lb	43,600
Gross tons	948
Trailing tons	687
Coal per d.hp.	3.8

The same arrangement of limited maximum cut-off used in the 2-10-0 locomotive already described has been embodied in a simple Mallet now running. This locomotive has the same speed elasticity as the 2-10-0 type. Unfortunately, this Mallet, which has a tractive power of about 130,000 lb., cannot be tried out on our present locomotive testing plant. Its drawbar pull is also above the capacity of our dynamometer car, so that no definite figures can be quoted until new recording springs have been applied and the machine calibrated.

In brief, the improvements in the steam locomotive, if properly availed of, have much narrowed the field of economical electrification.

SOME SALIENT TOPICS TAKEN UP BY MR. ARMSTRONG

Stand-by Losses.—While stand-by losses are actual and large it is very difficult to fix their value, as they are so much affected by the use made of the locomotive. Where the average monthly mileage is low the stand-by loss is presumably high, and it is a part of good operation to have the average mileage as high as possible. When all is said the electric locomotive has still an advantage with respect to stand-by losses, provided there are sufficient trains in motion to smooth out the total demand on the power plant, which is assumed to be steam-operated.

Weather.—The independence of the electric locomotive of severe weather is another undoubted advantage, not so much because of the performance of the motors but rather from the avoidance of losses and delays due to ashpit work and to frozen pipes and other parts, incidental to the presence of water on the steam locomotive. Where cold weather is a "steady winter diet," this is usually better handled than where cold spells are spasmodic.

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[*] Abstract of remarks made at joint meeting of railroad section A.S.M.E., metropolitan section A.S.M.E. and New York section A.I.E.E., held in New York City, Oct. 22, 1920.

Liability to Interruption.—Electric operation is dependent on uninterrupted connection with the source of power. In the event of breakage of the line, especially of the overhead construction, the trains in the section involved are dead and cannot get themselves out of the way of the repair trains. On large systems it is customary to make great changes in the assignment of locomotives to clear up congestion at any point on the system, also to avail of diversion routes on which steam trains may be moved around obstructions on the main line. The fact that the steam locomotive is a self-contained power plant is an immense advantage in this respect. In electric operation there is not this freedom of movement.

Speeds.—The question of speed is evidently treated from the freight standpoint, for there has never been any question as to the speed capacity of well-designed passenger locomotives. This is far beyond that permitted by the rules. In this connection it may be said that many of the electric locomotives could be very much improved by closer adherence to steam standards as to distribution of weights and in the adoption of wheel arrangements which will not set up resonant disturbances at high speeds.

While Mr. Armstrong treats the question of speed from the meeting point of view, it is probable that electrification will have its greatest application on roads where the traffic is dense, probably on multiple-track roads. As I see it, the feature of high speed of trains is of less importance than uniformity of speeds of different trains. If tonnage trains had the same speed as preference trains, and could thus avoid the great delay due to sidetracking of trains of inferior rights, far more would be accomplished than the mere saving in time over the division due to the increased speed. With steam trains at 25 m.p.h. water may be picked up from track troughs. Coaling stops will, however, still be necessary. Delays due to the train itself, such as those caused by hot boxes, burst hose, broken coupler knuckles, etc., would occur equally with steam or electric operation.

I fully agree with Mr. Armstrong that the 1,000-ton-mile has absolutely no value as a method of comparison for different roads and it should not be used except possibly for comparing the same division at different periods. His Table VIII (see ELECTRIC RAILWAY JOURNAL, Oct. 23, page 873) contains a fixed tractive coefficient which may or may not be obtained. The only comparison which has any value is the record of an accurate dynamometer car.

Cost of Maintenance.—Mr. Armstrong gives maintenance cost per mile for different electric locomotives. Any post-war data are so clouded by the abnormal labor and material costs as to be very doubtful. These locomotives have not run long enough to reach a general level of costs, as it will be noted that the average annual mileage is low except in the case of the Milwaukee locomotive. Besides this, there is no evidence as to the maintenance costs of the rest of the outfit, including power plant, transformers, transmission lines, converters or transformers, trolley or third rail, and track circuits, all of which are essential to the operation of electric locomotives, and are just as much a part of the electric locomotive as the boiler is of the steam locomotive. If power is purchased the purchase price, of course, includes the cost of maintenance of the power plant and of the transmission line to the point where the current is received on the road. If it is generated by the using company the cost of maintenance of the power plant should be included with the cost of maintenance of the locomotives. The renewals of parts of the power plant and transmission lines do not occur in the early stages of operation, but they are certain to come and when they do are heavy. From experience, I must deny that the back shop can be dispensed with with either class of locomotive, though it is admittedly more essential in the case of the steam locomotive.

Extent of Electrification.—Where electrification is contemplated a very serious question is: What shall be its extent? Naturally the desire would be to wipe out as many as possible of the extensive accessories to steam operation. If, however, it becomes necessary to operate steam trains over the electrified section, it will obviously be necessary to retain water stations and possibly fuel stations, provided the electrified section is sufficiently long. This operation of steam locomotives under their own power over electrified sections would be necessary in case of redistribution and possibly in case of diversions where the electrified section formed part of the diverted line. Therefore, the claim for economy in doing away with these features of steam operation would probably not be realized.

COMMENT ON MR. MUHLFELD'S PAPER

In my judgment Mr. Muhlfeld's enthusiasm has carried him too far in minimizing the advantages of electrification. The operation of the electrified roads has undoubtedly been good, whether it be terminal or road operation. The reduction in the number of engine terminals alone is a great advantage, to say nothing of the absence of fuel and water service with the stops that they entail, the way to get trains over the road being to keep them moving.

He also ignores the fact that the modern improvements which have so added to the performance of the steam locomotives are potential only. For instance, it is possible and common by indifference so to carry water in the boiler that the superheater becomes merely a steam drier and its value disappears. In many cases, because of neglect of damper mechanism or from dirty flues, little benefit is derived from improved appliances. Modernizing of steam locomotives calls for intelligent use of the devices, which will come when the old spirit of loyalty returns.

MR. GIBBS' CONCLUSIONS

The electric locomotive, or electric operation, has in many cases undoubted operating advantages because the power is generated in quantity at few sources and the power on any one train is not limited by the capacity of a self-contained portable power plant; sustained speeds are possible due to independence of fuel and water stations and, as a result of both these conditions, better use can be made of a given stretch of road.

Electrification does not at all obviate the numerous delays due to the train itself, such as hot boxes or other of the numerous derangements which when combined so much retard the movement over the road.

Electrification does not obviate that class of delay arising from necessary classification on line of the road to meet terminal requirements. Where the terminal conditions limit the capacity of the road as a whole electrification is not the remedy.

On level grade roads, where the existing steam locomotives will handle all the cars that can be safely moved in one train, the value of electrification will be principally the absence of stops and probable reduction in overtime.

The claims for fuel saving have been greatly overstated because the comparisons which are made are not with the potential performances of the best steam locomotives.

Of course, with steam locomotives the maintenance or the indifference of those operating them, both on the road and elsewhere, may to a large extent nullify the savings possible.

Stand-by losses must exist probably with both classes of operation, but especially with steam, and may be any percentage of the total consumption, depending on the actual use of the locomotives.

The relative cost of repairs of both classes of equipment cannot be fairly stated at the present time because maintenance conditions are so abnormal and because the most modern locomotives of both classes are too new to have reached a stable condition, this being especially true of the electric one. While the indications are that the maintenance of the electric locomotive will be less than that of the steam, it must be remembered that the electric locomotives are dead affairs without the necessary electric generating, transmitting, converting and track appliances, all of which are an added expense, due solely to electrification; hence the cost of maintenance of all of these, in addition to that of all of the locomotives, divided by the locomotive mileage, is the real treasury cost of maintenance per locomotive-mile.

If the operating current is purchased, obviously the cost of maintenance of generating apparatus and of all appliances to point of delivery of current is covered in the rate, but in any event it is ultimately paid in some form by the user.

Personally, I believe that many roads now operated by steam will be operated in whole or in part electrically, but that this will not be decided in the offhand manner advocated by some.

It is to be noted that practically all of the electrifications on steam railroads so far have been based on local conditions. In the electrifications in and around cities a moving cause has been the elimination of smoke and other objectionable features incidental to steam operation and the possibility of increasing the capacities of the passenger terminals. On the Milwaukee road it was the utilization of available water power. On the Norfolk & Western it was to secure increase in capacity on a congested mountain division with tunnel complications. It is fair to assume that other electrifications will be similarly governed by local conditions.

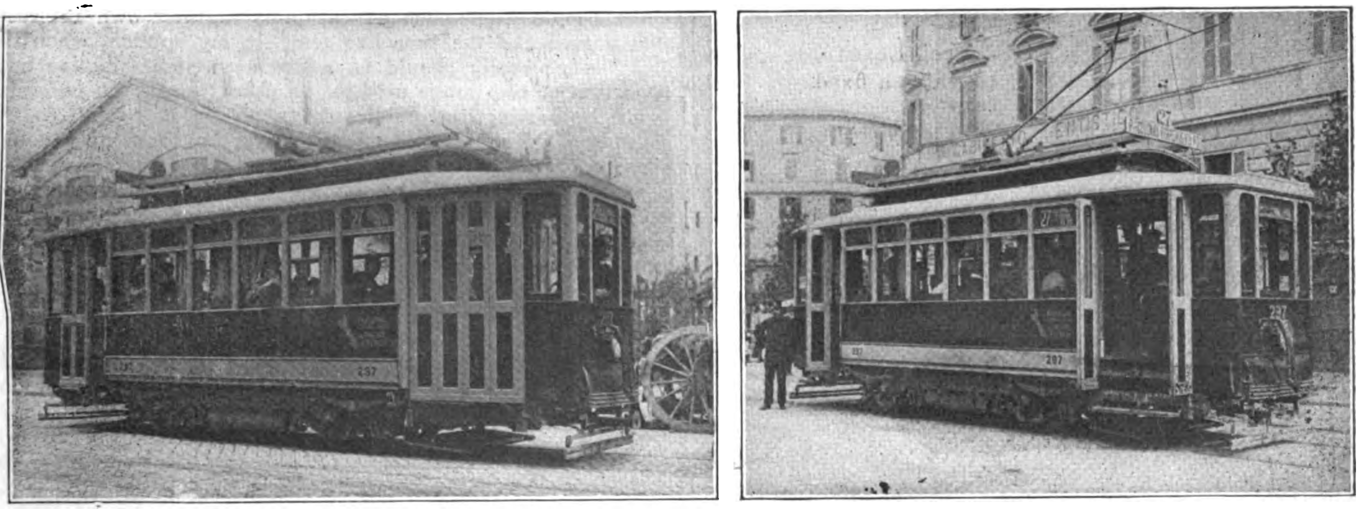
QUESTION LARGELY ONE OF ECONOMICS

If, after careful consideration of the road, based on actual train sheets for the heaviest actual or probable congested operation, the capacity and number of active and available locomotives required, crediting the operation with incidental savings which may be effected, and eliminating expenses peculiar to steam operation, it appears that there would be economy in electrification, either from actual savings or better operation, or both, it still remains for the management to decide whether the money required can be spent to better advantage for electrification than for some other features of the general operation.

In this connection it must be remembered that on originating roads a considerable part of the locomotives' assignment is devoted to service on the branches feeding the main line and forming part of it, and that in this service they make little mileage. If these branches are electrified, their operation will be a decided drag on the economies of the main electrification, for the reason that each of the steam locomotives will have to be replaced by an electric one, with its greatly increased first cost with small use to justify. If they are not electrified and the operation of the district is part steam and part electric, locomotive terminals, organizations and all that go to make up steam operation must be retained to an extent.

Prepayment Cars in Rome

FROM a report received from F. Cusani of Milan, Italy, it appears that the prepayment plan of fare collection has met with approval in Rome. Mr. Cusani has sent the accompanying pictures of a short, double-end prepayment car as used in the "Eternal City."



FRONT AND REAR OF PREPAYMENT CAR USED IN ROME, ITALY

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Movies in the Electric Railway Industry

MOVIES as a means for effectively disseminating railway publicity have been extensively discussed in recent issues of this paper. The appended contributions give further evidence of the continued interest which this subject holds in the industry.

News Features Good Subjects for Film Publicity

AMERICAN RAILWAYS COMPANY

PHILADELPHIA, Nov. 3, 1920.

To the Editors:

It seems to me that there are three means of publicity open to the electric railways today. First—The spoken word, the scope of which is limited, but nevertheless I believe that in every company there should be at least one man who is sufficiently well informed on the public utilities situation in general and the case of his own company in particular to appear before public meetings or gatherings, such as Rotary Club, Kiwanis Club, Chamber of Commerce, etc., to present—preferably not in an oratorical fashion, but clearly and succinctly—the facts as they exist. And it would be particularly advantageous if there could be connected with the company some organization of employees which would meet at least annually, at a picnic or dinner, before which could appear some official of the company in whom they would have confidence, and talk along these lines. There is nothing new or novel in this proposition.

Second—The printed word. This has been the most usual method through newspaper advertising, dissemination of news such as was prepared by the Committee of One Hundred, company publications and advertising in the company's own cars. This, if properly and skillfully done, is a very effective means. I know from personal experience that the matter is read and, if well done, is looked for, the public being curious as to what the company says next.

Third—The suggestion that the public be approached through the medium of the motion pictures. This, of course, would be very effective. It has been used with marked success in accident prevention campaigns. As to how it could be issued in connection with our general situation, I am inclined to agree with the communication published in your issue of Oct. 23 "From the Middle West Railway." I doubt very much that a scenario could be prepared which would give a true picture of our situation and for which the public would stand.

I do believe, however, that through the medium of one or more of the so-called news features or topics of the day flashes could be given which would take up from time to time certain features of the situation and present them to the public in a fashion which would be very helpful. It would, of course, require the assistance and co-operation of men skilled in this art and could be done only through the medium of a national organization, such as the Committee of One Hundred, as the expense would be such that it could not be done by an individual company. This medium, of course, would give the widest range to the presentation of the situation, and it would reach the young people and children along certain lines who would not be reached through either the first or second methods. It would also reach an element of the adult population who probably would not read the publicity matter in the paper and who certainly would not attend meetings at which it was discussed. The suggestion is worthy of careful consideration.

C. L. S. TINGLEY, Second Vice-President.

Rhymes of the Underground

The story has been told to you
Of good Adolphus Minns of Kew,
Whose virtuous ways have won renown
From Barking Creek to Acton Town.
Now with that hero's blameless life
Contrast the conduct of his wife:
Avoidance of egregious sins
Is not the way of Mrs. Minns.
That lady, I regret to say,
While bent on shopping every day,
Makes no attempt to get it o'er
Between the hours of ten and four.
To harassed booking-office clerks
She makes irrelevant remarks,
And tenders, to the crowd's despair,
A pound note for a penny fare,
Or, what perhaps is even worse,
Starts fumbling in a baggy purse.
She'll step aboard a Highgate train,
Then check and double back again,
And ask a dislocated queue
If she is right for Waterloo.
The liftmen, who, you recollect,
Spoke of Adolphus with respect,
Are pessimistic, even for them,
About the fate of Mrs. M.
Where Gertrude Minns will go when she
Departs this life is not for me,
Or you, or liftmen, to decree.
And, anyway, we needn't fret,
She shows no sign of dying yet.

From *Punch*, London.

To Public's Own Interest to Know About Their Utilities

BRITISH COLUMBIA ELECTRIC RAILWAYS, LTD.

VANCOUVER, B. C., Oct. 22, 1920.

To the Editors:

The next step in publicity work seems to me to be the training of thousands of more publicity persons among the employees and the public of each territory. The age when a company should have to force its propaganda upon the people when such education is in their own interests is passed and the time has come, in my opinion, when the public generally should be active as well as passive supporters of the public utility. In other words, the necessity for supporting the public utility should be "sold" to the public. Of course when you analyze this it simply comes down to the same kind of publicity as we all have been conducting, but perhaps it may remove some of the apologetic or defensive attitude the company may assume. Circumstances alter cases, of course, and in some territories it may not be possible to put the welfare of the public utilities up to the public from a purely self-interest point of view, and, again, some territories are handicapped by having a sort of vested antagonism against utilities. Then, again, in some places people are apathetic and take little interest in public utilities one way or another. I know our own territory alone in an intimate way, and it has been a problem to arouse people at times from their apathy. On the other hand, this apathy may be of advantage in deadening criticism which otherwise might occur.

Speaking of this district specifically, we expect that a wave of prosperity and development which is passing over us will take the public utilities out of the hands of a lot of carping critics and make people in general feel more disposed toward invested capital. This will also aid us because we are now in a position of having the public coming to us for extensions to service, and these cannot be made so long as public utility credit is at a discount.

We are using this argument on every possible occasion to win over to active support those elements of our population which are eager for increased facilities and development. I believe that in the course of time we will achieve that end, and for that purpose we are using all possible avenues of publicity in laying each case before the men on the street, the business men and the newspapers. By steadily pointing out the fact of lack of development we are gradually convincing those in allied industries that they must support their public utilities. While only the fringe of this work is being touched upon, I have no doubt that with the spirit which is prevailing at the coast here people will soon realize it is much better to be constructive in support of public utilities than destructive in their criticism.

Publicity, of course, is only one small feature in the making of good public opinion and no company can afford to overlook the service it gives and the work of its employees. Some people are apt to think that all that is required is the formation of a publicity department, whereas I believe it is realized in most companies that every employee, not to mention every official, must be an active propagandist, especially because so many people look askance at any statements or material coming from a publicity man. If we are to expect that the public will actively take up the backing of their public utilities how much more should this be the case among the employees of these utilities?

I have said nothing about the actual mediums of publicity because these are too well known to need comment. I have merely suggested the tone in which I believe the next steps in publicity work should be taken.

J. LIGHTBODY,
Publicity Manager.

Economy in Track Construction to Be Demonstrated by Movie Film

BOSTON ELEVATED RAILWAY

BOSTON, Nov. 2, 1920.

To the Editors:

I am very much interested in the attention which the JOURNAL is giving to the subject of publicity. I quite agree that there are certain shining examples which may be pointed out where a thorough job has been done. I do not believe that the full benefit of the proper kind of publicity has as yet come to the electric railway industry.

It must be appreciated that local conditions determine the starting point for the particular publicity necessary. For instance, with us publicity, as it is commonly known, must of necessity be influenced by the fact that no longer is the property operated by a private company pleading for a square deal and the rights of the investing public, but it has come under the direct management of state-appointed officers, and this of itself influences the public because of the knowledge that the management has no other interests but that of the car riders under a service-at-cost act.

It is quite surprising how different certain phases of operation under these conditions are as compared to those existing previously under private operation. It is relatively simple, therefore, by the printed word to show specifically where money is expended for improvements, and why. It is likewise simple to convey the effect of large increases in wages resulting from arbitration, as well as extraordinary increases in price of coal, etc., and their effect on the service and the problem of meeting costs within the limits of possible fares.

But to my mind the surest road to proper publicity must come through what is commonly called "good will," which lies to a large extent within the power of the large body of employees of a street railway to create. As we leave the unsettled period of the war behind and efforts are exerted toward efficient and economical production, the increase in production, interest and pride in the work of the employees must be the rock-bottom foundation of future publicity.

Where the labor turnover is large the problem of reducing wastefulness of labor turnover is necessary. Where conditions have become so settled that the labor turnover is small the present body of employees must be brought to a full realization of their actions on the fortunes of the company with which they are associated. If no printed publicity was sent out from a company whose body of employees represented perfection in the matter of securing good will of patrons, an outsider would undoubtedly comment that that particular road must have a good publicity department. The contact that these employees have with the thousands, their spirit of service, knowledge of the facts of the business and apparent interest in performing their work in the interest of the car rider would itself be a most powerful agent of publicity.

Unless this foundation has been laid publicity pamphlets, cartoons, motion pictures and statements cannot bring full results, because they will be counteracted by a knowledge on the part of car riders that the great body of employees are not producing good will.

If I may draw an analogy befitting the football season of the year, I would say that the loyal band of rooters for a football team before the game, during the game and after the whistle has blown, even though their team may have been outclassed, is the right kind of publicity for their particular university, even without the facts regarding the relative ability, experience, weight or height of the individual players comprising their team.

I believe I have advised you that we are working up a motion picture showing the efficiency and economy in connection with the work of our maintenance department in laying track as compared with methods employed but a short time ago. With labor organized and conditions as they are, I cannot but emphasize what to my mind seems the big problem, namely, the creating of good will permanently by the great rank and file of street railway employees.

EDWARD DANA, General Manager.

Publicity for Safety's Sake

The following shows an envelope inclosure card used in the safety publicity work of the Beaver Valley Traction Company:

Stop, Look and Listen

You're enjoying good health
—That's pleasant

You want to remain so
—That's natural

You may be careless
—That's possible

You may have an accident
—That's probable

You need protection
—That's evident

Better start now
—That's wisdom

WAIT for the CAR TO STOP

Get off the car in a safe and graceful manner. Take hold with the left hand and face the front of the car.
—That's proper

Do This and Avoid Accident

Beaver Valley Traction Co.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Ohio Committee Busy

B. E. Ling Outlines New Organization's Aims in First Statement to Press—Utilities Need Aid

Benjamin E. Ling has entered actively upon his duties as director of the new Ohio Committee on Public Utility Information. His first news bulletin to the press was issued under date of Nov. 6. In a statement outlining the purpose of the committee it is pointed out that public utility concerns of Ohio seek to prevent their business from falling into the same financial plight out of which the steam railroads are now trying to extricate themselves.

FAIR TREATMENT ASKED

All that the Ohio utilities ask is "sane, scientific, non-political and just treatment" such as will enable them properly to perform the service imposed on them by their intimate relationship with the everyday life of each man, woman and child in the State and the communities in which they operate. The introductory statement of the committee follows in part:

> It will be the aim of this committee to put before the people of Ohio by every means possible the economic facts about the public utility industry as an industry. This means the small town light plant as well as the big city central power station; the village street car line as well as the large city street railway system; the independent telephone company as well as the Bell.
>
> The utility companies of Ohio believe that their customers have the right to know and indeed should know the facts regarding the business organizations which serve them with such present-day necessities as street car, electric light and power, telephone and gas service.
>
> UTILITIES ASK NOTHING BUT A SQUARE DEAL
>
> Without efficient utilities, cities and towns cannot prosper, and utilities are unable to be efficient without being prosperous. Thus the prosperity of each community is intimately bound up with the prosperity of its utilities. Utilities are subject to the closest supervision and regulation by the State, consequently they cannot make any undue or unreasonable profits, but they must be enabled to earn sufficient revenue to pay for the cost of service rendered and insure a fair wage for both capital and labor.
>
> It is the sincere belief of the utility companies that the public is fundamentally fair and just, and that a better understanding of the problems of the utilities will bring about a closer, more intimate, and more fully sympathetic relationship between the people who are their customers, and the management of the companies which serve them.
>
> The utilities ask nothing but fair play—just treatment to enable them to conduct their business in such a way that the public is assured adequate and proper service, that the employees get a decent living wage, and that the men who have invested their money in the industry receive a reasonable return on their investment.
>
> Just treatment is essential for the maintenance of good service and for the protection of investors. Unless the public utilities of Ohio prosper, there can be no permanent prosperity in the State. A utility rendering a service to a growing community cannot stand still; it must grow as the community grows or the community will stop growing. Stagnation means weakening of the utilities service and eventual death for both the utility and the community so far as prosperity is concerned.
>
> Undermining the credit of the utility companies so that it is difficult or impossible for them to obtain additional capital cannot fail to have serious and far-reaching ill effects upon general credit and business prosperity.
>
> Inferior service is a result of weakening the credit of a utility. Impairment of credit comes about through unwarranted attacks upon the service companies and insistence upon rates too low for companies to make a reasonable profit and give a proper service.

SOME PAPERS HOSTILE

A fact which is frequently overlooked is that Ohio is the only State in the Union with seven cities having a population of more than 100,000 each. These cities are Cleveland, Toledo, Akron, Columbus, Cincinnati, Youngstown and Dayton. In all of these cities except Youngstown and Dayton newspapers of the so-called Scripps syndicate are published. These papers are avowed advocates of municipal ownership. Moreover, they are a real power in moulding public opinion. The Scripps paper in Toledo, the *News-Bee*, has injected itself into the Toledo franchise fight on all occasions, but as noted in the ELECTRIC RAILWAY JOURNAL for Nov. 6 the vote in that city at the recent election was a severe rebuke to tactics employed by the *News-Bee*, the municipal ownership proposal having been rejected.

Free Rides in Petrograd

Free rides are now provided by the tram cars of Petrograd, the former charge of 2 or 3 rubles having recently been discontinued. H. G. Wells, the British novelist, who has just returned from Russia, says of the Petrograd tramways that they "are the last legacy of capitalist enterprise" remaining in the city. Mr. Wells, in describing life in the former Russian capital, in an article in the New York *Times* of Nov. 7, says:

> People hurry past in the thin traffic compared with my memories of 1914. Electric street cars are still running, and buses until 6 o'clock. They are the only means of locomotion for ordinary people remaining in town, the last legacy of capitalist enterprise. They became free while we were in St. Petersburg. Previously there had been a charge of 2 or 3 rubles, the hundredth part of the price of an egg.
>
> Freeing them made little difference in their extreme congestion. During homegoing hours every one scrambles on a tramcar. If there is no room inside you cluster outside. In the busy hours festoons of people hang outside by any handhold possible. They are frequently pushed off and accidents are numerous. We saw a crowd collected around a child cut in half by a tramcar and two people in the little circle in which we moved in St. Petersburg had broken their legs in tramcar accidents.
>
> The roads along which these tramcars run are in frightful condition. They have not been repaired for three or four years. They are full of holes, like shellholes, often two or three feet deep. Frost has eaten out great cavities. Drains have collapsed and the people have torn up the wood pavement for fires. Only once did we see any attempt to repair streets in St. Petersburg. In a side street some mysterious agency had collected a load of wood bricks and two barrels of tar.

Franchise Acceptance Soon

Toledo Grant Will Take Effect Following Property Transfer—Commissioner to Be Non-Resident

The active working of the new cost-of-service franchise for the electric railway system of Toledo, Ohio, is now awaiting the untangling of legal and technical difficulties encountered in transferring the property of the Toledo Railways & Light Company to the Community Traction Company, formed by the provisions of the ordinance. The company's lawyers are busy arranging the legal details incident to the transaction. The company has ninety days in which to file its formal acceptance of the franchise, at the time of which filing it will become effective.

An agreement was filed before the ordinance was submitted to the people by two companies—the Toledo Railways & Light Company and the Community Traction Company—in which they agreed to accept the ordinance if passed by the electors.

WILL NAME BOARD OF CONTROL

As soon as the franchise is formally accepted Mayor Schreiber will appoint a board of control of three members which will have full charge of street railway matters during the life of the grant. The members will serve for terms of six years each except the first two appointed, who will serve terms of two and four years respectively.

This board of control will have the naming of the street railway commissioner and the fixing of his salary as one of its first duties. It will make recommendations to the Mayor, who will actually make the appointment. It is thought that the Toledo commissioner will be a non-resident in order to eliminate difficulties in the initial operation of the franchise.

One of the first duties to be taken up by the board of control will be the rerouting and reconstruction of the Toledo system. These matters will be taken up with a view to more efficient operation and better service. The building of a cross-town line will also be one of the first things to be considered in the rebuilding of the system.

WILL SCRAP SOME LINES

The Toledo lines were acquired by different companies combining small properties operating single lines. In this way the present system acquired several parallel routes which will probably be eliminated. The only limitation placed on the board in its arrangement of the system will be that it shall not cost more than $1,000,000, nor impair the ability of the company to meet its obligations and earn its specified return on its investment. For all money brought into the system in the building of the cross-town line and re-routing of the present lines, preferred stock will be issued to the Doherty interests which will yield them 8 per cent, thus protecting the present investors in the Toledo properties.

When the franchise is placed in effect it will immediately reduce the car fares from 7 cents and 2 cents for transfers to 6 cents and 1 cent for transfers. This fare scale will be in effect for six months, when the stabilizing fund will determine the fare level for the next six months.

City Rejects Service at Cost

Indianapolis Authorities After Exhaustive Study Request Withdrawal of Flexible Fare Proposal—Railway Asks Transfer Charge

The city of Indianapolis, Ind., on Nov. 4, filed a petition with the Public Service Commission of Indiana, requesting the withdrawal of the proposal for service-at-cost operation of the Indianapolis Street Railway. Immediately following the action by the city, the company filed with the commission application for authority to charge 2 cents for each transfer. The company in its petition declares that the additional charge is necessary to provide funds for the enlargement and improvement of the system. Officials of the commission indicated that the case would be given an early hearing. The present fare in Indianapolis is 5 cents with no transfer charge. The city presented the service-at-cost proposal to the commission several months ago. The commission has taken no action on the original proposal, but it is predicted that the proposal will be discarded. When the proposal was placed before the commission, the city, the Indianapolis Street Railway and some of the commissioners favored the general plan. Since that time the plan has come into disfavor with its original sponsors.

WHEN the city proposed the service-at-cost plan to the commission the company raised the objection that if, under the proposal, an increase in fares resulted in reducing the company's rate of return on investment, the company's credit would be injured greatly, if not actually destroyed. Accordingly, E. I. Lewis, chairman of the commission; Samuel Ashby, corporation counsel; Henry Jameson, chairman of the board of directors of the company, and H. H. Hornbrook, attorney for the company, studied the proposal and investigated the operation of similar systems in Cleveland and Cincinnati.

OTHER SYSTEMS STUDIED

In regard to this investigation the new petition of the city said:

> We have been unable to find or agree upon any plan of operation on the basis of service at cost which would furnish the incentive of private ownership in an operation of service at cost, and the result of our investigations generally has been to raise a most serious question and doubt as to the wisdom of the service-at-cost plan. The inevitable tendency seems to be for the operator or company readily to accept increased cost of operation with the view that it can be passed on to the public by higher fares. Such a course results in only adding to the burden of the public.

The experience of Cincinnati was cited as an illustration of the operation of the plan. On this point the petition said:

> The fare was increased from 5 cents to 6 cents, and from 6 cents to 7 cents, and from 7 cents to 8 cents, and during the comparatively short time in which the plan has been in operation, the company has accumulated a very large operating deficit. During practically the same time the Indianapolis Street Railway has been operating under the emergency order of the commission at 5 cents. It has been able to operate without a loss, its revenues have been more than its operating expenses and sufficient to pay a reasonable return on the fair value of its investment. The increased fare reduces the number of passengers, and has a tendency to increase the cost of operation. The result is that the revenue received from carrying ten passengers at 5 cents is more than eight passengers at 6 cents, or seven passengers at 7 cents, or six passengers at 8 cents. This is a simple illustration, but shows the effect of the higher fare and decreased number of passengers on the revenues of the company.
>
> At the time the city made its suggestions as to the plan of operation, it was genally supposed that this method was the best solution of the street car question. We attempted to take the best out of the various plans in operation in Cleveland, Cincinnati, Boston, Montreal and Memphis. All of these plans had some features which did not meet our approval and the plan suggested by the city was submitted to the Public Service Commission for its consideration and to bring this plan to the attention of the public for criticism and suggestions.
>
> After repeated conferences with Mayor Jewett, the city has concluded, in view of our investigations since the plan of service at cost was thus submitted to the Public Service Commission for consideration, and the unsatisfactory results of operation of this plan in other cities since then, to withdraw the same from further consideration by the commission.

The 2-cent transfer charge is asked by the company to cover only the present emergency period. The petition states that the additional 2 cents for each passenger issued a transfer would increase the yearly revenue about $300,000.

TRANSFER CHARGE IMPERATIVE

For a short time the company was granted a 1-cent transfer charge by the Public Service Commission, the 1 cent being refunded to the passenger in case the transfer was used. This charge was intended primarily to eliminate the wasting of transfers and the only revenue coming to the company was from transfers which were issued but not used. This plan was abandoned after a short trial and had little effect so far as the company was concerned.

Alleging that present conditions are the result of the emergency created by the war, the company states that present fares and revenues "are and will continue to be inadequate and insufficient to maintain your petitioner in a solvent operating condition and to enable it to discharge its duties as a public common carrier of passengers." It is also declared that proper service cannot be maintained without financial relief.

The cost of maintenance of the system during 1918 was $2,417,407, or 67.6 per cent of the gross earnings, according to the petition. This cost for 1920 is placed at $4,087,577, or 75 per cent of the gross earnings. Taxes have increased from $319,675 in 1918 and $401,806 in 1919 to $540,072 in 1920.

ALL COSTS INCREASED

The cost of coal has increased for the company from $566,712 in 1918 to an estimated cost for coal and power in 1920 of $899,584. It is stated that the price of coal has increased from $2.97 a ton in 1918 to $5.20 a ton this year. These increased costs, the company says, have more than overcome all increases in gross earnings so that the net earnings have decreased from $1,078,936 in 1919 to $813,007 (estimated) for 1920.

The petition states that the value of the actual physical property used and useful in the public service has been fixed by the public officials of the State of Indiana and of Marion County, for the purpose of taxation, at $18,058,570, exclusive of any intangible values, which is the value upon which its taxes are being assessed and paid. The Public Service Commission has heretofore tentatively found the value of the company's property to be between $14,000,000 and $16,000,000. Even upon such smaller sums the present net income of the company will fail to produce a reasonable return, the company contends.

Baltimore Men Accept 2-Cent Increase

The employees of the United Railways & Electric Company, Baltimore, Md., have accepted a wage increase of 2 cents an hour in lieu of the 15-cent increase they had previously asked. A wage scale of 50 cents an hour was fixed in August, 1919, and since that date the men have received no increases in pay. The company has been operating at a 7-cent fare since October, 1919. This 7-cent fare was to continue during 1920. The matter of continuing this rate will come before the State Public Service Commission within the next month. The showing of the company has been good, but the 15-cent rise sought by the men would have left the company facing a large annual deficit. Meetings were held between the company officials and the employees at which the company was represented by President Emmons and General Manager Flowers, while the men's interests were looked after by Charles C. Kranz, president of the employees' association.

The men at first indicated that they would not accept an increase of less than 15 cents an hour. However, when the company's position was made clear to them they decided to take the 2-cent increase which was offered to them by the company.

Kansas Court in Action

Hearing of Interurban Employees' Case Illustrates Workings of New Industrial Tribunal—No Talk of Strike

A striking illustration of the workings of the Kansas Court of Industrial Relations is afforded by a case now pending before that body involving a controversy between the Joplin & Pittsburg Railway, Pittsburg, and its employees. The company and the men are seeking an interpretation by the court of portions of the present wage agreement. This agreement was drawn up last spring after hearings before the court, and granted the employees a substantial increase in pay. At no time during the negotiations has there been talk of a strike. The court, acting in its capacity as a mediator rather than as a tribunal in the stricter sense, has aided both parties in setting forth their views. The hearings on the case have been harmonious. The court has now been in existence about a year. Under the law appeal from its decisions can be taken to the State Supreme Court.

THERE were several elements of the contract on which the company and men could not agree. It is hardly accurate to express the situation as "controversial." Throughout the negotiations there was none of the bitter hostility previously shown in the discussions of contracts. The men presented their suggestions as to clauses wanted, and the company responded with the arguments against these suggestions; failing to reach agreements, the matters were automatically referred to the Court of Industrial Relations. Some of the cases of difference were mere matters of disparity as to amounts and extent, both parties agreeing as to principles. There were some matters minor in immediate effect which involved principles on which neither side was disposed to yield.

WORKING CONDITIONS INVOLVED

Five major subjects were submitted to the court at a preliminary hearing held on Oct. 20. These subjects are:

1. Minimum wage for extra men.
2. Number of men in freight crews.
3. Eight-hour or nine-hour shifts.
4. Pay for Sunday shop work.
5. Period for prevalence of order.

The attitude of the company and the men on these matters is as follows:

1. The principle of minimum pay for extra train men is not disputed; the court is asked by both men and company to fix this minimum. The company now has twenty-seven extra trainmen, who during the past three months have made an average of $100 a month. Regular trainmen have averaged, in the same period, $150 a month.

2. The men are asking that a minimum of three constitute a train crew when three or more freight cars constitute the "string" to be handled. They advance precedents for this practice. The company maintains that the superintendent should have authority to decide whether two or three or more men should do the work on any "string."

3. The men are asking eight-hour shifts in train service, and assert that it is possible to evolve a plan whereby the eight-hour day can be established without disturbing the company's operating program. No precedent is advanced on this subject by the men. The company maintains that passenger service is established on an eighteen-hour day basis, providing for two shifts of nine hours each; that such eighteen-hour service can be divided into two nine-hour shifts, but not into eight-hour shifts; and that the service cannot be reduced to sixteen hours a day, which would be required under eight-hour shifts. The company also maintains that establishment of eight-hour shifts would result in trainmen working an hour overtime on every shift, and that the only result of an eight-hour order would be an increase in the wages, which have already been fixed by the court.

4. The men are asking time and a half for Sunday work in the shops. Here, again, a principle is involved. The shopmen now take Sunday work in rotation, employees averaging Sunday work in shops every other Sunday. That this practice is not burdensome or disagreeable to the men is argued by the company in view of the fact that shopmen wanting to be off on the Sunday when their turns come have no difficulty finding substitutes.

The company takes the position that extra pay for Sunday work is admittedly and rightly a penalization, to compel employers to reduce Sunday work to a minimum, and to prevent an employer from profiting by Sunday production and extra labor of employees. In this case the company does not operate shops on Sunday for profit, but for public service. It points out that Sunday shop work, particularly the cleaning of cars, is a regular and emergency feature of interurban operation, an unavoidable incident of the business and of the job. An order providing for extra pay for Sunday work would merely be an increase of wages.

5. The men and the company disagree as to the period over which any order issued by the court shall prevail. When the court fixes these disputed matters the order takes the place of a contract; and the men wish to be assured that the conditions of the order shall govern for at least a year. They are understood to be suggesting a two- or a three-year period. The company suggests the advisability of limiting the prevalence of the order to a short period if any limitation is set. A year would be the maximum period satisfactory to the company, under present uncertain conditions.

The court is alleged to have gone on record regarding the principle of the eight-hour day for trainmen. Judge Huggins of the court remarked that in principle the eight-hour day is desirable; but that nine hours a day does not constitute a physical or mental strain detrimental to health in train service, and is not long enough to deprive an electric railway worker of his social privileges. He said he would favor an eight-hour day if it could be done without overburdening the company.

LABOR SITUATION REVIEWED

Aug. 1, 1920, was a notable day in the history of the railway. This date has customarily marked the beginning of the "annual" strike. One year the men were out thirty days, another ninety days, while negotiations for a new contract were proceeding; Aug. 1 has been the date on which the company's contract with the various unions terminated.

On Aug. 1 last the company and the men had already agreed upon practically all the terms of the new contract; a few items remained under negotiation, and these were automatically and as a matter of course referred to the Court of Industrial Relations, the men continuing at work while the subjects were being settled.

A few words concerning the negotiations between company and men this year, affecting the contract now being formed, will help to connect the various phases of the present situation. Early in the spring of 1920 the employees of the railway began their annual practice of wondering what was going to happen when the contract negotiations were entered into. Pittsburgh, the headquarters of the company, is a coal-mining town, and one of the most thoroughly unionized communities in the United States. There were more than 600 strikes of coal miners in the Kansas and Missouri fields in a period of twenty months during the war; strikes had become a normal and accepted incident of discussions between employees and employers in almost every industry. The city is also the headquarters of Alexander Howat, president of the coal miners' union in Kansas, and Howat is aggressively hostile to the Court of Industrial Relations. Agitation promoting labor unrest is therefore continuous in Pittsburgh.

INDUSTRIAL COURT INTERVENES

When the employees of the railway began to wonder about the probable events accompanying making of a new contract to go into effect on Aug. 1 the Court of Industrial Relations made a visit to Pittsburgh. It summoned the committees of the railway men's unions, officials of the company and employees not officially designated to represent the unions. Frank O'Shea, of the Amalgamated Association, also appeared before the court.

The court, following the hearing, issued an order, effective May 1, fixing the wages of trainmen and shopmen at an advance of 5 to 10 cents an hour and fixing higher maximum for certain other classes of workers. The company and the men accepted the order without complaint or appeal. In July the trackmen, substation operators and others whose wages had not been readjusted in the May 1 order were heard by the court, the circumstances being the same as at the first hearing. Their wages were the subject of an order effective Sept. 1, some increases being granted, some wages being left as before. Again the findings were received by both parties without question.

ELEMENTS OF CONTRACT

The two hearings and the consequent findings going into effect May 1 and Sept. 1 related only to wages. The second wage reference to the court, as above noted, occurred in July while the company and the men were discussing the new contract. The discussion proceeded in relation to other phases of the contract than wages, and, during September, nearly every element of the contract was agreed upon. In most cases the paragraphs were reaffirmations of the same paragraphs in the previous contract.

Three of the elements in the new contract, as agreed upon by company and men, have particular interest:

1. The general conditions of employment, including seniority, selection of

runs by men, promotion, etc., were decided upon without trouble.

2. The company is at liberty to hire men who are or are not members of the union—the old contract having this same implication. Neither old nor new contract specifically mentions "closed" or "open" shop. The factor of interest in this liberty of the company is that the road has been so thoroughly unionized that the men did not consider it necessary to provide against employment of non-union labor, feeling sure that all new employees would eventually become members, and the men evidently have the same confidence of maintaining their organization under operation of the Court of Industrial Relations.

3. The new contract provides that there shall be no strike or lockout; that all differences shall be referred to the Court of Industrial Relations and both sides shall abide by the findings of that tribunal.

T. H., I. & E. Released in Electrolysis Case

The Judge of the Circuit Court of Putnam County, Indiana, recently returned a decision in an electrolysis case brought against the Terre Haute, Indianapolis & Eastern Traction Company by the Brazil Gas Company, in which the plaintiff was denied an injunction against the defendant; was declared to be not entitled to recover from the defendant for any damages, expenses or losses alleged to have been sustained, and was not entitled to recover damages in the action. The defendant was awarded judgment accordingly and for the costs laid out and expended.

The finding of facts brought out by the court showed that the gas company on July 31, 1918, filed a petition with the Public Service Commission of Indiana alleging that its underground pipes were being destroyed by stray current from the interurban which passes through a street in Brazil, Ill., that is occupied by a line of pipe of the gas company. The cause of this was alleged to be poorly bonded rails used by the interurban.

During the course of the hearings it was decided that a survey should be made by the Bureau of Standards. Thereafter the commissioners ordered the traction company to rebond its rails in Brazil within sixty days and to install a potential wire approximately 3 miles long with permanent taps to the track and switches provided to connect in a recording voltmeter for a period of one year. The gas company was simultaneously ordered to install within sixty days four insulating joints in the pipe line affected and to report to the commission the voltage drop across each joint. Both companies complied with the order, but the gas company endeavored to recover alleged damages through the court, with the result pointed out previously.

Saginaw Men Out Again

Strike Renewed on Account of City Council Failing to Keep Its Word with Railway

The trainmen on the Saginaw city lines of the Saginaw-Bay City Railway, Saginaw, Mich., went out on strike on Oct. 3 for an increase in wages of 10 cents an hour, the company having declared its inability to grant any further increases in wages until a higher rate of fare should be authorized.

On Oct. 5 the City Council of Saginaw gave the company what were supposed to be definite assurances that if the cars were put in operation the company would be granted fair consideration and the matter of an increased fare taken up immediately with a view of settling the railway question. A provisional agreement was then entered into with the trainmen for a temporary increase of 10 cents an hour pending the results of negotiations with the city.

Since that time the company has had several conferences with members of the City Council. That body has now taken a definite stand that it will not consider any increase in fare unless the company will agree to put on a number of motor buses to serve the outlying factory and residential districts not now being served by street-car lines.

RAILWAY SEEKS RELIEF

The company informed the city in answer to this proposal that it was in need of immediate relief to enable it to carry on the operation of the present system, and that it was impossible to take on any additional financial burden such as would be required by the operation of a number of motor-bus lines. Facing this inability to reach an agreement with the city, the company informed the trainmen that on Nov. 1 their wages would revert to the rate in force prior to Oct. 1. The men refused to work under these conditions and again went on strike Sunday night, Oct. 31.

The company is advertising for men to operate the cars at the same rate of wages paid before Oct. 1 but has not, at the time of this writing, been able to secure any men. Consequently no cars are being operated in Saginaw.

For some time the rate of fare in Saginaw has been 6 cents cash with labor and school tickets at five for 25 cents. The company filed petitions with the City Council of Saginaw on Sept. 1 and Sept. 7 asking for an increase in fare. Effort was made to show the City Council that at the prevailing rate of fare the company was not paying operating expenses and taxes, to say nothing of interest on the investment or allowance for depreciation.

The Council was requested to grant a 10-cent cash fare. As a counter proposal the City Council offered to submit to the people at the Nov. 2 election a proposition for an 8-cent cash fare, with five tickets for 35 cents and school tickets at five for 35 cents. The company needed immediate relief and requested the Council to pass an emergency ordinance granting an immediate increase in fare. This the Council refused to do. The company then offered a counter proposition of 10-cent cash fare, with four tickets for 30 cents and a 5-cent fare for children between the ages of five and twelve. This the Council also refused to consider.

ASK UNIFORM WAGE

The contract with the trainmen expired on Sept. 30. The men had put in a request for increased wages and had stated that they would not work for anything less than was being paid the same company's trainmen on the Bay City lines, where, however, the rate of fare in force is 10 cents cash, with four tickets for 30 cents and 5 cents for children between the ages of five and twelve.

The trainmen in Saginaw were receiving prior to Oct. 1 a maximum rate of 45 cents an hour on two-man cars and 50 cents an hour on one-man cars, while those in Bay City were receiving the corresponding rates of 55 cents and 60 cents an hour. The trainmen were informed by the company that it would be unable to grant any increased wages until it could secure an increase in its rates of fare.

The city of Saginaw permits unrestricted jitney bus competition and during the last few months about twenty large jitneys have been operating on the same street occupied by one of the most important street-car lines.

Interurbans Back Lake Route

Officials of interurbans operating in Indiana and other Middle Western states are much interested in the proposal to create a Lakes-to-the-Sea route, via the Great Lakes and the St. Lawrence River. Indiana business men and manufacturers testified in favor of the project at a recent hearing in Indianapolis before the joint congressional commission. The commission has been conducting an investigation, holding hearings in various cities, to determine the merits of the proposed scheme.

It is contended that if the lake ports were made available for ocean-going craft Gary would become the most important lake port of the state. It is thought that in this case Indiana manufacturers, doing a large export business, would ship materials either to Gary or to Chicago, via interurban. A number of traction officials are said to feel that if the proposed route was put through their lines would benefit.

One of the chief reasons why the traction lines of the state have not further developed their freight business is that there is at present no way of obtaining through business, there being no continuous connection between Indiana and the East. In the case of goods consigned for ocean shipment to ports as close at hand as Gary no such handicap would exist.

National Problems Discussed

Engineers at Chicago Urge Reform in Governmental Departments—Functions of Council Transferred

The Engineering Council met on Oct. 21 in Chicago in a session devoted largely to the making of progress reports and the closing up of affairs preparatory to turning over its functions to American Engineering Council of the Federated American Engineering Societies at the end of this year.

LICENSING PLAN APPROVED

The licensing bill for engineers was approved as a suggested model to be used by any governmental body wherein a discussion of this matter might come up. Some discussion was devoted to the situation in the Patent Office at Washington. The engineers had endeavored during the last session of Congress to correct affairs in the department through a bill to increase salaries of examiners and advance the wages of employees. This bill passed the House, but it was so amended in the Senate that its real object was lost. The result is that the work of the Patent Office is being seriously handicapped through the loss of competent examiners and the council therefore passed a resolution favoring a renewed effort at the next session of Congress to reinstate the original bill as it passed the House.

The most important matter which came before the council for discussion was the report made by M. O. Leighton, head of the national service department, on the status of the movement for the establishment of a national department of public works. In this report Mr. Leighton pointed out that there were two outstanding facts in connection with this movement:

1. The engineers of the country in good faith had started something which they do not now seem inclined to finish.
2. The scope of the movement and its ramifications will extend beyond all limits written or spoken of at the time.

The campaign to bring about the formation of such a national department of public works, said the speaker, had been successful to a degree beyond that anticipated, but the original enthusiasm of so many engineers for the movement had apparently been reduced to a passing interest.

NATIONAL COUNCIL URGED

Mr. Leighton spoke of the meeting held in New York recently at which the conclusion had been reached that confusion in Congress would be avoided by the organization of a Federal Reorganization Council which would act as a common body to carry forward an accepted program embodying the reorganization plans of the numerous interests now working separately along this line. Such a national council was tentatively adopted by the delegates with an agreement to report back to their several organizations for the purpose of securing adoption of the plan. The meeting for final organization will take place on or about Nov. 15.

In case the plan of procedure is followed that has been mapped out, the obvious result will be that a department of public works, if created, will not be an achievement of engineers and architects solely, but of men and women of many professions and vocations.

Mr. Leighton summarized his ideas as to the prospects for a department of public works by declaring it to be his belief that the principle is thoroughly settled in the minds of the public and of the majority of the members of Congress. The important question remaining is the kind of a department that we shall have, civil or military.

News Notes

Four Cents More for One-Man Operators.—Employees of the Wisconsin Railway, Light & Power Company at La Crosse, Wis., on one-man cars will get 4 cents an hour more wages than motormen and conductors on two-man cars. This action, recommended by the State Board of Conciliation, must be ratified by the State Railroad Commission.

Opposes City Ownership. — Judge Nathan L. Miller, Governor-elect of New York State, has not announced definitely what improvements will be effected under his administration in the transportation facilities of New York City. He has said, however, that he is opposed to municipal ownership, but that he will make a comprehensive study of the traction problems in the metropolis before any definite plans are set forth.

A Good Samaritan Needed.—Dr. Frank Crane, of newspaper fame, has written an article in the *Spokesman-Review*, Spokane, on the Federal Electric Railways Commission's report. Dr. Crane points out that while the advisability of private ownership or municipal ownership has not yet been decided on, in the interim, the electric railways should be put on a common sense basis. He says, "The electric railways on their way from Jerusalem to Jericho have fallen among thieves and are sorely bruised. They sadly need a good Samaritan."

Co-operation Urged.—The directors of the Board of Trade of Indianapolis, Ind., have adopted resolutions calling attention to the fact that the community cannot grow and prosper unless there is a good utility service for homes, factories and business institutions and urging co-operation between the public and the local utilities. The resolutions assert "that without reference to any particular utility, we express our belief that those who provide utility service are entitled to rates that will cover their expenses and give them a reasonable return on their investments."

No Settlement in Syracuse.—The matter of service-at-cost in Syracuse is still pending. A public meeting was held on Nov. 4 in the Common Council Chambers at which members of the commission, representatives of the employees of the New York State Railways and prominent citizens of Syracuse were present. Corporation Counsel Edmund H. Lewis has announced that the city administration will ask the Board of Aldermen to approve or reject the agreement between the railways and the city government without further delay.

An Example for Car Employees.—A conductor in the employ of the Waverly, Sayre & Athens Traction Company, Waverly, N. Y., was charged recently with petty larceny on two counts. After pleading guilty he was sentenced to thirty days in jail with a fine of $25. The offense was "knocking down" fares and reselling tickets which had been collected from passengers. President Rogers of the company has made a statement to the effect that this is the first step that has been taken by railways throughout the State to put an end to dishonesty on the part of employees.

Men Oppose Wage Cut.—Notice has been served upon the London (Ont.) Street Railway Company by a committee of the employees that if an attempt is made to reduce the wages of platform men below the present scale of 52 cents an hour, there will be a general strike. The 52-cent scale was made effective in September after a series of conferences at which company officials agreed to pay a scale based upon the company's earnings after certain charges had been deducted. The men have received word that the earnings of the company, after bond redemption has been provided for, will not be sufficient to pay the 52-cent scale any longer and that a 49-cent scale will soon become effective unless relief is immediately forthcoming.

Wages of Linemen Adjusted.—In the offices of District Attorney Stuart W. Walker, at Martinsburg, W. Va., late in October, a disagreement over the wage scale of linemen in the employ of the Monongahela Valley Traction Company, Fairmont, W. Va., was ironed out as the result of a conference between a representative of the company and the United States District Attorney. Some time ago the company granted its linemen an increase in wages. The increase was not large enough to suit the workers and they asked that it be raised. In order to settle the matter in an amicable way, the linemen selected James Riley, a union leader, to present their cause, and the company named F. W. Lawrence, of Sanderson & Porter, New York. Messrs. Riley and Lawrence conferred and decided to select Colonel Walker as a third member of the arbitration board. Colonel Walker said that the award in the case would not be made public until later.

Financial and Corporate

$1,022,000 Deficit for "L"

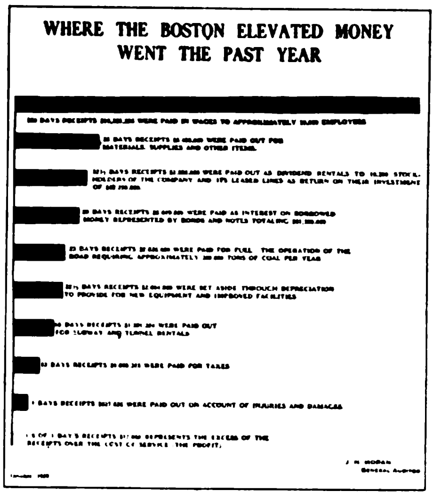
Boston Company Under Operation of Public Trustees Has This Amount to Overcome as of Oct. 1

During the period of three months ended Sept. 30, this being the first quarter of the trustees' fiscal year as defined by the public control act, the receipts of the Boston (Mass.) Elevated Railway from all sources have been less than the actual expenditures for the same period by the amount of $1,039,147. Applying to this the balance of $17,080, which represented the excess of receipts over the cost of service during the year ended June 30, gives approximately $1,022,000 as the amount of the current deficit to be overcome as of Oct. 1. In addition to this amount there is $435,348 retroactive back pay which was paid in October, 1919, but applied to the months of May and June, 1919, for which provision has not yet been made.

The actual increase in operating expenses for the past three months over the corresponding period of last year amounted to $872,692. Of this amount the increase in wages chargeable to operating expense totaled $426,000.

Because of the abnormal price that it has been necessary to pay for coal used to produce power, the cost of coal this year as compared with the same three months last year has increased $239,000. The average cost of the coal consumed last year was $5.75 per ton, while for the same three-month period this year it has been $11.50 per ton, and during the month of September the actual cost of the coal consumed was $12.67 per ton.

The increased cost for the three months over the same period last year of the materials used in maintenance and repairs amounts to approximately $160,000.



The month of October, is of course the period of heavy maintenance expenditures for the year This period having been passed, the management expects that the results during the balance of the present year and the first half of next year will provide sufficient excess of receipts over expenditures to overcome the deficit.

RECEIPTS AND COST OF SERVICE OF THE BOSTON ELEVATED RAILWAY FOR THREE MONTHS ENDED SEPT. 30

Receipts		
From fares		$7,850,434
From operation of special cars, mail pouch service, express and service cars		46,258
From advertising in cars, on transfers, privileges at stations, etc		75,172
From other railway companies for their use of tracks and facilities		13,338
From rent of buildings and other property		26,996
From sale of power and other revenue		4,979
Total "receipts" from direct operation of the road		$8,017,179
Interest on deposits, income from securities, etc		98 016
Total "receipts"		$8,115,195
Cost of Service		
Operating Expenses		
Maintaining track, line equipment and buildings		$1,011,297
Maintaining cars, shop equipment, etc		785,484
Power (including 50,537 tons of coal at $11.501—$581,217)		879,143
Depreciation		501,000
Transportation expenses (including wages of car employees, carhouse expenses, etc.)		2,978,089
Salaries of administrative officers		19,812
Law expenses, injuries and damages, and insurance		308,758
Other general expenses		315,928
Back pay		65,527
Total operating expenses (including $4,529,752 for wages)		$6,865,041
Taxes, proportion		401,093
Rent for leased roads (exclusive of subways)		670,711
Proportion of rent of subways and tunnels, to be paid to the City of Boston		382,555
Interest on B. E. bonds and notes		347,748
Miscellaneous items		16,575
Proportion of dividend rental under Acts of 1918		380,841
Proportion of rent of Cambridge subway to be paid to Comm. of Mass		89,775
Total "Cost of Service"		$9,154,342
Net loss for three months		$1,039,147
Revenue passengers	79,324,921	
Receipts per revenue passenger	10.23 cents	
Cost of service per revenue passenger (of which Labor cost 5.71 cents)	11.54 cents	

Aberdeen Up to Date

Operating Ratio 79 per Cent—294 Rides per Inhabitant per Year—Small Deficit Shown

Scotch foresight is obvious from the report of the Aberdeen Corporation Tramways for the year ended May 31, 1920. In preference to showing a deceitful surplus, William Forbes, general manager, recommended that the depreciation and renewal allowance be raised to £22,615 as against £13,877. This policy produced a deficit of £5,203.

FARE INCREASE HELPFUL

This deficit would have been avoided, however, if the fare increase deferred to June 1, 1920, had been made a little earlier. For example, the first ninety-four days following June 1 showed £9,292 more income, due to raising the ½d. six-tenth mile stages to ¾d. (1.5c.), while the 1d. stage was shortened from 1.6 miles to 1.25 miles and a 1.5d. stage introduced to give an average possible ride of 2 miles.

Despite unseasonable weather and the change to awkward fare units the loss in traffic is less than 1 per cent, while the revenue increase exceeds 21 per cent. Aberdeen hopes soon to be in the "no fixed charges" position of Glasgow, inasmuch as the reserve funds now stand at £355,747 against a capital expenditure of £385,878. "Interest on capital" was only £1,526. Statistical comparisons of the current and 1919 fiscal years follow, the 1919 figures being given in parentheses in each case.

EXPENSES ADVANCE 30.79 PER CENT

Gross earnings were £169,731 (£140,901) and expenses £141,852 (£108,451), interest, sinking fund, depreciation and renewals £33,082 (£25,613), net result £5,203 deficit (£6,837 surplus). While revenue increased 20.46 per cent, operating expenses rose 30.79 per cent, mainly due to wage increases and the 48-hour week. Passengers carried were 48,544,709 (41,946,442), an increase of 15.73 per cent, raising the number of rides per inhabitant per annum from 254 to 294 in a city of 165,000. Car-miles were 2,440,087 (2,215,795), or an increase of 10.12 per cent, while the passengers per car-mile were 19.87 (18.9).

MANY PAY REDUCED FARES

Receipts per car-mile averaged 16.69d. (33.38c.) and expenses 13.95d. (27.9c.). The operating ratio was 79.53 per cent. As more than one-third of the riders paid only ½d. fare and nearly all the rest only a 1d. fare the average revenue per passenger was only 0.84d. (1.68c.). At the end of the year Aberdeen had 13.4 double-track miles route and 1.1 miles single-track route. Eight cars were built in the home shops, increasing passenger rolling stock to ninety-two, and six more cars are under way. An important improvement is the general installation of inter-pole high-speed motors.

B. R. T. Deficit Grows

Summary of Operation of System for Year Ended June 30 Shows Loss of $686,725—Gross Receipts Increase $1,200,000

A summary of actual results in operating the rapid transit lines of the Brooklyn (N. Y.) Rapid Transit Company for the year ended June 30, 1920, was issued on Nov. 8 by Kuhn, Loeb & Company and Kidder, Peabody & Company, who are acting as a committee for holders of the corporation's three-year 7 per cent secured notes and of New York Municipal Railway first mortgage 5 per cent sinking fund bonds, series A. The statement, prepared by Stone & Webster, shows an actual deficit of $686,725 in earning fixed charges on these bonds and prior securities, compared with a previous estimate of a deficit of $474,000. The increase of $212,725 in the actual over the estimated shortage of net revenue to meet interest requirements occurred, according to the summary, despite an increase of gross earnings of about $1,200,000. The gross receipts amounted to $19,893,465.

THE report of the engineers to the banking firms notes that the prediction made last year to Federal Judge Mayer has been borne out, namely, that without an increased fare the transit lines would not be able to earn even the fixed charges upon the underlying bonds aggregating $22,937,000 and the notes, bonds and receivers' certificates together aggregating $73,000 000, to say nothing of the $14,654,794 of certificates of indebtedness, representing but a small part of the cost of the elevated lines contributed by the company to the rapid transit system. The report continues:

The actual results of operation for the past year, as shown by the accompanying table, prove that our prediction was fully justified, and in view of the increase recently made in wages, with the large advance in the cost of coal and even disregarding the cost of the recent strike, that prediction can be reiterated, with even greater force, as applied to the earnings for the fiscal year ended June 30, 1921.

DEFICIT EXCEEDS ESTIMATE

The actual deficit of $686,725 shown for the fiscal year ended June 30, 1920, an increase of $212,725 over our estimate, was, of course, determined without making allowance for any return upon the city's investment (including cost of completion) of more than $150,000,000 in the city-owned subways, nor is any allowance made for interest to the amount of $879,288 on certificates of indebtedness of New York Consolidated Railroad Company held by the trustee under the first refunding mortgage of the Brooklyn Rapid Transit Company, these certificates being, we are advised, junior to the subway bonds.

INTEREST CHARGES INCLUDED

The fixed charges on subway bonds (first mortgage bonds of New York Municipal Railway Corporation which are pledged for the 7 per cent notes and 5 per cent notes of Brooklyn Rapid Transit Company) as given in the table which follows, include interest at 5 per cent and the sinking fund charges, so far as chargeable to operation. In addition to the fixed charges shown $1,216,805 of fixed charges on subway bonds and receiver's certificates were chargeable to cost of construction during the year.

The results of the year's operations are summarized in the following table:

COMPARATIVE STATEMENT OF BROOKLYN RAPID TRANSIT COMPANY

Year Ended June 30, 1920	Actual	Estimate
Gross earnings	$19,893,465	$18,675,000
Operating expenses and taxes	16,536,796	14,691,000
Balance	$3,356,669	$3,984,000
Fixed charges prior to subway bonds	$1,254,130	$1,275,000
Miscellaneous rentals	43,312	43,000
Total	$1,297,442	$1,318,000
Balance	$2,059,227	$2,666,000
Fixed charges on 5 per cent subway bonds	$2,745,952	3,140,000
Deficit	$686,725	$474,000

The report says further:

It will be seen that the gross earnings increased substantially above our estimate, but that the operating expenses and taxes increased by an even greater amount. Our estimate was based on the expectation that the Montague Street and the Queensboro tunnels would be open for operation in the fall of 1919. This expectation was not realized and the two tunnels were not open for operation until August of this year.

The large increase in gross earnings was due to an unprecedented advance in the riding per capita which was general through all of New York City. The disintegration of the surface lines both in Brooklyn and Manhattan, involving an increased cost of riding on those lines, was undoubtedly an important contributory cause.

Unfortunately operating expenses were unexpectedly increased. To provide for the great increase in riding over the old lines additional car mileage was necessary. The cost of maintenance grew rapidly, due principally to the serious advance in the cost of materials and labor. Due chiefly to the unexpected advance in the price of coal the cost of power increased more than $500,000 above our estimate. Taxes also showed a material increase. We believe that the maintenance on the property during the past year has been good.

The reduction in the actual fixed charges below the amount estimated was due to the delay in completion of the new lines and equipment, as a result of which a greater amount of fixed charges on the company's obligations were charged to the construction account and a less amount to the operating account.

With regard to new lines and others under construction the engineers say that, "due to the short time they have been operated, and the disruption of service caused by the strike, no comparison of actual earnings from those new lines with our estimates can as yet be made." This refers to the Montague Street and Queensboro tunnel lines, which were completed and put into operation in August. The statement also is made that other important and necessary construction has been delayed, chiefly on account of the very difficult labor situation.

Denver Interest Defaulted

Ernest Stenger, president of the Denver (Col.) Tramway, has addressed a letter to the holders of the Denver City Tramway first and refunding 5 per cent bonds, notifying them of the default in interest on Nov. 1. Mr. Stenger expresses the hope that the deferment is only temporary and that the financial condition of the company will permit the payment of the coupons prior to the expiration of the period of default. He is also hopeful that the company will in the near future be granted an increase in fare. Mr. Stenger says in part:

Like other street railways and public utilities this company during the war and since experienced a large and substantial increase in its operating expenses, attributable principally to increased wages and cost of materials, while corresponding increases in rates of fare have not been granted.

On Aug. 1, 1920, practically all of the employees precipitated a strike, causing a cessation of operation in that month and an interference therewith since that time. It is hoped that within a reasonable time increases in fare will be granted by the proper public authorities to offset the above mentioned increases in operation and that thereby impairment of public service and a receivership may be avoided.

Dividend Cut Explained

President of American Light & Traction Company Looks for Upward Turn Soon

Emerson McMillin, chairman of the board of the American Light & Traction Company, New York, N. Y., has issued a statement to stockholders relative to the reduction which was made in the common stock dividends which were paid recently. He calls attention to the poor earnings that have been recorded by the company this year and that the management recommended a cut in dividends to adjust payments to existing bad conditions.

The report for the twelve months ended Sept. 30, last, follows:

	1920	1919
Gross earnings...	$4,074,414	$4,081,217
Expenses	396,559	209,027
Net earnings...	$3,677,855	$3,872,190
Previous surplus..	10,576,260	12,274,167
Total surplus ..	$14,254,115	$16,146,357
Total dividends ..	5,048,677	5,570,097
Final surplus...	$9,205,438	$10,576,260

Mr. McMillin said in part:

When the tide turns we will promptly recommend a readjustment of dividends to the then condition of earnings. To those who object to the continuance of stock dividends, let me call your attention to the fact that we are obliged to expend millions every year in extensions, additions, and improvements. These expenditures are generally met by issuance of bonds.

Our company has preferred to make these from earnings and then issue stock dividends for same, or for part of the expenditures. In this way the stockholder can get some return on his investment, which has been buried in the ground and to that extent keeps its property free from an increased mortgage debt.

The quarter ending Sept. 30, 1920, is the worst in our history. The quarter ending Dec. 31, 1920, will be bad, chiefly because of high costs. But we will be receiving better prices. With the closing of the year 1920 we will have passed the peak of high costs, probably, and at any rate will be receiving, we feel assured, much fairer prices.

At the beginning of this year the officers were encouraged to believe that we had passed the peak of high costs, and that the companies' earnings would gradually increase. But by April the wild spasm of higher priced coal was launched and that product went up from $3 per ton at the mines to as high in some instances as $15 per ton. But $9 was almost universally asked and those who were compelled to buy had to pay from $7 to $10 per ton. Labor at the same time was demanding and receiving increases. The result was from that time on to very recently our increase in earnings rapidly disappeared and the first eight months of 1920 showed more than $300,000 decrease, compared with the same period in 1919.

Road May Not Suspend

Although bondholders of the Cumberland Railway, Carlisle, Pa., had announced that operation of the road would be discontinued on Nov. 1, there is still a possibility that the line will not be abolished.

L. C. C. Trams Win and Lose

Continued Increase in London Street Railway Traffic at Higher Fares Does Not Offset Expenses

The report of the London County Council Tramways for the year ended March 31, 1920, shows that by that time at least the heavy riding of war years had not abated, despite the restoration of diminished bus services. Compared with the preceding fiscal year, passenger traffic rose from 636,157,361 to 685,124,156 and car-miles from 48,052,801 to 53,156,060. However, the number of passengers per car-mile dropped from 13.24 to 12.89 because the management finally was in position to put cars in shape for service without dismantling others to secure repair parts—a war-time expedient! At that, the traffic density in the year ended March 31, 1914, was only 8.86 passengers per car-mile.

RECEIPTS increased from £3,469,165 to £4,168,512, equivalent to an increase from 17.87d. (35.74 cents) to 19.4d. (38.8 cents) per car-mile, whereas revenue per car-mile in the last pre-war year named was only 8.9d. (17.9 cents). The increased revenue came partly from the greater density of traffic and partly from the increased average fare per passenger, which was 2.02 cents in 1914, 2.62 cents in 1919 and 2.92 cents in 1920 fiscal year. The fact that the London County Council Tramways system has to compete with much duplicating bus service over largely the very same routes, that it is physically shut off from the most profitable traffic area and that a lot of business is also carried by rapid transit lines keeps it from attaining the density of traffic and good load factor possible in other British cities where these handicaps are absent.

OPERATING EXPENSES OUTSPEED INCOME

In the fiscal year ended March 31, 1919, the tramways escaped a deficit with the tiny surplus of £8,069. In the following year, however, the deficit after meeting all debt charges was £100,712. This came about through a rise from £2,858,414 to £3,646,781 in operating expenses, a change which will be better understood by saying that car-mile expenses rose from 14.27d. (28.54 cents) to 16.62d. (33.24 cents) compared with 6.5d. (11 cents) in 1914 fiscal year!

In accordance with Parliamentary regulations applying to municipal undertakings, part of the capitalization must be written off annually in specified ways. Thus the net debt has been reduced from £9,923,528 in fiscal year 1914 to £8,086,570 in the last fiscal year. The fixed charges of the L. C. C. are much higher per mile than other British systems owing to the enforced use of the conduit system and extraordinary street widening charges.

No contributions have been made in relief of rates (taxes) since March 31, 1903. Nevertheless, the tramways this year paid the municipal governments £168,203 in property taxes and £34,424 interest and redemption charges on street improvements. Like any private corporation, income taxes must be paid to the National Government, that item alone amounting to £117,646 in the year ended March 31, 1920, while fixed charges were £675,324.

Up to May-June, 1918, the most-used ride—the penny—was good for 2 miles; from that date to May, 1919, the distance was 1.8 miles; from May, 1919, to April, 1920, 1.5 miles, and from April, 1920, to September, 1920, 1.2 miles. The present penny fare is good only for 0.6 mile. Children are charged 1d. for 1.5d. and 2d. stages, 2d. for 3d. and 4d. stages and 3d. thereafter. Workmen's tickets are now only of round-trip character with a minimum of 2d. for 3.6 miles round trip, 4d. for 7.2 miles and 6d. for further distances.

Since April, 1920, also the tramways have charged a 2d. (4-cent) universal fare good between specified terminals during 10 a.m. to 4 p.m. Mondays to Fridays inclusive except on bank or legal holidays. One purpose of this much-debated experiment is to increase off-peak riding; another, and some say the main purpose, was to make life miserable for the competing London General Omnibus Company. The latter, after vain efforts to have the mid-day fare abolished, followed suit on Sept. 27 so far as city traffic is concerned, although in a letter of Sept. 24 Lord Ashfield, chairman of the bus company, wrote that he considered the idea economically unsound. In the comparisons given above, 1d. is quoted for convenience as being the equivalent of 2 cents. Actually with exchange at $3.60 the equivalent of one penny would be 1½ cents.

The physical property of the L. C. C. at the end of the fiscal year detailed was 144 miles double and 5.1 miles single-track route; 1,376 double-truck, 240 single-truck, fifty steel subway cars used in the Kingsway tunnel, and 158 trail cars. The average number of cars in daily use was 1,248 motors and 115 trailers. The average schedule speed was 8.91 m.p.h. This is very good indeed considering the fact that the standard individual motor car is a seventy-eight-seat double-decker.

Interborough Still Showing Improvement

After deducting interest, rentals, etc., the Interborough Rapid Transit Company, New York, N. Y., for the month of September shows a deficit in its net income of $510,227 against a deficit of $484,722 for the corresponding month of the previous year. Compared with the August deficit of $658,482 the Interborough is showing an improvement.

SUMMARY OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY

Month Ended Sept. 30, 1920	1920	1919	Percentage Change Over 1919
Gross operating revenue	$4,326 560	$3,842,198	12.6
Operating expenses	2,905,293	2,513,214	15.7
Net operating revenue	$1,421,267	$1,329,984	6.9
Total taxes	217,361	213,536	1.8
Income from operation	$1,203,905	$1,116,447	7.8
Non-operating income	53,664	44,985	24.8
Gross income	$1,257,569	$1,159,433	8.5
Interest, rentals, etc., including Manhattan guarantee	1,767,797	1,644,155	7.5
Net Corporate Income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings	*$510,227	*$484,722	— 5.3
Operating per cent	67.15	65.38	..
Passengers carried (revenue)	80,664,382	71,528,478	12.8

Three Months Ended Sept. 30, 1920	1920	1919	Percentage Change Over 1919
Gross operating revenue	$12,442,573	$10,964,269	13.5
Operating expenses	8,482,088	7,031,204	20.6
Net operating revenue	$3,960,484	$3,933,063	0.7
Total taxes	653,131	640,609	2.0
Income from operation	$3,307,353	$3,292,455	0.5
Non-operating income	158,142	134,946	17.2
Gross income	$3,465,496	$3,427,401	1.1
Interest, rentals, etc., including Manhattan guarantee	5,177,631	4,951,608	4.6
Net Corporate Income (exclusive of accruals under the provisions of Contract No. 3 and related Certificates which under these agreements with the City are payable from future earnings	*$1,712,135	*$1,524,207	—12.4
Operating per cent	68.17	64.13	....
Passengers carried (revenue)	$231,251,570	$202,878,894	13.9

* Deficit.

For the three months ended Sept. 30, 1920, there was a deficit of $1,712,135. This was a decrease of 12.4 per cent over the corresponding period of 1919. In September the Interborough carried 9,135,904 more passengers than it did in the same month of 1919. For the three months ended Sept. 30 the revenue passengers carried increased 12.8 per cent.

Frank Hedley, president of the company, recently issued a statement in which he declared that the present 5-cent fare was inadequate.

Youngstown Refinancing Approved

The Ohio Public Utilities Commission has approved the plan for the refinancing of the utility properties centering at Youngstown, Ohio, discussed in the issue of Nov. 6, page 985. The commission has issued an order authorizing purchase by the Pennsylvania-Ohio Power & Light Company of the properties of the Pennsylvania-Ohio Electric Company, a subsidiary of the Republic Railway & Light Company, and has authorized the former company to issue bonds, notes and capital stock with which to secure funds to pay for the properties acquired. These properties are appraised at $27,200,000. Ownership passed to the company on Nov. 1.

The commission has authorized the Pennsylvania-Ohio Power & Light Company to issue these securities to pay for the properties: First and refunding mortgages of $13,000,000 at 7½ per cent, to be sold at 90; general mortgage 8 per cent bonds of $3,375,000, to be sold or pledged at 66⅔ per cent; 8 per cent 10-year collateral trust notes of $2,250,000, to be sold at 87; 8 per cent cumulative preferred capital stock of par value of $1,800,000, to be sold at 84; common stock of $10,000,000, to be issued and delivered fully paid and non-assessable.

An increase in the capital stock of the Pennsylvania-Ohio Electric Company, from $10,000,000 to $25,000,000, has been authorized. The refinancing plan is for the purpose of rearranging subsidiary companies and segregating railway, power and light companies.

Gas Law Declared Confiscatory

Judge Julius M. Mayer, in the United States District Court at New York, has handed down an opinion in which he indicates the form of the decree finding what is called the 80-cent gas law of 1906 unconstitutional in so far as it applies to the New York & Queens Gas Company. In the locality in which the company operates the statute allowed a charge of $1 per 1,000 cu.ft., however, but in other respects the case is similar to those of the Consolidated Gas and other companies which have been before the court in recent months. Judge Mayer summarized the findings of the special master who took testimony and substantially confirms the report. He states that the cost of making and delivering gas to the consumer by this company was $1.0076 without making any allowance for return on investment.

Judge Mayer emphasizes the fact that the court is not a rate making body and he refrained from indicating a figure which would be proper to establish as the price under the decision. In discussing this matter he shows that the cost of producing gas has been increased through conditions arising from the war and also through economic factors arising from industrial conditions, and he especially instances the cost of oil which now enters so largely into the making of gas, which has been greatly increased because of the use of oil for purposes not foreseen fourteen years ago.

He adds that the matter of fixing a new price rests with the Legislature and he expresses the hope that it will receive prompt and intelligent treatment from that body. As it might be cited as a reason for the delay on the part of the Legislature if the court should indicate a new price to be charged no such action will be taken, but the tribunal will merely declare the statute confiscatory under present conditions and therefore unconstitutional.

Reorganization Plan Abandoned

Elliott C. McDougal, chairman of the bondholders' protective committee of the International Traction Company, Buffalo, N. Y., has announced that the plan for the reorganization of the corporation has been abandoned. A defective notice of the plan given to the depositing bondholders and opposition developed by supporters of George K. Reilly, a Philadelphia banker, are given as reasons for abandoning the reorganization plan.

Plans are now being prepared by Mr. McDougal and leaders of the bondholders' committee for the submission to depositing bondholders of a modified proposition which it is hoped will meet with the support of the objecting bondholders, headed by Mr. Reilly, J. M. Johnston and R. M. Stinson, dealers in investment bonds in Philadelphia. Thomas E. Mitten, a member of the bondholders' committee and a big factor in the management of the International Railway, contends that the attitude of Reilly is a move to discredit his plans of management and operation of the property.

No date has been set for a meeting of the bondholders' protective committee, but Mr. McDougal has stated a conference will be held within the next two weeks.

Receivership Suit Dropped

The suit has been dropped in which a receiver was asked for the Toledo & Western Railroad, Toledo, Ohio. It was started in Common Pleas Court at Toledo, on petition of Frank Nevine, a holder of bonds of the company, who declared that the road was not meeting its debts and was allowing its equipment to deteriorate. He sued for $300. The company confessed judgment and paid the court costs upon agreement that the receivership proceedings should be dropped.

Recently the road defaulted on interest payments on its bonds. It has had difficulties for several years but according to officers is now beginning to get back on a paying basis. Recent tariff revisions by the Interstate Commerce Commission and increased passenger fares have brought up the earnings of the company. The road is operated by the Doherty interests and operates 86 miles of line, connecting Toledo with Sylvania and other towns.

Financial News Notes

Final Decree in Syracuse Case.—A final decree of dissolution of the Empire United Railways, Syracuse, N. Y., now the Empire State Railroad, which went into bankruptcy in 1915, has been handed down by Supreme Court Justice Leonard C. Crouch. The court has denied the applications for preferential payment, amounting to more than $10,000. The Railway Audit & Inspection Company was ordered paid $3,152 for furnishing conductors and motormen prior to the bankruptcy. C. Loomis Allen, now vice-president of the Syracuse & Suburban Railroad, who was receiver, was ordered paid $5,000. The assets of the company will be distributed by the receiver on a proportionate basis among the creditors. The total sum owing creditors is in the neighborhood of $8,000,000.

Would Merge Two Roads.—Nathaniel T. Bacon, who recently purchased the Sea View Railroad, Wakefield, R. I., formerly owned by the Rhode Island Company, has proposed a plan of consolidation of the road with the Narragansett Pier Railroad, of which he is the president. It is proposed to organize a new company with $500,000 capital stock, half in 7 per cent cumulative preferred and half in common, the preferred to be taken by the present owners in payment for the physical assets and the towns along the line to take the common stock at par to provide the necessary capital. The towns would pay for the stock in 4 per cent town bonds. The combined valuation of the properties involved is placed at $1,050,359. The plan will be acted upon at an early date.

Real Estate Sale Brings $390,000.—Three parcels of land belonging to the New York (N. Y.) Railways were sold at auction on Nov. 9. A total of $390,000 was realized. The parcels sold included the minor holdings, two large carhouse plots being passed by without a bid. It was announced that these will be offered again on Dec. 7. Sale of the properties is subject to the approval of the United States District Court, in which Judge Julius M. Mayer is presiding. The sale was ordered on an application of Job E. Hedges, receiver for the New York Railways, and held under the auspices of former Presiding Justice Francis M. Scott of the Appellate Division, who had been appointed special master by Judge Mayer. Both Mr. Hedges and Justice Scott were present at the sale, as were representatives of Stetson, Jennings & Russel, attorneys for the Guaranty Trust Company of New York, trustee for the New York Railways bondholders.

Traffic and Transportation

Buses Under Ban

New Haven Aldermen Repass Ordinance Restricting Jitneys—Hartford Ordinance Upheld by Court

The Board of Aldermen of New Haven, Conn., on Nov. 8 passed an ordinance ruling jitneys off the principal streets served by the Connecticut Company. This ordinance is identical with the one passed by the board on Sept. 13, but vetoed by Mayor Fitzgerald on the ground that the public hearings conducted on July 26, Aug. 6 and Aug. 16 were held on the trolley-jitney question in general, and not to consider a proposed ordinance, as required by law. The Mayor is expected to sign the new bill, his only objection to the previous measure being based on this technicality.

Fines for Law Breakers

The anti-jitney measure, after specifying the routes which the buses will be allowed to follow, provides that:

> All persons operating public service motor vehicles while carrying passengers for hire, or soliciting persons to become such passengers shall keep to the traffic routes designated and fixed by Section 1 of this ordinance.
>
> Any person, firm or corporation violating any of the provisions of this ordinance shall forfeit and pay a fine of not more than $100 for each offence.

Jitneys are again operating within the limits of Waterbury, the Waterbury City Council having repealed the ordinance barring them from the streets. The measure was repealed by the Council following the raising of the fare on the electric lines to 10 cents straight.

The Superior Court on Nov. 6 denied the application of the Jitney Owners' Association of Hartford for an injunction restraining the city from enforcing the terms of an ordinance relegating the buses to the side streets. The court held that in enacting the anti-jitney measures the city authorities had not exceeded the powers granted them by the General Assembly of the state. The court's opinion said in part:

> The fixing of routes and schedules for jitneys is an appropriate exercise of the regulatory power of states and municipalities.
>
> It is the claim of the applicant, however, that this ordinance is so unreasonable in its provisions as to render it null and void.
>
> An ordinance is reasonable (in the sense that it is not invalid on the ground of unreasonableness), if it tend in some degree to accomplish the object for which the legislative power was given.

Hartford Bus Operators Jailed

Failure of the injunction proceedings has given rise to a demand on the part of the Hartford jitney men that the City Council repeal the present ordinance. The whole question was to come before the Council this week on a petition from the Jitney Owners' Association. This petition is said to have been signed by several thousand citizens. If the present law is repealed the Connecticut Company is expected to withdraw service from its Hartford line, as it did in the case of Bridgeport.

Six jitney drivers were arrested on Nov. 8 because they persisted in operating their machines in defiance of the city ordinance. The battle between the trolleys and the jitneys in Hartford has been brewing for a year. It came to a head on Oct. 22 when the State Public Utilities Commission ruled that the Connecticut Company might charge a straight 10-cent fare on all its lines within the state. The bus operators have been placarding their buses with posters reading:

> The trolley car company charges you 10 cents. We charge you only 5 cents. Help get the lower fare by protesting to the City Council to repeal the city ordinance right away, so that the jitneys may be restored to the streets of Hartford.

Seven Cents in Kenosha

The Wisconsin Railroad Commission on Oct. 30 authorized the Wisconsin Gas & Electric Company, Kenosha, to increase the fare on its lines in Kenosha to 7 cents cash with eight tickets for 50 cents. The increase in rates was made necessary by the recommendation of the State Board of Conciliation, approved by the commission, increasing the wages of trainmen and other employees in the transportation department of the company. The company offered testimony to the effect that for the year ended Sept. 30 the railway department had available after depreciation a net return of $2,887 on a valuation of $486,000. It is estimated that the wage increase would amount to approximately $13,700 a year.

In connection with the rate case the commission considered the matter of service. In a previous decision it had recommended a number of extensions of the company's lines. Compliance with these suggestions the company had found inadvisable if not impossible because of the difficulty of obtaining money. It has, therefore, provided a bus service over three of the four proposed track extensions, which is being operated in every way as a part of the railway system. The operation of the buses for a period of one month indicated that the proposed track extensions would be unprofitable as the bus revenues are too low to pay running expenses. After considering the matter the commission held that the buses are furnishing a much-needed service and that their operation should continue. Under the circumstances, it was of the opinion that the revenues and expenses of bus operation are properly included in the utility business.

Court Again Intervenes

Federal Judge Appoints Masters to Report on Des Moines Case—Fare Solution Sought

Judge Martin J. Wade, of the Federal District Court, has named three masters to devise a plan whereby the receipts of the Des Moines (Iowa) City Railway may be increased to meet the necessary expenses of interest, operation and fixed charges. In appointing the masters Judge Wade calls attention to the fact that the present 6-cent fare is not sufficient to meet the current expenses and pay any material amount on the back wages of the employees.

The appointees are John A. Guiher, of Winterset, Iowa, a member of the State Railroad Commission; E. D. Perry, a Des Moines attorney, and Paul Beer, manager of the Flynn Dairy Company, Des Moines, whose training has been along engineering lines.

Temporary Solution Sought

The position of the masters, according to the memorandum of the court, will be to look over the field, confer with representatives of the city and with the receivers and suggest to the court some method by which receipts may be made to equal expenditures. They will also be expected to take into consideration the question as to whether it is not possible to increase the service.

The masters will not be called upon to conduct an extensive investigation, since Judge Wade holds that the question is only a temporary one in that the Iowa Legislature will meet within the next few weeks and he expects some action to be taken there to meet the rate situation in Des Moines and other cities of the State. "I am only endeavoring to find a way to keep the cars running until some permanent plan can be agreed upon and I do not see how this can be done without legislative action," said Judge Wade.

In his ruling Judge Wade summarizes the local traction situation as follows:

1. With few exceptions Des Moines has lower street car fares than any city in Iowa.
2. Des Moines car men get more pay than those in other cities in the State with one exception.
3. Every advance in wages has been earnestly requested by the city and opposed by the receivers so that no one can contend that so far as the receivers are concerned they are responsible for the unwarranted expenditures.

Insolvency Common Knowledge

4. The Des Moines City Railway is insolvent and was insolvent when the franchise was granted, of which every one had common knowledge because its indebtedness was a matter of common knowledge.
5. The company has not made a profit since the franchise was granted.
6. There is no source of payment for certain interest charges and fixed charges and the expense of operation which must be paid except fares.
7. Books are kept open and the court has been open to hear any criticism.
8. The 5-cent fare prior to the last rise in wages just about paid running expenses and fixed charges.
9. One cent additional fare was added to cover the last raise in wages and the court assumed that it would pay current advanced wages and back wages within a few months.
10. With increase in fare travel was decreased so that extra one cent is not sufficient to cover certain expenses as expected.
11. There is a deficiency at present which must be made up.

Eight-Cent Fare Made Permanent

Chicago Surface Lines Granted Rate to Yield 7.5 per Cent Return—Commission Places Valuation of $159,113,114 on Properties

The Illinois Public Utilities Commission on Nov. 8 made public its decision on the valuation of the Chicago Surface Lines for rate-making purposes. This valuation, as of April 30, 1920, was fixed at $159,113,114. To enable the company to earn a reasonable rate of return, which the commission finds to be 7.5 per cent, the temporary order of the commission for a straight 8-cent fare was made permanent. This order of the commission comes directly after hearings at which the representatives of the Chicago City Hall endeavored to convince the commission that it should not grant any further rate increases nor fix any more valuations during the remaining period of its existence. It will be recalled that the Republican candidates on the Mayor Thompson ticket in the recent campaign were elected by a very large majority, their principal fight in the campaign having been waged on the platform of abolishing the public utilities commission and re-establishing 5-cent fares.

At the hearings, Chester E. Cleveland, special counsel for the city, declared that the people by an overwhelming vote had registered their disapproval of the actions of the Public Utilities Commission and that in the face of this condemnation the commission should cease to issue any further orders. The city sought to frustrate the work of the commission in establishing a valuation and permanent rate by renewing the appeal in the Circuit Court for an injunction to prevent the companies from charging an 8-cent fare in violation of their contracts with the city calling for a 5-cent fare. The court has held several hearings on this case but had reached no decision at the time of this writing.

The present order of the commission as to valuation and rate of fare is the outgrowth of a petition filed on Aug. 2, 1919, by the four corporate companies operating under the designation of the Chicago Surface Lines. In their petition the companies asked the commission to establish such rates of fare as would provide a fair return upon the valuations established by agreement in the 1907 ordinance contracts. The original valuations fixed in these ordinances for the respective companies follow:

Chicago Railways	$29,000,000
Chicago City Railway	21,000,000
Calumet & South Chicago Ry.	5,000,000
The Southern Street Railway	775,000
Total	$55,775,000

The amount added to capital account upon certificates of the Board of Supervising Engineers from Feb. 1, 1907, to June 1, 1919, was as follows:

Chicago Railways	$61,805,533
Chicago City Railway	33,011,570
Calumet & South Chicago Ry.	6,184,105
The Southern Street Railway	924,254
Total	$101,925,462

The total capital valuation of the respective companies as of June 1, 1919, were therefore represented to be:

Chicago Railways	$90,805,533
Chicago City Railway	54,011,570
Calumet & South Chicago Ry.	11,184,105
The Southern Street Railway	1,699,253
Purchase price	$157,700,461

While the surface line companies sought to obtain only a fair and reasonable rate of return upon this agreed purchase price, they nevertheless offered to prove that the fair value of the property devoted to the public service is more than the agreed purchase price when ascertained by consideration of the cost to reproduce, the original cost, investment, present value, all overhead, including such preliminary costs as engineering supervision, interest, insurance, organization and legal expenses during construction, contingencies, and all other elements of value. They further offered to prove that they should be permitted to earn a just and reasonable return upon not less than the aggregate purchase price.

COMMISSION'S JURISDICTION QUESTIONED

The city of Chicago, in answer to the petition of the companies, sought to establish that the commission was without authority to change or modify the rates of fare, since these were specified in contracts which were considered valid and binding between the city and the companies. The city said that if the petitioners charged fares in excess of those fixed by the ordinances, either with or without the authority of the commission, such action would amount to a repudiation of the contract ordinances and give the city the right to cancel the privileges granted. It contended that in view of the large benefits received by the stockholders in the past, the burden resulting from increased cost of maintenance and operation should be borne by them.

It also contended that the capital account or agreed purchase price was inflated by $75,000,000 over the fair value of the properties employed in the public service. The city also made various other representations among which was one that the service given is inadequate and inefficient and does not justify an increase in fare, and another that the company should be required to spend $9,000,000 accumulated in the renewal fund to meet increased expenses.

Despite the representations of the city, the commission subsequently issued several temporary orders increasing or changing the rate of fare, and these orders were challenged in the courts and finally upheld by the Supreme Court of the State.

The hearings for the purpose of determining the valuation of the properties commenced on Sept. 8, 1919, and closed on June 15, 1920. The order of the commission gives a full review of the testimony taken, the evidence submitted and various matters pertaining to the final decision of the commission, consuming forty pages of the printed order, which is known as No. 9357.

In support of the contention that the value of the properties used in the public service is in excess of the agreed purchase price, the companies submitted data to substantiate the following values: Based on unit prices as of April 1, 1919, the cost to reproduce new was set at $200,371,689; based on unit prices as of April 1, 1920, $247,246,637; based on average prices for the six-year period from 1914 to 1917, $164,812,046; and based on the average prices for the seven-year period from 1914 to 1920, $176,588,415. In contrast with these figures, the city submitted valuations purporting to show that the cost to reproduce new the property, based on unit prices as of April 1, 1919, was $186,335,695; and on the basis of average prices for the period from 1915 to 1919, was $157,704,406. The cost to reproduce new less depreciation as of April 1, 1919, was shown by the companies to be $164,453,284 and by the city, $139,644,835.

In connection with these values the city contended that various items totaling $9,095,027 should be excluded from the value of the property, as it represented property not used or useful in the service to the public. In this connection the commission found that the claims of the city were not sustained, but pointed out that the final ruling on the petition, in which the applicants limit the valuation which they ask to the amount of the agreed purchase price under the city ordinances, is the same whether the property to which the city objects is included or excluded.

The commission found that the cost to reproduce new, including certain defined eliminations and corrections, is $170,000,000, as of Jan. 31, 1919. The cost to reproduce the property new less depreciation was established as $143,900,000. Going value was found to be $20,000,000. The present value for rate-making purposes as of Jan. 31, 1919, excluding franchise values, going value and all other intangible values, is $143,500,000. Including the element of going value, the value is established as at least $163,500,000.

The commission further finds that, eliminating from consideration the property which the city claims should be excluded from the inventory of the useful properties, the present value for rate-making purposes on Jan. 31, 1919, is at least $157,164,908. Between Jan. 31, 1919, and April 30, 1920, there were additions to the property of which the commission finds the present value to be $1,948,206. Making these additions to the inventory of Jan. 31, 1919, the commission finds that the present value of the property as of April 30, 1920, with eliminations claimed by the city, is at least $159,113,114.56.

The commission states that this figure "is the one which we find as the rate base in this case for the reason that the petitioners in their application have limited themselves to the amount of the capital account and have sustained their application, even if the contention of the city as to the rejection from the inventory of certain property herein above mentioned is sustained."

GRANTS 7.5 PER CENT RETURN

As to the rate of return, the commission finds that the companies are entitled to earn an amount sufficient, after paying operating expenses and taxes, and after setting aside what is reasonably required to take care of depreciation, to pay a return of 7.5 per cent upon the present value of the properties. The amount necessary for this purpose is found to be $11,933,483. The allowance for depreciation is set at 8 per cent of the gross receipts, as provided by the city ordinances. This amounts to about 3 per cent on the value of the property as established by the commission. On the basis of a uniform 8-cent fare, it is estimated that the annual gross earnings of the company will probably not exceed $62,600,000. The amount required annually to take care of operating expenses, including additions to the renewal fund and taxes, will probably not be less than $47,400,000. On the basis of these estimates, an 8-cent fare will provide a residue of approximately $15,200,000. After deducting from this amount the city's 55 per cent share under the terms of the ordinance, there will remain as the annual earnings of the companies not more than $11,250,000. The commission points out that this is less than the amount which has been found above as the amount which the petitioners are entitled to earn.

The order of the commissioners was concluded by a statement that it has in view the possibility and probability of readjustments of operating expenses resulting from a return to normal conditions, and that the right is reserved to the commission to hear proceedings in this connection as well as to the sufficiency and adequacy of service, at any time in the future.

Will Survey Sacramento Lines

A survey of the Sacramento lines of the Pacific Gas & Electric Company, Sacramento, Cal., will be made by the California Railroad Commission, to determine whether the company is in need of financial relief. The railway recently applied to the commission for authority to raise its fare, leaving the fixing of the new rate to the commission. The present fare is 5 cents. At a recent hearing before the commission a valuation expert, representing the company, testified that an immediate increase in fare was needed to enable the company to earn a fair return on the value of its railway properties in Sacramento.

Six-Cent Fare in Cleveland

New Rate Expected to Continue for a Period of Six Months at Least —Company Must Recover Much Lost Ground

Patrons of the Cleveland (Ohio) Railway will pay a 6-cent cash fare beginning Nov. 14. An additional cent will be charged for a transfer, with no rebate. Tickets will be sold at the rate of nine for 50 cents. This is the first time under service at cost in Cleveland that the cash rate has been more than 5 cents. When the new rate goes into effect the company will have only $100,000 in the interest fund. As the interest fund must be built up to $700,000 before there can be another change in the fare, the prospects are that the rate which goes into effect on Nov. 14 will have to be continued for six months at least.

THE statement of earnings of the company for September, made public on Nov. 4, shows an actual deficit of $201,688. This was largely due to heavy costs for maintenance, power and labor. The statement for September is shown on the following page.

In the decade under service at cost in Cleveland since 1910 the fare has gone from 3 cents cash, with 1 cent for a transfer and no rebate, to the proposed 6-cent fare. Still Clevelanders are not complaining. There has been a constantly growing cumulative effect of the educational work carried out in connection with the operation of the company under the present arrangement with the result that appreciation has become general of the fact that costs must be reflected in the rate of fare. Just how the fare has changed from time to time under service at cost is shown in the above table.

CLEVELAND FARES UNDER SERVICE AT COST

From March 1, 1910, to May 31, 1911, rate e, 3 cents cash fare, 1 cent transfer, no rebate.

From June 1, 1911, to Aug. 31, 1914, rate f, 3 cents cash fare, 1 cent transfer, no rebate.

From Sept. 1, 1914, to Dec. 14, 1917, rate e, 3 cents cash fare, 1 cent transfer, no rebate.

From Dec. 15, 1917, to Dec. 25, 1917, rate d, 4 cents cash fare, three tickets for 10 cents, 1 cent transfer, 1 cent rebate.

From Dec. 26, 1917, to April 2, 1918, rate c, 4 cents cash fare, three tickets for 10 cents, 1 cent transfer, no rebate.

From April 3, 1918, to April 9, 1918, rate b, 4 cents cash fare, seven tickets for 25 cents, 1 cent transfer, 1 cent rebate.

From April 10, 1918, to Aug. 3, 1918, rate a, 4 cents cash fare, seven tickets for 25 cents, 1 cent transfer, no rebate.

From Aug. 4, 1918, to July 5, 1919, rate 2, 5 cents cash fare, five tickets for 25 cents, 1 cent transfer, no rebate.

From July 6, 1919, to Dec. 15, 1919, rate 3, 5 cents cash fare, eleven tickets for 50 cents, 1 cent transfer, no rebate.

From Dec. 16, 1919, to May 11, 1920, rate 4, 5 cents cash fare, six tickets for 25 cents, 1 cent for transfer, no rebate.

From May 12, 1920, to Nov. 13, 1920, rate 2, 5 cents cash fare, five tickets for 25 cents, 1 cent for transfer, no rebate.

From Nov. 14, 1920, to May 1, 1921, rate 1, 6 cents cash fare, nine tickets for 50 cents, 1 cent for transfer, no rebate.

Under the Cleveland plan fares increase automatically when the interest fund drops below $300,000. On Aug. 31 the fund was $316,154. The interest fund, which is the gage for fares, is figured on allowances and not on actual expenditures. Operations for September showed a deficit in this fund of $60,031. It is estimated that on Nov. 14, when the advance recently announced goes into effect, the balance will be less than $100,000.

This condition of the interest fund takes no account of the actual financial condition of the company. In addition to building up the interest fund to the point where fares may be reduced ($700,000) the company must wipe out deficits in the maintenance and operating reserve funds, and write off the capital value of certain road and equipment costs, aggregating $1,500,000. This in itself necessitates taking from revenue approximately $100,000 a month.

Mounting costs have outstripped the ordinance allowances. In consequence last month Council agreed to increase allowances of 28 cents a car-mile for operation and 10 cents a car-mile for maintenance to 29 cents for operation and 11 cents for maintenance. The Council also agreed to permit the company to reimburse itself for the deficiency incurred up to Oct. 1 at the rate of not less than $25,000 a month. Actual deficits in the road and equipment and three other accounts are being extinguished at the rate of $20,000 for each of the accounts, or $80,000 a month for the four accounts.

Under the new rates of fare the maximum has been reached that is provided in the Tayler settlement. This would seem to prove, if it proves anything, that even under the wisest settlement plan it is impossible for any set of men to project themselves very far into the future. The present service in Cleveland, all things considered, would seem to leave little to be desired. Still the necessity exists for extensions and improvements owing to the natural growth of the city. How best to bring these about is the problem now before the city and the company. The opinion seems to prevail that funds for such work can best be realized by the sale of the remaining $4,000,000 of stock of the company. The Cleveland Railway stock is held primarily for investment by some 5,500 stockholders, most of whom are local residents. The element of risk having been removed from the stock under the plan of the guarantee of the dividends, the quotation of $94 a share is regarded as purely nominal. Moreover, holders know that should the city at any time elect to take over the property then the stock, representing the actual investment of the company in plant and equipment, is callable at a premium of $10 a share.

Reference has been made before in the ELECTRIC RAILWAY JOURNAL to the proposal to carry out the plan of expansion by disposing of stock. That plan is receiving the very careful attention of the management as to the means that can best be used. The plan to increase the dividend rate from 6 per cent to 7 per cent went down to defeat despite the general recognition that investors in times like these can command a premium on money which they loan; but despite this the company hopes soon to announce a program under which stock will be sold at such favorable terms that the number of holders among local people will be greatly increased. With such extension of home ownership will come, of course, an even keener appreciation on the part of Clevelanders of the problems of the company than exists at this time.

INCOME ACCOUNT OF THE CLEVELAND (OHIO) RAILWAY FOR SEPTEMBER, 1920, COMPARED WITH LAST YEAR

	September		From Jan. 1	
	Amount	Per Cent Increase	Amount	Per Cent Increase
I. Based on ordinance allowances:				
Operating revenue	$1,461,716	12.91	$12,697,710	11.84
Ordinance allowances	1,239,303	24.78	10,128,349	34.84
Balance	$222,413	26.21*	$2,569,361	33.14*
Special allowances	60,000	......	735,530	.....
Net operating revenue	$162,413	32.72*	$1,833,831	38.30*
Non-operating income	11,468	16.80*	130,970	17.38*
Gross, less allowances	$173,882	31.86*	$1,964,801	37.24*
Taxes	64,712	24.47*	820,264	17.91*
Net income	$109,167	35.59*	$1,144,537	46.31*
Interest	169,201	1.35	1,581,694	5.28
Deficit	$60,031	......	$437,156	.....
II. Based on actual expenses:				
Operating revenue	$1,461,716	12.91	$12,697,710	11.84
Actual expenses	1,400,960	42.15	10,838,107	37.82
Balance	$60,756	80.34*	$1,859,603	46.72*
Obsolete property	40,000	......	378,000	.....
Net operating revenue	$20,756	92.29*	$1,481,603	51.67*
Non-operating income	11,468	16.80*	130,970	17.38*
Gross, less expenses	$32,225	88.61*	$1,612,574	49.98*
Taxes	64,712	24.47*	820,264	17.91*
Net income	$32,487*	......	$792,310	64.39*
Interest	169,201	1.35	1,581,694	5.28
Deficit	$201,688	......	$789,384	.....

* Decrease or deficit.

May Ask More in Washington

Since the present fare for Washington, D. C., expires on the first of January under the terms of the order of the Public Utilities Commission of the District of Columbia, it is necessary for the Washington Railway and Electric Company to apply to the Public Utilities Commission for a hearing. The Washington Railway & Electric Company's revenues have increased since the 8-cent cash fare, with four tickets for 30 cents, took effect last May.

The increase has not been sufficient to allow the railway as great an income as was estimated by the commission for this fare schedule, since there has been a larger falling off in traffic than was anticipated. The company states that it is impossible at this time to determine whether only a continuance of the present rate will be sought or whether the company will ask for a still higher fare.

During the month of September the company carried 6,768,363 passengers, a reduction of 10.4 per cent in the number as compared with the corresponding month last year. The revenues for the month were $507,110, an increase of 25 per cent above the gross income of the corresponding month of the previous year. This income apparently will not provide the revenue which the commission intended that the company should earn from its investment, but a sufficient period of operation under the new fare has not yet been experienced to make possible final decision as to proper fare rate to yield the authorized return.

Bus Regulation Demanded

By defeating at the election on Nov. 2 the initiative bill submitted by the local jitney operators the voters of Seattle, Wash., served notice on the jitney operators that unregulated operation of buses will not be longer tolerated. The strong interest taken by the people in the jitney question was shown in the heavy vote cast on this ordinance, and the fact that out of a total of 65,023 votes 40,612 votes were cast against it.

The majority of the votes cast in favor of the jitneys were cast by citizens who live within walking distance of the business center. A majority of citizens of many outlying precincts served by both the lines of the Seattle Municipal Railway and jitneys voted against the measure. The Ballard district, one of the most distant suburbs, showed its protest against the present railway service by voting in favor of the bill.

Transportation News Notes

Ten Cents in Dover.—The Portsmouth, Dover & York Street Railway, Dover, N. H., has been authorized to raise its cash fare from 7 to 10 cents.

Asks Six-Cent Fare.—The South New Orleans Light & Traction Company, Algiers, La., has applied to the Commission Consul of New Orleans for permission to raise its fare from 5 cents to 6 cents. The company's employees are demanding an advance in wages.

Seeks 8-Cent Fare. — The South Covington & Cincinnati Street Railway, Covington, Ky., is seeking permission from the city authorities of Newport, Ky., to raise its fare from 5 cents to 8 cents. The company's employees were recently awarded an increase in wages by a board of arbitration. The Newport City Commission has announced that it will consider no proposition looking to a fare increase until the company has consented to make certain improvements.

Asks 8 Cents in Peoria.—Stating that the increased costs of equipment and operation require it, the Peoria (Ill.) Railway has petitioned the State Public Utilities Commission for a permanent 8-cent fare. The company has been operating on a temporary 7-cent fare since June 3, when the Public Utilities Commission authorized a 7-cent fare as an emergency measure of relief. The company at that time had asked for a 10-cent cash fare. The city of Peoria is opposing this increase.

Seven Cents or Shutdown.—G. H. Garrison, superintendent of the Cortland County Traction Company, Cortland, N. Y., recently announced that owing to the increased price of coal, freight rates and general expenses, the company would have to demand a 7-cent fare after Dec. 1. The fares will be collected under the zone system, 7 cents for each zone. Tickets will be offered for sale at sixteen for $1 and eight for 50 cents, bringing the fare down to 6¼ cents for regular riders.

Asks Lower Fares on One-Man Cars.—Attorney R. A. Morton, Los Angeles, Cal., has petitioned the Railroad Commission of California asking that the one-man cars be discontinued or that the fare be reduced to 3 cents by the Los Angeles Railway. The petitioner explains that economies are certainly effected by the operation of one-man cars and that the public and not the company should receive such benefits, especially since the people, as the statement goes on to say, are subjected to all the inconveniences of the new car.

Rejects Nickel Fare Proposal.—G. T. Seely, general manager of the Youngstown (Ohio) Municipal Railway, has informed the Youngstown City Council that the company will be unable to accept a proposition made by the city authorities that the fare on the local lines be reduced to 5 cents, with a 5-cent charge for each transfer. The fare is now 9 cents. Mr. Seely states that the adoption of the plan suggested by the Council would result in a loss of from $20,000 to $40,000 a month.

Zones on Interurban.—A zone fare system was recently placed in effect on the line of the Northern Ohio Traction & Light Company, Akron, Ohio, between Akron, Kent and Ravenna. Under the new system the fare from Akron to Ravenna remains 30 cents, with a 5-cent fare in each zone. Fare collections are made as the passengers leave the cars on through trips. Within zones a pay-as-you-enter system is in operation. A similar zoning system will be installed on the company's line between North Canton and Massillon.

Safety Cars Approved.—The City Commission of Joliet, Ill., has authorized the Chicago & Joliet Electric Railway to use one-man safety cars on its local lines. The commission has repealed an ordinance requiring that each car carry a crew of two men. The "safeties" will not be installed for some time, since such equipment will require more double track and the provision of additional switches. It is reported that the company has placed orders for several cars of the one-man safety type.

Would Raise Fort Smith Fare.—D. C. Green, general manager of the Fort Smith Light & Traction Company, Fort Smith, Ark., recently announced that the company would shortly apply to the Arkansas Corporation Commission for authority to raise its fare from 6 cents to 7 cents. The 6-cent fare took effect Jan. 15. Mr. Green stated that a 7-cent rate would still fall short of paying a sufficient return on the investment. Since the present fare was installed the service has been improved and the wages of the carmen have been raised.

Rate Increase Suspended. — The Washington Public Service Commission has suspended the proposed tariff of the Puget Sound Electric Railway, Tacoma, increasing passenger fares between Tacoma and Seattle and intermediate points. The order made by the commission extends over a period of sixty days, at the end of which the commission will hold a hearing. A complaint signed by a large number of residents of the Duwamish Valley was received recently by the commission. The company proposes to increase the fares 10 per cent.

Rate Decision Deferred. — Chairman Charles B. Hill of the Public Service Commission, Second District, has reserved decision on the application of the Buffalo & Lake Erie Traction Company, Buffalo, N. Y., for permission to increase passenger fares from 3 cents to 3.6 cents a mile along its route, except in cities and incorporated villages. Lyman M. Bass, counsel for the company, recently informed the commission that the future operation of the road depended on the gaining of permission to increase the rates. Representatives of the towns of Fredonia and Hamburg appeared in opposition to the proposed schedule.

Fare Rejection Stands on Recount.—A recount of the votes cast in a special election on Oct. 4 at which the citizens of Duluth, Minn., passed on a proposition to allow the Duluth Street Railway to raise its fare from 5 cents to 6 cents shows that the proposition was rejected. The report of the inspectors filed with the court in the contest proceedings brought by the railway is as follows: For the increased fare, 7,381; against, 8,170; 258 balance in doubt. The official count as previously canvassed by the City Council was 7,563 for and 9,098 against. As a result of the rejection of the increase the company recently curtailed its service.

Immediate Relief Urged. — Counsel for the receivers of the Manhattan & Queens Traction Corporation, New York, N. Y., has asked the Public Service Commission for immediate action on the company's application for an increase in fare. The company filed a petition with the commission last August, and on Sept. 16 the receivers were notified to resume operation pending an investigation by the commission. Since that date, it is alleged, the corporation has increased its deficit by $10,000. Unless speedy relief is granted the road will be compelled to close down is the conclusion now arrived at by the company.

City Operation Opposed.—Operation by the city of Lowell, Mass., of the Lowell lines of the Eastern Massachusetts Street Railway, is opposed by the Trades and Labor Council of that city. The council at a recent meeting went on record as favoring a reduction in fare to 5 cents with a charge of 1 or 2 cents for a transfer, the responsibility for operation of the lines to be retained by the public trustees of the system. The plan for control of the district by the city called for a straight 5-cent fare with an assumption by the city of responsibility for any deficit which might be incurred. The cash fare is now 10 cents, no transfers being given.

Buses Barred in Muskegon.—The City Commission of Muskegon, Mich., has revoked all schedules and routes of the Muskegon Jitney Bus Corporation, a consolidation of local bus operators, and has named a special committee to make recommendations as to what course is to be taken in the settlement of the city's transportation problem. City Manager Ellison has been given authority to allow such buses as he deems necessary to operate, until the committee reports. Petitions bearing 241 names were presented asking that the buses be stopped from running on streets where the cars of the Muskegon Traction & Lighting Company now operate and also on the parallel streets.

Asks More in Raleigh.—An 8-cent cash fare is asked by the Carolina Power & Light Company, Raleigh, N. C., in an application filed recently with the North Carolina Corporation Commission. The company proposes to sell four tickets for 30 cents and twenty school tickets, with return trip, for $1.60. In June, 1918, the company filed an application for an increase in fare from 5 cents to 7 cents. After a full hearing the commission authorized a rate of 7 cents cash with four tickets for 25 cents and twenty school tickets with return fare for $1.40. In its present petition the company states that under these rates it finds itself unable to earn a fair return upon its property.

More Cars in Rush Hours.—Colonel Albert T. Perkins, general manager of the United Railways, St. Louis, Mo., has announced that the first of the new cars recommended by the Missouri Public Service Commission are being placed in service and that sixty will have been completed by Jan. 1, 1921. These sixty cars, he said, would reduce the early morning and evening crowding, since each car will have a capacity of about 150 persons and will make four trips in the peak-load hours. Fifty of the cars are being built by the United Railways shops and others by the American Car Company, which will have ten ready by Jan. 1. The St. Louis Car Company is building a number of others.

Service Curtailed in Utica.—Because the Common Council of the city of Utica has refused to take any notice of the pleas of the New York State Railways for an increase in fare the company has curtailed the service in order to continue operation. About seventy-five motormen and conductors were thrown out of work, the remaining workers choosing runs by right of seniority. The company had been collecting a 6-cent fare in the city for some time and lately maintained that this was not sufficient, claiming a loss of $1,000 daily. It maintains that an 8-cent fare is needed. The Common Council will meet again Nov. 18 and it is likely that the matter of an increase will come up again for discussion.

Trainmen Will Compete.—A series of safety contests has been arranged for trainmen of the Los Angeles (Cal.) Railway. The first accident-prevention campaign under the new plan was held Oct. 31. Trainmen are given choice of runs every three months and each safety contest will continue for corresponding periods. Competition will be between the five divisions of the system. The division with the fewest accidents in proportion to the daily car mileage will be declared the winner. A safety championship flag will be held for three months by the winning division and a smaller streamer for permanent possession will be awarded. For the first three months operators of one-man safety cars will not be included in the competition. Later a handicap system will be arranged to give the safety cars a place in the contest.

Personal Mention

Lewis Nixon Retires

New York Commissioner Will Resume Private Business—A. M. Barrett Appointed His Successor

Lewis Nixon, Public Service Commissioner for the First District of New York, resigned on Nov. 5 and sailed for Europe on the following day to be gone several months. Upon his return to the United States he will engage in private business. Alfred M. Barrett, Deputy Public Service Commissioner, has been appointed Mr. Nixon's successor for the remainder of the latter's unexpired term, ending May 8, 1924.

Before leaving for Europe Mr. Nixon declared that the adoption of service-at-cost franchise offered the best hope of a solution of the traction problem in New York City. He pointed out that if in the drawing of the dual contracts the corporations had secured inordinate advantages this was the opportunity to correct the unfairness. "While the people have been made to think that they pay 5 cents, an excess fare well above 5 cents is levied upon our taxpayers for all who travel, whether taxpayers or not, and this will continue for more than forty years and add more than $500,000,000 to the burden of taxation laid upon the people," said Mr. Nixon.

Regarding the operation of the lines by the city, Mr. Nixon said that "municipal ownership seems to be the only way to avoid resort to strike or violence in wage disputes, but there are so many pitfalls and difficulties due to the difference in point of view of office holders when entering and when leaving office that our people may be slow to adopt such a policy."

With reference to buses, Mr. Nixon said that their use in New York City would not lead to a betterment of transit conditions. In shaping the character and establishing fixed transit lines in outlying areas he thought that they had a place. "If we could build new and up-to-date electric street railway cars, with the best of tracks, permitting a speeding up of service, we should be much better off than with buses," said Mr. Nixon. Since this cannot be done, he declared, without a service-at-cost fare deterioration of the service must go on to the point where even a bus will be more efficient.

British Association Elects

George W. Holford, general manager of the Salford Corporation Tramways, was elected president of the Municipal Tramways Association of Great Britain, at the nineteenth annual conference of that body at Cardiff on Sept. 15 and 16. Mr. Holford succeeds Sir John Courtis, chairman of the Cardiff Tramways Committee. The proceedings of the conference were summarized in the issue of ELECTRIC RAILWAY JOURNAL for Nov. 6, page 980. Alderman R. Mayne, sheriff of Newcastle and chairman of the Newcastle Tramway Committee, was chosen vice-president.

Mr. Holford has been actively identified with the work of the association for the past fifteen years. More than a hundred companies, representing the municipally owned and operated tramways of the British Isles, are members of the organization. The privately-owned tramways are organized into the Tramways & Light Railways Association, of which Sir Arthur Stanley, G.B.E., M.V.O., is president.

As general manager of the Salford Corporation Tramways, Mr. Holford has direct charge of a system serving a community of approximately a quarter million persons. Salford is an industrial city near Manchester and separated from the latter city by the Irwell River. In addition to the urban trackage the tramway operates suburban lines.

W. H. Glenn to Resign

W. H. Glenn has tendered his resignation as vice-president of the Georgia Railway & Power Company, Atlanta, Ga., to become effective Dec. 1. Mr. Glenn will at that time take up the active duties of president of the Shippers' Compress Company, which operates cotton warehouses and compress plants in many cities of Georgia and Alabama. His successor has not yet been selected.

Mr. Glenn has been connected with the Georgia Railway & Power Company, and its predecessors for the past twenty-nine years. Shortly after his graduation from the Georgia Institute of Technology, he entered the employ of one of the constituent companies of the present system as a rod-man. He subsequently served for several years in the shops. Then came a promotion to purchasing agent. He was next appointed superintendent of track and roadway. In this position he had charge of most of the reconstruction work following the formation of the Georgia Railway & Electric Company, and worked out many of the problems of the physical property that necessarily followed the consolidation.

Twelve years ago Mr. Glenn was appointed general manager of the railway department of the Georgia Railway & Electric Company. Still later he was advanced to the position of vice-president and manager of railways of the Georgia Railway & Power Company. In 1904 he surrendered that title for that of vice-president and operating manager, with widely increased duties.

Mr. Potter in Charge

Made Manager of the Bridgeport Lines of the Connecticut Company, Succeeding Joseph S. Goodwin

J. B. Potter has been appointed manager of the Bridgeport Division of the Connecticut Company, New Haven, Conn., to succeed Joseph S. Goodwin, who resigned recently to become general manager of the Detroit (Mich.) Municipal Railway. Mr. Potter was formerly manager of the New York & Stamford Railway, Port Chester, N. Y. He resigned three years ago to join the firm of Sanderson & Porter, engineers, New York City.

As manager at Bridgeport, Mr. Potter will be in charge of the third largest division of the Connecticut Company. The Bridgeport unit operates in and connects the cities of Bridgeport, Stamford, Derby, Ansonia, and Norwalk, and a number of other communities, and comprises 105 miles of track. Service was resumed on the Bridgeport city lines on Sept. 20, after a suspension lasting eight weeks resulting from a failure of city authorities to take steps for the regulation of jitneys.

Mr. Potter's first work in the railway field was with the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., with which he was connected during 1897 and 1898. He then resigned to join the firm of Sanderson & Porter, as constructing engineer, building an electric railway from Central Village, Conn., to Webster, Mass. In November, 1900, he was appointed manager and treasurer of the Webster & Dudley Street Railway, Webster, Mass., continuing in this capacity for two years. He was then made manager of the Worcester & Webster Street Railway.

These properties remained under Mr. Potter's management until September, 1903, when they were leased to the Worcester & Connecticut Eastern Railway and Mr. Potter was made general superintendent. This company was afterward known as the Consolidated Railway, Putnam Lines. In August, 1905, in addition to his duties as general superintendent of the Putnam lines of the Consolidated Railway, he was made general superintendent of the Worcester & Southbridge Street Railway. Three years later he was appointed manager of the New York & Stamford Street Railway and the Stamford lines of the Consolidated Railway.

Leaves War Sales Office

E. C. Morse has resigned as director of sales of the War Department. Mr. Morse will return to civil life, but has as yet made no announcement as to the line of work which he will follow. Since the organization of the office of director of sales surplus stocks costing more than $1,685,000,000 have been sold to the public, transferred or authorized for transfer to other government departments. An average recovery of more than 63 per cent of the original cost of this material has been realized.

W. B. McKinley, United States Senator

President of the Illinois Traction System Wins Election by Large Majority—Long a Member of House of Representatives

Scoring an overwhelming victory over his Democratic rival, William B. McKinley, president of the Illinois Traction System, Peoria, Ill., was on Nov. 2 elected a United States Senator from Illinois. Mr. McKinley's nomination and election were a great personal triumph. He was the only opponent of the state political machine of Mayor Thompson of Chicago to win a nomination at the primary election held some time ago. The other successful candidates on the Republican ticket were all Thompson men. Mr. McKinley's election to the Senate comes as a climax of a long business and political career. He first entered public life in 1904, when he was chosen to represent the 19th Illinois district in the House of Representatives. Since that time he has served continuously as a Congressman and is now rounding out his seventh term as a member of the House. Mr. McKinley's work at Washington has been characterized by keen understanding of the needs not only of the immediate district which he has represented but also of the nation as a whole.

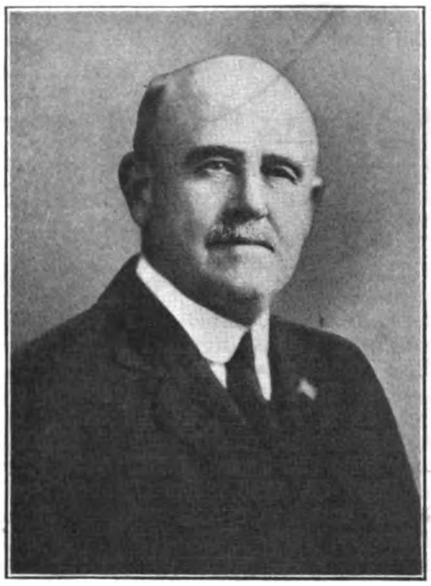
A MAN of many-sided nature, Mr. McKinley has demonstrated his ability as a leader. For a number of years he has been a deep student of economics and political questions and has made himself an authority on matters involving foreign relations. He has traveled widely, thus gaining an accurate conception of conditions in various parts of the world. Several years ago Mr. McKinley, accompanied by a party of friends, went on a trip around the globe, spending considerable time in the principal foreign cities.

AN INTERURBAN PIONEER

Mr. McKinley may justly be called the father of the Illinois Traction System. His vision and organizing genius were directly responsible for the formation and development of this great utility, now one of the largest and most important in the country. The foundations of the present system were laid in 1900, when Mr. McKinley purchased the traction system of Danville, Ill. Shortly thereafter he interested a group of Montreal capitalists in his plans, and bought up rights and franchises for lines in various places, which the original promoters had been unable to finance and to build.

In nine years the line in Danville had grown until it had become the Illinois Traction System, operating 500 miles of track, with its own bridge across the Mississippi River at St. Louis and its own terminal there in the heart of the city. The public utilities operated by the McKinley interests are included in two holding companies, of which Mr. McKinley is the president. These are the Illinois Traction System and the Western Railways & Light Company. These comprise besides the main interurban and local railway lines in Illinois, electric railway and lighting systems in Atchison, Topeka and Wichita, Kan., and in Oskaloosa, Iowa, and electric lighting and gas companies in a number of cities in Illinois and other states.

Mr. McKinley gained his first business success as an electric railway man. In 1884 he began to interest himself in public utility enterprises. He had already formed financial relations with capitalists in the East, and in that year he built the waterworks at Champaign. Shortly thereafter Mr. McKinley constructed an electric lighting plant in Champaign. He then bought the horse railway between Champaign and Urbana and equipped it with electricity. In 1890 he acquired the gas and electric plant in Defiance, Ohio, and built a street railway in that city.



W. B. McKINLEY

Two years later he bought the horse railway in Springfield, Ohio, and electrified it and did the same thing at Bay City, Mich.

At the time of the panic in 1893 Mr. McKinley had considerable money invested in farm mortgages in Kansas and disposed of most of the utilities which he had bought. Three years later, however, he re-entered the public utility field by building an 11-mile electric railway to Joliet. Within the next three years he bought and modernized the street railway lines in Quincy and Galesburg and constructed an interurban railway to Knoxville. These early experiences qualified him to undertake the work of building up the interurban system.

Mr. McKinley was born in Petersburg, Ill., on Sept. 5, 1856. When he was two years old the family moved to Champaign, where his father became pastor of a small Presbyterian congregation. Champaign has since been the home and headquarters of the younger Mr. McKinley. At an early age he entered the University of Illinois, then known as the Illinois Industrial University. He gained his early business training as a clerk in a drug store, later working in a similar capacity in a real estate office. He then entered a bank in Champaign, where he advanced in a short time from bookkeeper to manager. He then became associated with his uncle, J. B. McKinley, in the farm loan business, branching out in 1884 to enter the utility field.

E. S. Davis has been elected vice-president of the Springfield (Vt.) Electric Railway.

C. J. Driscoll has been appointed assistant secretary of the Escanaba (Mich.) Traction Company.

E. T. Smith has been made master mechanic of the Savannah (Ga.) Electric Company. Mr. Smith was formerly master mechanic of the Tampa (Fla.) Electric Company.

Lewis A. Sargent has been appointed master mechanic of the Tampa (Fla.) Electric Company. Mr. Sargent was formerly purchasing agent of the Northern Texas Traction Company, Fort Worth, Texas.

John Duerr, superintendent of the Buffalo-Niagara Falls high-speed line of the International Railway, Buffalo, N. Y., has been transferred to the position of trainmaster of the Buffalo-Lockport Division of the International's interurban lines.

John F. Donovan, superintendent of the old Buffalo-Niagara Falls line of the International Railway, Buffalo, N. Y., has assumed charge of the high-speed line between the two cities and will henceforth serve as superintendent of both interurban divisions of the company.

R. J. Diefenbaugh has been appointed soliciting agent for the freight and traffic department of the Chicago & Interurban Traction Company, Chicago, Ill. This line, which connects Chicago and Kankakee, Ill., is now under the management of Britton I. Budd of the Chicago Elevated Railways.

Edwin R. Booth, who has been paymaster for the Northern Ohio Traction & Light Company, Akron, Ohio, since last January, has been appointed manager of Meyers' Lake Park, a resort owned by the company near Canton. Mr. Booth took charge of the park on Oct. 1. He was born in Springfield, Ill. He began work with this company in 1912, and, except for one year, has been in its service since that time. He began as treasurer of Meyers' Lake Park, and held that position until 1915, when he was placed in the payroll department in Akron. He also worked in other departments of the company, being assistant paymaster until called for military service in May, 1918.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Bronze Overhead Line Products on the Decline

Easier Copper Market of Last Six Weeks Brings Reductions in Price of Ears, Splicers, Crossings, etc.

With the drop in price of copper which started about six weeks ago, there has been expectation in the trade that in a short time this would be reflected in easier prices of certain electrical materials. To date virtually the only effect has been found in slightly reduced prices on copper wire, rail bonds and certain kinds of brass and bronze overhead line material for electric railway work.

On some classes of rail bonds reduced prices went into effect the last of October, when discounts went to 20 per cent. On other types the prices are following to an extent the price of bare copper wire at the mill; this price is now quoted at from 17 to 17½ cents, while 22½ cents to 23 cents was the price at the end of September.

Brass and bronze overhead material, such as trolley ears, splicers, crossings, frogs, etc., produced by certain manufacturers, fell into line on Nov. 5 with a shade in prices of 4 points, amounting to about 6 per cent. At the same time the demand on all this material is merely nominal, just enough to continue maintenance.

Electrolytic copper is now quoted at from 14.75 to 15 cents a pound delivered; both producers and second hands are making sales at these figures. There was a buying spurt two weeks ago, but the demand at present is light. It is not expected that prices of copper products will respond to much of a decline until the high-priced copper stocks held by manufacturers have been pretty well exhausted.

Uneven Demand in Fare Register Market

Production Is Proceeding Favorably and Deliveries Are Fairly Good—Prices Hold Steady

Conditions of demand in the market for fare registers apparently vary considerably. On the one hand sales are held to be about average. Demand is rather spasmodic, usually on behalf of replacements and additions to new cars, with occasional orders for changing over the entire equipment of a road. On the other hand, this has been a banner year for business, according to one of the largest manufacturers in this line. More registers have been sold by this company this year to date than ever before in the history of the business. The growing attention devoted to methods of fare collection on the part of electric railways and the great cost of paper where cash receipts are issued are held to be important factors.

Production in general is proceeding at a favorable rate. Malleable castings have been difficult to obtain in the past, but little trouble is experienced now with the raw material supply. Labor conditions are much improved too, as the greater supply permits inefficient workmen to be weeded out. In one case at least additions to plant are being made in order to increase the present output. Deliveries are made in reasonable time. In some cases the number of back orders mounted up to such an extent that new business, while still accepted, cannot be filled on some types of fare registers until next year. This condition does not seem to be representative, however. Stocks in general are maintained at a fairly good level. Manufacturers report being able to make deliveries on many types of registers from stock up to one week's time. On some varieties deliveries range as long as four months.

No recent price changes have occurred. Fare register prices have held at a fairly even level during the period of advancing costs, the maximum advance in a representative instance having been 50 per cent over pre-war quotations. For this reason no reductions apparently are contemplated in the near future. No cancellations have been received and customers are reported as paying their bills promptly.

Softening Prices Feature Iron and Steel Market

Unfilled Tonnage of U. S. Steel Corporation Declines—Cancellations Are Large and Buying Is Light in Face of Expected Readjustments—Coke Prices Drop

The current features of the iron and steel market are cancellations of orders, lighter demand and gradually softening prices in some lines. Unfilled tonnage on the books of the United States Steel Corporation on Oct. 31 is reported as amounting to 9,836,852 tons, a decrease of 537,952 tons from the figure of 10,374,804 tons on Sept. 30, 1920. The October total is the smallest excess reported since February, 1920. Few new orders are being received, buying at present being almost entirely of the "absolute necessity" class. The steel corporation's mills are still reported operating at about 80 per cent of capacity, however, but the business of independents is probably running closer to 50 or 60 per cent of capacity.

Prices of steel rails as quoted by the United States Steel Corporation have undergone no change, the quotation still being $45 for standard bessemer rails and $47 for open hearth. Orders are accepted, however, subject to price revision when quotations for 1921 are announced, which it is expected will not occur before early in December. The costs of independents' rails are given as considerably above this level, and according to the *Iron Age* a recent booking by an independent at $62.50 per gross ton is held to be a likely indication of the future price level in that quarter.

Orders for track bolts, spikes, etc., have fallen off to a considerable extent so that the scarcity, especially in bolts and nuts, that was reported some time ago has been relieved. Deliveries of spikes from Pittsburgh can be made as quickly as three weeks. Prices of wire and nails within the past week have eased off. Announcement is made of a reduction of $5 a ton in the base price of nails and wire by the Youngstown Sheet & Tube Company, which had previously held to a base of $4.50 per keg for wire nails, but is now quoting $4.25 per keg for nails and $3.75 on plain wire.

Steel-bar mills are now operating at a good rate as the result of accumulated orders. The only apparent softness existing in bars is on the larger sizes, which are said to be tending a little under the average of 3-cent base. Weakness prevails in the market for sheets and prices continue to slide. Black sheets are now easily obtainable at 6-cent base, which price independents have quoted, and as low as 4.75 cents has been made on blue annealed sheets. Independent mills generally quote 8 cents to 8.25 cents on galvanized, but some business has recently been placed as low as 7.50 cents.

Costs of fuel and labor have heretofore been strong factors in maintaining price levels in the iron and steel market. More talk is now heard of wage cuts, while coke prices have slumped noticeably. According to the same source of information as above Connellsville furnace coke for prompt delivery at oven declined from $9 per net ton to $8 within the last week or so, and foundry coke from $11 to $9 per net ton.

Orders for Badges More or Less Spasmodic

Trouble with Raw Material Supply—Deliveries in One to Two Months—Prices Steady

Demand for badges, while heavy on the whole, has been more or less spasmodic, according to one of the largest manufacturers furnishing this class of goods to electric railways. This is a natural result of the character of the business, it is said, as large orders are in great part the result of consolidations and changes in the organization of traction companies that necessitate complete changes in the existing badge equipment. Another factor that often accounts for orders of this material is the occurrence of strikes and labor troubles whereby employees fail to return badges used by them. The past year is reported as being fully up to the standard of other seasons as regards sales.

The raw material supply has been occasioning some trouble in this line, though this condition is now improving. German silver and celluloid have been difficult to obtain, though aluminum has been in good supply, according to a representative badge manufacturer. Deliveries are ranging from thirty to sixty days in this case, as the company has fallen behind on orders to that extent as a result of heavy demand, labor difficulties and trouble with raw material. No change in prices is anticipated, it is said.

Deliveries of Trolley Wire Are Improved

Buying Has Been Fairly Regular and Good Prospects for Future Business Are Seen—Prices Softening

Buying of bare trolley wire on the part of electric railways, while not extra heavy this year, has proceeded at a good substantial rate. At present the volume of demand is light, but such a condition normally prevails at this season until new extensions get under way in the spring. Furthermore, at least one large interest is not encouraging new business at present because of the unsettled condition of the copper market.

Reports on the foreign market differ. One view holds that foreign inquiries are picking up in line with a steady growth in demand abroad, but other interests are receiving fewer inquiries from that quarter. On the other hand, the market for composition trolley wire, both domestic and foreign, it is stated, has been stronger than any previous year.

PRODUCTION CONDITIONS IMPROVED

Production conditions as regards labor, raw material, etc., are much improved. Deliveries of trolley wire which last summer averaged six to eight weeks now range in the neighborhood of two to four weeks. Stocks of the finished product are not maintained, but the raw material surplus is good. Deliveries of composition trolley wire are reported slightly longer than the ordinary type, as back orders have piled up owing to the strong demand. On the general sizes about two to six weeks is quoted.

The condition reported last summer that some producers were drawing trolley wire stock to fine sizes and insulating it in order to cope with the overflow orders on insulated wire is no longer existent. The former delay occasioned by drawing processes has also been largely overcome. Reports vary as to whether railways are fairly well stocked with trolley wire to care for necessary repairs. It seems logical to believe that the statement that reserve stocks are small is more nearly correct, however, in view of the necessarily curtailed buying of many lines. A few cancellations have been received, but the number has not been large.

Prices have generally softened commensurate with the drop in the copper market. A representative producer is quoting trolley wire on a 19¾ cent base at present. The further trend of prices is dependent on the direction which copper takes, since the raw and the finished product in this case go largely hand in hand. Manufacturers express an optimistic view regarding the outlook for future business. Prospects for the further electrification of steam roads and hope of foreign markets opening up to a greater extent lend an encouraging tone.

Buying Active in Steam Railroad Field

Manner in Which the Railroads Have Come Into the Market Is Index of Expected Electric Railway Purchases in 1921—Fare Increases of Many Electric Lines Absorbed by Debts

The sales of one large electric manufacturing company to the steam railroad field for the month of October, 1920, were ten times what they were for the same month in 1919. This is a single criterion of how rapidly and materially the steam railways are getting back into the market for materials and supplies and equipment. This activity on their part has followed with remarkable closeness upon the nationwide rate increases granted by the Interstate Commerce Commission in late August and early September.

RATE INCREASES HELP BUYING

This is indicative of what may be expected in connection with the buying of the electric railways in a more gradual way. The outstanding difference between the two fields is that in the steam road field all of the railroads received the increases simultaneously, and all are beginning simultaneously to buy. In the electric railway field the increases in rate have been granted one at a time, here and there, all over the country, but the accumulation of rate increases should begin to manifest itself in buying activities more striking than heretofore this year, though the purchases made this year have placed many manufacturers in a position where deliveries have been very slow. This condition may, however, be more nearly ascribed to slow production than to the great volume of business.

Many electric railways which have received rate increases and have been operating under them for perhaps a number of months were involved in such heavy debt prior to the increase that the higher earnings were absorbed for long periods in paying off these active debts, so that these companies have not been in a position to be active in the market. Furthermore, at just this time of the year, a good many companies whose fiscal year is common with the calendar year cut down purchases to absolute necessities in order to improve the financial showing for the year. It is safe to believe, then, that early next year there will be a decided increase in the number of electric railways which will be getting back on their feet financially as the result of the continued higher earnings and there should follow a period of heavier buying in the electric railway field. It cannot be said that the buying during 1920 has been exceedingly poor, but it is believed that various improving conditions in the industry will conspire to make 1921 a far better year for the manufacturers. For the railways, with the prospect ahead of being able to buy, it means that the next few months will be a period of active planning. Equipment and material needs must necessarily be carefully checked and the necessary orders placed to insure the high standard of efficiency which has been the major premise for granting rate increases.

Rolling Stock

The Detroit (Mich.) Municipal Railway, through the Department of Street Railways of Detroit, and subject to the approval of the Common Council, has accepted the bid of the Osgood Bradley Car Company for twenty-five safety cars of the Birney type. Delivery of the cars is to be made in forty-five days it is reported.

The Topeka (Kan.) Railway expected delivery of eight new safety cars about the middle of this month. These were ordered nearly two years ago, but delivery has been awaiting approval of the $48,849 in equipment certificates, to pay for the cars, by the Court of Industrial Relations. This approval was granted by the court the latter part of October.

Twin City Rapid Transit Company, Minneapolis, Minn., announced in the Sept. 11 issue as changing over 300 cars to the front-entrance type, has placed two of the cars in operation on the Payne-Groveland line. A feature of the new construction of these cars is the replacing of the old hot water heaters by hot air heaters. The company is also starting to rebuild trailers for rush-hour service in St. Paul. The reconstructed cars will have a rear entrance and front exit.

Track and Roadway

Georgia Railway & Power Company, Atlanta, Ga.—The Georgia Railway & Power Company has anounced to the street committee its readiness to rebuild its tracks from the Broad Street viaduct to Alabama Street in Atlanta and also to pave between the tracks an area of approximately nine feet.

Louisville (Ky.) Railway.—The Louisville Railway is planning to install a loop in the near future at Audubon Park north of the Southern Railway crossing. Just as soon as the loop is completed city service will be extended to the new loop, which will be a great convenience to regular riders.

New York State Railways, Syracuse, N. Y.—The Public Service Commission, Second District, today granted permission and approval to the New York State Railways to construct a loop from its track in Milton Avenue in Solvay upon private property to the Semet Solvay Company's plant for the improvement of service for the employees of the Solvay companies. The village has granted the company the required franchise for operation and Commissioner Frank Irvine, the sitting commissioner, holds that public convenience and necessity require the construction of the loop and operation of the electric cars thereon.

Frontier Electric Railway, Buffalo, New York.—The Frontier Electric Railway, which proposes the construction of a new double track electric freight line between Buffalo and Niagara Falls, has petitioned the municipal authorities of North Tonawanda for permission to extend the time for commencing the construction of the line through that city. The time for starting the construction is set for Dec. 31, 1921. An extension of two years was sought. The proposed line would be operated by the Lackawanna and Pennsylvania Railroads. The right of way parallels the new high speed line of the International Railway Company, Buffalo.

Dallas (Tex.) Railway—The Dallas Railway must start immediately on its improvement program outlined by the city, or legal action will be taken against the company. J. F. Strickland has written the Mayor to the effect that the company was financially unable to reconstruct its tracks on South Lamar Street and it was also unsuccessful in its attempt to raise money for that purpose. The Mayor has replied that the Board of Commissioners will wait until Nov. 2 for assurances from the railway that the necessary improvements will be undertaken.

Power Houses, Shops and Buildings

Los Angeles (Cal.) Railway.—The Los Angeles Railway has just closed an order for two 1,000-kw. synchronous converters with 1,000-kva. oil-insulated self-cooling type transformers for operation on 50-cycle, 16,500-volt primary lines and to be automatically controlled. These units will supply energy at 600 volts to the direct-current trolley lines of this system. One of these units with a complete equipment by the General Electric Company will be located in the Garvanza District. The second unit, likewise automatically controlled, will be furnished by the Westinghouse Electric & Manufacturing Company and located in the Vernon District. The Los Angeles Railway power supply comprises ten substations, manually controlled, totaling 26,000 kw.; the largest single station is rated at 6,000 kw. Most of the units are induction motor-generator sets although four 1,500-kw. synchronous converters were installed recently.

Trade Notes

The Pierce Fuse Corporation of Buffalo, N. Y., announces the appointment of Emory M. Coffin as sales manager, succeeding P. S. Klees.

The Shanklin Equipment Company, Inc., Springfield, Mass., which recently developed an automatic transfer issuing machine, announces that it has installed this equipment on the one-man cars of the Maple Street lines of Springfield and also on the two-man cars of the Walnut Street line. Installation in other cities, it is stated, will begin this month.

Franklin P. Wilds has severed his connection with the Irvington Varnish & Insulator Company to become vice-president of the Standard Insulator Company at Rutherford, N. J., it is announced. The latter company manufactures varnished cambric, oiled paper, oiled silk and various kinds of varnished treated papers. Mr. Wilds was formerly with the Mica Insulator Company, the Linonite Company, Keene Mica Products Company and for the past ten years with the Irvington Varnish & Insulator Company.

The American Gear Manufacturers' Association held its fall meeting at Mohonk Lake, New York, on Oct. 27, 28 and 29. About 100 members of the association were present, representing about eighty-five of the largest gear manufacturing companies of the country. The keynote of the meeting was standardization. P. G. Agnew, secretary of the American engineering standards committee, spoke on "Standardization from the Point of View of the American Engineering Standards Committee"; Calvin W. Rice, secretary of the American Society of Mechanical Engineers, gave an interesting talk on the subject of "Standardization"; C. L. Collens, II, president of the Reliance Electric & Engineering Company and past-president of the Electric Power Club, made a helpful address on "Industry Organization," and Christopher Haigh of the General Electric Company presented the "Machine Rate Method of Distributing Expense." The spring meeting of the association will be held at St. Louis.

George N. Brown, until recently electrical engineer of the New York State Railways, Syracuse-Utica lines, on Nov. 1 took up his new work as district manager at the New York office of the Pittsburgh Transformer Company. Mr. Brown came directly to his new position from the engineering department of the Brooklyn Edison Company. He is a graduate of the Cornell University course in electrical engineering, immediately thereafter beginning railway work as inspector of car equipment with the Utica & Mohawk Valley Railway. In the fall of 1908 he was transferred to Syracuse as car inspector on the Oneida Railway, but returned to Utica after a year as assistant to H. S. Williams, electrical engineer of the Utica & Mohawk Valley Railway. In November, 1910, he became connected with the Boston & Maine Railroad and took part in the Hoosac tunnel electrification, afterward acting as switchboard operator in the North Adams power plant. In May, 1912, Mr. Brown became assistant engineer of the three lines which now form the Syracuse-Utica division of the New York State Railways. He was later made electrical engineer of these lines.

New Advertising Literature

Car Heaters.—Holden & White, Inc., Chicago, Ill., has published an illustrated folder on its line of electric car heaters with Cutler-Hammer heating units.

Car Plant.—The J. G. Brill Company, Philadelphia, Pa., is distributing copies of the pictorial section of the Philadelphia *Public Ledger* for Oct. 17, which contains two pages of interesting pictures of the Brill plant as part of a series appearing each Sunday on "Great Industries That Have Made Philadelphia Great."

Engineering Service.—Ford, Bacon & Davis, engineers, 115 Broadway, New York City, are distributing pamphlet 29, dated Oct. 15, on "The New Jersey Valuation Law," which contains editorial opinions of the New Jersey law calling for valuation of street railway properties in the state, under which the company has been retained to do the work of appraising.

Employee Relations.— Westinghouse Air Brake Company, Wilmerding, Pa., is distributing publication 9,044, a sixty-one page illustrated brochure entitled "The Air Brake Family," which describes the industrial, social and welfare activities of the company.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Don't Forget Those Christmas Seals

AS DECEMBER approaches, we are reminded of the sale of the Tuberculosis Christmas Seals, and the JOURNAL feels it not improper to call the attention of its readers to this humanitarian effort on the part of the National Tuberculosis Association. It may not be amiss to mention that statistics show that one out of every three deaths of men between the ages of fifteen and forty-five is due to tuberculosis. As to the electric railway industry specifically, the association quotes statistics to show that from 1 to 2 per cent of street car conductors, motormen and linemen have tuberculosis in an active stage. Approximately 1 per cent is the figure for office workers and shop men. The economic loss due to decreased efficiency and production of all these men is a direct loss to the railways and the communities served. The National Tuberculosis Association is in the field to help fight this disease. The sale of Tuberculosis Christmas Seals from Dec. 1 to 11 gives to every one an opportunity to support this great national movement.

Can Repair Shop Layout Be Standardized?

THE ideal of the electric railway mechanical department is to keep out on the road every car which is not in the shop for inspection or scheduled overhaul, and the condition of the shop in this respect, barring abnormal conditions such as those of last winter, is an indication of the general efficiency of the management. The degree to which cars can be kept rolling depends in part on the way in which they are routed through the shops. This, in turn, is dependent upon the ideas underlying the shop layout. The writer recently had occasion to visit a large number of shops and was impressed by the wide difference between good shops and poor ones. Some showed that they had been designed really to meet the needs of the maintenance work, others apparently "just grew." The shop where the cars were going through in an orderly manner, where the stock of burned-out armatures was inconspicuous and where neatness stamped the work as having been carefully done was the shop which had been properly planned for its work. The condition of the rolling stock, in general, reflected the condition of the shop.

Now as to this matter of standardization, there are, of course, certain things that must be done to a car to keep it in good running order; while others are desirable they are not absolutely necessary. Each master mechanic has his own ideas as to what he wants to have and do in his shop, but there are certain fundamentals which are the same everywhere. This leads to the question as to the possibility of standardizing upon certain essentials so that the master mechanic and the manager may be sure that they are as nearly up to date in their shop layout as their funds permit.

If anything can be done in the way of standardizing the principles of shop layout, it would be well for the Engineering Association to take the matter under consideration. The work program for 1920-1921, approved at Atlantic City, indicated that a start will be made in this direction. Meanwhile, the management of every property might profitably consider whether improvements could be made locally which would expedite maintenance work. It's a rare shop where some improvement cannot be made. We shall be pleased to receive and print statements regarding economies that have been found practicable even in these strenuous times.

Boston's Problem as Shown by Its Last Quarterly Report

ON ITS face the last Boston quarterly statement, published in this paper last week, is certainly discouraging, showing as it does a deficit over "cost of service" for the quarter of $1,039,147 and for the fifteen months ended Sept. 30, 1920, of $17,080 less or $1,022,067. In addition to this deficit there is $435,348 retroactive back pay, which was paid in October, 1919, but applied to the months of May and June, 1919, and for which no provision has yet been made. All this is regardless of the fact that the company is conservatively capitalized, has had model management over a long period of years and has been providing "service at cost" under public trustees since July 1, 1918, and in spite of successive increases in the fare from 5 cents to 7 cents, then to 8 cents and finally to 10 cents, the 10-cent fare having been established on July 10, 1919.

The official quarterly statement says distinctly that the total receipts per revenue passenger were 10.23 cents, whereas the cost of service per revenue passenger was 11.54 cents, and it points out that the cost of labor alone was 5.71 cents per revenue passenger! The deficit during the last quarter is so large that should the increase in the cost of coal, $239,000 (at $11.50 per ton instead of $5.75), and in maintenance and repairs, $160,000, be eliminated, there would still be a deficit for the quarter of $640,000. Not even the remission of subway and tunnel rental charges paid to city would cancel the deficit, since these totaled $382,555.

Those who have followed the financial fortunes of the Boston Elevated Railway know that beginning October, 1919, or three months after the establishment of a 10-cent fare, receipts began to exceed expenditure and so continued to May, 1920, inclusive except during February. The net result for the year ended June 30 was the surplus of $17,080 previously mentioned. It was then hoped that the succeeding year would enable the company to escape "going on the rates," as the British say of tax-aided municipal systems, even if it could not accumulate the $1,000,000 reserve fund necessary before attempting to lower fares. What is the present opportunity for such an outcome?

A study of the detailed figures of expenses for the quarter shows that the largest item, wages, amounting to 5.71 cents per revenue passenger, is a slightly larger sum than for the previous twelve months, when the figure was 5.053 cents. Yet, as pointed out in the Nov. 8 issue under "Fares Cannot Recede Yet," a cut in wages would work severe injustice so long as there are no substantial cuts in the cost-of-living items that make up the bulk of the family expenses. Besides, arbitrary reduction is out of the question. Manufacturers can shut down their plants and profit thereby because they have a surplus to work off. Hence, today, they are more likely to welcome than to fight a strike against wage reductions. Electric railways have no surplus to work off. Interruption to service can never be made up by the public taking deferred rides. Arbitration toward permitting a lower wage, based upon proof that the cost of living really has fallen, is practically the only way open, but arbitrations take time while deficits hurry.

But there are other reasons why the results for the quarter and for the year are not more satisfactory, and in this connection it would be better to consider the report for the year ended June 30 as a whole, because in Boston the third quarter is always characterized by light receipts and heavy expenditures in track work so that it is low in net. Among these general conditions are the scarcity and high price of coal, already mentioned, the increase in private automobile travel in good weather and the unusual severity of last winter. The fact must also be borne in mind that the narrow streets in Boston and the large extent of subway construction make the city an expensive one for car operations. Thus, the charges paid last year by the company for the use of subways and tunnels amounted to $1,591,323, which of itself would make a very respectable surplus.

There are, of course, two ways to increase the net in any business enterprise. One is to reduce the expenses and the other is to increase the gross, and some may ask if it is not possible to increase the number of revenue passengers, which for the year ended June 30, 1920, was lower than for any year since 1912 and less by 55,474,000 than in 1917. That is to say, the question naturally arises whether there is any possible way of attracting any considerable number of short-distance riders, presumably the ones lost, who could be carried at a profit at a lower fare if the fare to the long-distance rider would not thereby have to be reduced? To test this possibility the management put in service some time ago several short routes at a 5-cent fare, and of these routes two are still in service. Unfortunately for such a trial the Boston system is not very well adapted for short-route cars, in that its main or arterial lines through the center of the city are underground, where the addition of short-route cars would introduce complications both in fare collection and in making turnbacks. But with cars operating entirely on the surface these obstacles do not exist, and it may be that elsewhere on the system, both in the heart of Boston and in the many self-contained communities in its outskirts, there would be opportunity for such a service.

We trust, however, that the climax has been reached in high costs and low receipts in Boston and that the final quarter of this year will show increased traffic and a satisfactory net for the Elevated. But whether it does or not, the management, in the person of Mr. Dana, has gone on record to the effect that the remedy for decreasing net receipts is not an ever-increasing flat fare. While a property might derive sufficient revenue therefrom out of necessity riding to meet the costs of service, in his opinion it thereby has become diverted from its primary function, which is that of developing community growth and intercourse for the greatest number of the inhabitants in the community, and instead provides a service which can be purchased only by those who can afford it or to whom at any price it is indispensable. We may therefore expect that every effort possible will be exerted in Boston to prevent any further increase in the unit fare.

Fundamentals of Finance and Service

BANKRUPTCY courts and receiverships are not our ideals for utility operation. Such agencies cannot alter facts, and the fundamental fact is that adequate service cannot be rendered at less than cost.

Adequate service is what the public wants irrespective of the financial condition of a utility, but when a receiver is in charge of a property he is wagering his reputation on his ability to improve the financial condition of the utility without primary consideration of service to the public.

Every community can, if it wishes, pay a return to a private utility enterprise which will enable experienced utility operators to render adequate service; every community can drive its utilities into the bankruptcy courts and on into the hands of a receiver, with the result that service is ruined and the going value of the property highly depreciated, or every community can own its utilities and throw the financial burden on the taxpayers and the operating burden on the politicians.

Whatever the procedure, some one must pay the bill. There are no short cuts in utility operation, and the public has the ultimate decision as to the course it takes. But the wisest course is to recognize that poor service in the end is the most expensive to both community and company.

Creepage of Railroad Rails

AT THE meeting of the American Society of Civil Engineers held on Nov. 3 Dr. J. A. L. Waddell, the noted specialist in bridge design and other branches of civil engineering, presented a paper on creepage of railroad rails. This subject is one which may well receive the attention of engineers of way of many electric railways.

The phenomenon of rail creepage is one that has puzzled track engineers ever since railroad tracks were first used. Its causes have long been in doubt, but obviously the primary cause is traffic, since idle tracks show no creepage.

The troubles caused by rail creepage are both numerous and costly, while there is also an element of danger attendant upon its occurrence, which directly affects the lives of the traveling public. Our observation indicates that creepage, though prevalent, is not so serious in electric railway tracks as it is upon steam railroad tracks; nevertheless, it is found in all open tracks electrically operated, whether these be located in subways, on elevated structures, in roadbed or on private right-of-way. That it is not found in tracks in street pavements is due to the retardation or frictional resistance given by the pavements, which resistance also prevents trouble with welded rail joints.

Dr. Waddell, in his A. S. C. E. paper, opens up this subject for discussion. The editors of this paper desire to be of assistance to him in his study of means for overcoming the trouble and have reprinted in this issue the questions sent out by the doctor in a questionnaire. We should be pleased to print any answers to these questions bearing on electric railway experience which our readers may forward. Dr. Waddell states that he will furnish copies of his paper to interested engineers so long as the supply holds out.

You Can Lead a Mule to Water, but——

MASS transportation is a human as well as an engineering problem, and in the modern city, with its mammoth but vigorous swarm of human bees, the human element is a deciding factor in planning transportation.

Large city transportation systems are chaotic, but the cities are in the same condition—like Topsy, they both just grew. A realization of this condition and of the nuptial relationship of city planning and transportation is now existent and a tendency toward co-ordination is in evidence.

As an engineering project, a competent committee could co-ordinate existing transportation agencies, *i.e.*, the rapid transit electric, the suburban steam, the street railway and the motor bus, in such a manner as to carry the traffic adequately and could allocate to each agency its place in the general scheme. But this co-ordinated transportation plan might fail unless it considered the human elements of the problem.

A primary factor in transportation psychology is speed. Apparently, no agony or discomfort is too great to suffer provided three minutes in time can be saved in going to the office or in returning home. Those who have experienced the rush-hour conditions in subway or other rapid transit agencies can appreciate the absolute speed mania of the metropolitan. The word "express" creates a riot and produces a greater physical and mental stimulus than booze ever did. It enables people to submit to crushed corns with smiling faces and produces a giant's strength in the sharp elbows of diminutive maidens. A luxurious Pullman, if two minutes slower, would not tempt even a crippled straphanger in the express.

Another fetish of the rider is the "through train." He does not like to transfer from elevated to subway or from surface car to motor bus; once located in a transportation agency going in his direction he hibernates until he reaches his destination and any change en route arouses his bearish ire. He may even take a local instead of an express if the latter involves a transfer.

Did you ever compare the Sunny Jim smile and hear the sigh of contentment from the man in front of you as he subsides in his seat after readjusting the window to his satisfaction with the apoplectic countenance, impotent wrath and sibilant expletive of the man across the aisle whose window is immovable? Then, again, how some people do like to push the button on the signal system and how they do kick if it doesn't happen to ring the bell.

A more irascible, impatient and unthinking being than the average metropolitan rush-hour rider cannot be found, and in this modern political age he must be humored and petted, not driven.

Get the City Editor's Point of View

WE HAVE been impressed by several recent remarks or statements that the electric railway managements as a rule do not have an adequate conception or appreciation of the psychology of the general public. These statements have come from men whose opinion deserves respect. Among them are public service commissioners who are continually dealing with the public relations of railways and also several public relations representatives or enterprising publicity men of the railways themselves. None from whom such expressions have come has any purpose other than sympathetic constructive criticism. The remedy suggested is to get the "city editor's" viewpoint.

There has been at no time any intimation that railway men are averse to knowing the public, but on the contrary an appreciation that the railway men are eager to have the public understand the problems of railway operation. The question resolves itself into the very practical one of exactly how to do it, a question which has had no end of discussion, but one upon which new suggestions are always welcome. One commissioner, Judge Clyde M. Reed of Kansas, says that we must recognize that the general public as a whole is unreasonable and must be treated as an unreasonable group. Public utility men, he says, appear to treat the public as if it were intelligent and knew or could appreciate almost as much about the nature of the business of furnishing public utility service as do the utility men themselves. This, he says, is false.

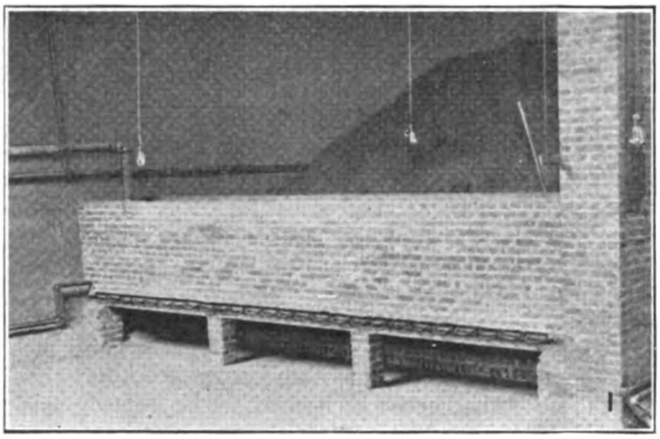
Himself a newspaper man, Judge Reed likens his business to a public utility; at least as a near approach, in that it deals with a larger proportion of the public than any other business. By painful practical experience he has learned that the public's characteristics are as he outlines them. He, and others of experience, urge the railway men to get the city editor's point of view, to study mass psychology, which Commissioner E. I. Lewis of Indiana says is not now included in the curriculum of a public utility employee.

What viewpoint is this which the city editor has and which the electric railway man should acquire if he does not have it? Principally, it seems, the city editor has been talking to the public so long and has felt so directly the reaction to his kind of talk that he has learned the language of the general public. He has learned a good deal about what the public thinks and wants to know. It may not please electric railway men, who have been dealing with the public for years, to be told that they don't know its characteristics.

But let it be pointed out that the relation of the electric railway man to the public in the past has been chiefly through the medium of service and fares and in noting the public's reaction to this and the consequent effect on gross and net receipts. Today we all say that there are new elements and methods in the business and these are chiefly concerned with publicity and public relations—principally education of this public in the details of the electric railway business.

So, say these advisers, get acquainted with the city editor. Learn what he knows about the public and its attitude. At the same time, be sure he becomes fully educated on electric railway problems himself and he will become an agent for the correct portrayal of electric railway matters to the public and also an interpreter to the railway man of the public's attitude.

Novel Apparatus and Methods for Maintaining Electric Railway Equipment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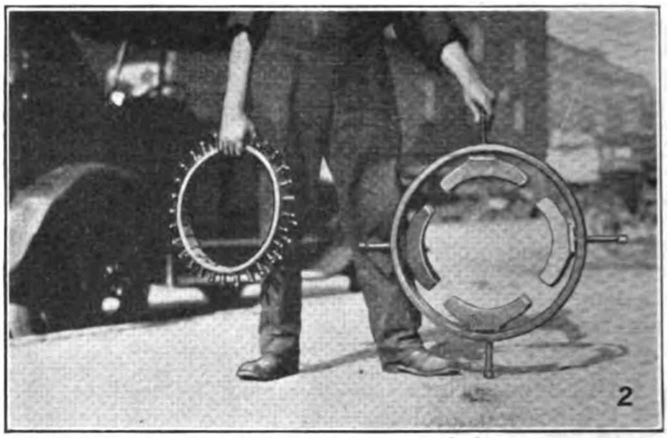
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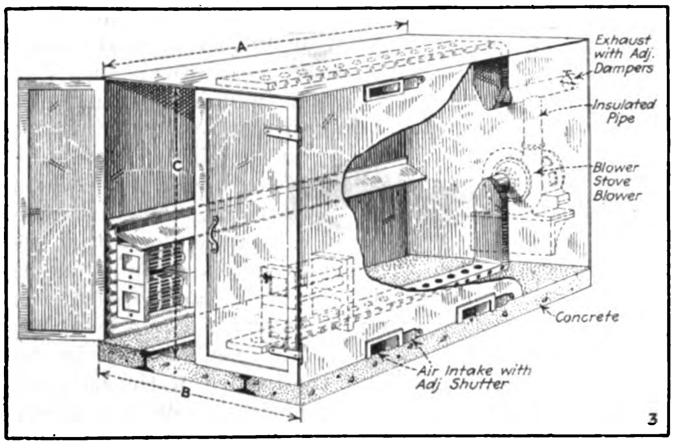
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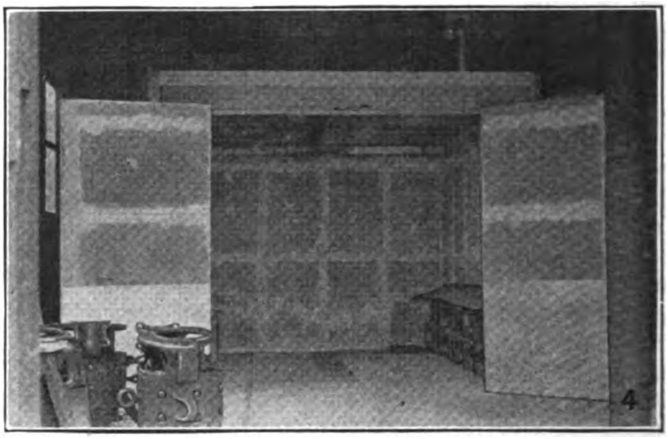
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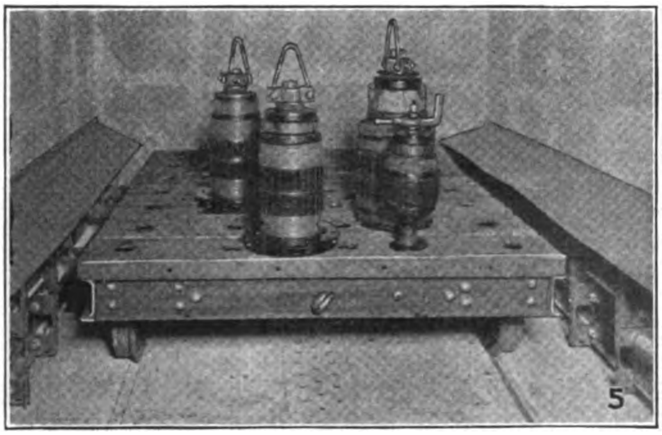
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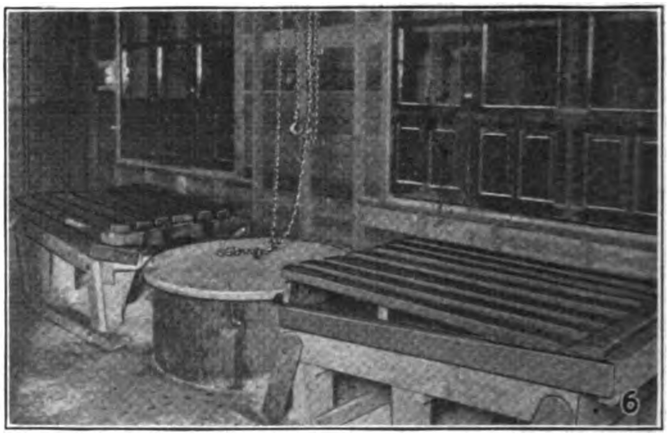
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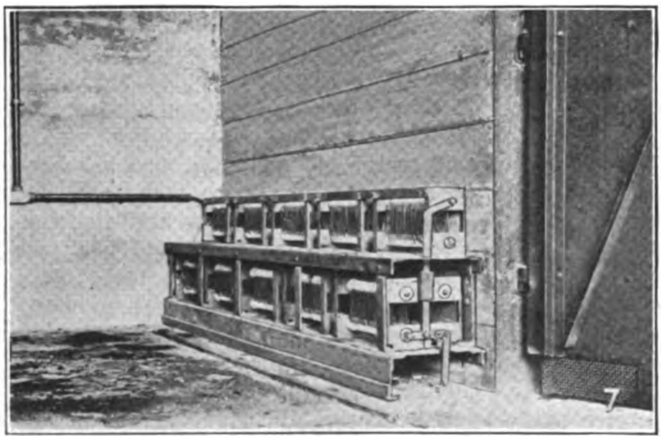
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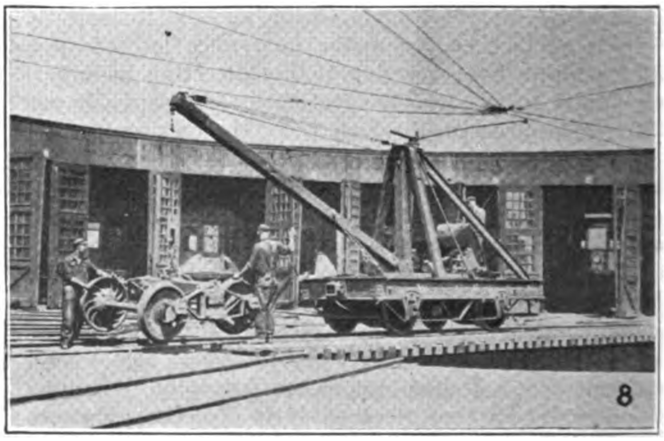
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Fig. 1. Steam-heated sand drier installation in the Sioux City, Iowa, shop.

Fig. 2. Two devices rigged up in the Sioux City shop to facilitate the banding of armature coils.

Fig. 3. Isometric drawing of new bakeoven as recently installed in Omaha shops.

Fig. 4. New bakeoven at Omaha, showing ventilating duct in floor and ceiling and recording thermometer suspended from ceiling.

Fig. 5. Interior of Omaha bakeoven, showing car used for moving armatures in and out of the oven and manner of supporting armatures in vertical position.

Fig. 6. Dipping tank in the Omaha shops with drain rack on either side made movable to permit putting cover on tank.

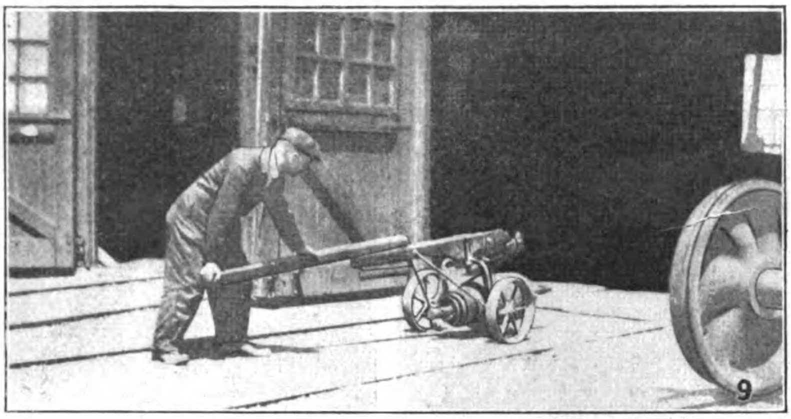
Fig. 7. Interior view of the concrete bakeoven in the Waterloo, Iowa, shops.

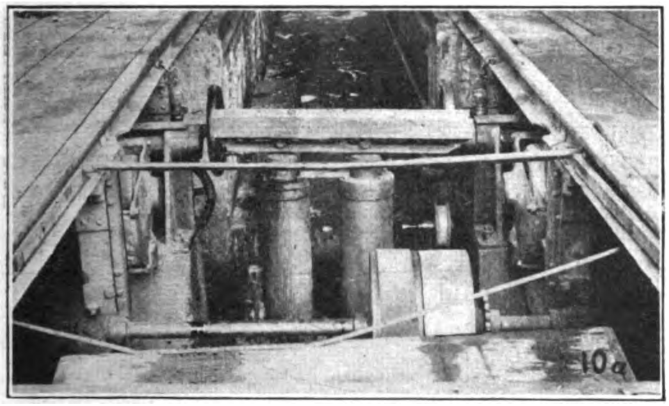
Fig. 8. Handy home-made derrick used for lifting and shifting anything at all about the shops of the Waterloo, Iowa, company

Picturing Iowa Shop Kinks

Various Stereopticon Pictures of Shop Equipment Shown and Discussed at the Recent Omaha Meeting of the Iowa Railway Association

IN ADDITION to the pictures taken to accompany papers presented at the recent Omaha meeting of the Iowa Electric Railway Association, and reproduced with the report of the meeting in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 25, 1920, a number of other pictures were shown as a means of urging master mechanics to describe interesting kinks in use in their shops. These are presented herewith, together with a brief description. C. M. Feist, master mechanic Sioux City Service Company, explained the accompanying picture of the sand drier, Fig. 1, used at his shop. The wet sand is shoveled into the drier through a window in the wall to the rear. As needed, the sand is moved forward in the drier to the portion of the bin which is heated with steam pipes. To begin with, it required twenty-four hours to dry 7 cu.yd. of sand. Later it was found that by pushing a broomstick down through the wet sand at numerous points the evaporation of the moisture was much more rapid and 7 cu.yd. of sand could be dried in twelve hours. The twenty-four-hour time required before this practice was started seemed to prevail whether the drying was done with the drier open or closed. After the sand in this drier has become thoroughly dried it is removed at the bottom by pulling out the series of iron slides seen along the lower front edge of the furnace, each slide having a loop handle.





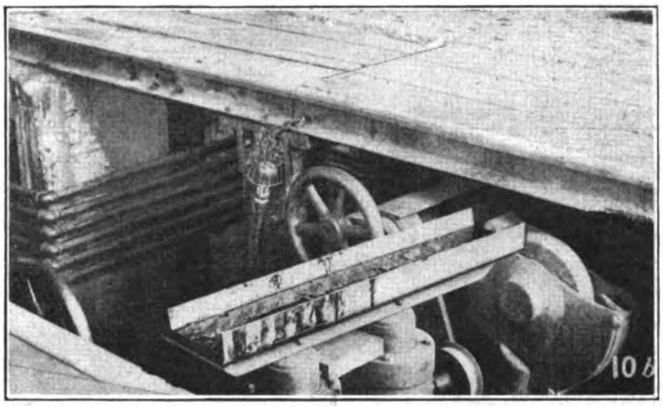
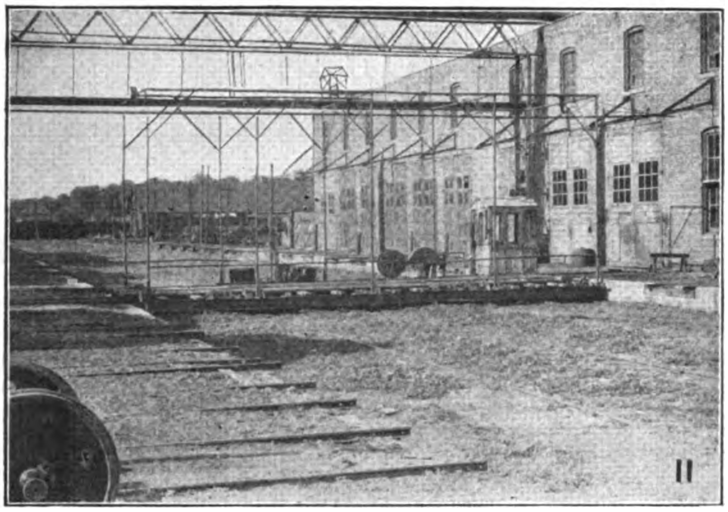
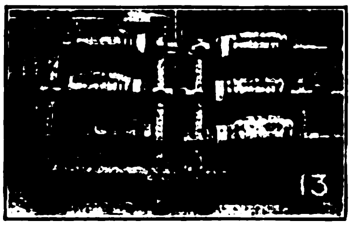
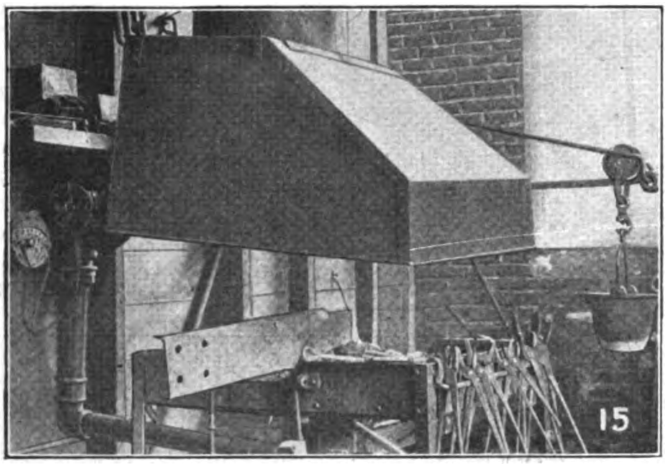


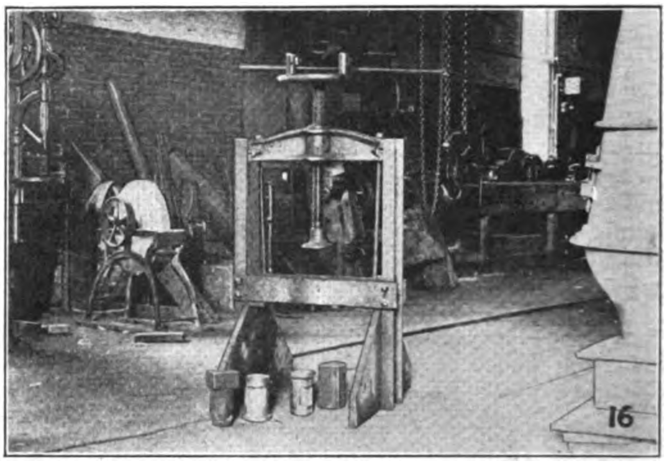
Fig. 9. The Waterloo "mule" found very convenient in transporting armatures. Figs. 10a and 10b. Two views of the hydraulic jack and pit wheel grinder in the Des Moines shops

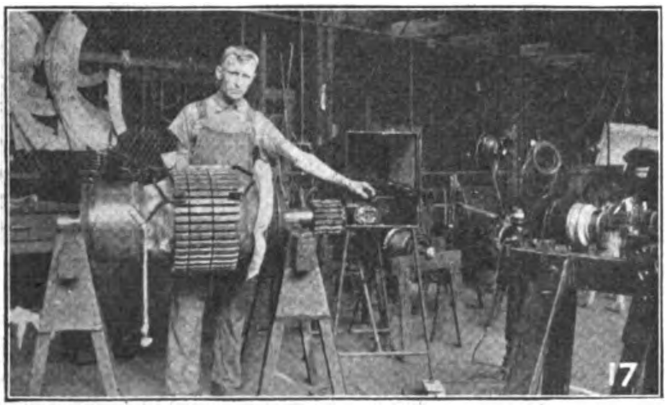
Another piece of equipment from Sioux City that was pictured is used in putting in new armature coils, and another for holding the coils while banding, Fig. 2. The first of these consists of a steel ring ½ in. by 3 in. containing two rows of setscrews laid out to correspond with the slots in the armature. This device is used to force the coils down into the slots solidly and hold them there until they are banded. Caution is taken not to clamp the coils too hard, as this might cause a short circuit, but by forcing them hard against the bottom of the slots all vibration is eliminated. A piece of key stock which fits into the slot is placed between the coil and the setscrew to avoid breaking the insulation as the setscrew is screwed down. The banding of armatures has been done cold up to the present, but it is expected to do it hot in the future. The other device shown in this same picture and having four setscrews and four curved clamps is used to hold the ends of the armature coils while the banding is being done. One of the things which created a great deal of interest both at the Omaha shops on an inspection trip and in the meeting where it was pictured was the new bakeoven recently installed there. An isometric drawing as well as pictures of this oven are shown herewith, Figs. 3, 4 and 5. This oven was laid out according to recommendations made by the Westinghouse Electric & Manufacturing Company. It is built of wood and measures 10 ft. wide by 12 ft. high and 14 ft. long. The walls are made up with 2 x 4-in. vertical members, on the outside of which was placed a layer of 2-in. Johns-Manville thermo fire felt in 24 x 36-in. sheets. On the inside of these two-by-fours were placed two layers of ½-in. Flax-li-mum in 30-in. x 9-ft. sheets, the two layers separated by 1 x 2-in. furring strips placed opposite the 2 x 4-in. studding. This construction left air spaces betwen the two inner linings and the outside lining of the heat insulating material. This same construction was used for the ceiling and for the double doors opening into the end of

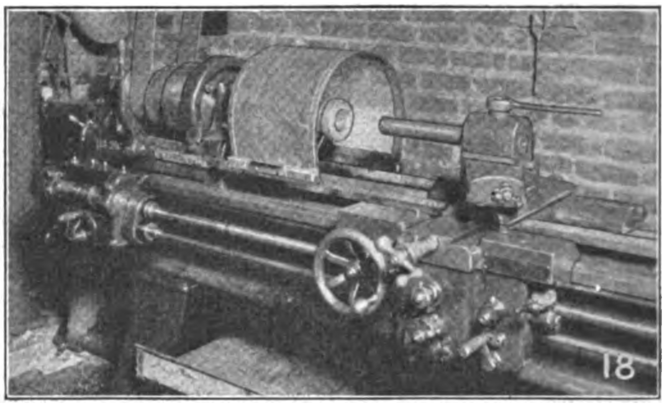


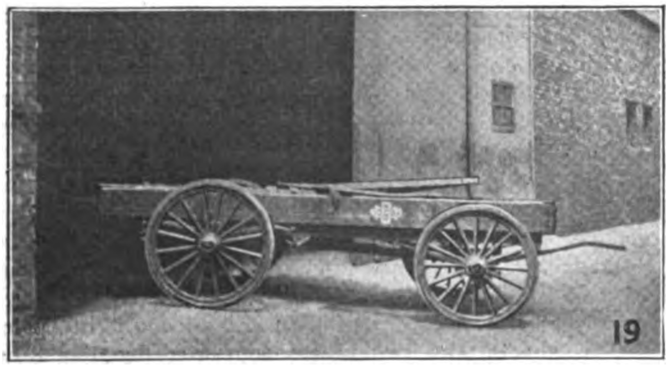












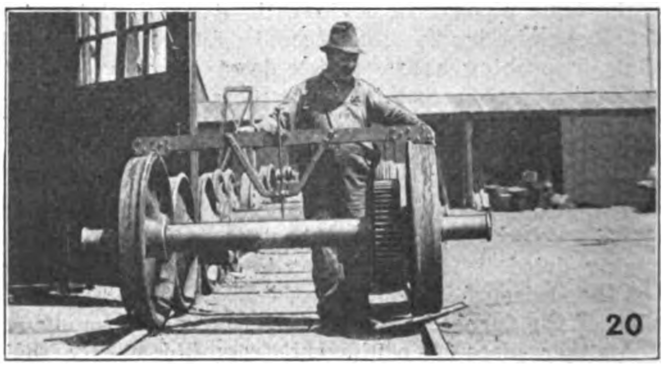


Fig. 11. Transfer table at the Omaha shops equipped with motor-driven "niggerhead" for moving dead cars.

Fig. 12. Method of storing extra armatures at Des Moines.

Fig. 13. Armatures in the Tri-City Railway shops are stored on castor-equipped racks for ready transport from storage to motor assembly room.

Fig. 14. How extra armatures may be neatly stored in the small shop at small expense.

Fig. 15. Counterbalanced hood over blacksmith forge in the Centerville, Iowa, shops.

Fig. 16. Bearing press made out of old cider press in the Centerville, Iowa, shops.

Fig. 17. Small electric oven for warming coils just prior to installation in armatures, Tri-City Railway shops.

Fig. 18. Protection for the eyes of the machinist while boring out brass bearings.

Fig. 19. A handy trailer used in Des Moines for transporting tools and materials.

Fig. 20. Wheel gage used in Waterloo to insure that the wheels shall be pressed on at equal distances from the axle center.

the oven. These doors were faced on the beveled edges with an asbestos rope so that they are as heat proof when closed as the walls.

BLOWER KEEPS AIR CIRCULATING

One of the most interesting features of this oven is the ventilating system. This consists of a small blower which is connected with a ventilating duct along the ceiling of the oven and another installed in the floor. This blower can be made simply to keep the air circulating from the blower through the top duct, down through the oven and returning through the bottom duct to the blower, or by simply adjusting a damper in the blower exhaust pipe the air and gases from the oven may be exhausted outside. When the baking of armatures is first begun it is necessary to exhaust the naphtha gases out into the open to avoid the possibility of an explosion, for an accumulation of these gases might be ignited by the red hot elements of the heaters.

The oven is heated by two sets of heaters, one installed on either side of the oven, on the floor, and protected from above by a steel apron. The temperature within the oven is regulated automatically and is recorded by a recording Bristol thermometer. The temperature to be maintained during any heat is adjustable and is usually made 210 deg. F. for small armatures and 260 deg. F. for the large armatures. The thermometer control permits a variation in temperature of 5 deg. either way from the setting. For each heat a new chart is placed on the recording thermometer, on the back of which is entered the serial number of the apparatus placed in the oven for that heat, and the thermometer then records graphically the exact temperature which prevailed during that heat, so that in the case of any armature failure a check may be made to determine that a proper oven treatment was secured. This also forms a check for the men operating the oven that a proper heat is being maintained.

This graphic recording thermometer, the floor switch, the control switch and the main and sectionalizing switches for the two sets of heaters are all mounted on a standard switchboard panel placed at one side of the oven. The Omaha oven had not been in use long enough at the time of the meeting to determine any operating results, except that considerably better service from the armatures thus prepared was indicated. Armatures are heated over night before dipping and then baked from twenty-four to thirty-six hours.

NOVEL DRAIN RACK CONSTRUCTION

Another interesting part of the equipment used in conjunction with this Omaha bakeoven is the pair of drain racks and dipping vat installed adjacent to the oven. One of these racks was placed at either side of the vat and arranged so that the drippings from armatures laid on them will drain back into the vat. These racks were built with a toggle joint so that they could be hinged back away from the vat in order to make it possible to put a cover on the vat when not in use and thus prevent the rapid evaporation of the dipping fluid. This arrangement can be readily seen in an accompanying illustration, Fig. 6.

W. G. Lamb, Waterloo, Iowa, spoke briefly of the 50-kw. baking oven used in his shop, Fig. 7, which has 8-in. concrete walls, floor and ceiling and insulated steel doors. It measures 10 x 12 x 14 ft. Only natural ventilation is provided, there being openings in the doors and louvres along the sides at top and bottom. The temperature is thermostatically controlled. This oven has so improved the service given by armatures that one man is now able to do the work which formerly required three armature winders in maintaining the 267 machines in use on that property.

Mr. Lamb also described the small derrick car, Fig. 8, which he has found exceedingly useful about the shop. It was constructed entirely of parts removed from old equipment. The underframe is 20 ft. long, the mast 8 ft. high and the boom 26 ft. long. The car weighs 15 tons and it will pick up and swing a 5-ton load. In fact, it will lift considerably more than its own weight will hold down, and for this reason the back end has been provided with anchors for use when it becomes necessary to lift an unusually heavy load. The weight at the rear end of the car was also made as great as possible by mounting the motor on this axle on the outside, while the motor on the forward axle is mounted on the inside. This small derrick car is also equipped with a third motor which operates the hoist and swings the boom, and it has been found very useful in handling wheels and axles, trucks and for various work about the shop. It has even been used for handling special trackwork on the street in a few cases.

In this same picture, incidentally, is shown the turntable which serves the shops of the Waterloo, Cedar Falls & Northern Railway. To overcome the necessity for calling three or four men out of the shop to move the turntable when it is necessary to change its position Mr. Lamb installed an old 12-A motor on it so that it could be moved by power.

In Fig. 9 is seen the Waterloo "mule," which has been found very convenient for transporting armatures about the shop. Its simple construction is readily seen from the picture without description.

PIT GRINDER SAVES TIME

Fig. 10 shows two views of the pit grinder used in Des Moines for truing up slid flat wheels. The yoke across the top of the two hydraulic lift cylinders fits over the axle bearing housings so that the pair of wheels to be ground can be held in a firm position while they are being revolved by the car motor. As the jack raises the pair of wheels up off the rails the short section of rail on either side is taken out and the emery wheels moved up in contact with the car wheels. The latter are then driven in one direction while the emery wheels are driven in the opposite direction by a separate motor mounted in the pit as shown in the illustration.

The showing of these pictures aroused some discussion, in which it was brought out that the advantage of the pit grinders is that wheels can be ground in about the same time that is required when they are put in a lathe, but the time of taking the pair of wheels out from under the car and replacing them is saved. It was also brought out that screw jacks are used in some shops instead of the hydraulic jacks. When running the car motors during this grinding process, Mr. Feist stated that he makes use of a water rheostat to reduce the voltage from 600 to about 110.

Fig. 11 was taken for the purpose of showing the "niggerhead" installed on the transfer table at the shops of the Omaha company. This is found to be very handy in pulling dead cars on and off the transfer table without the need of getting another motor car to do this shifting.

Figs. 12, 13 and 14 show the methods employed to store armatures in the shops of the companies at Des Moines, Davenport and Centerville, respectively. At Davenport they are supported on a frame mounted on ball-bearing castors, which facilitates their handling. By pushing the frame to the point where a motor is being reassembled only one hoist-handling of the armature is necessary in removing it from its storage position and lowering it into the motor frame. Fig. 14 affords a good illustration of how a small shop can take care of its extra armatures in a neat manner with little expense.

Fig. 15 shows an adjustable hood mounted over the blacksmith's forge in the shop of the Iowa Southern Utilities Company, Centerville, Iowa. In this small shop it is sometimes necessary to heat a very heavy piece in the forge. The consequent necessity to build up a big fire formerly filled the shop with smoke and made working conditions disagreeable. This was overcome by installing this hood, which is let down closely over the fire during a heavy heat and then raised out of the way when the heat is completed. The hood is counterbalanced so that it is easily raised or lowered.

In Fig. 16 is shown what was devised by Charles Wells, master mechanic Iowa Southern Utilities Company, Centerville, as a substitute for a bearing press when money was not available for the purchase of a much-needed tool. He purchased the head and screw of an old cider press from a junk dealer and mounted this between two channel-iron supports and thereby devised the press, which has worked out very satisfactorily for the small amount of this kind of work to be done in this small shop.

COILS HEATED TO PREVENT CRACKING

In Fig. 17 is pictured a small electrically heated warming oven which has been found to be of great value in the shops of the Tri-City Railway, Davenport, Iowa. It was found that after armature coils lie in storage for a long period they become rather stiff, so that the fabric is very easily cracked in installing the coils. By putting the coils in this warming oven for ten or fifteen minutes just prior to installation the insulating compound is softened and injuries to the fabric are avoided. The oven is heated by one electric car heater. It is made of sheet steel large enough to hold a bundle of coils and is mounted on legs which bring it up to a convenient height for the armature winder. It is portable, so that it can be moved to any position in the armature room where work is taking place.

The picture of Fig. 18 was taken simply to show the means devised in the Omaha shop to protect workmen from flying chips while boring out brass bearings. This consists of a semicircular steel frame supporting a heavy wire mesh and resting on the lathe bed. By watching his work through the screen, the machinist is fully protected from possible injury to his eyes.

Fig. 19 shows a rubber-tired utility trailer which has been found to be very handy in Des Moines. Tools, materials, etc., can be loaded into it and hauled behind a truck or work car to any particular job, where the trailer can be detached and placed at a convenient point to the work.

Fig. 20 shows the gage used at Waterloo to insure that car wheels shall be pressed on at equal distances from the axle center. The axles are prick-punched at the center and this forms the gage mark to which wheels are subsequently pressed on, making use of the convenient gaging device pictured.

Other pictures shown and discussed at the Iowa convention which have already been published in the ELECTRIC RAILWAY JOURNAL were the following:

Adjuster for installing the springs on gear case covers, page 566, issue of Sept. 20, 1919, as developed at Des Moines.

Reclaiming worn axle bearings in Des Moines, page 565, issue of Sept. 20, 1919.

Shop carriage for fenders, Davenport, page 925, Vol. 54, No. 20, dated Nov. 15, 1919.

Wheel pressing a one-man job in Davenport, page 161, issue of Jan. 17, 1920.

Trolley wheel truing with self-centering chuck, page 374, issue of Aug. 21, 1920.

Unusual Cause for Broken Axle Bearings

AN ELECTRIC railway company with a considerable number of old-type motors on its cars decided to replace these with a modern interpole type. The cars on which this change was made were of a double-truck type and the motors which were used to replace the old type were made by a different manufacturer than were the original motors. Shortly after the re-equipped cars were put in service a considerable amount of trouble developed from worn and broken axle bearings, broken gear cases and broken armature shafts. The railway company's forces were unable to locate the cause of the trouble and so the manufacturer was called upon to determine why the motors would not satisfactorily perform the service. A careful study of the trouble encountered was made and a compilation of results showed that at least 90 per cent of the trouble was with No. 2 motor, while No. 1 motor seemed to give very satisfactory service. Both motors were mounted upon one truck of the car and the other truck was used as a trailer.

One of the cars was given a test run with the trap doors open to permit watching of the operation of the motors. It was found that in notching up the control and while going into transition from series to the parallel position the No. 2 motor gave an unusually severe kick, which apparently subjected the parts of this motor to severe mechanical strains. This condition was checked up by running the car in both directions and while operating the controller from either end of the car. The results were the same in all cases.

With this information at hand the electrical department checked up the current peaks as they occurred on each notch of the control and while changing from the series to the parallel position. It was found that the grid resistors, which were arranged for the old-type motors, required rearrangement in order to give proper stepping with the new equipment. This rearrangement was made and further tests showed that the severe kick had been eliminated. Further service with the equipment changed showed that this had been the cause of the trouble as the repeated breakage of bearings, shafts and gear cases stopped.

An investigation to determine the stresses in steel car wheels, similar to the work recently completed on chilled iron wheels, has recently been undertaken by the Bureau of Standards, Washington, and tests on six of the wheels were completed during October.

Copper, Zinc, Tin and Their Alloys

The General Use of These Metals and Their Alloys by Electric Railways Is Covered, Together with Examples Taken from Various Specifications

BY NORMAN LITCHFIELD

COPPER is, without doubt, the one material which differentiates electric industries from all others. While on the one hand it is the metal which history shows was the first to be used by man, on the other its greatest demand came with the development of the use of electricity. This is because copper holds in a marked degree the combined qualities of low resistance to the passage of an electric current, high ductility, permitting it to be drawn into wire, little or no tendency to corrode by atmospheric action and comparative inexpensiveness.

The steam railway gets along very well with a comparatively small amount of copper, its chief dependence being on iron and steel, but an electric railway without copper is unthinkable.

At the present time copper is divided commercially into two chief grades, *viz.:*

1. Lake copper, which is obtained from the Michigan mines.
2. Electrolytic copper, which is obtained by an electrolytic process from the ores found in the Western states.

A third and lower grade is that known as "Casting Copper," made or recovered largely from brass foundries.

An interesting note on this customary classification is given in the A. S. T. M. specifications for lake copper, reading as follows:

> These specifications have been drawn to cover the peculiar trade situation which has classified the large production of copper from this geographical district as a product in a class by itself. It is realized that a better classification from an academic point of view could be made by method of production or by chemical composition, but the trade does not yet seem ready for such a step.

For electric railways copper (unalloyed) is used most largely in the form of wire, and to a lesser extent as bars and castings.

HIGH CONDUCTIVITY IS IMPORTANT

The all important quality for electrical purposes is its ability to carry current, or its conductivity, and as this feature depends upon the purity of the copper, *i.e.*, its freedom from other elements, the grade of the copper is really rated by this quality, although it is customary to allow any percentage of silver, as the latter's qualities of ductility and conductivity are equally as good as those of copper. The simplest way of determining this purity is by measuring the resistivity, and this method has come into general use in recent years, as is fully explained in a note appended to the A. S. T. M. standard specifications for soft copper wire:

> Electric conductivity was formerly expressed as a percentage on the basis of determination made by Matthiessen about 1865 of the electric resistivity of supposedly pure copper. Since that time the methods of refining copper have advanced, so that it is not uncommon to find copper of more than 100 per cent conductivity on the Matthiessen basis. There has until recently not been international agreement on the electric resistivity of copper to be considered the standard for the expression of conductivity. While international agreement upon the value 0.15328 ohm per meter-gram at 20 deg. C. for the resistivity of copper equal to 100 per cent conductivity was reached by the International Electrotechnical Commission in 1913, it has been deemed preferable to express the requirements in standard specifications in the terms of quantities directly measurable, rather than by reference to some quantity whose standard value is the subject of agreement only. The use of the arbitrary term "conductivity" has no more warrant than the employment of arbitrary gage numbers. Therefore in these specifications the requirements are stated as the maximum rejection limits to the resistivity.

Lake copper is again divided into two subgrades: (1) Low Resistance Lake and, (2) High Resistance Lake.

According to the A. S. T. M. standard specifications, Low Resistance Lake wire bars are required to have a resistivity not exceeding 0.15535. Ingots and ingot bars are permitted to have resistivity not exceeding 0.15694. High Resistance Lake has a resistivity greater than 0.15694.

All the above figures are given in international ohms per meter-gram at 20 deg. C. (annealed). The purity of the Low Resistance Lake is required to be at least 99.880 per cent, silver being counted as copper. The High Resistance Lake is required also to have a purity of 99.880 per cent, but in this case silver and arsenic are both counted as copper. In both cases the purity is to be determined by the electrolytic assay. Electrolytic copper is required to have the same qualities of purity and resistivity as the Low Resistance Lake copper.

MECHANICAL PROPERTIES OF COPPER DISCUSSED

Aside from the purely electrical features already discussed, certain mechanical properties are of importance in the successful use of copper in electrical industries. Chief among these are the tensile strength and the ductility.

Copper has a tensile strength running from about 35,000 lb. per square inch in the annealed state up to over 60,000 lb. per square inch in the smaller sizes of hard-drawn copper wire. This quality is largely affected by drawing, the tensile strength running from 49,000 lb. per square inch in a wire of 0.460 in. diameter up to 67,000 lb. per square inch with diameter of 0.040 in. The elongation reduces naturally from 3.75 per cent in the first case to 0.85 per cent in the other.

The necessary selection must be made of the proper physical qualities for the particular purpose in hand. Thus ordinary insulated wire and cable must be flexible and hence require copper having a tensile strength running from 36,000 to 40,000 lb. per square inch, with an elongation in 10 in. of from 30 to 10 per cent. Other properties of this grade of wire are given in the A. S. T. M. tentative specification for tinned soft or annealed copper wire for rubber insulation, Serial No. B 33-19 T. The resistivity reduced to pounds per mile ohm at 20 deg. C. runs from 938.20 in the smaller sizes (0.003 to 0.011 in. diameter) to 896.15 in the larger sizes (0.460 to 0.290 in. diameter).

On the other hand, trolley wire necessarily demands the use of copper of considerably greater strength.

Thus, in the A. E. R. E. A. standard specification for round and grooved high conductivity trolley wire physical properties are required as follows:

Area, Circ.mil	Tensile Strength, Lb. per Sq.In.		Elongation in 10 In., per Cent
	Min.	Max.	
211,600	49,000	53,000	3.75
168,100	50,000	54,000	3.25
133,200	51,600	56,000	2.80

The specification further requires a twisting test, "for the purpose of determining defects which may be prejudicial to the life of trolley wire, owing to its peculiar service, as compared to that of copper wire for other purposes," as follows:

Area, Circ.mil	Twists in 10 In.
211,600	8
168,100	9
133,200	10

The wire is required to be "twisted to destruction and not to reveal any seams, pits, slivers or surface imperfection not consistent with the best commercial practice."

The effect of tinning copper wire is given in the A. S. T. M. specifications: "The coating of tin on copper wire is for the purpose of protecting the copper against the action of the rubber insulation. It is therefore necessary that the coating be continuous. The test in a sodium-polysulphide solution is therefore prescribed for the purpose of determining whether or not the wire carries a continuous envelope of pure tin. Under the same conditions of tinning the coating on all sizes of wire, excepting on fine wire, is approximately the same. The coating on fine wire is generally relatively heavier than that on coarse wire.

"It has been found that the tin coating on copper wire consists of two parts, an envelope of pure tin on the outside, with an intermediate layer of copper-tin alloy. This tin alloy, as well as the amount of tin present, has an effect on the resistivity of the wire. Since the relative amount of tin coating and alloy is greater on the small wire than it is on the coarser wire, the resistivity of the wire increases as the size decreases. This also accounts for the decrease in elongation due to tinning soft wire."

The foregoing covers in a general way some of the chief uses of pure copper in the railway field. The next consideration is the use of copper in some of its alloys.

COMPOSITION OF BRASS AND BRONZE

Brass consists of copper and zinc and is probably the most widely used alloy of copper. The composition should always be borne clearly in mind in order that brass be not confounded with the other important material, bronze, which is an alloy of copper and tin. The terms are quite generally mixed up in common use, a notable instance being the use of the term "journal brass," the metal of which in reality is an alloy of copper, lead and tin. A great variety of brasses are made having varying proportions of copper and zinc, the ordinary alloys running from a minimum of about 55 per cent copper up to nearly 100 per cent.

The color of the resulting alloy varies with the amount of copper contained therein, and hence it has always been more or less customary to differentiate the variation of some sort of color nomenclature. This is more or less of an indefinite matter, but this year one of the committees of the A. S. T. M. has attempted to define a series of limits of composition for the various color designations, as follows:

Yellow brass, containing from 63 to 80 per cent copper and having a yellow or brass color. Typical composition zinc 30 per cent, copper 70 per cent.

Red brass, containing more than 80 per cent copper, the color varying from a golden to a copper red. Typical composition zinc 15 per cent, copper 85 per cent.

Yellow red brass, containing from 55 to 63 per cent copper and having a yellowish red color.

In addition to the straight brasses, which as before pointed out are alloys of copper and zinc alone, there are many varieties of special brasses in which a small amount of some other metal or metals is added in order to impart certain special qualities. These have been known by various names, such as manganese bronze. Tobin bronze, leaded brass, etc.

In the term "manganese bronze" we have another misnomer, inasmuch as it is in reality a brass, and furthermore in the finished product there is practically no manganese, a small amount of the latter only having been used as a deoxidizer and disappearing in the process of manufacture. Its composition as given in the A. S. T. M. specification is: Copper, 53 to 62 per cent; zinc, 36 to 54 per cent; aluminum, 0.05 to 0.5 per cent; lead, not over 0.15 per cent.

Its physical properties are considerably above those of ordinary brasses—tensile strength, 70,000 lb. per square inch; elongation in 2 in., 20 per cent.

Likewise "Tobin bronze" is a trade name for a brass which is said to contain about 58 per cent copper, 40 per cent zinc and the balance tin, iron and lead. "Free cutting" brass contains about 3 per cent lead, which is added to improve the machining qualities, particularly for threading. For these and other special alloys the A. S. T. M. committee has recommended: "In cases where other metals are added to the brass in small amounts these brasses be designated by the use of the proper prefix or prefixes, thus:

Lead Brass, such as lead, 1 per cent; zinc, 33 per cent; copper, 66 per cent.

Tin Brass, such as tin, 0.5 per cent; zinc, 39.5 per cent; copper, 60 per cent.

Manganese-tin-brass, such as manganese, 0.50 per cent; tin, 1 per cent; zinc, 38.50 per cent; copper, 60 per cent.

COMPOSITION OF FORGING BRASS

To obtain a brass which can be forged and easily machined, the copper content is kept down around 60 per cent and small amounts of iron and lead are added, the A. S. T. M. specification being: Copper, 58.5 to 61.5 per cent; lead, 1.5 to 2.5 per cent; iron, not over 0.15 per cent; materials other than copper, lead and zinc, not over 0.35 per cent; zinc, remainder.

This material will stand flattening while hot, until reduced to 20 per cent of the original length, without cracking. With regard to this material an explanatory note is added: "The material exhibits a very considerable variation in properties with slight changes in composition. Its strength, stiffness and ability to stand forging operations are in inverse proportion to the copper content; so also is the amount of lead which the alloy can contain without producing hot shortness. Toughness, on the other hand, is directly proportional to the copper content."

As before stated, bronze is an alloy of copper and tin, containing more than 50 per cent of copper. The tin content runs from about 4 per cent to 25 per cent.

In this class are a great variety of alloys, a characteristic one used industrially being "gunmetal," whose composition is: Copper, 86 to 89 per cent; tin, 8 to 11 per cent; zinc, 1 to 3 per cent. Its physical properties are: Tensile strength, 30,000 lb. per square inch; elongation in 2 in., 14 per cent.

A variety largely in use for car hardware is that known as "statuary" bronze, which contains a small amount of lead and on exposure to the air takes an "oxidized" finish.

Bronze is used to a considerable extent for trolley wire chiefly on account of its resistance to wear. Standard specifications do not call for a given chemical composition, but simply require that the bronze shall be of "such nature and composition as to secure, by proper treatment, the qualities desired." Two grades are covered by the specification, one to have a conductivity of 40 per cent and the other 65 per cent, figured according to the International Annealed Copper Standard, which is 0.15328 ohm per meter-gram at 20 deg. C.

The 40 per cent conductivity wire is required to have a tensile strength of about 70,000 lb. per square inch, and the 65 per cent about 60,000 lb. per square inch. This is as compared to the plain copper trolley wire having a tensile strength of about 50,000 to 55,000 lb. per square inch.

KINDS OF BEARING METALS USED

The alloys commonly used for bearings are of four kinds: Copper base with more than 50 per cent copper; tin base with more than 50 per cent tin; lead base with more than 50 per cent lead, and zinc base with more than 50 per cent zinc.

The bearings in general use for car truck journals and motors consist of a so-called "phosphor" bronze lined with "babbitt." The term "phosphor" bronze really does not describe the metal, as only a very small amount of phosphorus is added to the metal, and the purpose of it is simply to act as a cleanser during the process of manufacture, there being practically none left in the alloy when completed.

The American Railroad Association (M. C. B.) has a standard specification for bronze for journal bearings, which permits two alternative compositions, as follows:

	A per Cent	B per Cent
Lead	24.0 to 30.0	8.0 to 16.0
Tin, not less than	4.0	7.0
Copper, not less than	65.0	Not over 82.0
Zinc and other impurities, not more than	3.0	3.0

The A. S. T. M. has prepared a tentative specification for car bearings, serial No. B 17 - 18 T, which provides as follows: Lead, 17.0 to 22.0 per cent; tin, 4.0 to 6.0 per cent; zinc, maximum 2.5 per cent; iron, maximum 0.40 per cent; antimony, 0.50 per cent; copper, remainder. Total impurities, including zinc, maximum 3.0 per cent.

The A. R. A. (M. C. B.) committee on specifications and tests for materials presented at the convention in June of this year a report calling for a revision of the standard A. R. A. (M. C. B.) specification, so that it will be as follows:

	A per Cent	B per Cent
Lead	16 to 24	24 to 30
Tin	5 to 7	4 (minimum)
Total of other impurities, maximum	4	3
Copper	67 to 77	63 to 72

"The owner of the equipment on which the bearings are to be used shall specify which class of metal is desired. If he does not do so, metal of Class A shall be furnished."

It is to be understood that the foregoing is not yet a standard of the A. R. A., but is simply the recommendation of the committee. It is possible also that some action may be taken to bring the specifications of the A. R. A. and the A. S. T. M. into agreement.

The present A. R. A. (M. C. B.) standard specification for lining metal is as follows:

	Up to ⅛ In. Thick	⅛ In. Thick and Over
Lead	94.0 to 96.0 per cent	Not over 88.0 per cent
Antimony and tin	3.0 to 5.0 per cent	Not over 17.0 per cent
Tin	0.50 to 1.5 per cent	....
Other impurities, not over	0.5 per cent	0.75 per cent

The A. S. T. M. tentative specification for lining metal, Serial No. B 17 - 18 T, calls for copper, 0.50 per cent maximum; tin, 4.5 to 5.5 per cent; zinc, none; antimony, 9.25 to 10.75 per cent; arsenic, 0.20 per cent maximum; lead, remainder. Total impurities, maximum 0.75 per cent.

The A. R. A. committee report this year recommends the following for lining metal:

	C per Cent	D per Cent
Tin	3 to 5	0.5 to 1.5
Antimony	8 to 10	....
Antimony plus tin	12 to 14	3 to 5
Arsenic, maximum	0.2	....
Total of other impurities, maximum	0.5	0.5
Lead	85 to 88	94 to 96

"Metal of Class C is for linings of a nominal thickness over ⅛ in., metal of Class D is for linings of ⅛ in. or less in nominal thickness. Either composition of the back may be used with the composition of lining metal specified for the thickness of lining which is ordered."

A. E. R. A. HAS NO STANDARD SPECIFICATIONS

In passing it may be noted that the American Electric Railway Association has never adopted any standard specification for either bronze or lining, although A. R. A. specifications are used by many of the electric railways for journal bearings. Another generally used specification for journal bearings is the following:

Bronze.—Copper, 77 per cent; lead, 15 per cent; tin, 8 per cent; phosphorus, 0.2 per cent.

Lining.—Lead, 85 per cent; antimony, 10 per cent; tin, 5 per cent.

For armature and motor bearings a high class "phosphor" bronze is quite generally used by electric railway companies in this country having the following composition:

Copper, 84.00 per cent; lead, 0.50 per cent; tin, 12.00 per cent; zinc, 3.50 per cent.

Lining metal.—Tin, 83⅓ per cent; antimony 8⅓ per cent; copper, 8⅓ per cent.

Attention is called to the fact that the lining material above quoted has a tin base, which makes it expensive, but this composition is particularly desirable for armature bearings on account of the high speed of the shaft and difficulties of lubrication. This is a true "babbitt" metal, the term applying strictly only to tin base bearing metals having over 50 per cent tin in their composition. The journal linings are therefore not strictly "babbitt," but should rather be termed "lead lining metal."

To sum up, we may make use of the following tabular form for the alloys in common use:

1. *Pure Copper:*
   - Lake
     - Low resistance
     - High resistance
   - Electrolytic
   - Casting
   - (a) Wire:
     - Cable (annealed).
     - Trolley wire (hard drawn).
   - (b) Bars for buses, etc.
   - (c) Castings for terminals, controller fingers, etc.
2. *Brass.*—Compound of copper and zinc (over 50 per cent copper):
   - (a) Yellow brass, typical composition, copper 70 per cent, zinc 30 per cent.
   - (b) Red brass, typical composition, copper 85 per cent, zinc 15 per cent.
   - (c) Yellow red brass, typical composition, copper 60 per cent, zinc 40 per cent.
   - (d) Special brasses, such as "Manganese Bronze," "Tobin Bronze," "Leaded Brass," "Forging Brass," etc.
3. *Bronze.*—Composed of copper and tin (over 50 per cent copper). Typical composition, copper, 90 per cent; tin, 10 per cent.
4. *Bearing Metals:*
   - (a) Copper base (over 50 per cent copper, such as journal brasses), copper, 65 per cent; lead, 30 per cent; tin, 5 per cent.
   - (b) Tin base (over 50 per cent tin, such as lining for armature brasses), tin, 83½ per cent; antimony, 8¼ per cent; copper, 8¼ per cent.
   - (c) Lead base (over 50 per cent lead, such as lining for journal bearings), lead, 85 per cent; antimony, 10.4 per cent; tin, 5 per cent.
   - (d) Zinc base (over 50 per cent zinc). Not in general use.

It has been impossible in the limits of an article such as this to give other than an outline indicating the general nature and use of these metals and their alloys. And it must be remembered that any specification does no more than the recipe book of the housewife, providing simply the basis on which a good cook can produce a good loaf of bread. And so in the handling of these copper alloys a great degree of experience is necessary in their manufacture, as it has long been recognized that brass founding is one of the most difficult of arts. The figures given herein are therefore merely illustrative and are used simply to give a slight indication of the nature and the use of these materials on electric railways.

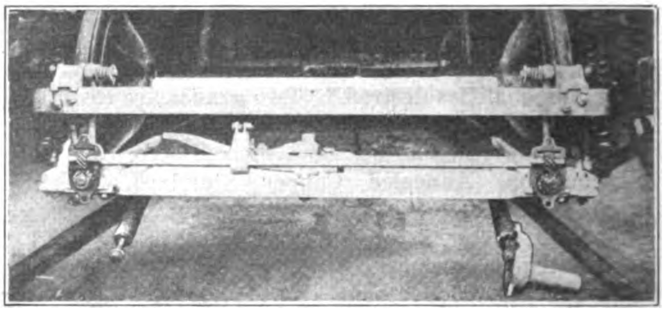
Fire and accident hazard have been almost wholly eliminated by the use of gas for removing and setting locomotive tires in the shops of the Colorado & Southern Railroad. Also less space, time and fuel are required by the use of gas burners which fit around the circumference of the tire, which is chained into position and all ready to be set when the expansion is sufficient. Formerly it was necessary to heat the tires over wood or forge fires and then handle them while hot. Later, liquid fuel burners were devised to heat the tires while in place, but the heat control was difficult, and the danger of fire and accident was very serious.

New Type Brake Adjuster

A DEVICE for the convenient adjustment of the brakes on surface cars has been designed by S. Thomas, engineer of the Peckham Truck & Engineering Company of London. It consists of a geared arrangement which can be fitted to any type of truck, and the adjustment of the brake rigging is accomplished by turning a ratchet pawl.

The advantages claimed for this device are:

That it adjusts all brake shoes evenly and simultaneously, so that all the brake shoes have proper clearance from the wheels, thereby insuring perfect braking of the car.



HAND ADJUSTER FOR BRAKE RIGGING

That it is so constructed that it is impossible to adjust one pair of brake shoes without adjusting others.

That it is impossible to adjust the brakes so that the shoes will be too tight against the wheels.

That the adjusting mechanism is entirely encased in a dust tight grease box and is always free from dirt.

That once adjusted it is not necessary to readjust the brake rigging every time that old brake shoes are replaced with new ones, as the nuts on the brake rods are slackened off evenly.

To renew worn out brake shoes, the pawl of the ratchet lever on the adjuster shaft is released and the adjuster shaft is then turned with a spanner wrench. This will slacken the brake shoes from the wheels evenly and the old shoes can then be replaced with new ones. The ratchet pawl can then be allowed to fall into position again.

Charring Does Not Preserve Wood

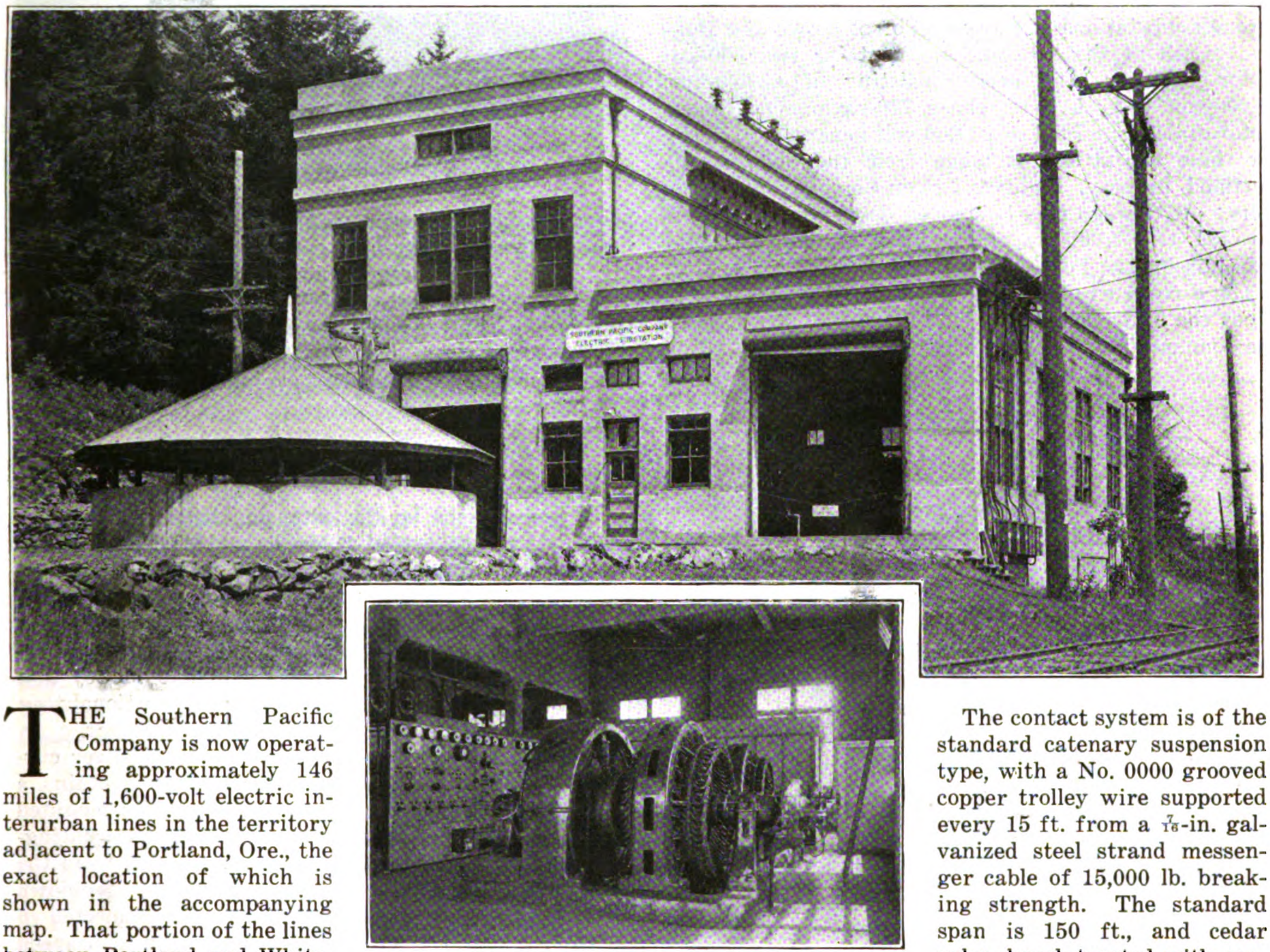
CHARRING is of little value in protecting the butts of fence posts and telephone poles from decay. This is shown by service tests made by the United States Forest Products Laboratory on fences of charred and untreated posts of various species. The charred posts proved in these tests to be even less durable than the untreated ones.

Theoretically, an area of charred wood around a post should prevent decay, because charcoal does not decay or encourage the growth of fungi. But the charred area around a post is not usually a solid covering. It is checked through in many places. If posts are seasoned before they are charred the charring does not reach to the bottom of the season checks which are always present. If green unchecked posts are charred checks will open through the charred part as the wood seasons. In either case the uncharred center of the post is exposed to fungus infection and will decay as rapidly as any untreated wood. Charring deep enough to resist decay would undoubtedly weaken a post of ordinary size.

Substation Layout of Southern Pacific Company in Oregon

Power for 1917 Extension of Interurban Lines Furnished from Substation with Outdoor High-Tension Construction—Two-Unit Rotary Converter Sets Installed

By PAUL LEBENBAUM
Electrical Engineer Portland Division Southern Pacific Company



EXTERIOR AND INTERIOR VIEWS OF OSWEGO SUBSTATION

The upper view shows the 1,000-kw. substation at Oswego, with indoor switching equipment. The lower view shows the 500-kw. synchronous motor-generator sets in this substation.

THE Southern Pacific Company is now operating approximately 146 miles of 1,600-volt electric interurban lines in the territory adjacent to Portland, Ore., the exact location of which is shown in the accompanying map. That portion of the lines between Portland and Whiteson, a total of 103 miles, was placed in operation in January, 1914. Articles descriptive of this appeared in the issues of the ELECTRIC RAILWAY JOURNAL for Feb. 14, 1914, page 359; July 10, 1915, page 57, and Sept. 10, 1915, page 562.

In June, 1917, an extension to the foregoing electrification was placed in service, comprising 43 route-miles of track between Whiteson and Corvallis. A brief résumé of the main features of the earlier construction may not be out of place at this time. The contact system and, of course, the rolling-stock are common to both sections. The differences, appearing principally in the substations, are illustrative of the advance in the art of designing railway conversion apparatus during the time intervening between the purchase of the first sets in 1911 and the newer sets in 1916.

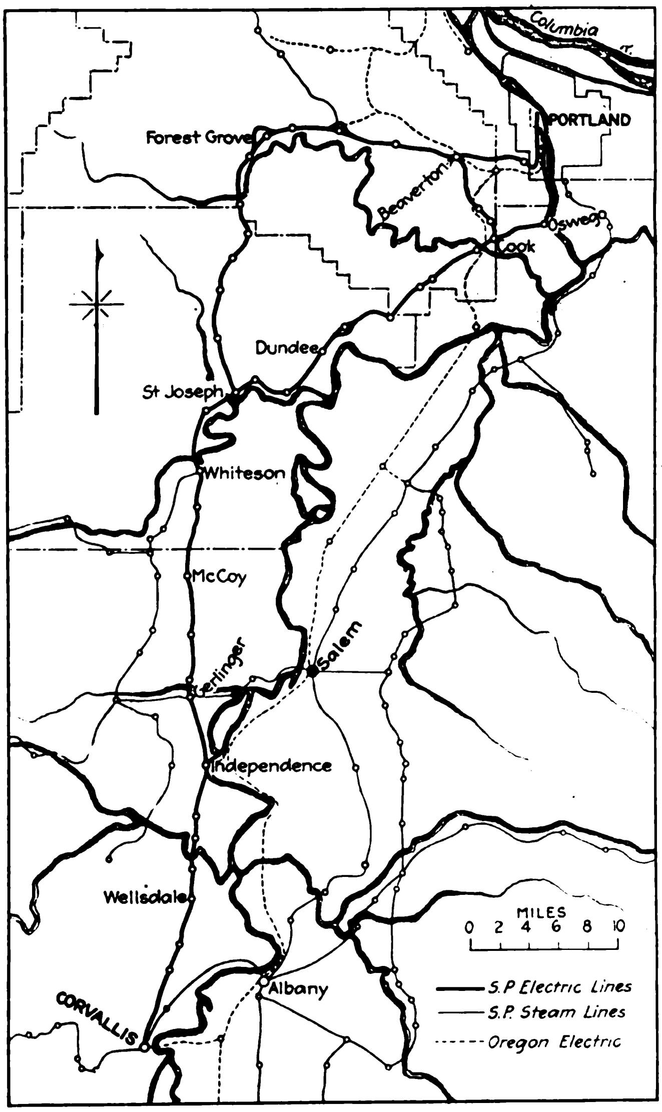
The contact system is of the standard catenary suspension type, with a No. 0000 grooved copper trolley wire supported every 15 ft. from a $\frac{7}{16}$-in. galvanized steel strand messenger cable of 15,000 lb. breaking strength. The standard span is 150 ft., and cedar poles, brush-treated with carbolineum, were used. As a result of favorable experience with the preservative treatment it was decided to give all poles used in the extension from Whiteson to Corvallis an open-tank treatment with creosote. Steam, obtained from an existing boiler plant, was fed through coils laid on the bottom of the treating tanks. The poles were set in the cold oil and the temperature was raised until it registered between 215 deg. and 220 deg. F. The length of time at which the oil was maintained at this temperature varied from fifteen minutes for a run of well-seasoned poles to two hours or more for the greener poles. A satisfactory penetration was obtained, ranging from $\frac{1}{2}$ in. to 1 in.

In the operation of the road, trains are made up with from two to six cars, both motors and trailers, in the ratio of one trailer to every two motor cars. All cars are steel, the motors weighing 51 tons and the trailers 35. The motor equipment consists of four GE-205B 110-hp. motors, with Sprague-General Electric type M multiple-unit control. There are in use thirty-eight motor cars and eleven trail cars, and there have been ordered for delivery in 1921 six additional motor cars and six trail cars. This will bring the total number of cars, including eight cars for mail, baggage and express, up to sixty-one. All freight trains are operated by steam locomotives.

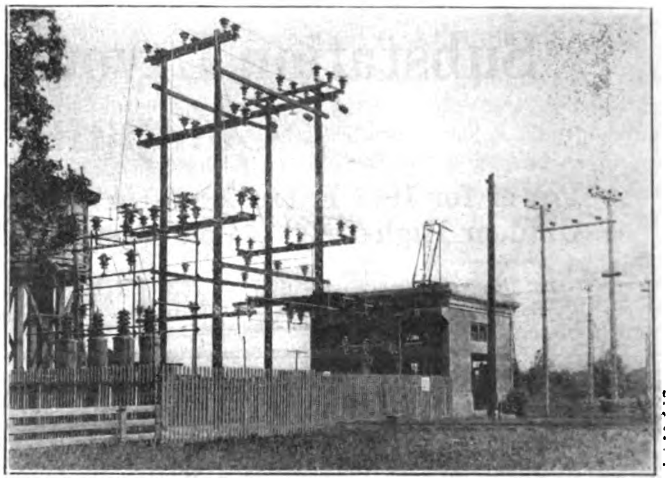
EARLY 1,600-VOLT GENERATORS SUCCESSFUL

For the lines between Portland and Whiteson direct current at 1,600 volts is supplied to the contact system through substations at Oswego, Forest Grove and Dundee. Each of these substations contains two 500-kw. motor-generator sets, each consisting of a 560-kw., 13,000-volt, 60-cycle, three-phase, 720-r.p.m. synchronous motor direct-connected to a 1,600-volt generator. Energy for these substations is taken from the lines of the Portland Railway, Light & Power Company at 55,000 volts. At Oswego this is stepped down to 13,200 volts through two 1,000-kw., three-phase transformers for transmission to Forest Grove and Dundee.

The direct-current generators, ordered in 1911, were about the first machines to be built with 1,600 volts on one commutator. They are equipped with commutating poles, but have no compensating pole-face windings or flash-barriers. Everything considered, they are operating in a satisfactory manner; flashovers occur occasionally, but they are seldom of a serious nature. During the winter, when the heating load is added to the regular traction load, the two sets at Oswego often carry a maximum half-hour average load of 1,200 to 1,400 kw.



MAP OF SOUTHERN PACIFIC COMPANY'S ELECTRIFIED LINES IN OREGON



WELLSDALE STATION, SHOWING OUTDOOR HIGH-TENSION APPARATUS

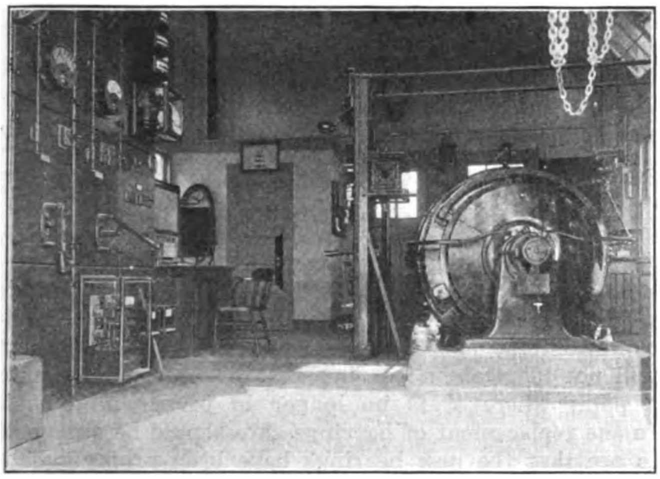
NEW SUBSTATIONS ARE OF ROTARY CONVERTER TYPE

The substations on the extension between Whiteson and Corvallis are located at McCoy and Wellsdale. They are supplied with energy at 55,000 volts, delivered at Salem by the Portland Railway, Light & Power Company to the transmission line of the railroad. From Salem to Gerlinger this line is on the company's right-of-way; at Gerlinger it branches north to McCoy and south to Wellsdale. Open-air, pole-top sectionalizing switches are located in each branch at Gerlinger.

Sixty-cycle rotary converters are used to deliver current to the contact system. Each station contains a 1,000-kw. set, consisting of two 500-kw. units mounted on a common base with three bearings. The alternating-current ends of these units operate in parallel from the doubly-wound secondaries of the three-phase step-down transformer. The direct-current ends are connected in series to give 1,600 volts. The rotaries run at a speed of 1,200 r.p.m. The over-all dimensions are 4 ft. 5½ in. x 5 ft. 7¾ in., with a height of 4 ft. 10¼ in. The total weight of the set is 22,250 lb.

All high-voltage alternating-current apparatus is situated outside the building. This permits a very compact arrangement of the apparatus inside of the building, with the result that the inside dimensions of the building are only 19 ft. x 22 ft. The transmission line ends at a pole-top, fused switch, operated by a lever from inside the station. Choke coils and a four-tank electrolytic arrester afford protection against lightning and other line disturbances. The step-down transformer is star-connected on the primary side with a doubly-wound secondary of 480 volts. Each secondary winding is tapped at the center to obtain starting voltage for the converters. This makes a total of eighteen secondary leads.

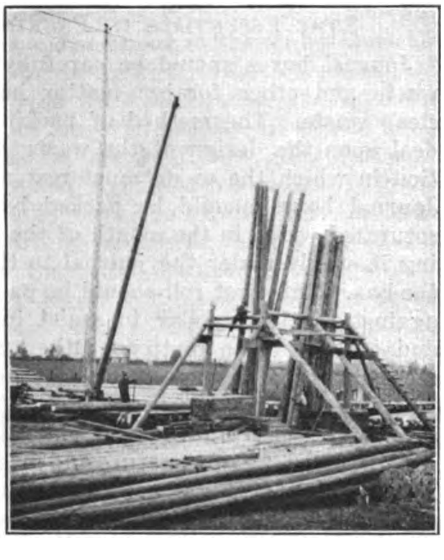
The rotaries are six-phase, diametrically connected through suitably interlocked starting and running oil



INTERIOR OF WELLSDALE SUBSTATION, CONTAINING ONE 1,000-KW. TWO-UNIT ROTARY-CONVERTER SET

switches to the secondary leads. The oil circuit breakers are manually operated and provided with low-voltage release coils. In starting, the "low" machine is first put on the line at starting voltage, direct-current polarity is fixed in the usual manner, and then the machine is thrown on full voltage. The same operations are performed in starting the "high" machine. The negative circuit breaker and switch are closed, then the positive breaker, and finally the closing of the positive switch, which is interlocked with the breaker, places the machine on the line.

The set is guaranteed to carry 300 per cent load momentarily. On a test load of 2,500 kw. the direct-current breakers were opened without any sign of sparking at the commutators. The only protection against flashing is the feeder resistance of 0.12 ohm between the machine and the first tap to the contact wire. Flashing occurs at infrequent intervals and is caused mainly by line or equipment trouble. The machines were originally equipped with soft graphite brushes, which threw a great deal of dust around the station when the commutators flashed over. More recently a harder type of carbon brush was substituted. It gives apparently the same highly polished commutating surface as the graphite brush, but has the advantage of not disintegrating on flashover to the same extent as the other brush. There have been no flashovers between collector rings.



POLE-TREATING PLANT, ST. JOSEPH, ORE.

The transformers are water-cooled. Water is supplied from a well at each station and raised to the water tank by means of a motor-driven triplex pump. From the tank the water flows by gravity through the transformers back to the well.

A motor-driven air-compressor is provided for blowing out the machines.

On the switchboard, besides the usual ammeters and voltmeters, there is a graphic recording wattmeter, measuring the incoming power, and a wattmeter indicating the wattless component of the incoming energy.

The substations, completely equipped and ready for operation, cost approximately $25 per kilowatt.

Creeping of Rails

Dr. J. A. L. Waddell Inaugurates Investigation by Means of Questionnaire — Subject Should Receive Attention of Engineers of Way

IN A PAPER presented before the American Society of Civil Engineers in New York City on Nov. 3, 1920, Dr. J. A. L. Waddell gave the results of a canvass which he had made, on behalf of a client, to determine the facts regarding rail creepage. He used the following questions in his investigation, and they are reprinted here for the convenience of way engineers of electric railways who may desire to contribute the results of their experience.

1. What troubles, in your experience, are engendered by the creeping of rails?
2. Is rail creeping proportional to the amount of traffic passing over a track?
3. With the traffic in one direction only, is the creeping greater on down grade or up grade, and to what extent?
4. On a single-track line, is the creeping greater in the direction of the heavy traffic, and, if so, to what extent?
5. On what portions of your line do you find the greatest creeping of rails—on tangents or on curves?
6. Does the degree of curvature affect the amount of creeping?
7. Does one rail in a track ever creep more than the other? Under what conditions?
8. For the same train loads, is the creeping greater on light rails or on heavy ones, and, if so, to what extent?
9. Does the amount of creeping vary with the nature of the roadbed, and with the kind and depth of the ballast, and, if so, to what extent?
10. Does the amount of creeping vary with the temperature and weather conditions?
11. Does the amount of creeping vary with the character and efficiency of the rail splicing, and, if so, to what extent?
12. Does the amount of creeping depend on the use or the non-use of rail-chairs or of tie-plates, and, if so, to what extent?
13. Have you found any satisfactory method of checking or of lessening creeping, and, if so, what is it?
14. Have you evolved any theory as to the causes of rail creeping, and, if so, what is it?
15. Have you had any computations made as to the resultant force causing creeping under specific conditions?
16. Is there any information on the subject that you can furnish, not covered by the preceding questions, and, if so, what?

The National Research Council has established a Research Information Service as a general clearing house and information bureau for scientific and industrial research. This "Service" on request supplies information concerning research problems, progress, laboratories, equipment, methods, publications, personnel, funds, etc. Ordinarily inquiries are answered without charge. When this is impossible because of unusual difficulty in securing information the inquirer is notified and supplied with an estimate of cost. Requests for information should be addressed, Research Information Service, National Research Council, 1701 Massachusetts Avenue, Washington, D. C.

Lubrication of Electric Railway Equipment

Facts and Figures to Demonstrate the Relation of Correct Lubrication to the Problem of Keeping Operating Expense Down to a Minimum

THE September issue of *Lubrication* contains an article on the relation of lubrication to operating expense. Some parts of this are given in the following paragraphs:

Two very important factors of operating expense are affected by lubrication, the initial cost of lubricants and the cost of car maintenance. The relation of these two factors to the total operating expense is shown by the consolidated figures of five typical electric railways operating in one of the Eastern states. The following figures were taken from their annual reports for 1918 to the State Public Utilities Commissioners:

	Total	Per 1,000 Car-Miles	Per Cent of Total
Total operating expense	$12,659,000	$237.40	.....
Maintenance of equipment	1,357,000	25.71	10.82
(*a*) Cars	599,000	11.28	4.72
(*b*) Electrical	419,000	7.89	3.31
Cost of lubricants	13,296	.25	.10
Total car-miles	53,184,000	......	.....

From these figures it is very clear that the actual cost of lubricants is the insignificant amount of one-tenth of 1 per cent of the total operating cost and only 2.21 per cent of the cost of maintaining the cars. These costs prevailed in 1918, and although the cost for 1920 will be much higher the ratio between the various items will not be far different.

An essential requirement in reducing maintenance cost as affected by lubrication is the regular inspection of cars. The inspection periods will vary with different properties operating under different conditions and with varied equipment and should be worked out in accordance with conditions. These inspections are usually divided into three classes, daily, light and heavy.

The daily inspections cover all the safety devices and the repair of broken parts reported by the crew. In addition, some types of motors require daily oiling and in some instances other parts of the equipment as well. Such daily oiling periods should be eliminated whenever possible through co-operation with equipment manufacturers in the way of design in which efficient lubrication should be given proper consideration.

The light inspections, at intervals of eight to ten days, include a thorough inspection of all mechanical and electrical equipment that may become worn or damaged under normal operating conditions. Modern types of motors having oil and waste lubrication are oiled at this time and the amount applied should be given careful consideration, as the excessive application of oils does not improve lubrication and can have but one effect, which is absolute waste.

The heavy inspections covering complete overhaulings are determined by the normal life of the equipment and must be regulated in accordance with the various elements surrounding the particular operation, the mileage made by the equipment and many other factors which demand close attention and good judgment by those responsible for the general upkeep of the equipment.

At the time of any of these inspections if it is shown that any of the bearings are worn beyond the safe limit allowed they should be removed promptly, as many damaged armatures have been caused by careless inspections and the attempted use of bearings which should have been removed. The best of lubricants and the most efficient method of applying them will not lubricate a bearing that has become worn to a point where it is no longer in proper alignment. In the replacement of bearings care should be exercised to see that the new bearings have been properly babbitted, finished and lined up.

The efficiency of lubrication depends to a considerable degree upon the suitability of the bearing metal used in connection with the work imposed upon both the bearing and the lubricant. Certain kinds of babbitt may give excellent results under a given set of operating conditions, while under other conditions they may be wholly unsatisfactory. As he is not in the bearing-metal business, it does not behoove the oil man to attempt to say what kind of metal should be used, although the lubricating engineer should make a study of and be qualified to advise with master mechanics as to the proper metal, the method of heating and pouring babbitt, the heating of bearing shells and all other details connected with this important factor. After suitable bearings have been provided care should be given to the correct method of cutting oil grooves, as well as to see that all bearings are properly lined up.

SOME ESSENTIALS IN PACKING OF BOXES

Journal boxes should be carefully cleaned of all old waste and other foreign matter before packing with clean waste. The method of packing depends a great deal upon the design of the waste cellar and the position in which the waste must rest against the journal. Journal boxes should be packed by placing a roll of saturated waste in the mouth of the box and then shoving it evenly under the journal to the extreme back of the box. This first roll should be packed in very tightly against the sand collar to assist in keeping out sand and other foreign matter. Other rolls are packed in similarly until the box is full to the end of the shaft. The waste should not extend in front of the journal nor above the center line of the journal on each side.

In the packing of armature and axle boxes where waste rests on top of the shaft the waste around the sides of the box should be packed down very tightly to hold the waste in the box securely for the purpose of keeping the oil from flowing down the sides of the box when added to the waste, and all loose ends of the waste should be gathered up and packed in tightly to prevent any leaking of the oil from the box.

Axle and armature bearings of the side window type should be packed in such a way that the waste keeps its position against the shaft, to permit of the capillary action of the oil. On certain types of such bearings it is necessary to use a wedge to hold the waste in place.

The waste used in packing all bearings should be of a high-grade quality and resilient, so that it will not pack down in a soggy mass at the bottom of the box when oil is added. It too often occurs that the initial price of the waste is the first consideration without any thought being given to its life, the frequency of renewal and the ability of the waste to carry the oil to the bearings in the proper quantity.

SATURATION OF WASTE IMPORTANT

The initial saturation of waste should be given careful consideration and can be best accomplished in a tank containing a sufficient amount of oil completely to submerge the waste which has been thoroughly pulled apart. The oil should be kept at a temperature of not less than 70 deg. F. and the waste allowed to stand for forty-eight hours, after which it should be placed upon a coarse-mesh screen and allowed to drain for twenty-four hours before being put in use.

In addition to efficient waste saturating tanks the well-equipped oil house should have steel tanks with measuring devices for holding car oils, compressor oil and signal oil, as well as a waste-washing machine. While it may seem expensive to install this equipment it pays for itself in a short time through the improved condition of lubrication, the elimination of foreign matter in the waste as applied to the bearings and the elimination of considerable waste of oils, the latter occurring to a large degree through leaky barrels and the accessibility to the supply by those who are not interested in economies. When wood barrels are emptied into steel containers they can be returned promptly to the oil seller, who will pay the market price for them, thus offering another opportunity to make a saving in the initial cost of lubricants.

HUMAN ELEMENT SHOULD BE CONSIDERED

After officials of street railway companies have done all that can be accomplished in the way of providing suitable equipment and methods for handling lubricants there is still the human element to be considered, viz., the type of man who actually handles the lubricants and applies them to the equipment. In power houses considerable money is spent in providing automatic lubricating devices and elaborate means are furnished to insure efficient lubrication. Conditions in power houses are not nearly so severe as those imposed upon rolling stock, and the latter naturally requires closer attention to bring about the desired results, consequently it is not economical to use the cheapest possible men for this work, as so much depends upon the thoroughness with which the work is carried out. To so great an extent can car maintenance cost be reduced by proper attention to lubrication that intelligent, trained men should always be employed for this work. Trained men are necessary to care for the mechanical equipment and to keep it in good condition. Why should not the man who is responsible for the application of the lubricants, the principal factor affecting the condition of the equipment, be as thoroughly trained in his part of the work?

With the equipment in good condition and with trained men to apply the lubricants we must now decide what lubricants should be used. The rolling stock of all electric railways is subjected to very severe service, entailed by rough tracks, dusty and sandy roadbeds, mud and water, snow and ice. The vibration of the car and the other elements mentioned all tend to make efficient lubrication somewhat difficult. The varying conditions of operation and equipment require different kinds of lubricants, but in every instance the higher quality lubricants will last longest and give the most efficient results.

Too little attention has been given to the reclamation of oils. All oils retain their lubricating value until they have decomposed, and as the decomposition of straight mineral oils, which can be and should be used quite exclusively for electric railway lubrication, is of such an indeterminable period proper filtering facilities should be installed for the purpose of reclaiming oils from discarded waste, from compressors and all other places where it is possible to gather dirty oil, which, at the present time, is quite generally thrown away. This oil, if properly filtered, will afford just as efficient lubrication as it did in its initial state. Users of mechanism in all other classes of business are giving close attention to the reclamation of dirty oils, by which enormous savings are shown. This factor should be given the careful attention it deserves by electric railway companies.

GEAR AND PINION LUBRICATION

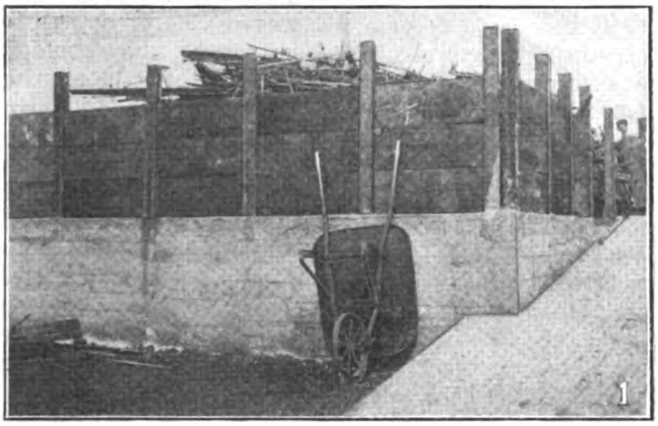
One of the most important problems and one which has received the least actual practical consideration in the way of developing a suitable lubricant is that of the gear and pinion lubrication. Gears and pinions when properly installed should be provided with an oil-tight gear case which will provide means for the bath system of lubrication, if so desired, as well as preventing grit, dirt, water and other foreign matter from coming in contact with the gear and pinion teeth. A suitable lubricant should be semi-fluid, heavy enough in body to reduce wear to a minimum, sufficiently adhesive to be carried up to the gear teeth by the pinion and to remain on the teeth at the highest speed of operation. It should not be so thin in hot weather that it will leak out of any possible crevices in the gear case onto the streets, nor so heavy in low temperature that it consumes an excessive amount of power. To meet these extremes of temperature summer and winter grades are necessary.

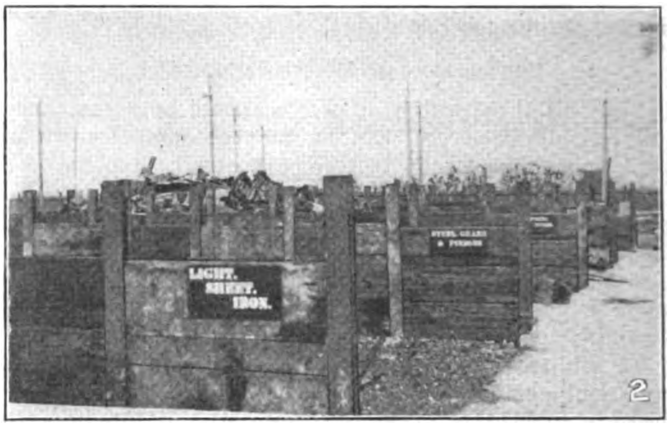
When gear cases are properly installed enough gear lubricant should be placed in the gear case to cover the lowest teeth on the pinion and any larger quantity is unnecessary. When gear cases are worn or loose fitting the lubricant must be heavier and no bath carried. The lubricant should be applied to the teeth direct at the point of mesh between pinion and gear, and by moving the car a short distance the lubricant will be spread over all the teeth uniformly. If it has the necessary adhesive qualities it will lubricate for a long time. The difficulty of securing gear cases that will stay tight is a serious one and the manufacturers of such equipment have a great field for investigation and improvement.

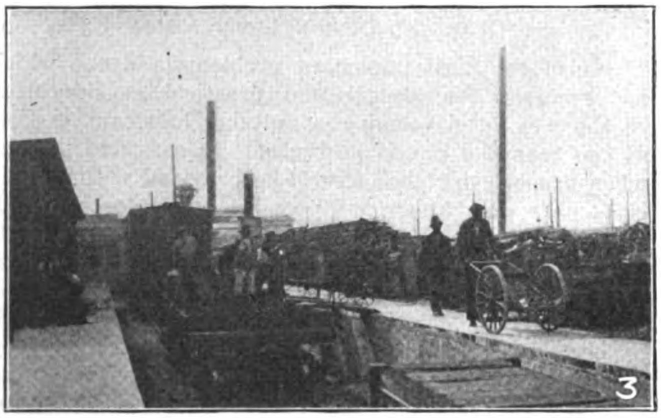
AIR COMPRESSOR LUBRICATION

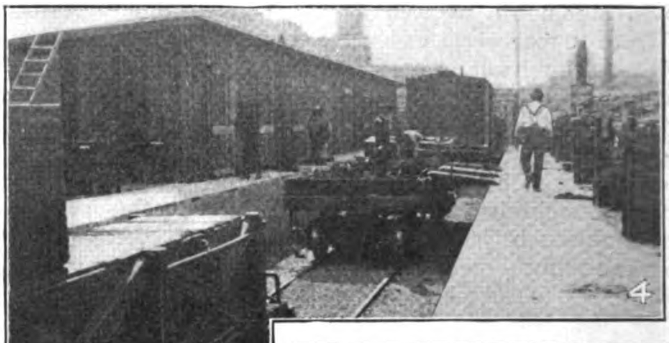
The air compressors should be lubricated with an oil of proper viscosity to maintain a film on all the bearing and cylinder surfaces and to assist the piston rings in forming a seal to prevent the leakage of air. Compressors lubricated by the splash feed system run in a bath of oil, so that any excessive oil getting past the piston rings should vaporize quickly and be carried out of the cylinder with the air. If it remains in the cylinder too long the heat will carbonize it and the valves will clog. This excess oil vapor is carried into the main reservoir, where it condenses and may be drained out with the water.

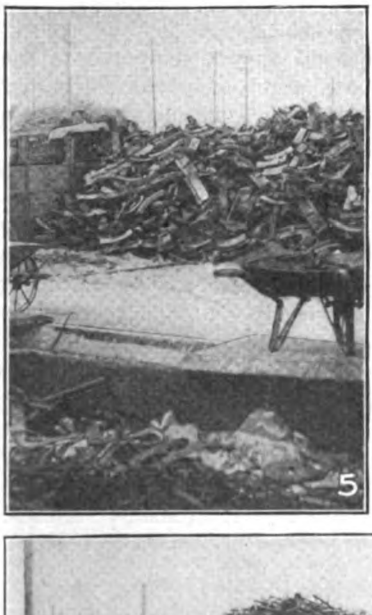
Scrap Material Is Salvaged and Efficiently Handled by Means of These Bins by the Pacific Electric Railway

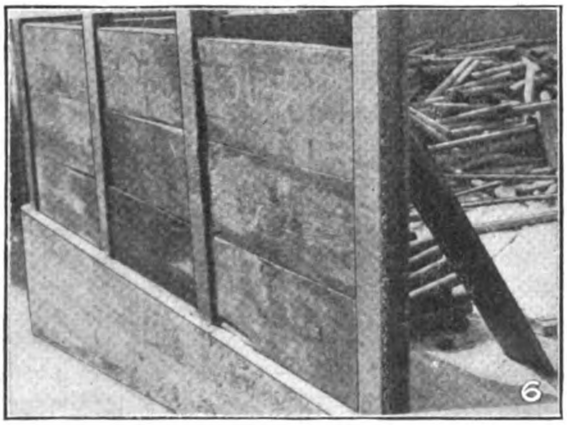


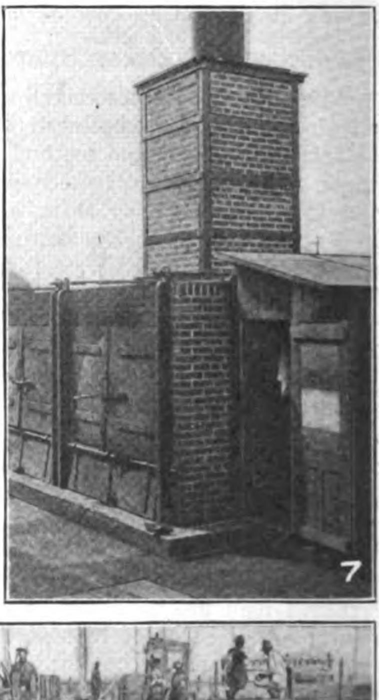


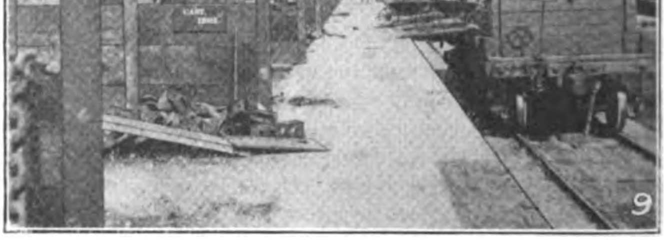












1. End view of scrap docks and ramp approach to dock platform.
2. Bin arrangement and signs designating class of scrap stored.
3. Switching track between platforms with shop forces handling scrap from cars to bins.
4. Runway in front of bins.
5. Scrap bin for brakeshoes.
6. Scrap bins for iron pipe.
7. Incinerator for burning rubbish and insulation from wire and cable.
8. Rear of scrap docks.
9. Arrangement of scrap bins and runway for handling material.

Salvaging Scrap Material

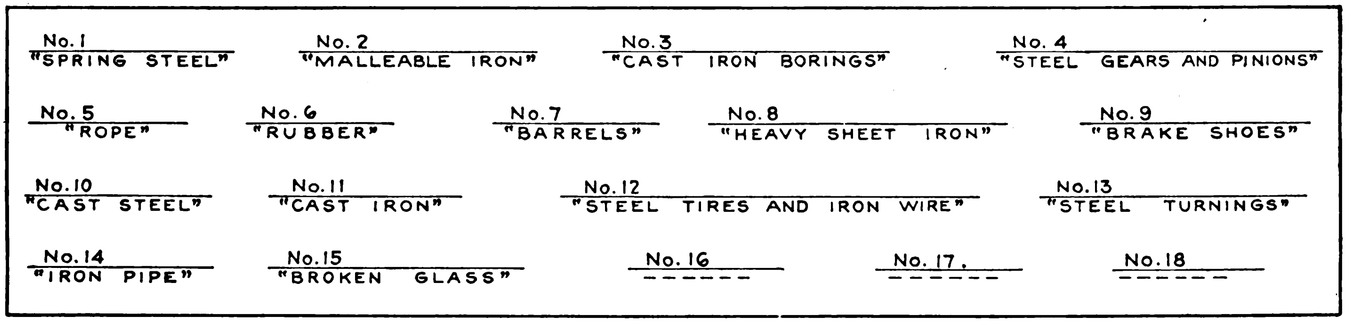
Scrap Docks and Storage Bins Constructed by Pacific Electric Railway for Efficient Handling and Salvaging of Scrap Material

By Clifford A. Elliott
Cost Engineer Pacific Electric Railway, Los Angeles, Cal.

THE Pacific Electric Railway has constructed at its new Torrence Shops two docking platforms with eighteen scrap bins to facilitate the handling of salvageable material. Each docking platform is 165 ft. long and 30 ft. wide and has a height from the top of the rail to the platform level of 4 ft. There is a switching track between the two docks so that cars can be loaded and unloaded as desired.

The platforms are of solid concrete construction and have concrete ramps at the ends for handling scrap material to and from the docks with trucks or wheelbarrows.

A somewhat novel method was followed in constructing the several scrap bins on the two platforms, 60 lb. scrap T-rail being utilized. This was placed vertically in the concrete for a depth of 3 ft. and extended 4 ft. above the surface of the platform. The use of this T-rail provided a convenient arrangement for holding the wooden planking that serves as the sides of the bins and for the various partitions. Three-inch planks, each 3 ft. in length by 1 ft. in width, were inserted between the ball and base of the rail. The height of the rails above the platform permits the inserting of four planks, but at present only three are used. This arrangement permits increasing the storage space in any bin by removing sections as desired and also provides an easy method of access to the bins. The bins are of nearly uniform size, approximately 25 ft. in depth. Six of them are 10 ft. wide, three 11 ft. wide, one 12 ft. wide and eight 15 ft. wide. There is a 5-ft. runway in front of the bins for the full length of both platforms.



ARRANGEMENT, NUMBERING AND CLASSIFICATION OF MATERIAL STORED IN BINS

Each Class of Scrap Confined to a Particular Bin

The outside scrap bins are so arranged as to confine each class of scrap to its particular bin. Each bin is numbered and the class and description of the scrap to be stored are designated on a wooden sign with black background and prominent white letters. This sign is displayed at the bin entrance. An accompanying diagram shows the numbering of the various bins and the material that is stored.

By the location of the docking platforms on a level with the car floors and by use of the concrete runways the sorting of various materials is easily taken care of. All scrap from outside points is transported directly from the carhouse or shop to the scrap docks on cars. These are brought in often enough to keep all outside points well cleaned. The sorting of the various materials is done after arrival at the scrap dock. All heavy scrap material is sorted at the outside bin and is then distributed to other bins. The sorting of finer metals and wire which requires additional work in salvaging is confined to an inside salvage warehouse or workshop. This latter class of salvage work requires more skill and attention.

The unloading of heavy scrap is handled by the store department's electrically operated crane, which is mounted on a flat car. This crane is now being equipped with magnets to simplify and reduce the cost of handling cumbersome and extra heavy classes of scrap.

A frame structure 105 ft. long by 25 ft. wide, located at the end of one of the platforms, is utilized as a workshop for the salvage or reclamation foreman and his assistants. There is a separate room in this building for the storage of scrap copper and other valuable metals. At the rear end of the scrap shop an incinerator has been built. This serves for burning rubbish and for removing the insulation from scrap wire and cable. The reclaiming of solder from wire joints, etc., has saved in one month nearly 750 lb. of this material.

The scrap docks as now operated handle from 80 to 100 tons of scrap each month and during some months as high as 300 tons of material has been salvaged. This scrap comes from all sources, such as division carhouses, way and structures and line departments, and the several maintenance shops of the system.

A carload of shop rubbish is handled daily, which consists of sweepings and clean-ups from around the shop buildings. This rubbish is put through the incinerator and finally, if there are any metal parts to be reclaimed, these are handled by the salvaging department. The scrap docks are under the jurisdiction of the general storekeeper at the new Torrance Shops, who has the full co-operation of the shop forces in carrying on the work.

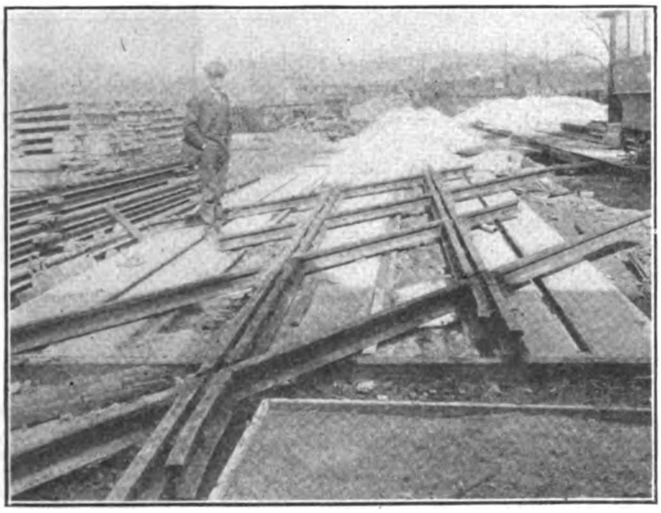
Under test conditions unusual performance was obtained from an installation of 665-hp. B. & W. boilers converted to oil burners by the Savannah Electric Company. Efficiencies ranged from about 82.5 per cent at 100 per cent rating to about 80 per cent at 300 per cent rating. A rather unusual circumstance discovered was that the superheat obtained was only half that obtained when the boilers were coal fired, due no doubt to the more complete burning of the oil in the combustion space, giving higher initial temperatures with better heat transmission in the first pass.

Shop, Track, Power and Line

These Articles and Ideas Are from Men on the Job Who Find Special Applications and New Methods an Incentive for Greater Effort — If You Have Something Good Pass It Along

Welded Crossings for Steam and Electric Intersections

IN ADDITION to the thermit shop-welded frogs and crossings installed in the paved streets of St. Joseph, Mo., described in the ELECTRIC RAILWAY JOURNAL for June 5, 1920, page 1135, the St. Joseph Railway, Light, Heat & Power Company has recently placed in service some of these welded crossings at certain intersections of the electric railway tracks with steam railroad lines.



ACUTE ANGLE CROSSING FOR DOUBLE-TRACK ELECTRIC RAILWAY AND SINGLE-TRACK STEAM RAILROAD INTERSECTION

An accompanying illustration shows an acute angle thermit-welded crossing for double-track electric railway and single-track steam railroad intersection. This crossing was built up in the shops of the electric railway company and installed as a complete section.

Carbon Dioxide and Monoxide in Flue Gas

CHIMNEY losses are indicated by three factors, the percentages of CO_2 and CO and the temperature of the flue gas. F. F. Uehling, in his paper read before the fuel section of the Sixth National Exposition of Chemical Industries, points out that the CO_2 determination is by far the most important as the CO_2 can easily be regulated by the fireman. Given a tight boiler setting, the operator can, by regulating the amount of air admitted and the thickness of the fuel bed, reduce the amount of excess air to about 50 per cent while striving for a maximum CO_2 indication. The determination of the percentage of CO, while necessary where there is suspicion of incomplete combustion, is not essential when CO_2 recorders are in use, Mr. Uehling said, since extraordinarily good economy results from their installation alone.

As an example of the result obtainable with recorders an instance is cited of the placing of a CO_2 recorder in a small New England plant in the engineer's office. None was installed in the boiler room. The firemen were advised to exert every effort to keep up steam with the least coal possible and a twenty-four-hour evaporation test was conducted. This showed a low percentage of CO_2. An additional recorder was then placed in view of the firemen, who were instructed to keep the steam at the customary pressure and to make the CO_2 reading as high as possible. On a second run, made under those conditions, the chart showed a consistently high average of CO_2 and under actual test the fuel saving was 9.9 per cent.

Side Window Curtains for Safety Cars

The Considerations that Led to the Use of Curtains in Cars Are Enumerated and Their Advantages Discussed

IN AN article in the ELECTRIC RAILWAY JOURNAL for May 15, 1920, page 984, one safety car manufacturer advocated the construction of safety cars without side window curtains. A representative of a curtain manufacturer presents the following in favor of the continued use of curtains:

Most passengers of traction cars consider side window curtains in the light of a necessity and also a convenience. The advocates of "curtainless" cars are, we believe, jeopardizing rather than promoting the interests of the traction companies. Their contention, which is based upon the viewpoint of economy of construction and maintenance, is, it would seem, the result of first thought and not a development of serious consideration.

In order properly to cover the subject let us consider the functions of side window curtains for safety cars from the viewpoint of the passenger, as well as from the viewpoint of the operator of the electrical equipment. The primary objects of side window curtains are as follows: (1) To afford shade to passengers. (2) To protect passengers from summer storms. (3) To furnish and trim the car. (4) To protect and preserve the interior of the car.

1. It is very seldom that the tracks of an electric railway on any route continue in the same direction. This necessitates the car's continually changing direc-

tion, thereby altering the angles at which the rays of the sun enter the car. The majority of electric railway passengers are carried in the earlier hours of the morning and in the late afternoon when the rays of the sun are at an acute angle. Without curtains, therefore, there is no means of preventing these rays from entering the car and affecting the comfort of the passengers.

2. When electric cars were originally built, they were divided into two classes—namely, closed cars for winter and open bench cars for summer use. This practice has gradually been discarded and the modern practice of electric railways is to build a car which will be suitable for all seasons. Especially in the summer months, therefore, when sudden storms occur at reasonably frequent intervals, we believe there can be no means provided to protect the passengers and at the same time afford adequate ventilation without the use of side window curtains. As a matter of fact, it is interesting to note that in the case of the open bench car, which has now been virtually discarded, it was found necessary to equip all such cars with curtains capable of being extended to the floor of the car, this being done simply for the purpose of protecting passengers from storms.

3. A very important purpose of the car window curtain is found in the completion of the car trimming. Any one would deem it illogical to consider a dwelling or other structure complete without the addition of such window hangings as would be comparable with the type of construction, and this is likewise true of any type of conveyance, not excepting the safety car.

4. Much harm can be done by the elements to car interiors through lack of curtains, particularly during the summer season. As a matter of fact, without curtains, under such conditions, the entire interior of the car is exposed to the elements and the natural consequences of same.

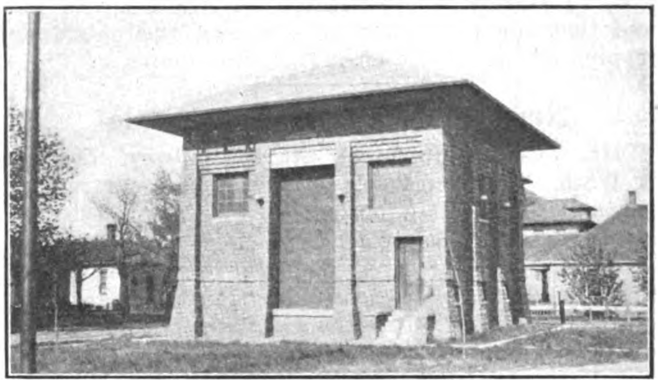
It is rather interesting at the present time to consider the expense that is actually necessary in order properly to equip the average safety car with side window curtains. It can be conservatively said that the cost of this equipment would not exceed $90 per car. The elimination of an item of $90 would hardly seem worth consideration from any viewpoint of additional saving in the car construction. Moreover, we believe it is a fact that the purchase, on the part of railway companies, of curtain material, fixtures and parts for the maintenance of such equipment is one of the lowest items on the books of these companies. From the standpoint of a manufacturer of side window curtains the evidences on our books would indicate this contention as absolutely correct.

In conclusion, it would seem as though a very substantial question which must of necessity be brought up is: "Do the owners of safety cars intend to place their equipment and their capabilities upon a par with the ordinary jitney or automobile bus, or do they intend to provide the public with a commensurate return for the increased fares over the jitneys that they advertise as being necessary?"

If the first is the case, safety cars should not be built with curtains, but, on the other hand, if electric car riders are to be provided with the best possible service and safest mode of transportation, the only way to back up the advertising of such service is to furnish most modern and attractively equipped cars.

Automatic Substation Building Constructed of Old Paving Blocks

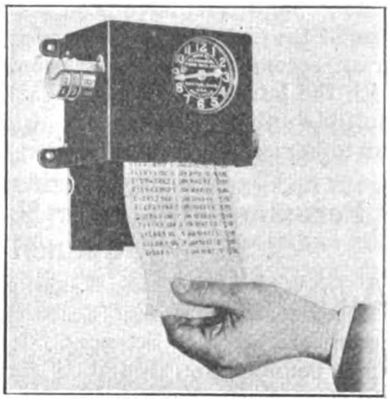
THE accompanying picture is of particular interest because it portrays with what pleasing results old granite paving blocks may be used in building construction. The building here shown is a new automatic substation built by the Omaha & Council Bluffs Street Railway, in Council Bluffs, Iowa, last spring. It is located in a residential section and conspicuously situated on a triangular corner lot. It is distinctly a beautifying addition to the surroundings. It is built from ground line to roof entirely from worn-out granite paving blocks, so that the material involved in the construction of the new substation may be said to have cost the company only the reclamation expense.


AUTOMATIC SUBSTATION IN COUNCIL BLUFFS, IOWA, BUILT OF OLD GRANITE PAVING BLOCKS

The station is equipped with one rotary converter and the automatic equipment for its control. The machine entrance to the building is closed with a rolling steel door, which may be seen in the picture. Ventilation for the machine is secured through three openings at the floor level on either side wall and a single opening on each of the four walls at the roof line.

Instrument to Check Truck Drivers

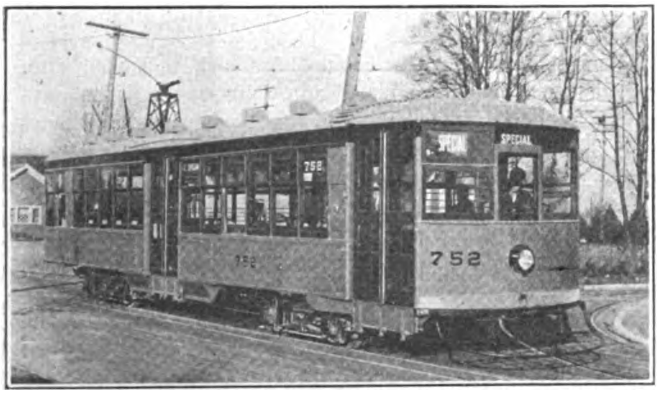
THE Ohmer Fare Register Company has recently perfected a device for truck owners in the form of the Ohmer Truck Auditor. This instrument produces printed reports of the day's work and acts as a mechanical cost accountant, recording the expenditures for truck operation in the terms of material, time and distance traveled. This device weighs 7 lb., is placed on the dash of the truck and provides a complete printed report of the day's work. The report gives such information as the machine number, driver's number, date and exact time, mileage and miscellaneous data about loading, changing of tires, taking gasoline and oil, etc.


TRUCK AUDITOR SHOWING RECORD

Each driver is provided with an identification key bearing his number. This key must be inserted in the truck auditor before it is possible for him to take his opening statement or to start the engine. He then turns the knurled knob at the right, which prints the opening statement, locks the key in the machine and allows the motor to be started. If the driver wishes to remove the key a closing statement must be printed, and a comparison of the two statements reveals the time and reason for leaving the truck. When the truck is stopped for any reason and the fact recorded, automatically the engine is cut off and another print must be taken to start it. The record thus made shows the time that the truck was stopped and the automatic stopping of the engine effects a great saving.

New Type Car Tried at Seattle

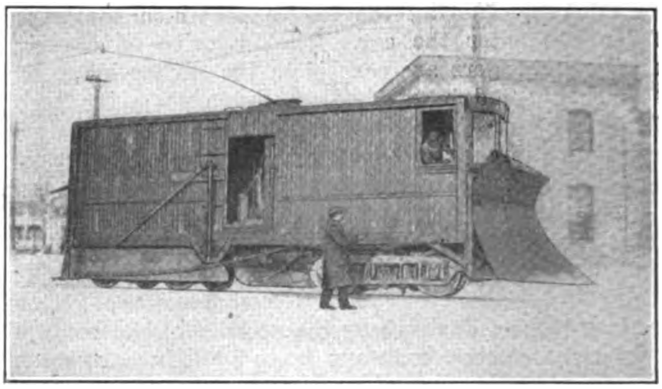
THE Seattle Municipal Street Railway, Seattle, Wash., has recently placed in service a car remodeled under the direction of A. Flanigan, assistant superintendent of equipment, which combines several features of modern cars. This car can be used for either one or two-man operation as it has entrances at both front and side. It is the intention to use two men during peak hours and one when the loads are comparatively light. Both entrances are constructed with double doors to facilitate quick loading and unloading. The car is approximately 50 ft. in length and has seats for fifty-nine passengers, with additional standing room for sixty passengers. Hand straps are not provided, but instead hand rails have been installed. The general design of the car, as well as the step construction, is shown in an accompanying illustration. The car is equipped with the latest safety devices and also is provided with multiple-unit control, which will enable this type of car to be used in train operation if it is found desirable.



SEATTLE'S ONE-MAN-TWO-MAN CAR

Permanent Home for National Research Council

A NEW building in Washington, D. C., will soon house the National Research Council and the National Academy of Sciences. It is to be erected on a block bounded by B and C Streets and Twenty-first and Twenty-second Streets, N. W., facing the Lincoln Memorial in Potomac Park. The site cost about $200,000, which sum was contributed by a number of friends of science, including such men as Charles F. Brush and Ambrose Swasey of Cleveland, Henry Ford, P. S. du Pont and George Eastman. Funds for the erection of the building have been provided by the Carnegie Corporation of New York.



SNOW PLOW OF MONTREAL & SOUTHERN COUNTIES RAILWAY

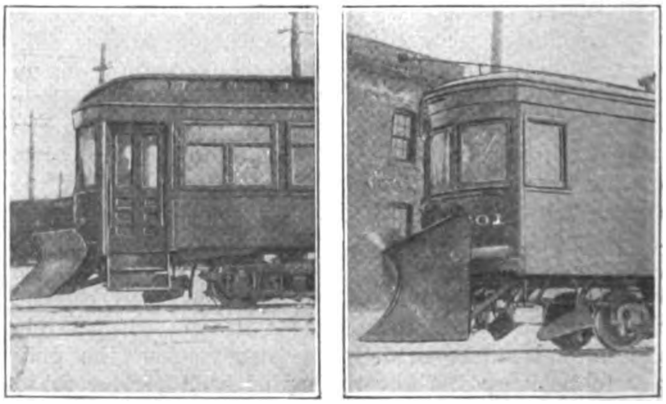
Snow Fighting on an Interurban

How the Montreal & Southern Counties Railway Equips Cars with Plows and Keeps Traffic Going All Winter

WHEN snowfalls are heavy and continuous each year, so that they form a part of the regular program of winter operation, there is no real difficulty in keeping the track clear. This, at least, is the experience of the Montreal & Southern Counties Railway, an interurban line supplying transportation between a group of prosperous communities southeast of Montreal and the city itself.

The line, which has about 66½ miles of track, all electrically equipped, is a part of the Grand Trunk System and crosses the St. Lawrence River on special electric tracks over the Grand Trunk Railway Bridge. Both single cars and trains are run, and for a considerable part of the system a 20-minute service each way is given during the greater part of the day. There has been a continuous increase in traffic since the electrical equipment was installed, and the increase this year is expected to be about 15 per cent.

The principal dependence for snow fighting is a form of steel nose plow, of which illustrations are shown. This plow is built in three sizes. The largest, of which there is one, is used on a 30-ton locomotive, employed as a snowplow in winter and as a locomotive in summer. The plow is somewhat shorter than would otherwise be used because of several sharp curves on the line. As shown, this largest plow is capable of being raised with compressed air, so that when the locomotive enters the paved streets of Montreal it can be lifted. This plow is also equipped with flanges for clearing the right of way.

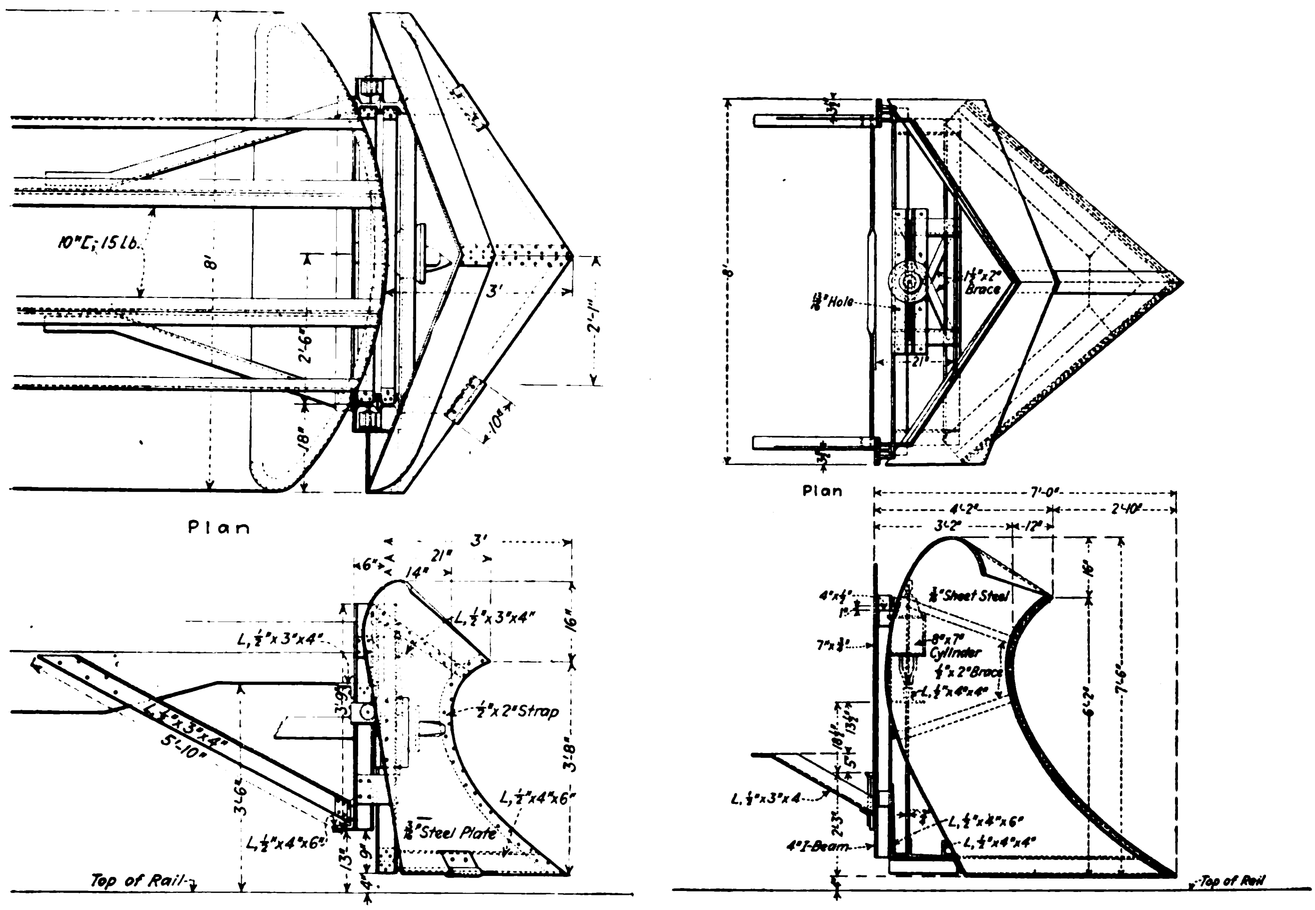


TYPES OF SNOW PLOWS USED ON CARS

The second or medium size plow is also illustrated. It is similar in general construction to that used on the locomotive, but smaller and lighter, weighing only about 1,000 lb., and being raised and lowered by hand. This plow is used on interurban cars. A smaller plow, weighing about 600 lb., is used on local cars. Both interurban and local cars are also fitted with scrapers.

It has been found that if about 40 per cent of the cars are equipped with these plows practical immunity from snow trouble is secured. The plows are installed on the cars about November and carried until the end of March.

In addition to the use of these plows the company has two sweepers and a large nose snow plow fitted with flangers. Originally a rotary was used, but the present equipment has been found more efficient and the rotary has been dismantled.



PLANS AND ELEVATIONS OF LARGER PLOWS

Blasting Pole Holes in Frozen Ground

DURING the past five or six years a good deal of dynamite has been used for blasting post and pole holes in frozen ground. Many contractors, construction foremen and others who have tried it condemn the practice because, they say, it makes too large a hole; that is, too wide at the top, and that there is a tendency to loosen the soil too much around the sides of the hole. E. I. du Pont de Nemours & Company, Inc., state that to blast a relatively straight up and down, narrow hole and avoid widespread loosening of the sides the charges should not be tamped in the bore holes.

Importance of Testing Welds

Weld Tests Not Yet Standardized—Microscopic Examination of Structure and Bending Test Gives Most Accurate Indications of Quality

AT THE September meeting of the Chicago Section of the American Welding Society S. W. Miller, proprietor of the Rochester (N. Y.) Welding Works, read a paper, of which the following is an abstract, on the development and value of different methods in use for testing welds.

As in all other developments, welding first received its principal impetus from the practical man. Of late, however, the tendency has been to investigate more carefully and more fully and by means not available to the ordinary welder. This means that scientists of all kinds have been called into consultation and that almost every conceivable method of test has been suggested to determine what methods and materials would make the best welds from a standpoint of security as well as service and cost.

Although the testing of metals, aside from welds, using the customary tensile, compression, shock, alternating-stress tests, etc., is quite well developed in practice, the microscope has been found to be of tremendous help in the study of metals as well as welds. While no one method of test shows everything desired to be known, the microscope is probably the most powerful single method of investigation in the case of metals, and in the study of welds it is particularly valuable because of the methods of their formation. A weld is a casting and is subject to all the defects found in castings, which are, however, exaggerated in the case of welds.

The welding of steel is frequently considered as not being especially difficult and it is also sometimes considered that steel is steel and that no different treatment is required in the case of different qualities and varieties of steel. It is not as well known as it should be that a comparatively small variation in the percentage of carbon in the material being welded makes a very great difference in the results of either a bend or tensile test. It has been found by experience that the higher the carbon the more difficult it is to get a satisfactory weld and the more danger there is of injuring the metal being welded. It is also evident that a weld made with a given welding rod or electrode can have only a given strength. If this strength is greater than that of the material being welded, the test pieces will always break outside of the weld, and if weaker of course the weld itself will rupture. It is necessary to know accurately the character of the material being welded to be able to use the right steel alloy for welding. Also the method of test in any given case depends on the use to which the welded piece is to be put.

There are no standards at present for weld tests, but it is advisable, whenever possible, to follow those of the A. S. T. M. Inasmuch as a welded piece is not of uniform character, it is not possible to use the elongation and reduction of area as commonly measured. Where the break occurs in the weld, the elongation of the whole test piece tells very little about the quality of the weld, and it is useful to take the elongation of each inch, two inches, etc., of the gage length, beginning at the center inch which includes the weld, and plotting these figures against the gage length.

The best test, in the opinion of Mr. Miller, to determine quickly the general character of a weld is to grind it off level with the surface of the pieces and clamp it on an anvil, with the center of the weld level with the top of the anvil and the bottom of the V toward the anvil so that the top of the weld is stretched when the projecting end is struck with a sledge. The blow should not be too heavy and the number of blows and the angle to which the piece bends before cracking are quite an index of the value of the weld. It is true in this test, as in the tensile test, that the quality of the material itself has a great influence on results. If a welded piece were to be used in a place where it might become red hot, such as, for instance, in a locomotive fire-box crown sheet, it would be entirely proper to test the weld at a good red heat.

In many cases the defects in welds are easily visible to the naked eye under test. In other cases they are not, and while it would seem plausible that the visible ones were more dangerous, the hidden danger due to the ones that are hard to see is a matter that must not be overlooked. For many years the dangerous defects in steel rails have been those which were not visible and which have usually been very small at the start. There has recently been developed a method for testing rails for these hidden defects which has been devised by A. M. Waring. It consists of etching deeply a polished surface of the material. For instance, a section of a weld might be cut out with a hacksaw, machined or filed to a true surface and polished on various grades of emery paper, ending with No. 00 Manning. It is then placed in a warm solution of 25 per cent hydrochloric acid for from half an hour to an hour. The acid will eat away the defects, making the edges of the material at them taper, so that rather large grooves and pits would be visible, where the defects prior to the etching would be only microscopic. The bending test, hot and cold, and the etching test are of the greatest value in ordinary shop practice where it is desired to find out rapidly and quite accurately what the quality of the work is done by different welders.

Some of the defects in welds are visible under the microscope, but others are invisible until the weld is strained. A small bending machine that can be placed on the microscope stage is very useful, because after etching the piece can be bent and examined and the effect of the strain can be seen. In the case of bare-wire electric welds, the rupture, according to Mr. Miller's experience, always occurs at the grain boundaries even where no defects are visible there at the highest powers of the microscope. Of course, where there are defects visible, the rupture takes place first at these. Where there are no defects, the distortion occurs by slipping in the grains as in normal steel.

An electric weld that will bend very little may be made much more ductile by heating in a reducing atmosphere at a low red heat for one or two hours, indicating that the weakness at the grain boundaries has been removed. Again, heating an electric weld in an oxidizing atmosphere makes it more brittle.

These rough tests, while satisfactory for determining the general quality of the work, do not answer as a basis for design and more refined tests must be used, as before referred to. The most important of these are the tensile and alternating-stress tests. The tensile test can be made in any shop provided with the usual tensile testing machine. The alternating-stress test is not as yet standardized even for unwelded material. The ordinary machine for determining the resistance to alternating stress uses a rather small test piece about ⅜ in. x 2 in. in section which is vibrated at about 1,000 alternations per minute.

Arc-Weld Rail Bonds

Successful Method Described of Rail Bonding Involving a Bond Which Has a Direct Weld Between Copper and Steel

THE extended use of electric-arc welding in the shops and on the tracks of electric railways has resulted in the development of rail bonds which can be applied with the electric arc in one form or another.

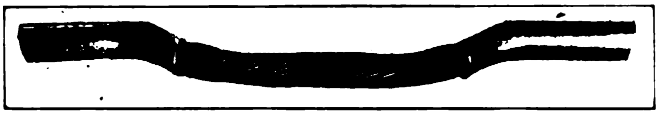
The American Steel & Wire Company has developed an arc-weld bond terminal which has a direct weld between the copper and the steel. This eliminates any possibility of the union being disturbed by the heat of the arc. The steel contact surface is in plate form, about ⅛ in. thick throughout, and a large area of copper is provided as a backing for the steel-welding surfaces. They are produced in various forms for application to different parts of the rail, but in all cases the designs are fundamentally the same. The steel of the terminals is in shell form. All parts which are exposed to the arc are of steel about ⅛ in. thick and the steel casing extends to form the terminal sleeve around the conductor where it enters the terminal. For the head of the rail a steel-terminal bond has also been designed.

The joining of the copper to the steel at the factory, leaving a steel to steel weld to be made in the field, is thought to be a big forward step in the art of bonding. The bonding becomes an adjunct of the welding art of necessity and metallic-electrode bonding is in no sense peculiar to the bonds. It is exactly like any other steel weld with which all arc welders are familiar.

Before welding, the terminal makes contact with the rail head along a comparatively thin edge, thus exposing for welding the major part of the rail surface opposite the bond terminal. This enables the terminals to be placed low on the rail heads, with ample clearance for the wheels above and the splice bars below. It is of great advantage on thin rail heads. The welding surface of the terminals of these bonds is concaved so that there is a wide welding angle at the bottom. Less steel is required to attach the bonds than is the case where the welding surface is 90 deg. to the rail. Also the steel current path is kept at the minimum for practical welding. This results in a minimum consumption of welding rod per square inch of contact area and consequently minimum time for installation.

The fundamental argument in favor of the welded bond is the permanency of the contacts. The metallic arc-welding process enables the bonds to be shaped for and applied to all parts of the rail without the need of special equipment. No molds are required and clamps are not essential. They are generally used to hold the bonds in position long enough to "tack" them fast with the arc. The attachment to the rails with steel imparts great mechanical strength to these bond and their theft is therefore discouraged.

The metallic-electrode process enables the bonds to be applied with any form of arc-welding apparatus, motor generator, or any form of ballast resistance set, and the electrode may be positive or negative. The advantage is apparent where there may be several kinds of apparatus on a property. Bonding can be done with each welder, wherever it may happen to be located, thus removing any necessity to transport special apparatus for bonding to every location where repairs are needed.



ARC-WELD RAIL BOND SHOWING SLEEVE CONSTRUCTION OF STEEL TERMINAL

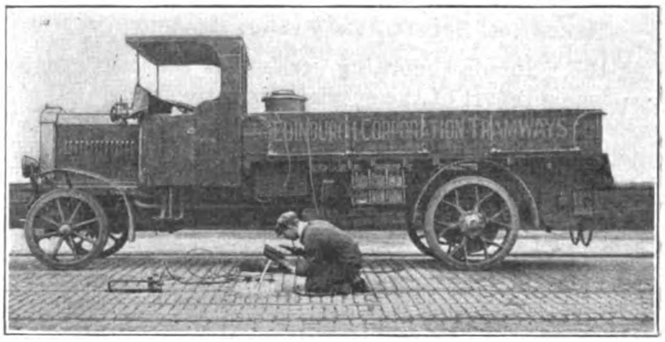
Gas and arc-welding bond steel terminals were described on page 199 of the Feb. 17, 1920, issue, and on page 796 of the April 17, 1920, issue of the ELECTRIC RAILWAY JOURNAL.

New Crane and Hoist Controller

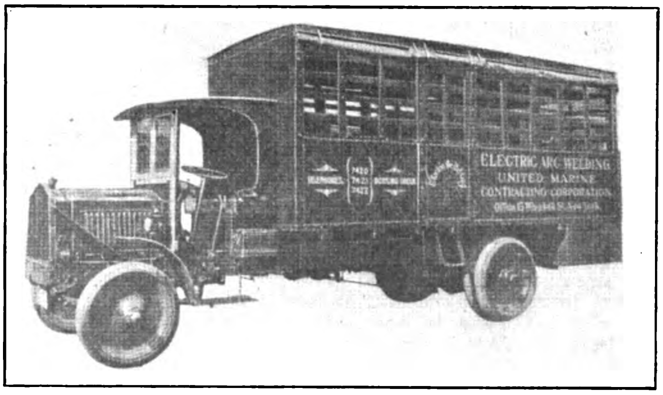
THE Allen-Bradley Company of Milwaukee, Wis., has developed a new line of crane and hoist controllers to supplant its types Q, R and S controllers for the same service. The new controller, made in sizes ranging from 1 hp. to 150 hp., is known as the "clapper-type controller," primarily because all switching and contact making is done with a clapper-switch contactor. The controller is simplified by the use of a graphite compression resistor, mounted within the controller, avoiding the use of grids or wire-wound resistors and the need of step contacts. All speed control is obtained by pressure variation upon the resistor column applied by the control lever. A single lever gives full control in either direction and also actuates the clapper contactors. Steel frame construction is used with pressed steel enclosing covers, reducing the controller weight. Switch cams positively open and close the switch clappers in either direction.

Welding Plant on Motor Trucks

ACCOMPANYING illustrations show two types of self contained portable electric arc-welding outfits mounted on motor trucks. The first of these is used by the Edinburgh (Scotland) Corporation Tramways for making repairs to its lines which are operated by cable, and where electric power is not available. They have also found this welding outfit of use at other parts of their lines as work can be carried out without interfering with normal operation. The second illustration is a portable electric arc-welding outfit used by the United Marine Contracting Company of New York City. Its object is to serve economically both marine and land requirements, and by mounting the equipment on a motor truck it can travel from job to job quickly, and in the case of marine repairs, which constitute the greater part of the work done, such an outfit can be run conveniently alongside boats that require repairs. The equipment of this outfit consists of an electric generator driven by a 40-hp. gas-kerosene engine, which produces direct current of 150 amp. for each welder at 50 volts. The capacity of this machine is two welders.



BUILDING UP RAIL JOINTS FROM WELDING OUTFIT MOUNTED ON MOTOR TRUCK



ROOMY WELDING OUTFIT FOR MISCELLANEOUS REPAIRS

The body is equipped with two reels for carrying 1,200 ft. of copper leads. Welding supplies, such as short lengths of welding wire, welding glasses, hammers, etc., are carried in small compartments built on the underside at the rear of the body. A 40-gal. spare fuel tank is provided, as is also a tank for 65 gal. of lubricating oil for the machinery. The equipment used by the Edinburgh Corporation Tramways delivers from 150 to 250 amp. at 60 volts.

Commissioners Discuss Valuation

National Association Report Shows Majority Favor Investment Basis or Liberal But Not Peak Reproduction Cost

A REPORT of most of the sessions of the convention of the National Association of Railroad & Utility Commissioners held last week in Washington was given in last week's issue of this paper. That which follows completes the report of this convention in so far as it pertains to electric railways.

REPORT ON SPECIAL VALUATION RESOLUTION

At the Thursday morning session of the convention there was a report of the special committee appointed to consider the following resolutions which had been presented by Paul P. Haynes of Indiana at the 1919 convention at Indianapolis:

> Whereas in recent years the cost-of-reproduction method of evaluation has in many instances become the controlling factor in determining the fair value of the property of public utilities, and
>
> Whereas during the past few years there has been an unprecedented increase in the cost of materials and supplies entering into the construction of utility properties, and
>
> Whereas the cost-of-reproduction method of evaluation, although applied with moderating averages, arbitrarily attaches to properties constructed before the high-price period, values greatly in excess of the actual prudent investment therein, in many instances from 25 to 100 per cent greater than such investment, and
>
> Whereas under present abnormal conditions the cost-of-reproduction theory has ceased to perform the service which it was designed to perform, and now leads to unwarranted and unreasonable values which offer little guidance in determining the fair value of the property of public utilities, and
>
> Whereas the continuance of the cost-of-reproduction theory as the controlling factor in public utility valuations will in the future undoubtedly cast a burden upon those utilities which were required by public necessity to make substantial plant investments during the high-price period; now, therefore, be it
>
> Resolved, by the National Association of Railway and Utilities Commissioners, that a continued disposition on the part of commissions and courts to consider cost-of-reproduction or cost-of-reproduction-less-depreciation as the controlling factor in determining the value of the property of utilities will tend to impair scientific and equitable regulation, to permit the establishment of unwarranted and unreasonable values, and ultimately to diminish public confidence in commissions and courts and thereby impair their usefulness; and be it further
>
> Resolved, that one of the obligations of commissions and regulatory bodies is to protect and preserve, in so far as it lies within their power, honest and prudent investment in utility properties, and that, in view of abnormal price conditions now prevailing, equity, justice and a proper regard for the interests of utilities as well as the public seem to demand that in the valuation of public utility property greater weight should be given to the honest and prudent investment therein; and be it further
>
> Resolved, that it is not intended by this resolution to hold that the fair value rule should be abandoned or impaired, but rather that under the fair value rule and in view of abnormal conditions prevailing, a greater measure of justice and equity will be secured by giving greater weight to the honest and prudent investment, and less weight to the cost-of-reproduction or cost-of-reproduction-less-depreciation.

The committee reported that it had sent the resolutions to each state commission and had received thirty-four replies, twenty-one of which favored the resolution, two were unfavorable, four were non-committal and seven gave no expression of their attitude. The following states indicated that they were favorable to the resolution: Texas, New Jersey, Oregon, Oklahoma, Washington, Massachusetts, Kansas, Georgia, Wisconsin, North Dakota, New Hampshire, New York, First District; South Carolina, Michigan, Virginia, Wyoming, Montana, Connecticut, Louisiana, West Virginia and Ohio. New York, Second District, and Nevada reported unfavorably; non-committal replies were received from Maine, Utah, Illinois and Minnesota; acknowledgment of receipt was received from but no action taken by California, Porto Rico, New Mexico, Florida, Maryland, District of Columbia and Vermont.

The committee recommended that no formal action on this report was necessary or desirable. It says: "The investigation has served a useful purpose in that it has brought together the minds of practically all the commissions on this very important question."

In the discussion which followed the report of this committee the consensus of opinion seemed to be that current prices should not be used on account of their very high level; that rate of return should, in general, not be raised too high, but that a liberal policy with respect to valuations finally determined should satisfactorily take care of the present, and probably temporary, situation of high prices and high interest rates. Favorable consideration was given to the proposal recently made by Hagenah & Erickson, valuation engineers, Chicago, that reproduction costs of today be figured on prices projected from a trend-of-prices curve beginning with 1896, but no action was taken except to defer the general subject to the main valuation committee for its consideration.

WHY COAL CAR ASSIGNMENT WAS DISCONTINUED

At this session, also, there was a revival of the car distribution discussion started the previous day. Commissioner Funk and Judge Reed were reinforced in their questions by Commissioner Lewis of Indiana, and M. H. Aylesworth, executive manager National Electric Light Association, presented the case of the utilities, saying in effect that previous to the discontinuance of orders 9 and 16 on Oct. 15 public utilities were getting their contract coal, but that since that date they were getting no coal at all.

Chairman Clark and Commissioner Aitchison of the Interstate Commerce Commission defended the change in rules and made the statement that the change had been brought about largely on account of the abuse of the assigned car privilege granted them. Commissioner Aitchison said that this privilege had been granted for obtaining contract coal for current use, but that many utilities not only tried to pile up reserves through the exercise of this privilege but even went to the extent of reassigning shipments to their advantage. He said that data presented to the commission proved that in three districts alone the coal ordered by consigned cars was equal to the total average consumption of all the utilities in the United States.

Mr. Aylesworth said for the utilities that the utilities would "police" a reissuance of the car assignment order or, failing the confidence of the commission to "police" the order themselves, would finance any "policing" the commission might authorize.

At the Friday sessions important reports were heard from several committees, among them the main valuation committee, which referred chiefly to the railroad valuation work of the Interstate Commerce Commission; the committee on publication of decisions and orders of state commissions, and the committee on statistics and accounts of public utility companies. The last-named committee presented suggestions for standard classifications for gas corporations and for electric corporations. It has this to say with reference to other systems, including, presumably, electric railways:

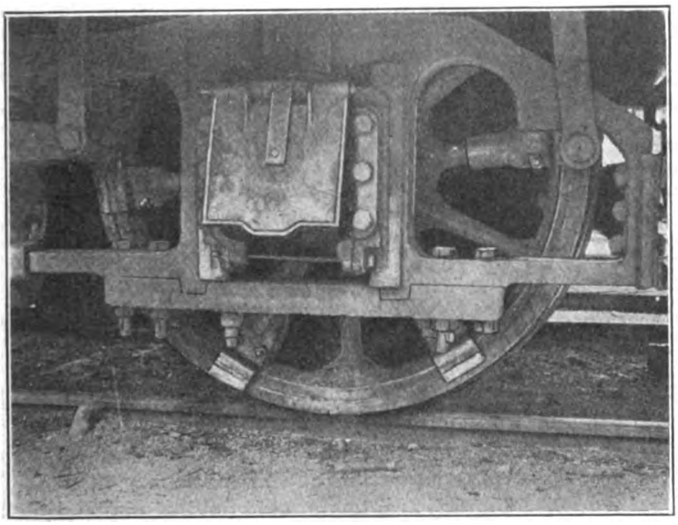
"When it became apparent that the inevitable lack of time necessarily would restrict the number of classes of utilities for which uniform systems could be completed the committee centered its efforts on the electric and gas systems, believing the greatest good could be accomplished through conducting its work in this order, and it was further influenced in this belief through the number of suggestions favoring the adoption of the Interstate Commerce Commission's systems, wherever prescribed, subject to future revision, the essentials of which would still leave the Interstate Commerce Commission's systems substantially intact."

APPOINTMENT OF COMMITTEES

The president-elect, J. A. Perry, announced the appointment of the executive committee for the coming year, as follows: Chairman, Carl D. Jackson, Wisconsin; Joseph B. Eastman, Interstate Commerce Commission; E. I. Lewis, Indiana; Clyde M. Reed, Kansas; R. Hudson Burr, Florida; Alfred M. Barrett, New York; J. J. Murphy, South Dakota; James A. Perry, president (ex officio); James B. Walker, secretary (ex officio).

Bringing in a Crippled Locomotive

THE Inland Empire Railroad has a number of alternating-current locomotives which are used in heavy freight service on its Colfax-Moscow line. Recently one of these locomotives fractured a tire when out on the road and the master mechanic, M. G. Charles, had on his hands the problem of getting the machine into such shape that it could be brought back into the shop. How he did this is shown in the illustration.



EMERGENCY RETAINING CLAMP FOR FRACTURED ELECTRIC LOCOMOTIVE DRIVING-WHEEL TIRE

The device consisted simply of a set of split clamps placed on alternate spokes. These clamps were roughly forged from strap steel in such form that they bind the spokes tightly and at their outer end form guides for the tire so that it cannot slip off. The fracture in the tire was also welded to insure continuity.

A revised edition of the standard specification for portland cement has been issued by the British Engineering Standards Association, the office of which is 28 Victoria Street, S. W. 1, London, England.

Symposium on Lightning Protection

Manufacturers' Engineers Explain Present Status of New Types of Arrester and Operating Engineer Gives Results of Investigations

THE 365th meeting of the American Institute of Electrical Engineers, held at the City Club, Chicago, Ill., on Friday, Nov. 12, in conjunction with the Western Society of Engineers, was devoted to the subject of lightning protection. Four papers, presenting different phases of the subject, were read. The titles and authors of these were as follows: "Lightning Arrester Spark Gaps," by C. T. Allcutt, Westinghouse Electric & Manufacturing Company; "Life and Performance Tests of 'O.F.' Lightning Arresters," by N. A. Lougee, General Electric Company; "Studies in Lightning Protection on 4,000-Volt Circuits," by D. W. Roper, Commonwealth Edison Company, and "Electrostatic Condensers," by V. E. Goodwin, General Electric Company. The meeting was held under the auspices of the Chicago section, of which J. R. Bibbins is chairman, and the protective devices committee, of which Mr. Roper is chairman.

The investigation reported by Mr. Roper was declared to be one of the most comprehensive studies based on actual experience ever recorded on this broad subject of lightning protection in power and lighting work.

President A. W. Berresford, of the Institute, was present. He spoke on the subject of the Federated American Engineering Societies, pointing out that thus far there has been accomplished only a broad enabling act to make the Federated Societies possible, and under which the details of operation will be worked out. He said that the object of the federated organization is to provide the engineering profession with a body competent to represent it in a broad way.

F. K. Copeland, president Western Society of Engineers, which has not yet joined the federated movement, addressed the meeting briefly as to the position of the Western society, indicating that the society was taking a neutral position until there has been time to consider the proposition from all angles.

The meeting was preceded by a reception and dinner at which J. R. Bibbins presided and presented Mr. Berresford, who took charge of the technical session in the evening. During the day following the meeting arrangements were made for inspection trips to the Mark Plant of the Steel & Tube Company of America, to one of the automatic substations of the Chicago, North Shore & Milwaukee Railroad, at Lake Bluff, Ill., and to the Northwest Station of the Commonwealth Edison Company in Chicago. Announcement was also made by a representative of the Chicago, Milwaukee & St. Paul Railway that one of the new electric locomotives was on exhibit near the loop for the benefit of the engineers who were interested.

Abstracts of the four papers presented at the meeting are given below.

Mr. Allcutt's paper was a supplement to one on the same subject presented by him before the Institute in June, 1918. This was abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 10, 1918, page 241. In the earlier paper he described a type of lightning arrester spark gap which will discharge a high-frequency disturbance at a voltage considerably less than the normal-frequency discharge voltage. This type of lightning arrester, which has now come to be known as the "impulse gap" arrester, was then in the experimental stage. It has since come into extensive commercial use and the purpose of the present paper was to present data as to its operation and to discuss some of the features upon which the protective value of the gap depends.

Mr. Allcutt explained that a handicap to the electrolytic arrester is that it must be connected to a line through a spark gap, as permanent connection to the line will result in overheating and ultimate destruction of the arrester. It is necessary that the spark gap which connects the arrester to the line be so adjusted that it will not discharge normal line voltage. It is highly desirable, however, that the spark gap should discharge high-frequency disturbances at the lowest possible voltage in order to obtain a high degree of protection against such dangerous disturbances. Herein lies the value of the impulse gap.

The gap proper consists of two sphere-horn electrodes, which are connected respectively to the line and to an electrolytic arrester in the usual manner. In addition to these main electrodes, an auxiliary electrode is provided which is connected to one of the horns through a condenser and to the other horn through a similar condenser and a high resistance. If the auxiliary electrode is placed half way between the main electrodes, the gap will be virtually cut in half for high-frequency disturbances because the impedance offered by the resistance element is very much greater than the impedance of the condensers. Obviously, the result is a gap which is most sensitive to high-frequency discharges and consequently can have a higher voltage setting for normal frequency. In practice actual condensers are not used, but pin insulators having the necessary electrostatic capacity take their places in maintaining the auxiliary electrode at the proper potential. The unbalancing resistance is furnished by resistors inclosed in porcelain tubes mounted on a porcelain pillar. The auxiliary electrode is a pointed brass rod 0.08 in. in diameter, mounted on a substantial iron arm. Mr. Allcutt gave in his paper the results of many tests of modified forms of impulse-gap arresters and promised more data at a later date.

Mr. Lougee gave the results of tests made with the oxide-film (O.F.) lightning arrester developed more than two years ago.* He said that several hundred arresters of this type, up to 73,000 volts rating, are now installed on both indoor and outdoor circuits. Higher voltage units will soon be in service. This arrester consists of cells with lead peroxide filler. The cells consist each of two sherardized steel disks on the sides of a porcelain ring, the interior space being filled with the peroxide. One of the disks is covered with a varnish film, or both may be covered.

Mr. Lougee summarized the results of tests made to duplicate, in a short time, actual operating conditions encountered during an extended life in normal service. Some arresters which have been subjected to this sort of intensive test during the past two years or more, corresponding to several times this period in actual service, have shown up well. Sample oscillograms given by the author indicated some of their characteristics.

The paper by D. W. Roper continues the account of investigations recorded in a paper by him presented before the Institute in 1916. The primary object of that paper was the reconciliation of the differences between laboratory experiments and experience in service in this field. A main purpose of the investigations forming the basis of both papers was the determination of the relative merits of the several types of lightning arresters installed on the 60-cycle distribution system of the Commonwealth Edison Company in Chicago. Data obtained from practice over a long period were used by Mr. Roper in the preparation of curves showing the relation of "density of arresters"; that is, number per square mile, and the rate at which transformers were burned out, or fuses were blown. He also outlined a specification which he thought summarized the results of experience with several types of arresters. These were as follows:

1. The arrester must consist of a number of gaps in series with a resistance, with the number of gaps and the amount of resistance properly adjusted to the line voltage so that the dynamic arc following a lightning discharge will be quickly broken without damage to the arrester.
2. The resistance rod must have the resistance uniformly distributed throughout its length, so as to prevent the progressive short-circuiting of the rod with heavy lightning discharges and the destruction of the arrester which will follow.
3. The amount of resistance in the resistance rod should not be seriously affected by repeated heavy discharges.
4. The leads for connecting the arrester to the line should leave the arrester so that they will form drip loops, and the leads should be so arranged that the arrester can be connected to a line wire on either side of the arrester.

For low maintenance cost the following features are desirable:

5. The enclosing case should be of fireproof insulating material that is not affected by the weather; and it should be constructed so as to protect effectually the metal parts from the weather, and to prevent accumulation of dust on the gaps.
6. The gaps in the arrester should be between parallel plates, disks, or rings instead of between cylinders or spheres so as to permit repeated heavy discharges without seriously altering the length of the gaps.
7. The arrester should be constructed so that in the event of the failure of the arrester to interrupt the dynamic arc the enclosing case will be shattered by the heat so as to give some visual evidence of the trouble and result in the opening of the circuit.
8. The arrester should be without moving parts or parts which require inspection, renewal or adjustment and should preferably be made in the form which cannot be inspected or repaired without removing it from the pole.

Mr. Roper said that experience with the arresters covered by his investigation indicates that several types are now available which comply with the above specifications. He closed with a summary of conclusions, but cautioned against the attempt to compare the results secured by lightning arrester protection in Chicago with those in other localities without giving due consideration to all of the performance factors.

The last paper in the series, by Mr. Goodwin, was a plea for greater appreciation of the condenser in practical work. This, he said, has a wide field of application in electric circuits, for power-factor correction, for improvement in line regulation, for protection from lightning and high-frequency disturbances, etc. He listed the following advantages of the electrostatic condenser for power work:

1. As the apparatus is stationary, it requires no attention.
2. The power loss is small because the equipment has high efficiency.
3. With reliable condensers the maintenance cost is practically nil.
4. The corrective kilovolt-amperes can easily be increased or decreased by cutting sections in or out.
5. The outfit can be connected to any parts of the system and thus provide correction at the points where the greatest saving can result.
6. Condensers are noiseless and require no special foundations.
7. The first cost for small installations is low.
8. Condensers can be used to improve line regulation.

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*See issue of ELECTRIC RAILWAY JOURNAL, July 20, 1918, page 101.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Toledo Board Named

Board of Control Will Supervise Enforcement of New Service-at-Cost Ordinance

The members of the board of control for the operation of the new cost-of-service franchise at Toledo have been named by the commission which drafted the ordinance. David H. Goodwillie, former service director of the city and head of the commission which placed the valuation on the railway property of the Toledo Railways & Light Company, has been selected to fill the six-year term. W. W. Knight, vice-president of the Bostwick-Braun Company, wholesale and retail hardware, and one of the most aggressive members of the cost-of-service commission, has been appointed for the four-year term. Henry C. Truesdall, president of the Toledo Clearing House Association, of the Union Savings Bank, and vice-president of the Northern National Bank, will serve for the two-year term.

The appointees are considered both by the public at large and by the officials of the Rail-Light to be well qualified for their work. It is the general opinion that they represent the spirit of the cost-of-service commission.

Will Begin Work Soon

The first duties of the board when it is legally empowered to do business upon the acceptance in writing of the ordinance by the Toledo Railways & Light Company, and the Community Traction Company, and the formalities involved in the transfer of railway property from the former to the latter and the filing of an agreement with the city, will be to select a transportation commissioner to represent the city and the re-routing of the present car lines.

The Central Labor Union submitted eleven labor representatives to be considered in the selection of the three members of the board of control but they arrived too late for consideration by the commission. The eleven names submitted by the Mayor included one woman—Mrs. S. M. Jones, wife of the former Toledo Mayor of "golden rule" fame.

In announcing the result of their choice, the service-at-cost commissioners said:

> We wish first, however, to voice our sincere appreciation of the confidence you place in our judgment by expressing your intention to appoint the men we select. It is a responsibility we might well evade, were we not so deeply concerned in knowing the city's and the car riders' interests under this ordinance will be capably and honestly protected.
>
> Our commission is particularly pleased to be able to suggest men of such diversified experience, and hence exceptional fitness for all of the various responsibilities which will devolve on the board of control, and to have them willing to serve.

The final date for the franchise ordinance to go into effect will be Jan. 30. It may be put into effect at an earlier date if the companies involved in the transfer of property fulfill the three qualifications for acceptance of the ordinance.

Traction Settlement Applauded

The passage of the cost-of-service plan has been received with the most enthusiastic commendation by the city's business men. The local railway situation has kept the lines from expanding and has hampered city growth for nearly fifteen years. Prospects of relief from a condition of that kind within a year have brought a new feeling into the business life of the city.

Officials of the Toledo Railways & Light Company are pleased at the victory scored at the polls. They have been working for nearly ten years in an effort to get some kind of a settlement of the traction question. Henry L. Doherty at one time during the negotiations admitted that the cost-of-service measure drawn by the Milner commission was the best that he had seen. However, he has felt rather dissatisfied with the proposition on account of the fact that he was almost forced to yield to a valuation of $8,000,000.

This brings up one of the most interesting of the historical phases of the present situation. In 1914 there was agitation for municipal ownership and a valuation of $9,000,000 was placed upon the lines. During the last year—it is just a year ago since the famous "ouster" went into effect—negotiations have involved a valuation under city auspices. The city-appointed commission headed by Mr. Goodwillie fixed the valuation at $7,110,000 on a prewar basis of prices. They admitted that the replacement valuation would exceed $12,000,000. Mr. Doherty dropped his price to $9,000,000.

Striking Linemen Return

A strike of linemen employed by the Tri-City Railway & Light Company, Davenport, Iowa, has been settled. The men have accepted a wage scale of 77½ cents an hour. This is the scale offered the men a few days after they went out on strike in April. At that time the linemen refused the offer and demanded $1.25 an hour. The union men are now willing to return to work with the non-union men. Twenty-eight men went on strike last April. Twelve have returned to work. At the time the strike was called the scale was 70 cents.

City Ownership Proposed

F. W. Strickland Suggests that City Purchase Dallas Railway—Rate Increase Alternative

Municipal ownership of the Dallas (Texas) Railways or granting by the city of a rate sufficient to give the present company a fair and reasonable return on property value, is proposed by J. F. Strickland, president of the Dallas Railway, as the only means of meeting the present conditions that are retarding the development of the local transportation system. Mr. Strickland sets forth his views in a communication addressed to the Mayor and Board of City Commissioners.

In reply to Mr. Strickland's letter, the Mayor and Board of Commissioners have announced that any alteration of the present franchise of the Dallas Railway or a new franchise will receive consideration of the municipal authorities only under certain conditions, and that any proposed changes would be submitted to the voters at the election to be held next April for their approval.

City Asks Guarantees

The company is also informed that no action of any kind will be taken on any proposal to amend the present franchise or grant à new franchise until commitments have been received from the company that it will make extensions and improvements necessary for the growth of the city.

Mr. Strickland states that 17.86 per cent of the company's gross receipts have been invested in maintenance, although the company is required to invest only 10 per cent. This investment has amounted to $1,189,572. The letter says in part:

> As you know, since the beginning of operation under the present franchise on Oct. 1, 1917, the company has been under the supervision of your utilities department, and reference to the monthly reports which have been submitted by the company to the supervisor of public utilities will show that for the thirty-six months of operation, beginning Oct. 1, 1917, and ending Sept. 30, 1920, the company has failed to earn its permitted return of 7 per cent on the established property value, by $618.574. The average rate of return on property value for the thirty-six months has been 4½ per cent, while the rate of return for the month of September, 1920, just passed, was only 3.41 per cent. . . .
>
> It would seem, therefore, that the solution of the problem resolves itself into the following alternatives:
>
> Either the purchase of the railway property and operation of the same by the city of Dallas, or the granting by the city to the Dallas Railway Company of such a franchise as will permit it to earn a return on its investment sufficient to establish its credit and attract new capital to the enterprise.
>
> Should it be the desire of your honorable body to enter into negotiations with the company looking toward the purchase of the railway property, we would be very glad to discuss the same at any time designated by you.

Graduated Return to Induce Economy

Proposed Service-at-Cost Franchise for Akron Lines Provides Return Based on Fare— Buses for Outlying Sections

A new franchise embracing a number of unique features has been agreed upon between the Northern Ohio Traction & Light Company, Akron, Ohio, and the city of Akron, for the operation of the company's local lines. This franchise is the result of several weeks of negotiation between officials of the company and the members of the public utilities committee of the City Council, assisted by the city administrator and a traction expert. It was presented to the Council on Nov. 9, and while no vote has been taken it is said to meet the approval of practically all members of that body. The grant is for a term of twenty-five years and is based on the service-at-cost plan. It provides for the appointment of a public utilities commissioner, who is to "act as the technical adviser of the City Council and all city officials in all matters affecting the interpretation, construction, meaning or application of any of the provisions of the ordinance and all action thereunder affecting the quantity or quality of service, the cost thereof, or the rate of fare."

THE ordinance mentions no fixed valuation at present, but there is a section which provides that the valuation shall be fixed by an appraisal board, consisting of one appraiser to be chosen by the city, one by the company and a third by the United States District Court. The unusual features of the contract are:

1. Incentive for economical management. The basic rate of return is 7 per cent, but if the fare is held at 4 cents the rate of return is to advance to 8 per cent; if held at 5 cents it is to be 7½ per cent. The present rate of fare is 5 cents.

FEEDER BUS LINES PLANNED

2. Provides for an "auto bus system" to be operated by the company. In sections of the city where transportation, aside from street railway transportation, is deemed necessary the company is to operate the buses under city control.
3. New paving between tracks is to be done by the city, but the company is to keep this paving in repair.
4. An amortization fund is to be established after the franchise has been in effect fifteen years which shall be sufficient to meet the capital value at the expiration of the franchise period —twenty-five years.
5. Arbitration upon all points of disagreement, the United States Circuit Court of Appeals to select the third arbitrator.
6. The city is given the right to purchase or lease the property upon one year's notice at the valuation fixed by the appraisal plus subsequent additions to the capital value.

The initial rate of fare is fixed at 5 cents for a period of thirty days from the effective date of the ordinance, or until the valuation appraisal is made. The schedule of fares fixed in the contract is as follows:

4 cents cash, 5 tickets for 20 cents.
5 cents cash, 10 tickets for 45 cents.
5 cents cash, 5 tickets for 25 cents.
6 cents cash, 10 tickets for 55 cents.
6 cents cash, 5 tickets for 30 cents.
7 cents cash, 10 tickets for 65 cents.
7 cents cash, 5 tickets for 35 cents.
8 cents cash, 10 tickets for 75 cents.

It is further provided that the rate shall be adjusted above and below the steps in this schedule in like reductions and increases as such reductions or increases may be necessary under the service-at-cost plan, except that unless otherwise agreed the fare shall not exceed 10 cents. No rate is fixed for "owl" car service, but the contract provides that the public utilities commissioner is to designate the rate charged between 12:30 a.m. and 4:30 a.m.

RETURN VARIES WITH FARE

The section governing fare changes and rates of return provides that whenever the rate of fare is 6 cents straight or higher the rate of return to the company on the property value of the system shall be 7 per cent; but that as the fare decreases in the fixed steps the company's allowed rate of return is increased for each lower step ¼ of 1 per cent above the rate of 7 per cent for the period only during which lower steps of fare shall obtain. The minimum period during which a given fare shall obtain is fixed at three months. In other words, the rate of return for the corresponding ticket rates of fare will be 7 per cent for 6 cents or higher, 7¼ per cent for 5½ cents, 7½ per cent for 5 cents, 7¾ per cent for 4½ cents and 8 per cent for 4 cents.

The contract stipulates that no contribution, subscription, gift or donation by the company shall be charged to operating expenses and that employees of the general offices shall not be given free transportation.

The company operates interurban lines in and out of Akron. Its terminal building is included in the valuation of the property and power shall be sold for use on the city system at the rate of 1¼ cents per kw.-hr. for a period of five years, after which a new agreement is to be made as to the cost of power.

SERVICE QUALITY GUARANTEED

In the matter of service the company pledges itself to operate cars of a modern design equipped and furnished with such improvements and appliances as shall be deemed by the city to be necessary and proper for the safety, health, convenience and comfort of the passengers and the public, and to operate cars in such numbers, at such intervals and under such rules and regulations as the city may from time to time require. The city reserves to itself the entire control of the service, including the right of fixing schedules and routes, the character of new cars, the right to increase or diminish service, and the right to order reasonable changes in routes and terminals of interurban cars.

Either the company or the city may propose extensions, betterments or permanent improvements. Should they fail to agree upon such extensions a court of arbitration is to be available. The city may at any time build extensions to tracks and distribution facilities of the city system and upon the capital value of such additions the city is to receive the same return as the company.

At any time when the ordinance or any renewal or extension has less than ten years to run the company is given the right to create an amortization fund by making monthly charges to operating expenses and deducting the amounts from gross revenues, which amounts, together with the interest and other accumulations, if any, shall at the termination of the grant or at the termination of any renewal or extension equal a sum corresponding to the then property value less an estimated salvage value. This amortization fund shall be under the joint control of the city and the company. In the event the grant is renewed or extended the amount at that time in the amortization fund may be used for extensions, betterments or permanent improvements, the value of which shall not be added to the property value, or the money may be used for the purpose of reducing the then property value.

MONTHLY ACCOUNTING PROVIDED

Any discount and expenses resulting, or commission and expenses paid in the furnishing of money by the company for extensions, betterments and permanent improvements or for refunding shall be amortized monthly and included in the operating expenses over the life of the securities sold to provide any or all of the necessary money. If at any time the cost of money furnished by the company for extensions, betterments and permanent improvements expressed in annual percentage exceeds the rate of return allowed, then the difference between the allowed rate of return and such annual cost shall be charged to operating expenses. All renewals or replacements are to be added to the property value and all property sold shall be deducted from property value.

The city reserves to itself and the company grants to the city the right to purchase and take over at the end of any two-year period from the effective date of the ordinance the entire city system by giving the company not less than one year's written notice. When the city purchases the property it shall pay the then property value but no franchise value. The same terms apply in case the city desires to lease the property.

The city is given the right to use free of charge the poles of the city system for fire alarm, patrol or public lighting purposes.

In case the company fails to conform to any of the conditions of the contract a penalty of $40 a day is incurred. The company is also required to furnish a bond of $250,000 for faithful performance of the contract.

Hydro-Radial Terminal Planned

In giving further evidence during the week ended Oct. 30 at the sitting of the Canadian Hydro-Radial Railway Commission F. A. Gaby, chief engineer of the Hydro Commission, admitted that the site of the old Union Depot, now used by the steam railways, had been considered by the commission as a possible terminal for the radial lines which will be run into the city of Toronto from the east and west of Ontario.

The daily increase of traffic on the Danforth and Gerrard lines of the Toronto Civic Railway during August was at the rate of 12,000,000 passengers a year. The Hydro-radials expected to handle about 25 per cent of this traffic when the lines are run downtown to the terminal in the heart of the city. The fare will be 5 cents for a distance of about 5 miles.

It was stated by Mr. Gaby that the proposed London, Stratford and Guelph radial line was to be abandoned following upon the plans now being considered for acquiring the Toronto Suburban, which runs from Toronto to Guelph. It is expected that arrangements can be made to secure running rights over the Grand Trunk Railway tracks between Guelph and Galt and Galt and Elmira.

Public Trustees Attacked

Mayor Roscoe Walsworth of Revere, Mass., has appealed to Governor Calvin Coolidge to hold an inquiry into the management of the Revere District of the Eastern Massachusetts Street Railway with a view to a reduction of fares and an improvement of service. Mayor Walsworth asks for a public hearing on the conduct of the affairs of the district by the public trustees of the railway, and calls for the removal from office of such of the trustees as may be proved incompetent.

Fares on the Bay State lines were recently increased through the elimination of transfers and the raising of the ticket rate, the cash fare remaining 10 cents. The advance was made necessary by the award of an increase of 11 cents an hour to the railway's employees by a board of arbitration. The wage advance will add approximately $1,400,000 annually to the cost of operating the system. The only district exempted from the fare increase was that including the city of Fall River, which has been paying its way under the "home rule" plan.

The Mayor of Lawrence at a recent meeting of the City Council demanded that the members of the "home rule" committee which has been in charge of the Lawrence Division of the Bay State, tender their resignations.

Highest Court Denies Injunction

Plea of Detroit United Railway Refused by United States Supreme Court—City Orders Equipment, Disposes of Bonds

The injunction asked by the Detroit (Mich.) United Railway prohibiting the city of Detroit from continuing with steps already taken leading to the acquisition of municipally owned street railway facilities has been denied by the Supreme Court of the United States. The suit was brought by the D. U. R. on the grounds that the municipal-ownership ordinance is confiscatory and contrary to the Federal constitution. Two motions are now before the Supreme Court on the appeal of the suit of the D. U. R. for an injunction. The appeal had been denied by the District Court. A brief has been filed by Charles Evans Hughes, who has been retained as counsel for the Detroit United, asking that the city be enjoined from selling bonds for the financing of the municipal street railway and from proceeding with construction. If the injunction is not granted, it is asked that the case be advanced for trial.

CORPORATION Counsel Wilcox for the city of Detroit asks that the case be dismissed as no federal question is involved. A second motion asks that if the first be denied, the court affirm the judgment of the District Court, whose decision was to the effect there was no basis for the D. U. R.'s suit. Finally it is asked that if neither of the first motions be granted, the case be advanced for trial. Jan. 3 has been set by the Supreme Court as the date for hearing the arguments in the case.

CITY GOING AHEAD

In answer to the contention of interests opposed to the proposed municipal system in Detroit to the effect that the State Public Utilities Commission has no power to grant a municipal line rights to cross the tracks of a privately owned utility, it has been stated by the city street railway commission that no trouble is anticipated on that point.

The reason that no municipally owned line has been laid across the D. U. R.'s tracks is given as the fact that the special trackwork needed for such a crossing has not yet been received. This work is under contract but has been deferred as winter work which can be done when other work must be suspended.

No legal controversy on the question is expected by Corporation Counsel Wilcox. It is held that if the Public Utilities Commission should decide that it lacks the power to grant this right to cross, the situation would revert to the time before the formation of the commission, when one public utility had the right to cross the property of another. No difficulty ever occurred in the scores of times such situations occurred before.

City lines will cross non-franchised lines and day-to-day agreement lines of the D. U. R. where, according to Corporation Counsel Wilcox, the city's rights are unquestioned. The new D. U. R. Northwestern belt extension will also cross one of the city lines.

In case of attempted obstruction on the part of the D. U. R. there are many lines, according to Mr. Wilcox, which could be pursued to make such obstruction unlikely, one of which would be to bar all interurbans from entering the city. This could be done by a councilmanic ordinance limiting the weight of all cars running on city streets.

The street railway commission's recommendation that twenty-five one-man safety cars be bought for the municipal railway has been concurred in by the Council, despite the adverse report of Councilman Kronk, who investigated the value and use of these cars on a recent trip to Eastern cities where one-man cars are being used.

It was the opinion of some of the Councilmen that according to the city charter the Council could only accept or reject tentative routes but could not decide on equipment and that therefore there was nothing else to do under the charter but to concur in the commission's recommendations in regard to the cars. The one-man cars are planned for use on the light traffic lines only.

MORE BONDS SOLD

Acting upon the recommendation of the city comptroller the Council has authorized the sale of $1,000,000 worth of street railway bonds to a New York firm for further financing the municipal system. The bonds are 5½ per cent bonds, but at the price bid, 103.17, the interest rate to be paid by the city will be approximately 5¼ per cent. The recent bids are reported as the first in which a private party has been high bidder on the street railway bonds. This authorized sale brings the amount of bonds authorized up to $2,750,000 and leaves $12,250,000 yet to be sold.

In discussing the local traction situation, the Detroit United Railway through its publicity department states that the opponents of service-at-cost settlements have never been able to produce a single valid argument against the merit of fundamentals underlying the proposal. A plan of unified operation and unified fares without the taxpayers having to dip into their pockets, made slim by a multitude of taxation requirements and demands, awaits the people of Detroit.

The piece-meal undertaking, according to the D. U. R., is in itself a service-at-cost proposition—if the city charter is not persistently violated by the authorities—the big and important difference between the two being that under municipal piece-meal all the costly extravagances of municipal spending must be met while the service-at-cost contract with a company to enter the service gives to the riders, through lessened costs, the economies practiced by private companies.

Indiana Committee Working with Commerce Bodies

The Indiana Committee on Public Utility Information, of which Charles L. Henry is chairman, is endeavoring through the local utility men in various communities to bring about the passing by chambers of commerce, boards of trade, rotary clubs, etc., of resolutions recognizing the difficult situation in the public utility industry, that good public utility service is a paramount issue, that the utilities are entitled to a measure of co-operation on the part of the public and that in general those who provide such service are entitled to rates that will cover the operating expenses and give them a reasonable return on their investment. The effort to secure the adoption of such resolutions in various cities was inspired by action of this character taken by the Chamber of Commerce of South Bend, Ind., recently.

Wage Rehearing Again Denied

Denial of a motion for a rehearing of its recent wage award of 5 cents an hour increase in the pay of employees of the United Railways of St. Louis has been announced by the Public Service Commission of Missouri. The decision was unanimous. The employees had asked for 35 cents an hour increase, the commission sitting as a board of arbitration in the case. The men are now paid 50, 55, and 60 cents an hour, according to the length of service. This was the second denial of a motion for a rehearing by the commission. The second motion was filed after the carmen's union had unanimously voted not to accept the award.

The men declared that David E. Blair, a member of the commission who heard the presentation of the case, resigned before a decision was reached and did not vote on the decision, but that the deciding vote on the award was cast by Mr. Blair's successor, John Kennish, who had heard none of the case. Edward Foristel, attorney for the men, said that he felt the award was disappointing, but that he would advise the men to stand by the decision, inasmuch as they had agreed previously to accept whatever decision the commission rendered. He said he would present the claims of the men to the commission in December, when the present rate of fare expires and the company appears before the body.

May Build Oklahoma Interurban

Plans for building an electric interurban line from Oklahoma City to Muskogee, Okla., via Henryetta, which were begun before the war but were halted, have again been taken up and it is believed they will be carried through to completion at an early date. R. D. Long, promoter of the enterprise, has already spent about $50,000 on preliminary surveys. Mr. Long has just returned from the East and he reports that he has been assured co-operation of Eastern financiers.

Plans contemplate the erection of a large power station near Henryetta in the heart of the coal fields for supplying current for the entire line and for cities touched by the railway. The road and power plant, it is estimated, would cost in excess of $24,000,000. Plans contemplate bringing the line into the cities on elevated tracks, thus eliminating all traffic delays and making unusually fast time possible.

Persons interested in the project will hold an early meeting in Muskogee for the purpose of taking action looking to something definite with regard to building the road.

News Notes

Service Restored in Paducah.—Electric railway service is practically normal again in Paducah, Ky., after a cessation of more than three weeks. New generating units have been installed at the power house of the Paducah Electric Company to replace those wrecked by an explosion at the plant a month ago. It has been found necessary to take off cars at night to conserve lighting for commercial purposes.

Ask More on One-Man Cars.—Employees of the Eastern Pennsylvania Railways, Pottsville, Pa., are demanding double wages for the operation of one-man cars. The company has stated that although one-man operators are entitled to an increased scale, it is unable to meet the demands of the men. The dispute had its beginning in September of this year, when the employees declared that the Eastern Pennsylvania Railways had no right to operate this type of car. After the company refused to arbitrate the issue the men struck and the entire system was tied up for five days. Later wage arbitration was agreed upon.

City's Plans Take Shape.—Grover A. Whalen, Commissioner of Plant and Structures of New York City, is completing arrangements for taking over the lines of the Staten Island Midland Railway, Richmond borough. Under the terms of an agreement approved by the Board of Estimate the city will operate the road for a period of one year beginning about Dec. 1. John J. Kuhn, receiver of the Richmond Light & Railroad Company, has signed a contract whereby the latter company will permit the city to use its tracks through St. George and Tompkinsville. The Richmond Light & Railroad Company will also supply the city with current at cost.

"Scribner's" Has an Article on Utilities.—James Edwards has contributed to *Scribner's* for November an article "The Public Utility Field." To the man actively engaged in public utility work there is nothing particularly new in what Mr. Edwards has written, but he has presented some of the utility problems in a way that should help to a better understanding of the problems of the industry by the general public. He says that it is fundamentally true that the people as a whole have a keen sense of justice and in the long run will arrive at a correct decision, and while they are entitled to and will insist on reasonable rates they are willing to pay for good service.

More Authority for Toronto Commission.—At a meeting of the City Council of Toronto, Ont., on Nov. 9 an ordinance was passed vesting in the Toronto Transportation Commission complete control of the city streets with respect to the construction and operation of tubes or of motor buses. The commission was recently appointed in connection with the proposed taking over of the Toronto Railway at the expiration of the latter's franchise next September. The city already has power under the city of Toronto act of 1910 to construct, build, maintain and operate a system of underground railways for the carriage of passengers and freight and may acquire any necessary land therefor under the provisions of the law.

Service Halts in Braintree.—The Eastern Massachusetts Street Railway, Boston, Mass., recently discontinued service in Holbrook and Braintree, Mass., owing to the refusal on the part of the towns involved to revoke jitney licenses. The trolley situation in these sections served by the Eastern Massachusetts Street Railway was discussed at a meeting in Braintree on Nov. 3, at which representatives from Braintree, Holbrook and Weymouth were present. Although it was pointed out that jitneys had given good service the citizens expressed appreciation of a dependable railway system. At a later meeting authorization was given to the Board of Selectmen of Braintree to call on the trustees of the Eastern Massachusetts Street Railway to see what could be done in the matter of having service restored. The board later passed an ordinance regulating the buses, following which service was restored.

Charge for Power Before Commission.—Application has been made to the Public Service Commission by the International Railway, Buffalo, N. Y., for an order determining the just and reasonable rate for electric energy to be charged by the Tonawanda Power Company for operation in Tonawanda, North Tonawanda, Lockport, Wheatfield, Pendelton and Newfane after Jan. 1, 1921. A contract made fifteen years ago by the International Railway with the power company expires at that time. The railway alleges the power company seeks an increase in rates after Jan. 1 of approximately 43 per cent. It is the contention of the railway that such an increase in the cost of electricity will cause a burden on operating conditions and an additional hardship on traffic in the territory. The company says the proposed rate is unjust, unfair and unreasonable.

Financial and Corporate

More 10-Cent Cities

Statistics Compiled by American Electric Railway Association Indicate Tendency Toward Basic 10-Cent Fare

Statistics compiled by the American Electric Railway Association showing the rate of fare in effect on Nov. 1, 1920, in the 288 cities of the United States having a population of 25,000 or more, indicate a continuing upward trend in street railway rates and a distinct movement toward a base charge of 10 cents.

The association's figures show that a larger urban population is now paying a 10-cent base rate than is paying the former nickel charge. New York City has been omitted from the calculations because, owing to a complicated political situation, the principal surface lines are in the hands of receivers and various rates, from 8 cents to a flat 5 cents, are in effect, making comparisons impossible.

Fifty-two Nickel Cities

The 287 cities, excluding New York City, have a combined population of 32,173,312. Forty-nine cities having a combined population of 4,992,414 are on a 10-cent base rate; two cities with a population of 189,085 have a 9-cent base rate; twenty-seven cities, population 5,191,725, have an 8-cent base rate; eighty-four cities, population 10,415,175, have a 7-cent base rate; fifty-five cities, population 5,283,100, have a 6-cent base rate; fifty-two cities, population 4,222,307, have a 5-cent base rate; and eighteen cities, population 1,879,506, have zone systems which make the rate higher than 5 cents.

The increase in fares as compared to February, 1920, when the association issued a similar statement, is most significant. The 1920 census added some fifteen cities to the group under consideration without, however, affecting the general divisions. Cities in the 25,000 group paying more than a 5-cent fare increased from 192 to 235; the 10-cent cities increasing from twenty-three to forty-nine; 8-cent cities from fourteen to twenty-seven, and 7-cent cities from fifty-eight to eighty-four, while 6-cent cities decreased from seventy-one to fifty-five; 5-cent cities from eighty to fifty-two, and zone system cities from twenty-six to eighteen. Of the fifty-two cities charging a 5-cent fare only four have a population of more than 100,000 and of these there is immediate prospect of increase in two.

Dime Fares in Many Cities

Chicago (on its elevated lines), Boston, Pittsburgh, Seattle, New Haven, Bridgeport, Hartford, Fall River, Lowell, Cambridge and Lawrence are among the large cities having a 10-cent base, while for cash passengers securing transfers, at certain points, the fare in Philadelphia is 10 cents, as it is in Washington for riders transferring between the two separately-owned systems. In certain of the zone-fare cities, such as Providence, Worcester, San Diego, Springfield and New Bedford, the fare for all but the short-ride passengers is 10 cents or more.

With regard to the basic 10-cent fare the association's statement says:

> A study of the statistics prepared by the association and comparison with previous tabulations of the same kind together with the applications for increases pending in various cities seem to indicate that the street car fare in the United States is gradually gravitating toward a flat rate of 10 cents in order to catch up with increased operating costs, which it is claimed by the industry have more than doubled since 1914.

Profit of 0.267 Cent per Fare

The 8-cent fare on the Chicago (Ill.) Surface Lines produced the revenue in August and September indicated in the accompanying statement. The half-fares collected from children brought the average rate per revenue passenger down to a unit slightly below 8 cents. The average rate of fare per passenger for September was 4.47 cents; in other words, 78 per cent of the revenue passengers used transfers. As to the disposition of the revenue per passenger, the first item in the table shows that 4.308 cents is taken for labor alone.

DISPOSITION OF FARE BY CHICAGO SURFACE LINES

	August 1920	September 1920
Passenger revenue.	$ 5,021,478	$ 4,940,323
Revenue passengers carried	63,138,188	62,044,885
Total passengers carried	113,396,053	110,488,632
Average fare, per revenue passenger—cents	7.953	7.962
Disposition:	Cents	Cents
Wages	4.269	4.308
Material, power and other expenses	1.494	1.472
Taxes	.250	.256
Damages	.282	.287
5 per cent on purchase price...	1.060	1.045
55 per cent to city	.329	.327
45 per cent to companies ...	.269	.267
	7.953	7.962

This throws interesting light on the possibility of Mayor Thompson's campaign for 5-cent fares. The total profit after deducting operating expenses and the 5 per cent allowance for interest on bonds is 0.267 cent, of which 55 per cent goes to the city and 45 per cent to the companies for dividends. Recently the Public Utilities Commission decided that the allowed rate of return on the value of the property should be 7.5 per cent. This will reduce the amount available for profit in future months.

Income Increase Shown

$15,000 Net Gain in September Compared with Results in July, $28,000 with August

The net income of the Minneapolis (Minn.) Street Railway increased $15,363 in September, as compared with July, and $28,261 compared with August, according to a report submitted to the City Council by President Horace Lowry. The quarterly income statement is required by the ordinance which granted the company authority to increase the fare from 5 cents to 6 cents Aug. 16.

The report of Mr. Lowry showed the total operating revenue was $571,150 in July, $596,728 in August and $657,066 in September, making a total of $1,824,945 for the quarterly period. The total operating expenses were $383,181 in July, $422,286 in August and $458,390 in September, a total of $1,263,859 for the three months. The net operating revenue was $187,968 for July, $174,442 for August and $198,675 for September, making a total three months' net revenue of $561,086. The total non-operating income was set forth as $1,993 for July, $2,042 for August and $2,567 for September, a total of $6,603 for the three months.

Net Income $66,729

The gross income was shown to be $133,551 for July, $120,088 for August and $146,700 for September, a total of $400,340. The total deduction for miscellaneous rents, interest on funded debt, interest on unfunded debt and miscellaneous debits amounted to $82,185 for July, $81,520 for August and $79,970 for September, a total of $243,677, leaving the net income $51,366 for July, $38,567 for August and $66,729 for September, a total of $156,663 for the three months.

Mr. Lowry explained that with fifty-nine additional cars in service at the end of September, the comparisons with July and August regarding the net income would in the following month naturally show a decline, for the service improvement was accelerated in September until the maximum shown in the report was reached.

At the same time, Eugene Lund, city street railway inspector, submitted a report showing an increase of fifty-nine cars operated from Aug. 17 to Sept. 30. In that period, according to the report, 1,015 more car miles were operated on the average weekday.

To meet the rush-hour demands and in carrying out the promise of the company for improvement in service, Foster Hannaford, general manager of the railway, said twenty-five improved type trailers would be in operation this winter. The order for these trailers, similar to one tried on the Nicollet Avenue line, was placed on Oct. 22.

The company is committed to a plan of placing 300 front exit cars in service by early in 1921 and the first six of these cars, remodeled at the Snelling Avenue shops, will be in operation soon, Mr. Hannaford said.

P. R. T. Gaining

Receipts Increase Approximately 20 per Cent Under 7-Cent Fare—Ten Months' Deficit $1,702,120

The gross passenger earnings of the Philadelphia (Pa.) Rapid Transit Company for the first fourteen days of November totaled $1,735,000, an increase of $319,000 over the same period a year ago. Of this amount, $222,400 represents the increase in revenues over and above that which would have been secured through the normal business under the former 5-cent fare without change of the exchange ticket and free transfer privileges. This indicates an increase of approximately 20 per cent in the daily earnings under the 7-cent cash fare, with four tickets for a quarter, effective Nov. 1.

RESULTS EXCEED EXPECTATIONS

In announcing the company's receipts for the first two weeks of the 7-cent fare officials of the company intimated that the results under the new rates far exceeded their expectations. On the basis of the results thus far obtained, the 7-cent fare is expected to increase the company's revenues approximately $7,000,000 annually. In 1919 the company collected $34,739,589 on a straight 5-cent fare. The 7-cent rate, it is estimated, will give the P. R. T. more than $10,000,000 in excess of that figure. The usual increase in the number of passengers carried results in a gain of between $3,000,000 and $4,000,000 annually, so that $7,000,000 is a conservative estimate of actual increases from the new fare.

The company officials said that they did not regard the period taken as a complete test. It comes at the time of the year when the traffic is especially heavy. They contend that January and February must be passed before they will be able to reach a final decision regarding the success of the new rate. On the other hand, receipts are expected to take a marked jump during the rest of November and December. These two months of each year mark the high-water point in the number of passengers carried by the company. The latter part of this month and all of December are expected to result in perhaps $10,000 daily being added to the present receipts of $120,000.

Eighty-four per cent of the P. R. T. riders are using 6¼-cent tickets, leaving only 16 per cent paying the 7-cent cash fare. On Nov. 1, the first day of the higher fare, the sale of tickets approximated $250,000. Every effort is being made by the company to speed up the service so that more space will be available. Schedules have been rearranged and several lines have been rerouted to eliminate delays. On routes 3 and 27 the increased efficiency resulting from these changes will make possible twenty-five additional trips daily.

The income statement of the P. R. T. for October shows that the company will have to overcome a total deficit for the first ten months of 1920 of $1,702,120. If present conditions continue it is expected that more than half of this deficit will be wiped out by the end of the current year. This deficit includes the 5 per cent dividend to the P. R. T. stockholders. The deficit for the month of October was $187,131. The company's net income for the month amounted to $125,368 as compared with $256,806 during the same period one year ago.

SUMMARY OF OPERATIONS OF PHILADELPHIA RAPID TRANSIT COMPANY

Month ended Oct. 31, 1920		1920	1919	Percentage Change Over 1919
Operating revenue		$3,336,595.71	$3,165,552.88	5.4
Operation and taxes		2,445,370.67	2,140,411.79	14.3
Operating income		891,225.04	1,025,141.09	—13.1
Non-operating income		53,958.52	45,216.09	19.3
Gross income		945,183.56	1,070,357.18	—11.7
Fixed charges		819,815.43	813,550.95	0.8
Net income		125,368.13	$256,806.23	—51.3
Deferred wage adjustment—one month	$187,500.00			
Five per cent return on P. R. T. paid-in capital — one month	125,000.00	312,500.00		
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock		$187,131.87		

Ten months ended October 31, 1920		1920	1919	Percentage Change Over 1919
Operating revenue		$31,191,329.44	$29,160,983.65	7.0
Operation and taxes		23,005,600.94	20,029,040.98	14.8
Operating income		8,185,728.50	9,131,942.67	—10.4
Non-operating income		476,309.61	441,311.35	7.9
Gross income		8,662,038.11	9,573,254.02	9.6
Fixed charges		8,176,658.71	8,109,495.08	0.8
Net income		485,379.40	$1,463,758.94	—66.8
Deferred wage adjustment—five months	$937,500.00			
Five per cent return on P. R. T. paid-in capital — ten months	1,250,000.00	2,187,500.00		
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock		$1,702,120.60		

Deficit at Rochester

Commissioner Barnes Reports for First Full Month of Service at Cost—Total Loss $33,793

The operating revenue of the Rochester lines of the New York State Railways for September was $4,627 less than sufficient to meet operating expenses and other obligations, according to a report submitted on Nov. 9 by Commissioner C. R. Barnes to the Mayor and the Common Council. Charges for renewals and depreciation were eliminated from the calculations that yielded this deficit or it would have been larger. Under the contract between the city and the company a balancing fund of $300,000 was to be created for the purpose of taking care of losses and profits from operating revenue. The present 7-cent fare was to be reduced should the balancing fund exceed $400,000 or increased should the fund fall below $200,000.

TOTAL DEFICIT $33,793

The contract also specifies that each month at least 2 per cent of the fixed valuation of the physical property shall be placed in a "renewal and depreciation" fund, but this provision may be disregarded by consent of both the company's authorities and the commissioner of railways. Pending the appraisal of the property a valuation of $17,500,000 was established for the purpose of the contract. Under this valuation the minimum amount to be placed in the renewal and depreciation fund each month is $29,166. This charge was made upon the operating revenues of the company in August, but was eliminated in September.

For August a deficit of $71,000 was created. The contract became effective on August 1, but the increased fare was not put in force until August 28. Because of this delay it was decided to spread the August deficit over a period of months. Had this loss been made up immediately and an appropriation made in September for the renewal and depreciation fund, it would have been necessary to increase the fare at once.

A summary of the income statement for the month of September is as follows:

Railway operating revenue	$408,648
Railway operating expenses	302,285
Net revenue from railway operation	106,362
Auxiliary operation, deficit	23
Net revenue from operation	106,339
Taxes assignable to operation	23,728
Net revenue	82,610
Non-operating revenue	1,761
Gross income	84,372
Return on investment	89,000
Deficit	4,627

In accordance with the service-at-cost contract, the above deficit is made up from the balancing fund.

The report of Mr. Barnes follows in part:

> A charge for renewals and depreciation, which under the terms of the contract should be at least $29,166.66, has been excluded from the September statement. This is done by mutual consent, as authorized in the contract, for the reason that the net revenue was not sufficient to provide for such charge. . . .

During the month of August $29,166 was accrued for . . . reconstruction of track on Main Street east now taking place. The original cost of the track being replaced, less salvage, is a complete loss and such loss is charged against this accrued amount. * * *

STATISTICS OF OPERATION
(City lines only)

	Number of Passengers, September
Revenue passengers	5,878,006
Free passengers	119,969
Transfers	1,976,526
Total passengers	7,974,501

Free passengers as shown here are principally employees of the company who ride on free tickets. In addition firemen and policemen in uniform are carried free.

During September 60.64 per cent of the city revenue was derived from tickets; 33.62 per cent of the city revenue passengers used transfers.

In September there were 7.7 city revenue passengers carried per city passenger car mile.

The average rate of fare for full-fare passengers was 6.68 cents, an increase of 33.6 per cent over the 5-cent fare.

Comparison of passenger car miles on city lines operated in September, 1920, with September, 1919, is as follows:

September, 1920	766,585
September, 1919	652,367
Increase	114,218
Percentage increase in service	17.5

The number of revenue passengers carried during September, 1920, on the city and suburban lines included in the service-at-cost contract was 6,092,949. The cost per revenue passenger carried during September, 1920, on these lines was as follows:

	Cents
Labor	3.5740
Power	.3833
Material and supplies	.4957
Casualties	.2680
Miscellaneous expense	.2407
Taxes	.3894
Return on investment	1.4607
Total	6.8118
Average revenue from all sources per revenue passenger	6.7358
Deficit per revenue passenger	.0760

The above expenses do not include any charges for renewals and depreciation which if included would have made the deficit .5547 cents per revenue passenger.

To improve the service generally, especially in the matter of regularity, changes have been made in the operating methods. Inspectors are located at the important points on all lines to regulate and record the movement of cars. At the heavy loading points, additional men are stationed to assist in loading and despatching cars. Four men from the mechanical department are placed at different parts of the city to make immediate possible repairs to cars which become disabled on route. During the rush hours emergency trucks are stationed on the street at various points on the system for the purpose of facilitating their work in removing obstructions from tracks, repairing broken wires and caring for derailed or disabled cars. In addition to the above the service is under the constant supervision of this department, especially during the morning and evening hours. These and other changes made in the operation have resulted in material improvement in regularity of service. . . .

In the month of September of this year compared with the same month in 1919 there was an increase of 114,218 city car miles run, or 17.5 per cent, while the city passengers carried in September compared with thirty days in August of this year shows a falling off of 125,869 or 15.5 per cent.

Collateral Sale Nets $265,000

The 181,860 shares of common stock of the American Railways, Philadelphia, Pa., pledged as collateral for the National Properties 4 and 6 per cent bonds, were sold at public auction on Nov. 8, by order of the United States District Court, at the Federal Building, Wilmington, Del., by Francis de H. Janvier, special master. The stock was bought in by the bondholders' protective committee, of which Evan Randolph is chairman, for $265,000, this being the only bid made. The petition filed in the United States District Court at Wilmington in behalf of the above sale was denied by Judge Morris. The court fixed Nov. 19 as the latest date on which objections might be filed.

Attorneys representing the minority bondholders' committee have filed an involuntary petition in bankruptcy seeking to have the affairs of the company investigated. A representative of the minority bondholders is quoted as saying: "When a company is adjudged a bankrupt a referee in bankruptcy is appointed. Such officer would have authority to make investigations as to what caused the company to become bankrupt and make other investigation of its condition we desire."

Bay State Deficits Continue

The report of operations of the Eastern Massachusetts Street Railway, Boston, Mass., for September shows that only three of the eleven "home rule" districts of the company had a surplus after deducting the total cost of service, including an allowance of 6 per cent on the valuation of the property. The remaining eight districts had deficits ranging from $3,747 to $17,612 for the month. All districts, however, showed revenues in excess of operating expenses and taxes. The only districts having surpluses were those including Fall River, Lynn and Taunton.

The above table shows in detail the September operations by districts.

RESULTS OF OPERATIONS, EASTERN MASSACHUSETTS STREET RAILWAY,
SEPTEMBER, 1920

District	Total Revenue	Operating Expenses and Taxes	Six Per Cent on Property	Total Cost of Service	Surplus or Deficit
Chelsea	$127,556	$114,568	$20,100	$134,668	Def. $7,112
Melrose-Woburn	80,587	69,665	21,050	90,715	Def. 10,128
Lynn	144,664	112,989	21,550	134,539	Sur. 10,125
Salem	101,235	99,147	19,700	118,847	Def. 17,612
Lowell	125,503	105,900	23,250	129,150	Def. 3,647
Lawrence	77,925	71,098	14,600	85,698	Def. 7,773
Haverhill	41,485	37,768	9,850	47,618	Def. 6,133
Quincy	68,849	58,027	16,200	74,227	Def. 5,378
Brockton	127,558	114,757	28,800	143,557	Def. 15,999
Taunton	40,275	26,743	8,950	35,693	Sur. 4,582
Fall River	120,089	99,442	17,400	116,842	Sur. 3,247

G. E. Plans Stock Issue

The directors of the General Electric Company at a meeting in Boston on Nov. 12 authorized the issuance of $27,500,000 common stock to be offered to stockholders of record Dec. 8 at par at the rate of one share of new stock for every five shares of stock then held. Subscription to the new stock must be made on or before Jan. 20, 1921, and payments are to be made either in four equal installments on Jan. 20, April 20, July 20 and Oct. 20, 1921, or in full at time of subscription. The directors declared the regular quarterly cash dividend of $2 a share and the regular semi-annual dividend of 2 per cent in stock, both payable Jan. 15 to stock of record Dec. 8.

Foreclosure Decree Postponed

Issuance of a decree of foreclosure sale of the properties of the New York (N. Y.) Railways under the provisions of the first real estate and refunding mortgage, the interest on which has been in default for several interest periods, has been postponed by Judge Julius M. Mayer in the United States District Court to the third Monday in January. The junior bondholders' protective committee, represented by B. H. Blanc, opposes the issuance of a decree at this time on the ground that changing conditions are making an improvement in the situation of the company and that a dissolution of the properties at the present time would work an injury not only to the junior bondholders but to other creditors. Joseph P. Cotton, representing the holders of the first real estate and refunding 4s, opposed any further delay and told the court that the interest of the first mortgage bondholders was being curtailed by the accumulating tax liens now amounting to approximately $2,700,000 on the property.

J. G. Bouvier, who represented the creditors' committee, which has claims aggregating $1,500,000 against the company for damages, also opposed the issuance of a decree at this time. Judge Mayer in setting the third Monday of January for final argument in the matter expressed the opinion that recent political events had created a change in the state of mind of the public and that with assurances stated to the newspapers by Governor-elect Miller of his interest in the transit problems the creditors of the company had much more to hope for now than at any time since the receivership began. He asked that a conference of the creditors be called for Nov. 22 to discuss further measures to obviate any necessity for a final foreclosure.

Progress in Ontario Negotiations

Negotiations which have been carried on by Sir Adam Beck, chairman of the Ontario Hydro-Electric Power Commission, for the acquisition of radial railways and power companies in and around Toronto controlled by Sir William MacKenzie, have reached the point where the bondholders must be consulted. Sir William MacKenzie is now on his way to England for the purpose of placing before the bondholders two alternative propositions—one to discount their holdings and sell out for cash and the other to allow the Hydro Commission to assume all outstanding obligations.

The price mentioned is in the neighborhood of $35,000,000, which represents securities sold. If it can be arranged, either the city of Toronto or the Hydro-Electric Commission will take over the obligations, so that very little cash will have to be provided.

Four companies are concerned in the negotiations—the Electrical Development of Ontario, which owns the generating plant at Niagara Falls; the Toronto & Niagara Power Company, owning the transmission lines from the Falls to Toronto; the Toronto Electric Light Company, which distributes light and power; and the Toronto & York Radial Railway, owning and operating the Metropolitan, Scarborough and Mimico Divisions. The capital stock of all these subsidiaries is owned and controlled by the holding company known as the Toronto Power Company.

Westinghouse Offers $30,000,000 of Notes

Kuhn, Loeb & Company, New York, N. Y., have made a public offering of $30,000,000 of 7 per cent eleven-year bonds of the Westinghouse Electric & Manufacturing Company at 94¾ to yield 7¾ per cent. The purpose of the issue is to secure working capital for a fixed period, and the proceeds of the sale of the bonds are to be applied to the payment of more notes payable. The New York Stock Exchange has admitted the notes to trading when issued.

For the six months ended Sept. 30, 1920, billings amounted to $78,771,675, and it is believed for the fiscal year to end March 31, 1921, will exceed sales billed for the previous fiscal year. Income for the six months ended Sept. 30, 1920, after deductions for depreciation, federal and other taxes, amounted to $8,164,875, while interest charges for that period amounted to $751,852.

As of Sept. 30, 1920, current assets were $128,630,880, while current indebtedness, consisting mainly of accounts payable, not due, advance payments on contracts and accruals for interest, federal and other taxes, after applying as of said date the proceeds of the sale of the bonds, amounted to $31,112,486.

Consolidation Still Under Consideration

Any possibility of a consolidation of the traction lines of the Spokane & Eastern Railway & Power Company, Spokane, Wash., and the city lines of the Washington Water Power Company is still well in the future, according to F. E. Connors, vice-president of the former company, who has returned to Spokane from Chicago. Mr. Connors said:

> Nothing will be done in the consolidation matter until President Taylor comes to Spokane and he will be unable to do this for some time. Therefore I do not expect anything definite on the consolidation soon. I went east especially to visit my family and spent most of the time with them. No action was taken on the consolidation matter.

The question of the consolidation of the two lines through purchase by the Washington Water Power Company has been up from time to time in the past. Some months ago engineers of the two companies were set to work to figure out the traction valuation, the cost of connecting the two lines physically, the competing lines that would be eliminated and the resultant saving. While it is assumed that this work has been completed, the results are being held pending consultation of the representatives of the companies.

Financial News Notes

New Director Named.—James Dean has been elected a director of the Manchester Traction, Light & Power Company, Manchester, N. H.

Memphis Doing Better.—The September report of the Memphis (Tenn.) Street Railway shows a surplus of $12,257 for the month. The company has paid renewals and replacements amounting to $19,012 and taxes amounting to $21,338. The report showed that 4,514,393 passengers were carried during the month, only 20 per cent of whom took advantage of the 6½-cent fare.

Will Redeem Bonds.—The entire outstanding issue of three-year 7 per cent collateral trust sinking fund gold notes of the Republic Railway & Light Company, Youngstown, Ohio, dated Jan. 15, 1920, amounting to $1,233,000, has been called for redemption Dec. 6 at 100½ and interest from July 15 to Dec. 6, amounting to $27.42 for each $1,000 note, payable at the First Trust & Savings Company, Cleveland, Ohio.

Road to Be Sold.—Judge George E. Hinman, in the Superior Court, has authorized Robert W. Perkins, receiver of the Shore Line Electric Railway, to sell the property of the Norwich & Westerly Traction Company, Norwich, Conn., and has given him until Jan. 15 next to make the sale, placing the "upset" figure at $191,000. The court also advised that the road be kept in operation until Dec. 1.

Offers Line to City.—J. A. Cusick, president of the Bay Shore Street Railway, Green Bay, Wis., has notified the Green Bay City Council that unless relief is immediately forthcoming for the railway, the company will have to tear up its tracks and sell the cars, ties and rails as junk. Mr. Cusick has offered to sell the property to the city. The company operates about two miles of track.

Abandonment Approved.—The Public Service Commission for the Second District of New York has approved a declaration of abandonment by the Orange County Traction Company, Newburgh, of a portion of its line in the city of Newburgh. The commission denied the petition on Jan. 6, 1920, when the company applied for complete abandonment of its line on Bridge Street, but suggested that the company file a new petition, submitting a declaration of abandonment of a portion of the Bridge Street line.

Property Assessment Protested.—The receivers of the Memphis (Tenn.) Street Railway have given notice that they will seek a reduction in the assessment returned against their property by the State Railroad and Public Utilities Commission and upon which the company must pay taxes to the city. The amount at which the railway's property within the corporate limits of Memphis is assessed is $10,449,887. The holdings of the Memphis Gas & Electric Company are assessed at $9,104,600. The total amount at which the city's public utilities are assessed is $37,009,738.

Reorganization Plan Held Up.—It is reported that the operation of the reorganization plan of the Schuylkill Railway, Girardville, Pa., is being held temporarily in abeyance pending the determination of the ability of the company to meet the obligations required thereby. The interest deferred on Oct. 1, 1919, on the Schuylkill Traction first mortgage 5s of 1943 was paid on Dec. 31, 1919, and has been paid at maturity since that date. No interest has been paid on the Schuylkill Railway first consolidated 5s of 1935 since the maturity of April, 1919. Fares were increased on Oct. 1, 1920, from 5 to 6 cents cash for the modified zone, with twenty tickets for $1 instead of six tickets for 25 cents.

Winnipeg Company Offers Stock—René T. Leclerc, investment banker, Montreal, Que., is offering for subscription at 90, to yield 7¾ per cent, an issue of $3,000,000 7 per cent cumulative preferred stock of the Winnipeg, (Man.) Electric Railway, of par value $100. The issue was recently authorized by the shareholders of the company to retire notes and bank loans. It carries a bonus of 30 per cent in common stock. It is stated that the average annual net earnings of the company for the three pre-war years ended Dec. 31, 1914 (which would have been available for dividends under present issue of preferred stock), were $1,148,193. The average annual net earnings for the three years ended Dec. 31, 1919, were $496,637. The estimated net earnings for the current fiscal year, based on actual figures for the first eight months, are $630,000. The shareholders of the company will vote on Dec. 1 on a proposal to give voting power to the holders of the new issue and to provide that no additional issue of preferred stock shall be made without authority from at least two-thirds of such stock outstanding. At the same time, the shareholders will approve an increase in the common stock from $10,000,000 to $11,000,000.

Traffic and Transportation

Des Moines Value Fixed

Appraisers for City Report That Fare of 5¾ Cents Would Yield 7 Per Cent Return

The report of the appraisers appointed in August by the City Council of Des Moines, Iowa, to make an appraisal of the property of the Des Moines City Railway was made public this week. The report was filed a week ago, but announcement was made by the city attorneys that it would not be made public immediately but "would be held as a club over the heads of the traction company in future litigation." However, after severe criticism of the city's attitude by the daily newspapers, the report was given out in full.

According to the report the present depreciated value of the railway's property is $6,089,989. This is based upon prices in effect Aug. 1 of this year. The report estimates that it would cost to replace the entire property, new, $9,089,989. The actual value of the property on Aug. 1, 1915, which was placed in the franchise granted the Des Moines City Railway at $5,000,000, could not have been more than $3,201,570 and was probably nearer $2,025,678.

FARE RESULTS ESTIMATED

The report follows a survey of the property continuing over three months and fills 1,000 pages. It does not contain an audit of the books of the company which is to be made later under the direction of the City Council. The report does not attempt to fix the rate of fare which should be charged in Des Moines but sets out how much should be charged to secure given rates of return upon the capital.

Based upon the service being furnished in Des Moines at present the appraisers find that a 5½-cent fare would pay 6 per cent return on a valuation at the present price level and that in order to get a 7 per cent return 5¾ cents a passenger would be sufficient. Going into the question of increased service the appraisers state that if the present service were increased by 50 per cent a 7.2-cent fare would yield 7 per cent, 7.1 cents 6 per cent and 6.9 cents 5 per cent.

City officials and attorneys have announced that they are satisfied with the results of the appraisal and that they feel it will lead to a settlement of the local railway controversy. City Attorney C. W. Lyon declares that his policy in securing a settlement of the question will be to first consider the question of service and that he will favor a sliding scale of fares with a reserve fund.

F. C. Chambers, general manager and operating receiver of the Des Moines City Railway, holds that he could see no way in which the report of the appraisers would serve to bring about a settlement of the dispute with the city. Mr. Chambers states that with the exception of the present reproduction value, which he estimates to be from 10 to 15 per cent too low, the values announced by the appraisers are "little short of ridiculous." He calls attention to the fact that the Des Moines City Railway has never paid a dividend and has created no depreciation fund. The depreciated value as of Aug. 1, 1915, he says is "entirely out of the question," as the power-plant alone was worth half the figure announced as the total depreciated value by the appraisers.

Mr. Chambers further states that for the appraisers to offer figures to show what rate of fare is necessary to bring a 5 per cent return on the capital is merely a waste of time, considering the conditions of the financial market at the present time as regards interest rates. The appraisal was made at an expense of $10,000 to the city, which will have to be paid by the taxpayers of Des Moines.

Seattle Bus Operators Seek Compromise

Judge Walter French of the Superior Court has denied a motion of the city of Seattle, Wash., to dissolve the temporary injunction restraining the city authorities from prohibiting the operation of jitneys. The ordinance barring the buses from the streets was adopted by the City Council several months ago to afford relief to the Seattle Municipal Railway. Pending a final decision by the courts as to the legality of the measure, the buses have continued operation. The city will appeal the case to the State Supreme Court. It will be several months before a final opinion can be rendered.

Since the rejection by the voters at the election on Nov. 2 of a proposition to give the jitney men a practically free hand in so far as the fixing of fares and routes was concerned, the bus operators have adopted a more conciliatory attitude. The Sound Transit Company, among others, has offered to accept traffic regulations which it formerly opposed. These regulations have been drawn up by Carl H. Reeves, superintendent of public utilities, and prescribe routes and termini for the buses.

A recent check of jitney traffic made by the city authorities indicates that operation of the buses is resulting in a loss of between $600 and $900 daily to the Seattle Municipal Railway.

Favors Galveston Increase

Special Master Finds Nickel Fare Confiscatory—Company Seeks Injunction to Restrain City

The Galveston (Tex.) Electric Company is entitled to an increase in fare in its Galveston city lines. This is the decision reached by Henry J. Dannenbaum, special master, who has been taking testimony in the case of the Galveston Electric Company vs. the City of Galveston. The company is seeking an injunction against the enforcement of a municipal ordinance limiting the fare to 5 cents. Mr. Dannenbaum finds that the return earned by the company under the 5-cent fare is "insufficient and confiscatory."

DISPUTE OF LONG STANDING

The Galveston fare controversy dates back more than a year. At that time the company made application to the City Commission for authority to increase fares to 7 cents. Its petition was granted. Later a change was made in the city administration and the 7-cent fare ordinance was repealed. The company then went into the United States District Court and asked an injunction against the city to restrain the enforcement of the ordinance repealing the 7-cent fare and to restrain the city authorities in all efforts to prevent the collection of a 7-cent rate. The injunction was sought on the ground that the 5-cent fare, as demanded by the city, was confiscatory and did not permit adequate return on the company's investment.

Mr. Dannenbaum was appointed as special master to hear evidence in the case and to report his findings to the court. Further action on the issue of granting the injunction prayed for is to be taken by Judge J. C. Hutcheson of the United States District Court at Houston and will be based on the report and recommendations filed by the special master.

NET RETURN 1.86 PER CENT

According to figures allowed by the special master, the Galveston Electric Company earned for the year ended June 30, 1920, the sum of only $50,249, or 1.86 per cent on the value of its property. Estimating an earning capacity of 8 per cent, allowed on contention of the complaint, a deficit of $123,000 is shown between the company's earnings of $548,477 for the year and the cost of operation.

The total required revenue is arrived at as follows: Operating expenses, less maintenance, $314,073; maintenance, $80,322; depreciation allowance, $66,824; taxes (including income tax), $37,008; fair return on value, $173,404.45; total, $671,631. The value of the property for rate-making purposes is set down at $2,167,805. The company's figures regarding reproduction costs, depreciation and other items were accepted in the main by the special master.

Summary Withdrawal of Service Barred

Commission Rules Connecticut Company Must Run Cars in Waterbury Pending Hearing—Fare Increase Gives Good Results

The Connecticut Public Utilities Commission on Nov. 17 directed the Connecticut Company to continue service on its lines in Waterbury pending a public hearing on the transportation situation in that city. The company had previously announced that, because of continued jitney competition, it would withdraw all cars from its Waterbury Division on Wednesday evening. Following the receipt of the commission's order the company rescinded the instructions to its employees to "lay up" the cars at 6 p.m. The commission ruled that the railway must obtain its permission before making a suspension of service, and that permission to discontinue operation could only come after a formal hearing on all phases of the matter.

THE commission, in ruling against the summary withdrawal of service, said:

> It has come to the attention of the Public Utilities Commission, through the public press, that you propose to discontinue street railway service in the city of Waterbury and vicinity today, Wednesday, Nov. 17, 1920.
>
> This commission recently granted a substantial increase in rates applicable to Waterbury and other cities and territories served by your company. The proposed arbitrary suspension, practically without notice to the community, and without any notice to this commission, appears to be unwarranted.
>
> Wherefore, by the virtue of the power vested in this commission you are hereby summarily ordered and directed to refrain from discontinuing public street railway service in Waterbury and vicinity until this commission shall authorize same, after an investigation and hearing had, showing the necessity therefor.

On Nov. 15 President Storrs notified the city authorities of Waterbury that unless steps were immediately taken to bar jitneys from the principal streets containing electric railway tracks, the company would discontinue all service on its Waterbury Division beginning Nov. 17. This action by Mr. Storrs followed the repeal by the Waterbury Board of Aldermen of an ordinance regulating buses within the city limits.

BUS ORDINANCE UNACCEPTABLE

The board on Nov. 15 passed an ordinance forbidding jitneys to run in part over streets followed by electric cars and forbidding them to enter the center of the city, but allowing them to parallel the trolley routes and to operate in part over streets containing railway tracks. The measure as passed by the Board of Aldermen was unacceptable to the Connecticut Company because of its alleged failure to comply with the conditions laid down by Mr. Storrs. The company therefore announced service on the Waterbury lines would be withdrawn Wednesday.

The introduction of a flat 10-cent fare on the company's lines throughout the State of Connecticut has resulted in a considerable increase in the company's revenues. This fact is indicated by officials of the company, who state that during the first two weeks of November the company's passenger receipts were materially larger than under the former zone fare system.

The management also announced the volume of traffic had not been seriously affected by the increase in fare. While some city riders who formerly paid 7 cents have ceased to patronize the trolleys, this loss is more than made up by the fact that many more persons are now using the electric cars in the suburban districts. On outlying lines the 13-cent fare has been reduced to 10 cents, thus holding out an inducement to suburban riders.

GOOD RESULTS FROM NEW FARE

The company is doing everything in its power to improve the quality of its service. It will be some time, however, before the railway can put additional rolling stock in operation. Explaining the situation Charles Cheney, a trustee of the Connecticut Company, said:

> We are doing and have been doing the best we can to better the service, but it must be remembered that for three years there was no chance of a fare increase. The money is now coming in well, but it will take time to make improvements.

The anti-bus ordinance passed last week by the New Haven Board of Aldermen became law on Nov. 16. Mayor Fitzgerald approved the measure with the exception of a clause relating to Temple Street.

No jitneys are now operating in Hartford. The Hartford city authorities recently enacted an ordinance barring buses from the streets. The local association of jitney operators appealed to the Superior Court for an injunction prohibiting the enforcement of this measure, but, as previously stated, the court refused to grant them relief. They have now taken their case to the Connecticut Supreme Court and, pending decision by that tribunal, will refrain from operating their vehicles.

The city of Hartford has protested to the State Public Utilities Commission against its order allowing the Connecticut Company to increase its fare. The commission was scheduled to hold a hearing on this matter at Hartford during the week. A number of citizens of New London have also protested against the raising of the fare in that city.

Court Approves Double Fare

The Appellate Division of the Supreme Court of the First Judicial District of New York has reversed the order of Lewis Nixon, former Public Service Commissioner for the First District, requiring the Brooklyn City Railroad to cease charging two 5-cent fares from the city line to Manhattan.

The effect of the court's decision is to compel many patrons in the more distant zones to pay three fares to go to or from Manhattan by elevated or subway instead of one 5-cent fare as under the former system of free transfers between the surface and the elevated lines of the Brooklyn Rapid Transit Company before its subsidiaries were lopped off as the result of a receivership. In summing up the situation the opinion says:

> The Brooklyn Heights Railroad while operating this (the Flatbush) line was required to give free transfers from the various lines owned or operated by it. It voluntarily fixed a 5-cent fare on this line. These provisions were binding upon it so long as it controlled or operated the line. When, however, the lease terminated, and the owner resumed possession, it took the property with all the rights and subject only to the limitations originally imposed by its franchise which could in no way be limited by any act or obligation of the tenant.
>
> Therefore, we hold that the Brooklyn City Railroad in charging a second fare on that portion of the Flatbush Avenue line beyond the limits of the city line of Brooklyn, as it existed in 1860, is within its legal rights.

Nine-Cent Fare in Cincinnati

Under the terms of the service-at-cost franchise of the Cincinnati (Ohio) Traction Company the present 8-cent fare is to be increased ½ cent. Effective on Dec. 1 the new fare will be 8½ cents by tickets and 9 cents cash.

Figures in the office of W. C. Culkins, Director of Street Railways, show that the accumulated deficit of the company up to Sept. 30, 1920, is $332,758. The franchise provides that should there be a deficit in the cost of operation for two successive months the company must present a financial statement to the Director of Street Railways and give notice of an increase in fares on the 15th of the month following the two months where the losses in operation occurred.

The company's income statement for September follows:

	September	
	1920	1919
Total revenue and income...	$765,798	$672,052
Cost of service:		
(*a*) operating expenses....	559,898	460,487
(*b*) taxes and other deductions.............	274,854	242,818
Balance, deficit............	$68,954	$31,252
Fare, cents.................	8	7 (ticket 6½)
Revenue passengers, number	9,561,608	9,972,289

The decrease in the number of revenue passengers was about 400,000 for the month of September, 1920, as compared with the same month of last year. Under the franchise the company is compelled to make up any deficit which may accrue in the first month of a new quarter from the receipts of the succeeding month, in addition to showing a surplus for the second month.

Officials of the railway express the fear, however, that unless revenue passengers for the next nine months show a decided increase additional advances in fares can hardly be avoided. These increases, in the event of their materialization, would take effect on the first day of March, June and September when the fare would reach 10 cents.

Transportation News Notes

Higher Fare in Greeley.—A 7-cent fare went into effect on the lines of the Greeley & Denver Railroad, Greeley, Col., recently. The fare was formerly 5 cents. The increase was authorized by the State Public Utilities Commission.

Fares Up on Interurban.—Fares on the Rockford & Interurban Railway, Rockford, Ill., between Beloit and Janesville, Wis., were recently raised 20 per cent by authority of the Wisconsin Railroad Commission. The increase in fare amounts to 7 cents between the two cities. The old fare was 35 cents.

Eight Cents Asked in Joliet.—The Aurora, Plainfield & Joliet Railway, Joliet, Ill., has petitioned the Illinois Public Utilities Commission for an 8-cent cash fare. The company asks for permission to sell four tickets for 30 cents or ten for 70 cents. The Evanston Railway, Evanston, has applied to the commission for authority to charge a straight 7-cent fare. The company seeks to discontinue the sale of five tickets for 30 cents as required under the present arrangement.

Approves Reading Increase.—The Pennsylvania Public Service Commission has handed down an order authorizing the Reading Transit & Light Company, Reading, to raise its fare from 7 cents to 8 cents. The company filed a tariff calling for the 8-cent rate some time ago. As a result of protests from the city the company announced that it would suspend the increase pending action by the commission. The new rate took effect on Nov. 8 under authority of the commission's order.

Lower Fares on Suburban Line.—A reduced fare schedule went into effect on the Preston line of the Louisville (Ky.) Railway between the city limits and Camp Zachary Taylor on Nov. 1. Between the city limits and Audubon Park or intermediate points a cash fare of 5 cents instead of 7 cents is now charged. The new plan will give the occasional rider a fare of 10 cents instead of 12 cents and will give to the regular rider a fare of 8 cents by use of special tickets.

Wants More in Rockford.—The Rockford (Ill.) City Traction Company has filed a petition with the Illinois Public Utilities Commission for a 10-cent cash fare with four tickets for 30 cents and twenty school tickets for $1. The matter of increased fare was first taken up with the city officials and discussed, an agreement being reached that the company should petition the commission. The city has asked permission to have the city auditors check the figures presented by the company.

No More "Owl" Cars.—"Owl" service on the lines of the South Covington & Cincinnati Street Railway, Covington, Ky., was discontinued on Nov. 15. The company took action to curtail service because of the refusal of the municipal authorities in Covington, Newport and other cities of northern Ohio to allow the railway to increase its fares. The company contends that it is in need of increased revenue because of a recent advance in the wages of its employees.

Safety Cars in Janesville.—The Janesville (Wis.) Traction Company on Nov. 5 placed five new one-man safety cars in operation and thereby reduced the headway from twenty minutes to twelve minutes. Coincident with this improvement in the service, the Wisconsin Railroad Commission permitted the company to install a fare of 10 cents cash with seven tickets for 50 cents. The increase was granted contingent on the introduction by the company of the twelve-minute headway service.

Must Reduce Bridge Speed.—The transportation department of the Dallas (Tex.) Railway has fixed 8 miles an hour as the speed limit for cars in crossing the Oak Cliff viaduct and the Trinity River bridge. Several minor accidents and derailments recently have brought to the attention of the public and the transportation department the danger of loss of life on these bridges, and a speed limit that insures absolute safely has been fixed and will be rigidly enforced.

Service Improved in Baltimore.—The United Railways & Electric Company, Baltimore, Md., has recently effected some changes in its routing system and has established one entirely new line to better the transportation facilities of the city. The new route, known as the Hudson Street line, will extend from the eastern section to the center of the city. The lines rerouted are the North Avenue, Wolfe Street, Pennsylvania Avenue and Third and Eighth Streets lines.

Speed Limit Fixed.—The City Council of Sioux City, Iowa, has passed an ordinance for the regulation of vehicular traffic in that city. Under the terms of the new law electric cars are classed as vehicles and will be subject to the same restrictions. No car will be allowed to stop in the central district of the city any longer than is necessary to load and unload passengers. No vehicle or electric car shall be operated at a speed to exceed fifteen miles an hour in the business district or to exceed twenty miles an hour in other sections of the city.

Sparks Service Costly.—The Reno (Nev.) Traction Company recently filed a statement with the State Public Service Commission to the effect that for the past eight months operation of its line in Sparks had caused a loss of $1,000 to the company. This action was taken by the company in answer to charges of insufficient and inefficient service. In connection with improving its lines and equipment the Reno Traction Company has retained J. C. Linabary, a railway expert, who will have charge of car operation and maintenance of shops.

Jacksonville Hearings Concluded.—The Florida Railroad Commission has concluded hearings on the application of the Jacksonville Traction Company, Jacksonville, for an increase in fare. The company, in applying to the commission for financial relief, did not specify the amount of the increase desired, but intimated that a 10-cent fare would be needed. G. V. Ramsey, a civil engineer, who made a survey of the company's property, testified that the value of the system for 1920, amounted to $8,074,145. He placed a service appraisement on the property for 1914 of $3,628,454.

Fare Hearing Postponed.—Consideration on the matter of an increased fare by the Manhattan & Queens Traction Corporation, New York, N. Y., has been deferred for two weeks. During that time engineers instructed by Public Service Commissioner Barrett for the First District will make an investigation of the roadbed and the actual conditions of the rolling stock. The company recently informed the commission that unless immediate action were taken the road would have to shut down. The company's deficit has been increasing and it is contended therefore that an increase in the rate of fare is imperative.

Through Freight Service Soon.—The Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., has announced that through freight service is to be started immediately between Indianapolis and all Ohio points reached by interurban via Richmond, Ind., and Dayton, Ohio. The new service of the T. H., I. & E. company will include solid cars for Dayton, Ohio, leaving Indianapolis in the morning and assuring delivery the following day. It also includes direct transfer at Dayton for Springfield, Columbus, Zanesville, Lima, Toledo, Cincinnati and intermediate points. The company has announced to shippers that it can provide cars on short notice.

Eight-Cents in Butte.—The Montana Public Service Commission has granted permission to the Butte (Mont.) Electric Railway to charge an 8-cent cash fare until June 1, 1921. In June of this year the commission allowed the company to raise its cash fare to 8 cents on the condition that tickets would be sold at the rate of 7 cents each. This 8-cent fare expired on Oct. 15 and since then the company has been operating on a 7-cent basis. The commission decided upon the continuance of the 8-cent cash fare after an investigation of the company's statement of earnings, which showed a loss of more than $6,000 during September.

Jitney Ordinance Amended.—At a recent meeting of the City Council of Seattle, Wash., amendments to Ordinance 40,886, dealing with the jitney problem, and under which the Council last spring rejected all applications for jitney permits, causing an appeal to the courts and a restraining order against the city, were introduced by Chairman Oliver T. Erickson of the judiciary committee. A special meeting of the Council will be held shortly to vote on the amendments, which establish a maximum fare of 25 cents on runs after 1 o'clock, and a fare of 15 cents on long runs. Provision is also made for canceling permits for failure to operate, except in case of accident or emergency.

Mayor Asks Better Service.—At a recent meeting of the City Council of Lawrence, Mass., Mayor White stated that he would give the Eastern Massachusetts Street Railway, Boston, one week to improve the service on its Lawrence Division. If action were not taken within that period, said the Mayor, he would call on the city government to make changes in the transportation facilities. Mayor White asked the members of the "home rule" committee, which has been in charge of the affairs of the division for several months, to resign, basing his request on the ground that they had failed to produce results. The Mayor announced his intention of demanding a reduction in the fares in effect on the Lawrence Division.

Railway Checks Reckless Driving—The Dallas (Texas) Railway through its safety and efficiency department has been playing a conspicuous rôle in the safety movement in Dallas. So thoroughly has it engaged in the campaign for checking reckless auto drivers that it has gained the co-operation of several business concerns operating auto trucks. In the case of automobile and auto truck collisions with electric cars the safety and efficiency department of the railway follows up the matter and takes active participation in the discharging or putting on probation of careless drivers who were at fault. Clubs and schools have assisted in this "drive" and it is believed that the railway's efforts have already been rewarded in the noticeable decline in automobile accidents.

Voters Reject Fare Increase.—The voters in Kalamazoo, Mich., at the general election on Nov. 2 rejected the proposal to allow the Michigan Railway to charge a 6-cent fare on its Kalamazoo city lines. A three-fifths majority was needed to carry the proposition. An ordinance providing for the bonding and regulating of jitney buses was repealed by a small majority. Motor buses will now be allowed to operate in Kalamazoo without bonding restrictions. This is the third occasion upon which the Kalamazoo citizens have refused to allow the company an increase in fare. Fares reverted to a basis of 5 cents cash with six tickets for twenty-five cents on Nov. 9. The 6-cent fare had been in effect since September under a temporary agreement between the City Commission and the company as a result of labor difficulties.

New Publications

Wiring for Light and Power,

By Terrell Croft. Published by McGraw-Hill Book Company, New York, N. Y. Flexible cover, 448 pages, illustrated.

This second edition is a thoroughly overhauled and enlarged handbook, containing much new text and many added illustrations. Considerable rearrangement has been necessary due to the extensive changes in the 1918 edition of the National Electrical Code. In its present form it is a valuable handbook for those laying out and installing electrical wiring and apparatus.

Indicators for Carbon Dioxide and Oxygen in Air and Flue Gas

By L. H. Milligan, D. O. Crites and W. S Wilson. Technical paper 238. United States Bureau of Mines, Washington, D. C.

An excellent gage of efficiency in combustion of fuels is the percentage of carbon dioxide in the flue gas. A simple and accurate instrument for indicating the carbon-dioxide content of air and flue gas, which was designed in the chemical research laboratory of the Bureau of Mines at Pittsburgh, is described in this pamphlet.

Electric Traction and Transmission Engineering

By Samuel Sheldon and Erich Hausmann. Second Edition. 307 pages, illustrated. D. Van Nostrand Company.

In this second edition of "Sheldon and Hausmann" the plan of analyzing and reducing the problems of electric traction to their fundamentals used in the first edition has been followed but the text is based on more recent practice. The problems incident to a complete railway installation are presented and solved and the economics and engineering of transmission lines are also treated. The utility of hyperbolic functions in connection with the solution of transmission-line problems is clearly demonstrated.

The Making, Shaping and Treating of Steel

By J. M. Camp and C. B. Francis. The Carnegie Steel Company, Pittsburgh, Pa. 614 pages. Flexible leather binding.

This book has been written especially for the non-technical employees of the Carnegie Steel Company and others who may desire to secure a general knowledge of the metallurgy of iron and steel. The volume is divided into three parts, which take up successively the making, shaping, constitution, heat treatment and composition of steel. The first chapters are devoted to an elementary treatment of physics and chemistry which lead up to metallurgy. The various processes used in the manufacture of steel are described in considerable detail. Parts which are of particular interest to electric railway employees are those describing the rolling of rails, the Carnegie-Schoen method for manufacturing steel wheels and the forging of axles, shafts and other round shapes. The book is being sold by the Carnegie Steel Company.

Business Finance

By William H. Lough. The Ronald Press Company, New York, N. Y. 631 pages. Cloth.

Mr. Lough has a genius for writing readable books on business subjects. He was formerly professor of finance in New York University, School of Commerce, Accountants and Finance, and is now president of the Business Training Corporation, New York City. This new volume is along somewhat different lines from "Corporation Finance," which established Mr. Lough's reputation as an author. Business Finance is a complete working guide for the financial manager or organizer and a thoroughly practical manual of finance for the business man. It is also very useful for investors. In fact, the volume is designed to prove useful to executive officers, directors and organizers, to bankers, bond dealers and others who must investigate the financial management of enterprises and to engineers, lawyers, accountants and other professional men who are often called upon for financial advice. The subject matter of the book is divided into five parts. 1—Finance and Business. 2—Capital. 3—Securing Capital. 4—Internal Financial Management. 5—Financial Abuses and Involvements.

Traveling Publicity Campaigns

By Mary Swain Routzahn. 151 pages, illustrated. Russell Sage Foundation, New York.

The publicity train, electric car or truck has a number of advantages in the way of conducting an educational or selling campaign within a district. The book mentioned describes two campaigns of this kind conducted by trolley for child welfare and food conservation by women's committees of the Council of National Defence in Massachusetts in 1918 and in the same year in Michigan. The files of this paper have described several other similar campaigns for the education of farmers in improved agricultural methods. In the opinion of the reviewer, the trolley car, in some respects, seems to possess advantages over either of its principal rivals for this service, *i.e.*, the steam railroad train and the truck. As compared with the former, it can travel through the main streets of the city and get the incidental publicity possible thereby and then be sidetracked in an accessible point. As compared with the motor truck, there is less interference from bad weather and more space available for exhibits, lectures, etc. The author has given a number of very suggestive hints on how best to arrange such a tour, advance publicity desirable, arrangement of exhibits in the car, method of receiving visitors, follow-up work, etc. For any organization which intends to conduct a tour of this kind on traveling publicity campaigns the book should be invaluable.

Personal Mention

Director of Ohio Committee Long in Newspaper Field

Benjamin E. Ling, who has been chosen director of the Ohio Committee on Public Utility Information, is a newspaper man of wide experience. He was born in Cleveland and was educated at St. Ignatius College. As soon as he had completed his schooling Mr. Ling entered newspaper work. His first connection was with the Cleveland *Leader*, since merged with the *News*. He did work of a general reportorial nature for that paper for about three years. He then went with the Cleveland *Press*, a Scripps-McRae publication. There he filled about every desk, but steadfastly refused every offer of an inside position. The desire in him for contact with events in the making had become too strong for Mr. Ling to overcome, although he did consent to do semi-editorial news writing. All this time he had devoted himself more particularly to public utility affairs and to politics, until in Cleveland, and in fact all northern Ohio, Mr. Ling had come to be looked upon as probably the best informed newspaper man on utilities in that part of the state. Everywhere in Cleveland keen appreciation is expressed of "Ben" Ling as a fair and impartial observer of events.

When the desirability became apparent of establishing a bureau of information in the interest of the public utilities of the state agreement was unanimous among all the various interests that Mr. Ling was the man best qualified for the job. His paper was loath to lose him, but his superiors readily acknowledged that the new work upon which he was about to enter opened up greater possibilities for Mr. Ling than were offered in newspaper work, particularly as he insisted upon having a part in the making of history rather than being a mere recorder of events. Mr. Ling was in the service of the government at Washington during the war with the rank of Captain. While there he had a large part in the work of preparing "America's Munitions." He is thirty-two years old.

George Carson Joins Washington State Interurban

George Carson has been appointed claim agent of the Seattle & Rainier Valley Railway, Seattle, Wash. Mr. Carson will continue to serve as manager of the Pacific Investigation, Adjustment & Lawyers' Service Bureau, which he recently organized. He was formerly claim agent of the Fifth Avenue Coach Company, New York City. At one time he served as claim agent of the Puget Sound Traction, Light & Power Company. He is a former president of the Pacific Claim Agents' Association and of the American Electric Railway Claims Association. He removed to Seattle about two months ago.

J. A. Perry Elected

Georgian Chosen President of the National Association of Railway and Utilities Commissioners

In selecting James A. Perry for its president for the coming year the National Association of Railway and Utilities Commissioners has chosen a man who has proved that he will exert himself to the utmost to strengthen the prestige of the state regulatory bodies. Mr. Perry is a stanch supporter of the rights of the state commissions. He strongly opposes any curtailment of their powers at the hands either of the Federal Government or of municipalities. He has long been active in the work of the association and prior to his election as president occupied the office of first vice-president.

J. A. PERRY

Mr. Perry has for ten years past been a member of the Railroad Commission of Georgia. He has done much to build up its organization and to place its work on a basis of efficiency. As a member of the commission he has had a voice in deciding many important questions affecting the utilities of the State. The commission recently completed an exhaustive study of the affairs of its Georgia Railway & Power Company, Atlanta, and as a result of its investigation granted the company a substantial increase in rates, including an advance in cash fares on its Atlanta lines to 7 cents.

Mr. Perry was born in Gwinnett County, Georgia, on Jan. 11, 1875. He obtained his early education in the rural schools of that county and was graduated from the Law School of the University of Georgia in 1898. Two years thereafter he was elected Mayor of Lawrenceville, Ga., and later in the same year was elected to the State Legislature. In addition to his public duties Mr. Perry has conducted a law practice in Lawrenceville. He is now president and treasurer of a large industrial enterprise in Lawrenceville.

Richard J. Higgins, general counsel for the Kansas City Railways, Kansas City, Mo., presented his resignation on Nov. 6 to Judge Kimbrough Stone, before whom the recent receivership proceedings were filed. Mr. Higgins has become associated with a Chicago law firm, and will represent E. F. Swinney and the Continental & Commercial Trust & Savings Bank, Chicago, trustees for $28,000,000 of the bonds of the Kansas City Railways.

Obituary

H. C. King, president of the Mason Safety Tread Company, Boston, Mass., died on Oct. 28. Mr. King had been president of the company since 1912. Prior to that time he served as its treasurer.

Augustine S. Cooley, formerly president and treasurer of the Canandaigua (N. Y.) Street Railway, now the Ontario Light & Traction Company, died at his home in Canandaigua on Nov. 9. Mr. Cooley was born in Canandaigua sixty-four years ago.

Arthur E. Hauck, president of the Hauck Manufacturing Company, Brooklyn (N. Y.), manufacturers of oil-burning appliances, furnaces and forges, died in Brooklyn on Oct. 30, aged forty-one years. One of his principal patents is the method of vaporizing kerosene in a torch with proportioned heat-resisting nozzle, the form of vaporization reducing carbonization. Another is the method of atomization through proportioned pipes and openings and with composition nozzle.

Arthur M. Waitt, consulting engineer and railroad specialist, died on Nov. 10 at his home in Sharon, Conn., from the after effects of an operation performed several months ago. Mr. Waitt was a member of the commission which planned the electrification of sections of the New York Central & Hudson River Railroad. He was born in Boston in 1858, a descendant of Governor Hinkley of the Plymouth Colony. After graduating in 1879 from the Massachusetts Institute of Technology he spent many years with various railroads. While with the New York Central he was superintendent of motive power and rolling stock. In 1902 he was elected president of the American Railway Master Mechanics' Association. As a member of the Connecticut Assembly he wrote the automobile laws of that state.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Commission Discontinues Data on Coal Costs

Too Few Operators Report Voluntarily —Test Case Pending Will Decide Authority to Require Data

Since as now handled the monthly reports of the Federal Trade Commission on mine costs of coal are more expensive than they are worth, in the opinion of the commission, they have been discontinued. During the war the reporting of coal costs and sales realization by operators was required as an aid to fixing prices by the Fuel Administration. When the coal operators were released from Fuel Administration control, early in 1920, there was a desire to be free from all federal restriction.

Accordingly, the National Coal Association brought a "friendly" test suit against the Federal Trade Commission in the Maynard Coal Company case before the Supreme Court of the District of Columbia early in 1920. As a result an injunction was served prohibiting further requirement of reports from coal operators by the commission. The latter then requested voluntary reports from operators, to which request a good response was at first received.

The number of operators furnishing data gradually dwindled to about 550 on the June report, however, too small a number to furnish representative figures. This lack of co-operation by the mines was partly due to fear of their reports being used as a basis for possible future price fixing or control by Congress and partly to natural apathy in keeping the necessary cost records. Despite this, a considerable number of operators still favor the continuance of the commission's reports. The latter, in view of the great cost and reduced value of its monthly statistics, however, decided to discontinue their issuance until a decision is reached in the Maynard Coal Company case. In the event of a decision upholding the commission's authority to require reports on coal costs, it is stated, the work will be resumed later.

Good Deliveries of Metal Safety Treads

Orders from Electric Railways Not Extra Heavy, but Demand Is Large —Raw Material Is Plentiful

Demand on the part of traction companies for safety metal treads, while fair, is apparently not extra heavy. One manufacturer, though reporting a recent large order for shipment to California, and smaller ones for central and western states as well as two or three for New England, says that the demand for step treads for electric cars is rather below normal. On the contrary, it is stated the call for treads for steam railroad cars is fully sustained and on the increase. Another company states that orders for street cars are placed only as needed, in small lots from time to time, except where an occasional purchase for new equipment is made, as electric railways do not lay in a large stock of treads for replacements.

The demand for anti-slip treads for general purposes has been gradually increasing and today it is heavy, according to a representative producer. This company's plant is being constantly increased and at present, it is understood, is capable of turning out 60,000 lb. of this one product daily. Another important manufacturer reports that sales to electric railways constitute a comparatively small percentage of the business, as orders for general building and repair work are far beyond what is customary at this season.

Stocks of raw material are said to be ample for all needs, but in some instances no stocks of the finished product are maintained, as orders usually specify certain shapes and sizes. Because of the large factory stocks of steel that are kept on hand, as well as the long-term contracts that in some cases protect the supply of raw material, several manufacturers state that they have passed through the period of advancing steel prices without making substantial price increases and that therefore no fluctuation is expected for some time. The labor situation has eased up materially both as to supply and the attitude of workers. No trouble is experienced in filling any vacancies that occur.

Deliveries in general, it is claimed, can be made as fast as traction companies require the material. Where fabricated stock can be supplied orders can generally be filled immediately from distribution centers. On specification orders, however, shipments are made in from one to four weeks, depending on the size of order.

Factors Governing the Future of Railway Equipment Prices

Because of Lack of Quantity Production Principal Recession Must Come from Greater Efficiency in Management and Labor—Reductions Must Be Gradual

No question is of more absorbing interest to buyers today than that of price trends. Of course prices are coming down, but when? There is no categorical answer, but it is possible to analyze the governing economic conditions. This has been done for the ELECTRIC RAILWAY JOURNAL by a prominent sales representative of one of the well-known electric manufacturing companies, who says that "it's a good bet to gamble on that prices are coming down, but it's a decided risk to say at what rate the reductions will be and at what level they will reach six months or a year hence.

"The people," he continued, "want lower prices and have wanted them for some time, but prices have been very slow in responding. The economic forces that have been working to keep prices up are, among other things, cost of labor, expansion of credit, taxes and, in general, greater demand than supply, the latter, of course, resulting in excess profits on some commodities. While all of these causes and effects may be read by the railway operators and manufacturers and understood by some of them, both are face to face with the same cold fact that cost of operation and of manufacture does not indicate any appreciable weakening.

"Reductions in labor costs that appear possible, and they will be very gradual, are those reductions that will accompany increased efficiency of labor. As a guess, these may be reflected in a 2 per cent to 5 per cent reduction in prices during the next six months.

"Reductions in prices of raw material are much more difficult to deal with —some have come down, some have gone up and others have stood level during the past few months. However, aside from those special cases where stocks had to be converted into cash it is fair to assume that the principal reductions, if any, that occur in raw material will also be those which accompany greater efficiency of labor.

"Many of us overlook the fact in considering 'labor' and 'material' costs that the principal factor in 'material costs' is also labor, hence reductions in material costs must, of necessity, be those which are brought about by greater efficiency of labor or a reduction in labor rates.

"On account of the limited supply and an abnormal demand in some industries there have undoubtedly been some abnormal prices. A lessening of the demand will and has brought such prices down. On the other hand, many broad-minded business men realize that an immediate general reduction of 10 per cent to 15 per cent on all machinery prices would be nothing short of a calamity for the country.

"It is pretty well known that at the present time a vast number of manufacturers of standard supplies and machinery have about all of their assets in their inventories. A shrinkage in value of 10 per cent to 15 per cent would spell bankruptcy for a great majority of them. A condition of this kind would simply mean another panic. It seems therefore that notwithstanding the desire of every one to see prices come down buyers must be patient, for it will be some considerable time before any considerably lower levels are reached on standard supplies and machinery.

"There will, of course, be instances of appreciable reductions in this and that line for some time due to such things as:

"1. Demand dropping off, causing stocks to be put on the market in order to secure cash urgently required.

"2. Demand dropping off, resulting in reduced prices and reduced profits with no reduction in costs.

"3. An effort to encourage buying so as to avoid shutting down.

"Materials and machinery used principally by electric railways are of the standard or specialties class and none of the manufacturers serving them, with one or two possible exceptions, has ever been able to engage in what is commonly referred to as 'quantity production.' In other words, there has been no great 'demand' for supplies or machinery on the part of electric railways for years. Therefore it seems very reasonable to assume that the principal reductions in costs for both the railway operator and the manufacturer are those which, as previously mentioned, accompany greater efficiency in both management and labor."

Considerable analysis will no doubt be necessary to establish for individual companies the limits of practical economy in buying through jobbing houses and in purchasing direct from manufacturers. But if the needs of the railways are studied more intensively by special salesmen detailed by the larger jobbing houses to acquire a more intimate knowledge of the life and cost of traction supplies (especially in the repair shop and power plant), it is believed that real savings will become possible. The railway companies will purchase virtually as much material in the long run as ever, barring improvements in practice resulting from the detection of inefficiencies in design and application of equipment parts. The manufacturer will also handle larger orders at a time, and the jobber's overhead and running expenses per unit of product handled will decrease. It is the old story of looking far enough ahead to take advantage of the economic benefits of mass production.

Should Traction Companies Buy from the Manufacturer or Jobber?

By Scheduling Purchases Several Months Ahead Investment in Stock Can Be Reduced—Field for Larger Co-operation Defined

Every electric railway purchasing agent must decide for himself as to the extent to which he will buy material and supplies direct from manufacturers or through the jobber. Such a decision should be reached, it seems, only after an extended study of the service possibilities of each source of supply, the relation between seasonal and emergency demands, the cost of getting materials, and the possibilities of saving money through what might be called the commercial diversity factor. The increased cost of maintaining stocks in repair shops and elsewhere on traction systems justifies thorough examination of the opportunities for utilizing the facilities of the jobber, in order to cut down the total inventory of spare parts and extra material on hand from time to time

As a large buyer, the electric railway of good size is in a position to obtain liberal concessions on price from the manufacturer, or should be. But idle material standing in bins and filling shelves adds to overhead charges so fast that it is a moot question where to draw the line on reserve equipment parts, track and line material, office supplies, power plant merchandise, etc. The feeling is growing in the trade that if a more scientific study should be made by many companies as to the desirable size of their stocks of supplies as related to seasonal and emergency demands from year to year, it would show clear-cut opportunities for scheduling such purchases more accurately and thus offering the electrical supply jobber a chance to be of greater service. At the same time the manufacturer might become better informed as to the demands to be made upon his facilities for months to come, and would thus be enabled to put through orders more economically, bettering his own production load factor and tending toward ultimate lower costs and prices.

ADVANTAGES OF GROUP BUYING

Spasmodic buying of small supplies from scattered manufacturers lacks the precision attainable when such purchases are handled either individually or pooled through the jobber. To buy quality goods at lowest cost is of first importance to the traction company, but through the co-ordination of purchases the size of necessary reserve stocks can certainly be cut down, even granting the jobber his legitimate profit for maintaining the storehouse for one or more operating companies in his territory.

Some of the material required by electric railways is also useful to central stations. It follows that by anticipating and combining orders, both classes of utilities may be served advantageously. Just as interconnection of power plants has reduced the operating cost of stations when judiciously handled, and as it has cut down the amount of idle reserve equipment necessary, the plan of joint purchasing or of centralized material ordering indicated here offers real opportunities for saving in overhead and running costs. Central stations need to conserve capital at this time as never before, and foresight in purchasing supplies of joint usefulness such as poles, cross-arms, moderate voltage insulators, interior wire, fuses, dry cells, lamps for building service and many other items will repay the railway purchasing agent.

Rolling Stock

The Pacific Gas & Electric Company, Sacramento, Cal., recently received from the St. Louis Car Company six new street cars, costing about $36,000. Delivery of the cars, which seat thirty-four passengers, has been expected since last August.

The Pacific Electric Railway, Los Angeles, Cal., announces that a shipment containing nineteen of the new safety cars, announced in the Aug. 21 issue as being purchased by the company, are en route to the shops, where the cars will be assembled for service on suburban lines of the company.

The Springfield (Ill.) Consolidated Railway Company has received the first of the seventeen one-man street cars which it plans to install. Sixteen others are expected to arrive soon, the total cost of the cars, it is stated, being $117,000. The present twelve-minute schedule on the company's lines is expected to be reduced to nine and ten minutes with the operation of the new cars.

The Staten Island Midland Railway, New Brighton, N. Y., which, following its discontinuance of operation, as mentioned in recent issues of this paper, is being taken over by the city of New York, will be ready to resume operation by Dec. 1, it is hoped. Eight of the twenty-eight new safety cars ordered from the J. G. Brill Company about four or five weeks ago, at a cost of $7,050 each, have been delivered and the rest are said to be on the way.

Birmingham (Ala.) Railway, Light & Power Company, mentioned in the Oct. 9 issue as expecting delivery of fifteen new safety cars about the middle of October, will probably place these cars in operation on the Twentieth Street and Avenue B loop lines. Shipment of the first car was made from Cincinnati early this month, it is announced, and daily shipments will be made until the order is completed. Two more cars of the large "260" type were expected to be placed in operation on the North and South Highlands line last week.

Twin City Rapid Transit Company, Minneapolis, Minn., mentioned in the issue of last week as rebuilding cars into trailers, is reconstructing twenty-five of these trail cars to be placed on No. 11 trucks with standard 26-in. wheels. The trailers will be one step lower than formerly and will weigh 24,960 lb., compared with 42,300 lb. for the standard cars. The trailer conductor will manage the rear entrance door, while the front exit will be operated by the conductor of the motor car, the same as in the two-car unit 2,000 previously described.

Track and Roadway

Washington Railway & Electric Company, Washington, D. C.—The Washington Railway & Electric Company is planning to improve its track and roadway next year. The tracks on G Street from Fourth to Eleventh Street, Northwest, will be rebuilt and also the tracks on North Capitol Street from Massachusetts to New York Avenue.

Capital Traction Company, Washington, D. C.—The Capital Traction Company has proposed an extension of its line from N Street to Pennsylvania Avenue to relieve congestion on the Fourteenth Street line; also an extension on L or M Street, south, between Eleventh Street, east, and Seventh Street, west, and on New Jersey Avenue from E Street, south, to L or M Streets, south, to provide additional facilities for Navy Yard employees. The commission will consider these proposals at the next hearing.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—The Trenton & Mercer County Traction Corporation has completed its extension into the heart of Trenton Junction, and cars are now running over that division. For many years the traction company was unable to secure a right of way across the tracks of the Philadelphia & Reading Railway at Trenton Junction, and finally a tunnel was built under the railroad tracks at that place.

Muskogee, Okla.—Plans are again under way for the construction of an electric line from Oklahoma City to Muskogee This plan is referred to on page 1074 of this issue.

Philadelphia (Pa.) Rapid Transit Company. — The double-tracking on Cobbs Creek Parkway from Spruce to Market Street by the Philadelphia Rapid Transit Company has been delayed. Citizens of West Philadelphia have protested on the ground that boulevards that cost millions of dollars should not be used for street cars.

Wellsburg, Bethany & Washington Street Railway, Wellsburg, W. Va.—It is expected that in the near future the Wellsburg and Bethany line will be extended to Washington, Pa., which will develop one of the richest coal fields in the United States. It is reported that the property of this railway will soon be acquired by the West Penn Traction Company.

Power Houses, Shops and Buildings

Paducah (Ky.) Electric Company.—The Paducah Electric Company has installed new generating units in its power house to replace those wrecked by an explosion of a month ago.

Los Angeles (Cal.) Railway.—The Los Angeles Railway is planning to build two new substations which will cost about $100,000. One will be located near Vernon Avenue and Pacific Boulevard and the other on Buchanan Street. They will improve the power conditions in the districts near by.

Pittsburgh (Pa.) Railways. — The United States District Court has approved the improvement plan suggested by the receivers of the Pittsburgh Railways. The program includes the construction of two new carhouses at a cost of $159,000. One carhouse will be erected in Ross township and the other in Carrick, a suburb of Pittsburgh.

Rutland Railway, Light & Power Company, Rutland, Vt. — The Rutland Railway, Light & Power Company has built a new siding for the purpose of handling cars. It was constructed at the expense of the Vermont Milling Products Corporation, which in the starting up of a new factory greatly increased the freight business of the Rutland Railway.

Trade Notes

The Central Railway Signal Company, Chicago, Ill., has filed plans for the construction of a one-story building at a cost of about $23,000 at Hammond, Ind., to replace a structure destroyed by fire.

The Black & Decker Manufacturing Company, Baltimore, Md., advises that its net sales as of Oct. 31, 1920, are 163 per cent of the total net sales of the year 1919. The company expects its net sales for the year to exceed those of the year 1919 by almost 100 per cent.

The Chickasaw Shipbuilding & Car Company, Birmingham, Ala., is adding a pressed steel car works department to its plant which, it is said, will have a daily output of from twenty to twenty-five cars. Nearly $500,000 is being invested in the car plant.

American Di-Electrics, Ltd., New York City, manufacturers and engineers in the field of electrical insulation, announces that James C. Barr, 84 State Street, Boston, Mass., has been appointed railway representative for the New England States, handling the company's line of insulating varnishes and compounds.

The Austin Machinery Corporation, manufacturer of earth-moving and concrete-mixing and handling machines, announces that ten primary district offices and warehouses and upward of fifty subsidiary offices and agencies have been established throughout the United States. A distinctive trademark has also been adopted by the company.

Galena-Signal Oil Company, New York City, is issuing $4,450,000 of 7 per cent convertible debtenture bonds due April 1, 1930, in denominations of $100 and $1,000. The price given is 93.5 and interest, yielding approximately 8 per cent. The consolidated net earnings of the company and constituent companies available for interest and federal taxes, after making allowance for depreciation, for the nine months ended Sept. 30, 1920, were given as $2,302,154, being at an annual rate of about five times the annual interest charges on the total funded debt now outstanding, including this issue.

George H. Walbridge and Lyman P. Hammond have opened an office at 120 Broadway, New York City, and will undertake special executive work in the investigation, organization, reorganization and financing of public utility and industrial corporations for various investment and commercial banking institutions. They have resigned as vice-presidents of Bonbright & Company, Inc., but continue as active officers of the Colorado Power Company, The Arizona Power Company, Pacific Gas & Electric Company of Phoenix and as directors of other public utility and industrial corporations in which Bonbright & Company are interested.

Stanley W. Midgley and J. M. Borrowdale have organized the firm of Midgley & Borrowdale, with offices in the McCormick Building, Chicago, for the purpose of acting as sales representatives in the Middle West for manufacturers of products for electric and steam railways. The firm will handle the products of the Superior Steel Castings Company, the Pneumatic Safety Valve Company, the Henry Giessel Company, manufacturer of sanitary filters and coolers for passenger coaches; the Trumble Waste Manufacturing Company and the Steel Fabricating Company, manufacturer of sectional steel buildings. Mr. Midgley was Western sales manager of the Curtain Supply Company, from 1906 to 1914. Subsequently he became general sales manager of the Acme Supply Company, Chicago, and since January, 1918, he has been connected with the Liberty Steel Products Company. Mr. Borrowdale's activities have been largely in the steam railway field.

New Advertising Literature

Meters.—The Economy Electric Devices Company, Old Colony Bldg., Chicago, recently issued bulletin No. 70, describing the work of the Economy Meter in reducing energy consumption by electric cars.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Chicago Companies Win Against City in Commission Order

CITY officials of Chicago will find little consolation in the final order of the Illinois Public Utilities Commission in the Chicago Surface Lines fare case, an abstract of which appeared in our issue of Nov. 13. The ruling of the State body is a complete victory for the petitioning companies, granting a recognition of the full valuation contended for, a return of 7½ per cent and a continuance of the existing 8-cent rate of fare. Because of the immensity of the property involved—said to be worth at present-day reproduction prices more than $247,000,000—the summary of proceedings and the conclusions of the commission are worthy of special comment.

Since the Surface Lines' first petition was filed in November, 1918, a hostile city administration has resisted every order and has overlooked no legal technicality for possible reversal in the courts. These very attacks, however, only served to strengthen the companies' position because each resulting decision confirmed the attitude of the commission. In fact, the highest court of the State held that "the commission would be justly chargeable with neglect of duty if it had not done what it did," namely, grant emergency relief at a time when the continuance of a strike threatened the very existence of the utility. Nevertheless, the municipality is said to be planning further appeals, but having been guided by rulings of the Supreme Court in the Quincy case and the Springfield Gas case, the Illinois commissioners are believed to have framed a "bombproof" order.

An oft-repeated contention of Mayor Thompson's representatives is that the contract ordinance with the Surface Lines made it impossible to interfere with the 5-cent rate of fare. This point, however, has already been disposed of by the Supreme Court in the statement that the general assembly has never conferred upon any municipality power to make inviolable contracts for public utility rates. While continuing its objection that the State commission was without jurisdiction, the city resisted almost every proffer of evidence in the valuation proceedings. Seven different bases of valuation, all of which exceeded the capital account, were offered by the companies, but a return was asked only on the total of the capital account or price at which the companies had agreed to sell to the city. The commission did not accept the agreed purchase price *per se* as a valution for rate-making purposes, but by granting many of the deductions demanded by the city and adding other items, the resulting present valuation of property used and useful for public service was found to be at least equal to the existing capital account.

The commissioners followed the directions of the Supreme Court in the Springfield Gas case by setting forth all the elements of value declared to have been considered. They found, however, that nothing could be gained from a study of amount and market value of outstanding securities, and they disposed promptly of the city's argument that the "value for taxation purposes" should also be considered. An allowance of $20,000,000 was made for "going value," to represent the value of property destroyed as obsolete and 10 per cent which was added for cost of conducting construction.

The commission took a conservative attitude in stating that while the companies were entitled to a return of 7½ per cent on the allowed valuation and were not quite earning that amount, a higher rate of fare would not be granted because of the "possibility and probability of readjustment of operating expenses resulting from a return to normal conditions."

According to newspaper reports, the city's lawyers sought to intimidate members of the Illinois commission a few days before the final order was handed down by calling attention to the fact that a new state administration had been elected on a platform hostile to commission regulation. Chairman Wilkerson indicated by his response that he and his associates would not be swayed in their decision by this announcement. The final order was a complete answer to these attacks, and it contained the statement that "appeals to popular prejudice, involving baseless charges of so-called 'contract breaking,' are, in reality, assaults on the courts. They involve the startling doctrine that public officials shall disregard the duty which they are required to perform under their oaths of office."

Can Common Sense Control in Urban Expansion?

IF CITIES could only grow as they ought, that is according to some logical plan, vast sums of money could be saved and great inconvenience to people avoided. Unfortunately in the cases of many cities, particularly the older ones, the directions and rates of population spread have been determined by considerations other than the greatest ultimate good of the greatest number. For instance, one force, almost everywhere potent, has been the application of the skill and ambition of the real estate promoter. His desire to make money has furnished an incentive for the spread of population over larger areas. The result on the whole has been beneficial to the public, but many illogical distributions have thus occurred. Although, as Ben Franklin would have said, the promoter had an ax to grind, others besides himself benefited by the grinding of his ax, but not as much as they should have done.

The largest single factor in the spread of population has been transportation. Of course the motives of, first, the bus, and later the tramway and rapid transit line promoters was profit, just as in the other case. Transportation routes followed the lines of least resistance and of probable greatest ultimate and permanent traffic. Here again possible private gain and public good were inseparably linked, but competition and misdirected foresight sometimes caused expansion in directions not the most consistent and economical.

Congestion itself, of course, furnishes an incentive to expansion, but it is too bad for a city to wait until its inhabitants are uncomfortable or in danger from unsanitary conditions before suitable provision for their adequate housing is made. Where population growth is exceedingly rapid, however, the city fathers have a real problem on their hands, as is illustrated in New York City, Chicago, Boston and elsewhere today.

So much for incentives to growth and their effect on that growth. There is another consideration almost as vital, namely, the natural and artificial barriers which hamper growth in the directions wherein the incentives would foster it. Take, for example, New York City. This example is particularly appropriate at the moment because this issue of the ELECTRIC RAILWAY JOURNAL contains a report of a meeting of the New York Section of the American Society of Civil Engineers, held on Nov. 17, at which the transportation difficulties and possibilities of the "metropolitan district" were considered.

New York is developing largely to the eastward because that is easiest, although, logic says, abnormal expansion in that direction will be very costly to the city in the long run. To the north there is unlimited territory, but the north-and-south rapid transit lines are badly congested and facilities can be augmented only at enormous expense. To the south New York Bay separates Staten Island (Borough of Richmond) from Manhattan and, until an expensive tunnel under the bay is constructed, the island is, relatively speaking, isolated, water transportation being the only resource.

To the west the State boundary divides the city from the promising residence territory in near-by New Jersey. This imaginary line is a very real barrier to the healthy growth of the community. Even if resistance east, north and south were equalized, which it will be in time by the exercise of good engineering and skillful financing, the population spread would be forced by the State line to be fanlike rather than circular. The possible gains through symmetrical development are so great, however, that even the legal and political obstacles imposed by them ought to be overcome.

In New York the lopsidedness of the spread is particularly unfortunate because much of the supply of fuel, food and other necessities comes from the West, hence must cross or go around Manhattan. The result is not only increased direct cost but greatly augmented secondary cost through the consequent congestion. This condition tends to grow worse.

Another point to which we wish to call attention is the emphasis which Mr. Brinckerhoff, in his comprehensive paper, places upon the co-ordination of all desirable means of transportation in a city. In such a general plan each type of transportation would function where it could do so to the best advantage and as part of a well-balanced whole. The opportunities for such a comprehensive plan increase, of course, with the size of the city, although they are present wherever there are two means of transport. In the smaller cities and in those of medium size the only opportunity for union is with the trolley and bus service, each assuming the work for which it is best fitted. Where there are rapid transit lines, they should be made part of the general scheme.

While this plan has been followed in most large American cities except New York as regards rapid transit and surface lines, but few instances exist in any city in the country of the co-ordination of the services of buses and trolleys. It might be mentioned in this connection that in London the buses, trams and underground roads in the Ashfield system not only are operated under one management but pool their earnings, while a recent franchise in Paris puts both buses and trams under one management.

It is not too much to say that only in this way can the most satisfactory results be secured.

The New York situation has been treated at length, partly because it has been brought into the limelight by the A. S. C. E. meeting, partly because the transportation problem there is getting out of hand due to political and financial conditions. It illustrates what many cities are or will be up against, in lesser degree. It is hoped that concentration of attention upon the New York transportation problem at this time will point some helpful lessons of wide application, particularly as to the need for broad, future-looking city planning, which, in the case of New York and many other localities, should be large-scale regional planning.

Return to Level Rail Heads and Wheel Treads Proposed

AT THE annual congress of the Tramways & Light Railways Association, held in London on July 3, 1920, the subject of rail sections came up for extended discussion as the result of a paper presented by P. J. Pringle, M. I. E. E., wherein he raised the question of the advisability of returning to a level, flat tread for rail heads and wheels. In this paper the belief was expressed that "coned" treads on wheels and rails tended to create corrugation and that, as the life of the rail is decreased by wear, the coning of the rail tread is increased. The statement was also made that where flat, level wheel treads have been run on rails originally having flat, level treads, the rail heads became coned with a slope of about 1 in 20, but that this coning remained constant after reaching that contour. The wheel tread used had no connecting fillet between the flange and the tread.

This is a matter of particular interest because the views expressed are at variance with the recent and rather general adoption of the curved tread design for the heads of girder grooved rails in this country as well as in Great Britain and Australia, but the proposal to re-establish the flat tread is by no means new, since the tramway systems in France have but recently adopted a new standard grooved rail having a level, flat tread. The French action is a reversion from a design which had a curved tread contour. Unfortunately we are not advised as to the reasons assigned for the action of the French tramways.

British opinion on the subject is divided, but we believe that ultimately the British Standards Committee will settle upon the curved tread, just as the Australian and American engineers have done. Our reason for this belief is based upon the inability of any street railway system to re-lay all of its tracks overnight or to re-turn and re-shape all of its wheel treads at one fell swoop. With a curved rail-head contour of some form prevailing, the wheel treads are bound to take their shapes therefrom.

With regard to the statement that coned rail treads and coned wheel treads tend to create corrugation, it may be noted that this belief has been quite general in this country, and the adoption of the curved tread on the American standard girder grooved rails was first proposed as a possible means of eliminating corrugation. While the curved rail tread has not wholly succeeded in accomplishing this result, it has certainly been the means of prolonging the time of appearance of the evil.

As far as increased rate of coning is concerned, we are inclined to the view that the increase is often due to widening of the track gage which so frequently occurs as the tracks grow old, due to the weakening of the fastenings which permit the rail heads to tilt outward. This in turn causes the head near the gage line to take more than its share of the wheel contact pressure, resulting in increased wear at or near the gage-line fillet. Such wear is often neutralized if the rails are re-gaged. We do not believe that there are sufficient data available to support a claim that either wheel-tread coning or rail-head coning is increased proportionately as the life of the rail or wheel is decreased by wear. There are a great many things besides coning which have an influence upon the wear of rail heads and wheel treads.

The thought in this country is more to the effect that there may be wisdom in re-shaping our wheel treads to a concave contour, thus abandoning the conical wheel tread. Some experiments have been made along this line and the indications are that the curved wheel treads retained their original contour to a marked degree and did not acquire an increased coning. Data are insufficient to lead to conclusions relative to the comparative rates of wear between flat inclined wheel treads and concave wheel treads. but the impression has been gained that the rate of wear per thousand miles run is somewhat less on the concave treads. We think it quite timely that the committees on equipment and way matters of the American Electric Railway Engineering Association are about to take up the study of this important phase of the subject of rail and wheel wears.

American Engineering Council Is a Going Concern

LAST Thursday, Friday and Saturday there was a meeting in Washington which was of more than ordinary importance to the engineering profession immediately, and to the entire country ultimately. This was the first meeting of American Engineering Council, the governing body of the Federated American Engineering Societies, organized last June. The steps leading to the formation of this organization, the history of the organizing conference in Washington last June when representatives of almost 200,000 engineers were gathered, and the developments since then have all been chronicled in these columns. The outstanding fact today is that this work has resulted in an organization which is a going concern with the most praiseworthy objects and the ability and talent to achieve results of great value.

That Herbert Hoover should agree to accept the presidency of the new council and to add to his already heavy burden the active leadership of this organization should and does in itself indicate the importance and character of the program of endeavor ahead of the council.

The organization, be it plainly understood, is one for service for the public good. It is not so much that the engineer himself will benefit from the activities of the organization, but rather that he will have an opportunity, in a new and much larger way, to put his knowledge and training, his kind of thinking, to work on problems of general and national importance. The first task outlined by Mr. Hoover, in what proved to be his inaugural address, is to solve the largest problem of today, that involving or resting upon the relations of capital and labor. This is a social problem, but one which should be susceptible of solution by engineering methods. All other methods have so far failed to find the answer.

It is with this understanding that the country as a whole and the industries dependent upon engineering particularly should welcome and give unlimited encouragement to this newly formed or accomplished association of the engineers of the nation.

Labor Assumes a New and Constructive Attitude

TAKING the statements of Matthew Wold, vice-president of the American Federation of Labor, as representing the attitude of organized labor which has crystallized out of the past few years of unprecedented unrest, it appears that the efforts of the engineers on the particular problem mentioned above as a part of the program of American Engineering Council will be most welcome to the workers of the nation. Mr. Wold indicates that labor is now ready to co-operate in any and every way to increase production and he commends especially the work of efficiency engineers and others who have been trying through scientific analysis to make each man's efforts count for more. This appears to be a change in attitude which is wholesome and from which there should be untold benefit to the entire community. It is an attitude, of course, which is nothing more nor less than should be expected from a disinterested consideration of how each man may make the most of his opportunities in whatever capacity he finds himself, but, frankly, this has not been the apparent attitude of organized labor on this subject in the past. Mr. Wold has been accused of being an opportunist, but this stand, we hold, is so patently clear and logical that to uphold it can serve no temporary purpose, but must result, if maintained with any self-respect, in real advancement.

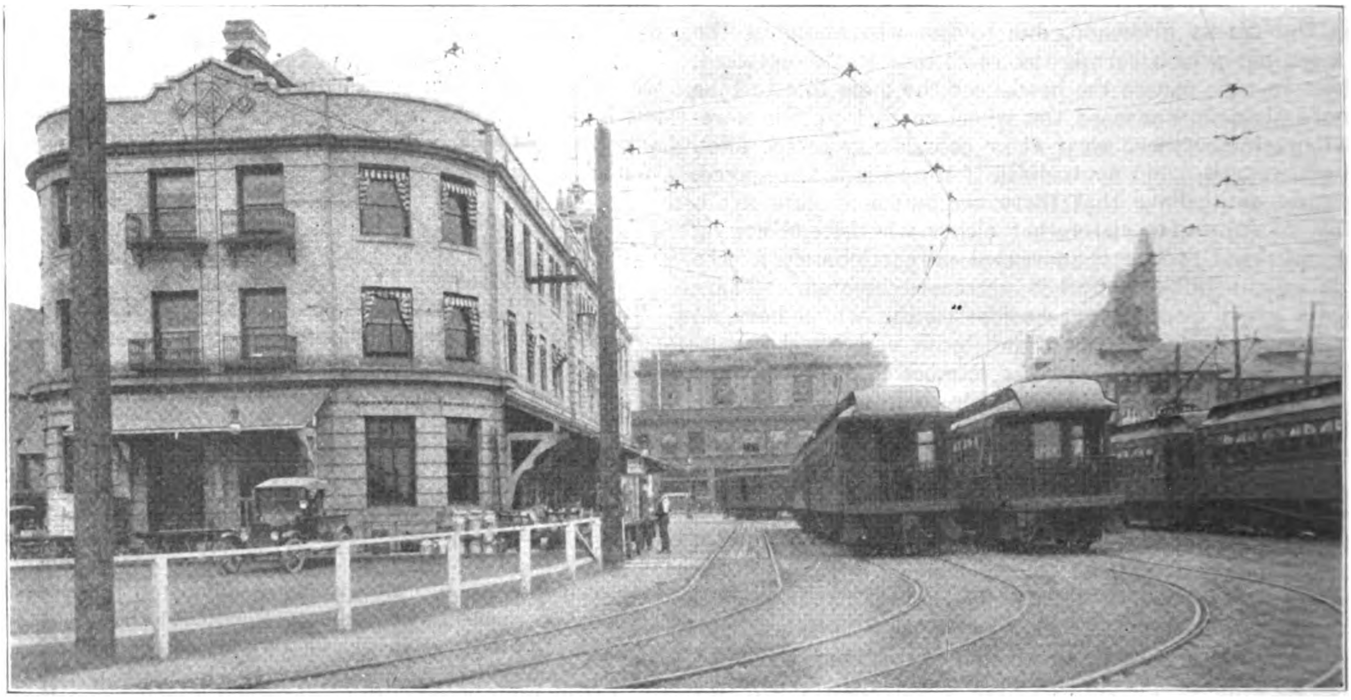
Engineers should be particularly pleased to find that their work of years is commencing to bring fruit in a most gratifying manner. Mr. Hoover, as the newly elected president of the American Engineering Council, mentioned this subject the day after Mr. Wold's declaration, and immediately recognized the added opportunity thus thrown open to the engineers in their efforts to work for better economic and social conditions in this country.

Electric railways have always had certain difficulties in this line and have faced labor problems more complex than in most other industries. If the engineer, the scientific analyst, can be accepted by both labor and capital as the proper person to undertake the task, he can be of service which will prove invaluable to railway properties in working toward more efficient operation, in providing better service to the community and in improving the general relations between capital and labor.

It may be, as the New York *Times* says editorially, that Mr. Hoover may "bring Mr. Gompers to accept engineers as a golden bridge between labor and capital."

Spokane's Traction Problems Are Being Solved

This Article Has Particular Reference to the Inland Empire System, Recently Reorganized After a Short Receivership—While It Was in Part Overbuilt, the Property Has Attractive Possibilities



INLAND EMPIRE INTERURBAN TERMINAL IN HEART OF SPOKANE

ALTHOUGH Spokane, Wash., is a young city, having been incorporated as the village of Spokane Falls, with 1,000 inhabitants, as late as 1881, it has had a vigorous electric railway history. In fact, the growth of the local transportation business was in some respects too vigorous for financial stability, particularly that of the interurbans built to connect the city with nearby points. The result has been the development of some difficult problems, particularly on the interurban lines, which were accentuated by the war. These are now in process of being solved, although drastic means have been necessary in the process.

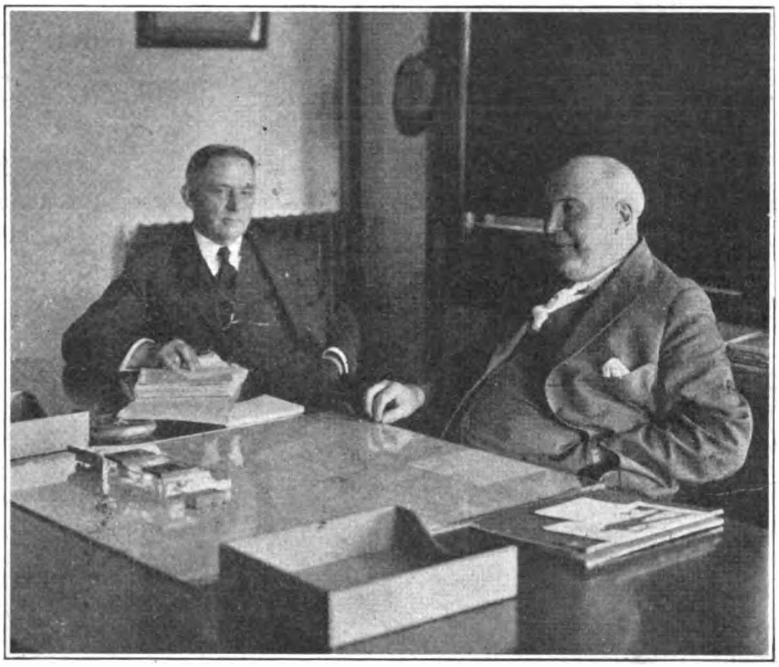
So many conflicting reports have been current regarding recent and prospective developments on the local properties that a representative of the ELECTRIC RAILWAY JOURNAL recently made a visit to Spokane to examine the situation at close range. This article contains the results of some of his observations.

The city has had a development which is remarkable, both as to dimensions and quality. Its location is such that it has been thrown upon its own resources more than most cities. It is situated in a rich timber and agricultural district which is the source of substantial freight and passenger business. The last census shows the city to have a population of 105,000. Its area is 39.25 square miles. To serve this population and this area it has a total of 140.5 miles of electric railway, expressed in single-track equivalent, within the city limits. Of this trackage 53.5 miles is owned by the Spokane & Eastern Railway & Power Company and 87 miles by the Washington Water Power Company. Besides the service inside the city the Spokane & Eastern Railway connects Spokane with Cœur d'Alene, Hayden Lake, Liberty Lake and Vera, and the Washington Water Power Company's interurban lines connect it with Hillyard, Medical Lake and Cheney. There is also a third road, the Inland Empire Railroad, which connects the city with Colfax and Moscow. This is a single-phase line. The Spokane & Eastern and the Inland Empire are constituents of the former Spokane & Inland Empire Railroad, which went through receivership, was duly sold and reorganized as two separate roads.

THE INLAND EMPIRE SYSTEM

Although the Washington Water Power Company is vitally concerned with the general transportation problem in Spokane, it is pursuing the even tenor of its way struggling to make ends meet on a 6-cent fare. The most pressing local problems are those now in process of solution on the Inland Empire System, which has been "through the mill" during the past few years.

When F. E. Connors was asked to go to Spokane as receiver for the Spokane & Inland Empire Railroad in January, 1919, he found it necessary to study the property minutely to discover the causes of its financial difficulties and the possibilities of improving its earning capacity. Mr. Connors is of an optimistic temperament and he approached his task in a cheerful frame of mind. And he needed it. He discovered that the property was hopelessly behind in its finances, although possessing a fairly adequate equipment. He first had a comprehensive summary made of the data regarding the property, showing that it had been formed by the consolidation of four original corporations, the Cœur d'Alene & Spokane Railway Company, Ltd., the Spokane Traction Company, the Spokane Terminal Company and the Spokane & Inland Empire Railroad Company. As of Jan. 1, 1919, the total of bonds of these companies outstanding was $4,414,500. The records showed also that in 1911 Henry L. Gray made a report on the actual cost, cost of reproduction and depreciated value of this property. The book cost as of Jan. 1, 1911, was $24,820,000 approximately. He estimated the cost of reproduction as about $13,922,000 and the depreciated value as about $12,133,000. In November, 1918, A. J. Witchell, chief engineer of the property, estimated its junk value as $5,950,000, included with which was the book value of the Nine-Mile power plant, $1,350,000.



VICE-PRESIDENTS CONNORS AND PAINE
(Mr. Connors is at the right)

A BIRDSEYE VIEW OF THE SYSTEM

Statistics are dry, but it is necessary to give a few facts regarding the property, as compiled for Mr. Connors by the department heads, in order that any discussion regarding it may be comprehensible.

First as to the system as a whole, Mr. Connors found on his hands a property consisting of two distinct divisions, one known as the "Interurban Division" and the other as the "Traction Lines." The former comprised 168 miles of main track, 18 miles of second tracks and 39 miles in yard tracks, sidings and spurs. On the traction line the respective figures were 44, 12 and 7 miles in round numbers. In the city of Spokane there was a total single-track equivalent of 53½ miles. In the city 9.3 route-miles was double track in paved street and 2.8 miles was single track. The interurban equipment included thirteen electric locomotives, fourteen passenger coaches, five combination motor baggage, express and mail cars, two combination motor and baggage cars, fifteen combination motor baggage and passenger cars, seven combination motor and baggage cars, two parlor cars, 136 flats, 212 box cars, five cabooses, fifteen gondola cars, nine stock cars, six refrigerator cars, eleven work cars and two automobile cars. The "traction" equipment, including the Vera line, included seventy-six passenger cars, two trailers, seven work cars and one electric motor truck.

Mr. Connors found the property equipped with a fair shop, with an adjoining carhouse and yard. On the traction side of these provision was made for a total storage capacity of ninety-two cars; there being five tracks in the carhouse with a capacity of four cars each, a track in the carpenter shop with a capacity of four traction or two interurban cars, a track in the paint shop with a capacity of six traction or two interurban and two traction cars, and trackage in the yard for sixty-two cars. On the interurban side there were two tracks for three interurban cars each, one for two interurban and two for one, each equipped with a 15-ton electric crane for heavy repairs. The yard storage capacity was for thirty interurban equipments, so that a total of forty interurban cars could be stored.

With the shops working full capacity, eight equipments could be put through per month for general overhauling; that is, three interurban and five traction equipments. The track repair facilities at full capacity could handle 225 box cars for medium and light repairs per month. As no changes have been made in the shops and yards as yet, that being a part of the property that Mr. Connors thought could wait until more pressing matters were cared for, these data are substantially correct for the present date.

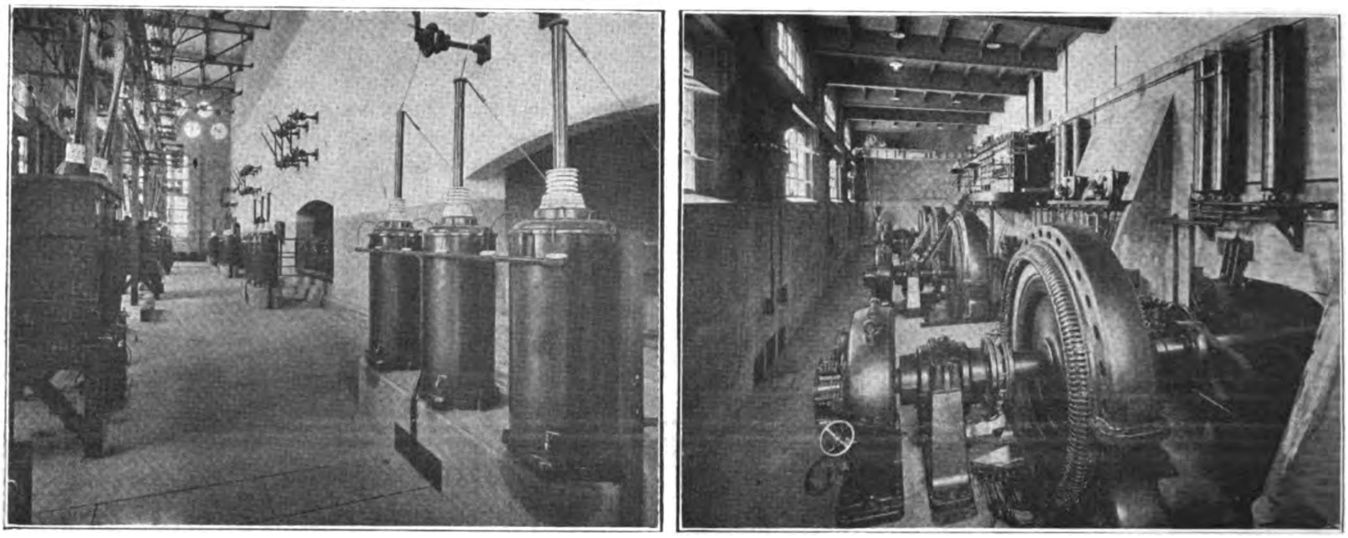
COMPANY OWNS MODERN WATER POWER PLANT

Now, as when Mr. Connors arrived on the scene, power for the traction and interurban lines and for industrial customers is supplied partly from a plant located at what is known as the "Nine-Mile Bridge" on the Spokane River, approximately 10 miles below Spokane. Construction on this plant was started in 1906 and the plant was put in commission in July, 1908. The dam is of the spillway type of construction, of concrete, 58 ft. high and 225 ft. wide. The power house, which is built as a part of the dam, is of brick and concrete construction approximately 82 ft. high x 65 ft. wide and 115 ft. long. It contains four 5,000-hp. Hercules turbines, of the open-flume type, built by the Holyoke Machine Company. These are controlled by oil pressure governors of the Lombard type. There are four double-leaf headgates to each wheel chamber, each 4 ft. x 20 ft. in dimension and electrically operated.

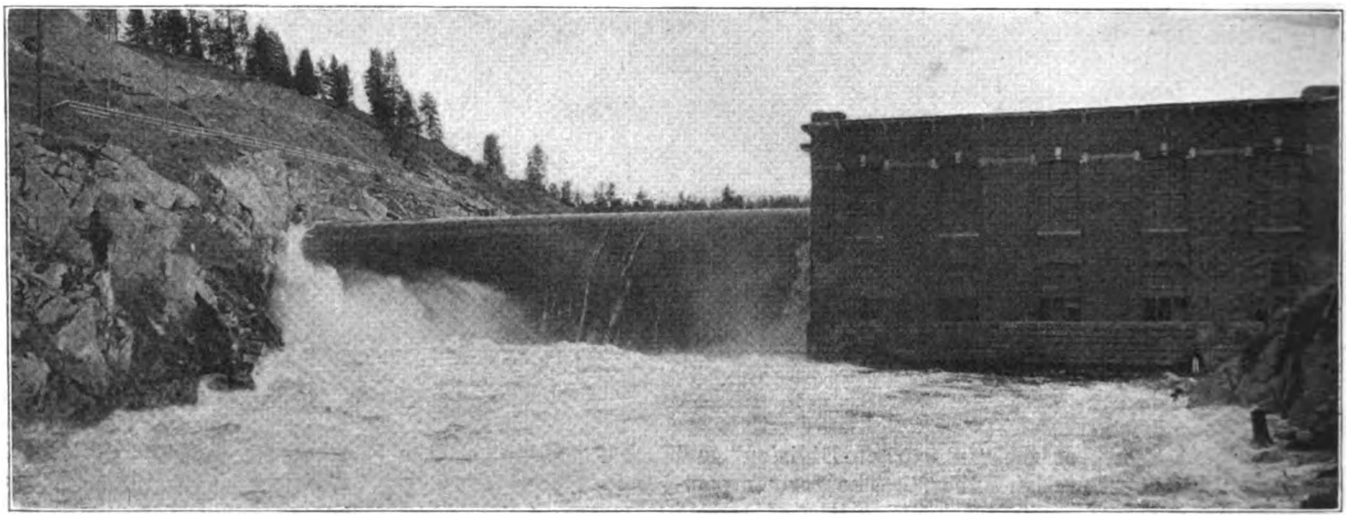
In the plant are four 3,000-kva. Westinghouse three-phase, 60-cycle, 2,200-volt generators, star-wound with neutral grounded, the power house being the only place where the neutral is grounded. In addition to the governor control of the turbines there is a water rheostat arranged to take the load in case of failure of the outside lines.

During the average low-water stage of the river the plant has a continuous twenty-four-hour output of 7,000 kw. Ability to handle peak loads lasting over natural periods is provided for by placing a temporary flashboard dam 4 ft. high on the dam's crest.

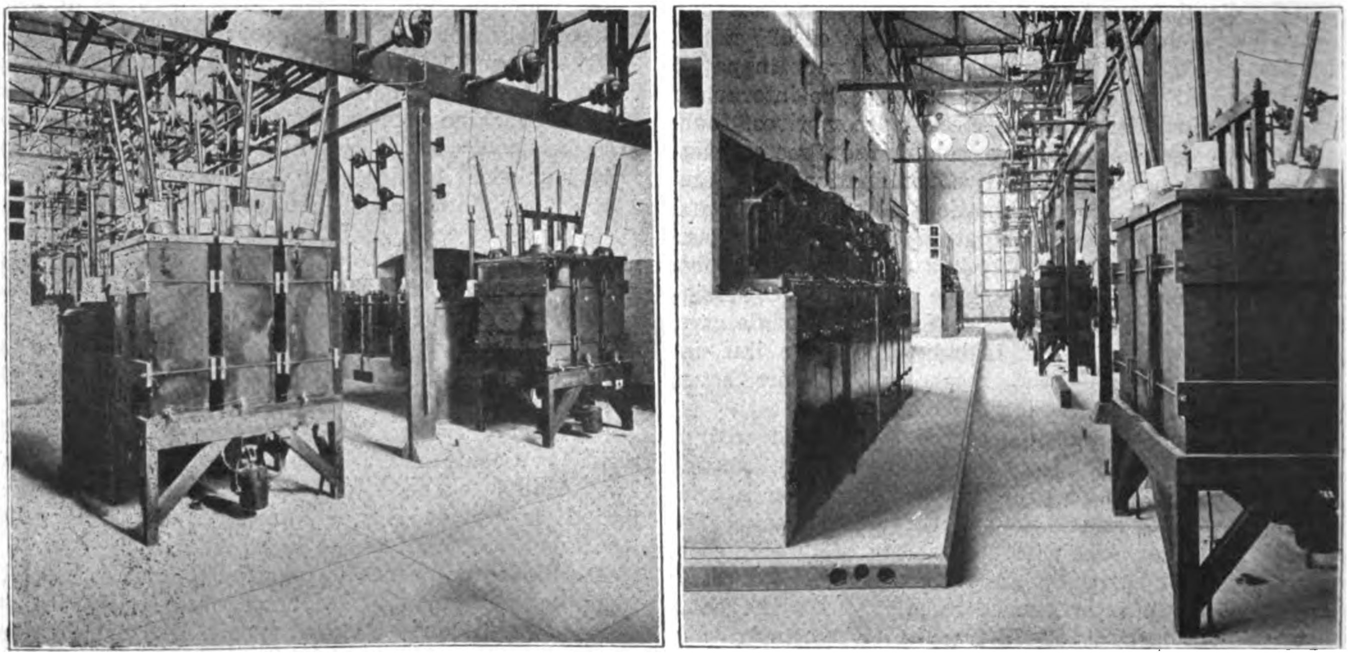
A crew of eleven men is required to handle the plant, including a foreman, a mechanic, release operators, etc. All mechanical and electrical repairs are made by the permanent force of men.



HIGH-TENSION AND GENERATOR ROOMS IN NINE-MILE BRIDGE PLANT. GENERATORS ARE DRIVEN BY 5,000-HP. TURBINES



NINE-MILE BRIDGE HYDRAULIC PLANT SUPPLIES PART OF SPOKANE'S RAILWAY POWER



SWITCHING, PROTECTIVE AND OTHER HIGH-TENSION APPARATUS IN THE NINE-MILE BRIDGE POWER PLANT

Power from the plant is sold to the Spokane Paper Company to the extent of nearly 20,000,000 kw.-hr., and more than 5,000,000 kw.-hr. to other customers annually.

SOME FACTS REGARDING THE POWER TRANSMISSION SYSTEM

From the Nine-Mile power plant duplicate transmission lines are carried over leased right-of-way 100 ft. wide, minimum, to a point inside the city limits of Spokane. These lines are 60,000-volt, three-phase, and they lead to what is known as the "City Substation." This supplements power purchased from the Washington Water Power Company. It contains two 1,500-kw. motor-generator sets, one 2,000-kw. set, four 2,000-kw. transformers and one 2,500-kw. booster set. The substation is used for regenerating power for use on the city lines and handling interurban cars into and out of town. It is also used as a high-tension switching station.

There is also a frequency-changing station for the supply of power to the single-phase division, containing four 1,000-kw. motor-generator sets, two 960-amp. booster sets and one 275-cell, 1,980-amp. battery with necessary auxiliary apparatus. This station is used to change the current from 60 to 25 cycles. The maximum demand upon it is about 2,500 kw. and the output 17,000 kw.-hr. daily. During the wheat-handling period the respective figures are 4,000 kw. and 25,000 kw.-hr.

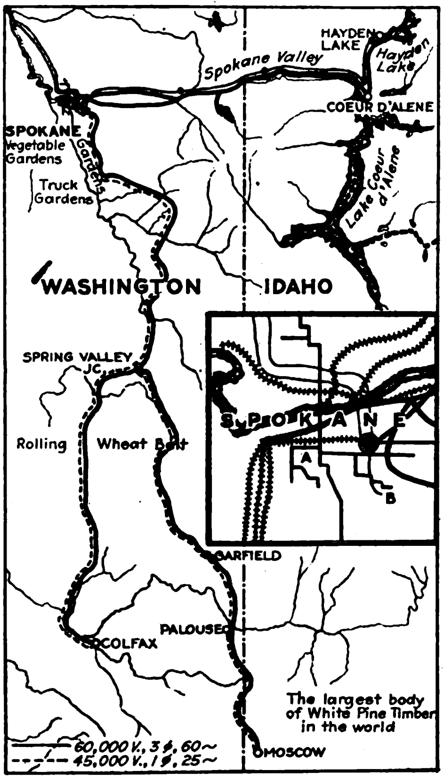
On the Colfax-Moscow interurban lines there are ten substations located approximately 10 miles apart, of standard design. They are of brick and concrete, and contain 375-kva. oil-insulated, self-cooled, single-phase, 25-cycle transformers, which transform the voltage from 45,000 to 6,600 for the contact system. No regular attendants are kept in the substations, the attendants in the adjoining passenger stations looking after the apparatus. The single-phase line which feeds the substations is carried along the right-of-way on wooden pole construction.

The 6,600-volt overhead on this line is of single catenary construction, the $\frac{7}{16}$-in. messenger supporting No. 000 grooved copper trolley wire. A small amount of commercial power is sold along this route.

The Cœur d'Alene line is a 600-volt direct-current line and power is supplied by a three-phase, 60-cycle, 60,000-volt circuit which also serves the paper company. There are four substations, which differ in capacity and construction, along this line.

The above summary gives a tangible idea of the physical property that Mr. Connors had to work with on taking charge of this property. It does not cover the personnel, which formed an intangible but very real part of the assets. Vice-President Waldo G. Paine, Superintendent J. F. Gannaway and other heads of departments had the operating details well in hand and co-operated with the receiver in the program of giving better service at less cost. With the assistance of these colleagues Mr. Connors immediately instituted a régime of rigid economy, pending the inauguration of plans for increasing the income, and he laid his problem frankly before the public, the City Council and the Public Service Commission. He made clear to those interested that wage increases and desired improvements in service could only be made when an adequate income had been secured. As receiver, Mr. Connors made an excellent impression on the "powers that be," and when the road was sold under foreclosure he was elected vice-president and general manager. He is building up a popular interest in the property, which is now about making operating expenses, including taxes and bond interest. His chief difficulty is with the Inland line, which is too expensive an operating proposition for the available business. Just how this will work out remains to be seen.

Of course the principal business of the Inland Empire system is interurban passenger and freight service. The city lines should be operated jointly with those of the Washington Water Power Company by one company or the other. For years plans to this end have been in preparation and still are so. One-half or more of the gross income of the property comes from freight traffic, from $700,000 to $800,000 per annum being derived from this source. The company has also a large regular and seasonal passenger traffic between Spokane, Colfax, Moscow, Liberty Lake, Hayden Lake and other points.

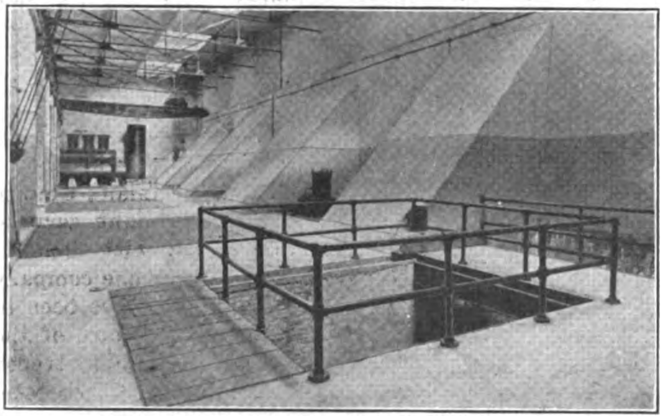


INLAND EMPIRE RAILWAY AND TRANSMISSION LINES

Since Jan. 1, 1919, there has been a substantial growth in the company's business. This is partly attributable to the public appreciation of the fact that the road is not a steam railroad subsidiary although it interchanges freight with steam roads and owns considerable freight rolling stock. Further, new industries are locating along the railway lines, bringing substantial and steady traffic increases. The use of good publicity methods is also a factor in this development.

In the way of improving passenger service, a new four-car daily train from Spokane to Moscow, Colfax and intermediate points has been added, with excellent financial results. While this line has steam competition the business that is being built up is to a great extent new business.

Economies are also being introduced by a process of elimination. For example, at Hayden Lake, an important traffic point about 40 miles from Spokane, the company has leased the hotel, which it owns, thus relieving itself in an unprofitable enterprise by transferring it to an individual who can easily make it profitable. It was necessary originally to build and operate this hotel in order to make a delightful resort available to possible patrons. As many patrons of the hotel and golf course now reach the lake by automobile there is less incentive to the railway to operate the hotel than there was formerly.



GANTRY ROOM IN THE NINE-MILE BRIDGE POWER PLANT OF THE INLAND EMPIRE SYSTEM

The company has also sold its development at Liberty Lake, 16 miles from Spokane. This point is the source of a satisfactory traffic, the round-trip fare being 75 cents for adults before 3 p.m., 50 cents thereafter, with half fare for children. By concentrating on the transportation phase of this arm of the business the management is able to get the best returns. For several years the railway also owned a baseball team as a means of inducing traffic. This venture never paid and has been discontinued.

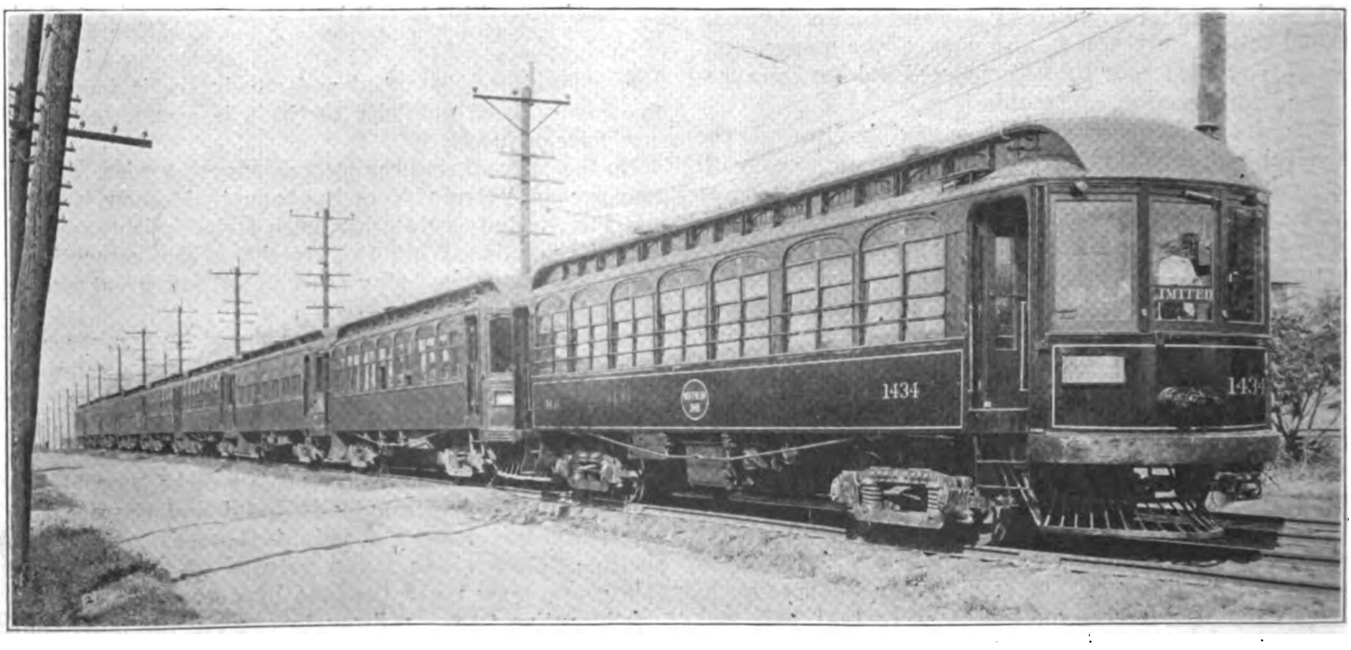
The Inland Empire System has long been famous for its excellent freight service, which is given in keen competition but also in close co-ordination with the steam roads. During the year as many as 12,000 cars of lumber, 4,000 of grain, 1,000 of apples and many of miscellaneous products originate on its lines. Its great appeal to patrons, particularly in l.c.l. business, is the promptness of the service, trains being made up about midnight with terminal delivery at 6 a.m. Of the company's nearly 500 freight cars a considerable number strayed during the war and have not since "turned up."

The freight department is operated strictly along steam road lines, similar freight terminals being employed. The company owns its right-of-way to these terminals. On the Moscow line each crew makes 178 local freight-train miles per day, six days per week, averaging twelve loads. All runs are made within the sixteen-hour limit and a crew consists of a conductor, a motorman and two brakemen. The Colfax line schedule calls for 154 local freight-miles per day. The railway furnishes no trucking service.

Spokane is a city with a small, compact business district. The car lines loop around this, connecting it with the several residence districts, and there is comparatively little cross-town and short-haul riding. The fare is 6 cents, and while tickets at the same rate are furnished for the convenience of patrons, few use them, say 5 to 6 per cent of the total. These tickets are sold by conductors and a number of storekeepers. The cars are largely one-man operated, having been rebuilt for this purpose. Ultimately all cars in the city (including those of the Washington Water Power Company) will be thus operated. Neither company has at present any cars of the safety type. No difficulty in fare collection is reported and there appears to be little delay in loading owing to the extra duty placed on the motorman. No fare boxes are used, the collections being recorded by means of overhead register.

Baseball Fans Speedily Transported

FOR the World's Series baseball games at Cleveland, the Northern Ohio Traction & Light Company operated a nine-car interurban train daily out of Akron. This train left the Terminal Building at 10:10 o'clock every morning and arrived in Cleveland at 11:40 a.m. Leaving the Terminal Building the train was cut in three sections and after leaving its Silver Lake Junction station the train was coupled at Fells and operated as a solid train to Newburg, the city limits of Cleveland, where it was again cut in three sections. The company operated special interurban trains every day from all points along its line and carried thousands of baseball fans to the series. It was the first time an attempt was made to operate a nine-car train over the lines of the Northern Ohio Traction & Light Company. The train made an attractive appearance, most of the cars being new.



SPECIAL NINE-CAR TRAIN. WHICH CARRIED WORLD'S SERIES ENTHUSIASTS TO CLEVELAND

Transportation for Greater New York

Civil Engineers Discuss Plans for Metropolitan District—H. M. Brinckerhoff Recommends Balanced Development by East and West Lines—Discussion Participated in by Representatives of Rapid Transit Commission, Transportation Companies and Others

THE transportation needs of Greater New York was the topic considered at a meeting of the New York Section of the American Society of Civil Engineers, held at the Engineering Societies Building, New York, on Nov. 17. An invitation to be present had been extended by this section to the Metropolitan Section of the American Society of Mechanical Engineers and to the New York Section of the American Institute of Electrical Engineers. The subject, whose official title was "Urban and Suburban Passenger Transportation," was introduced by a paper presented by Henry M. Brinckerhoff of Parsons, Klapp, Brinckerhoff & Douglas, consulting engineers. W. J. Wilgus, consulting engineer, and formerly vice-president New York Central Railroad, acted as chairman of the meeting. Abstracts are given of Mr. Brinckerhoff's paper and of the discussions which followed it.

Address of Mr. Brinckerhoff

LET us first free our minds of our habitual ideas of New York as Manhattan Island and think rather of the great surrounding district extending even outside of the five boroughs of Greater New York. The population of Manhattan New York, by the 1920 United States census is 2,284,103, or nearly 50,000 less than in 1910. Old Manhattan New York as an independent, self-contained city no longer exists. Part of its residential population has been forced out and beyond its borders by the crowding in of business, and others of its citizens have been tempted to move across the rivers by the improved transportation offered by its enlarged rapid transit lines.

For our purpose we may take the New York Metropolitan District substantially as defined by the United States Census Department, which includes in New York State the five boroughs of Greater New York and Westchester County north to include Yonkers and New Rochelle. On the New Jersey side it takes in all of Bergen and Hudson counties and parts of the counties of Passaic, Essex and Union. This district is shown in the first accompanying map and is outlined by a heavily shaded broken line. Taking the intersection of Thirty-fourth Street and Fifth Avenue of Manhattan as the urban center of activity and describing circles with 5, 10, 15 and 20 mile radii we find that this Metropolitan District lies mostly within the 15-mile circle and all within 20 miles of the center. It is true that there are in this territory many entirely independent, unrelated classes of people and interests, but we also find a constant growth in the commoner functions of city life. The trains, for instance, not only carry workers morning and evening from Newark to New York, but also simultaneously from homes in New York to employment in Newark. The average population density of this district is 21 per acre, which is the same as corporate Chicago in 1916.

The conception of this whole district as a Metropolitan unit, a single city, involves an urban and suburban traffic view in which Manhattan Island figures as the central delivery district for this larger area, with sub-centers of activity in Brooklyn, Newark, Yonkers, etc., but all related to one another by the common necessity of easy, frequent passenger intercommunication. Outside our central Metropolitan limits we must visualize a further zone of strictly suburban character, contributing daily riders to and from the center, but less closely tied to the city district in other respects.

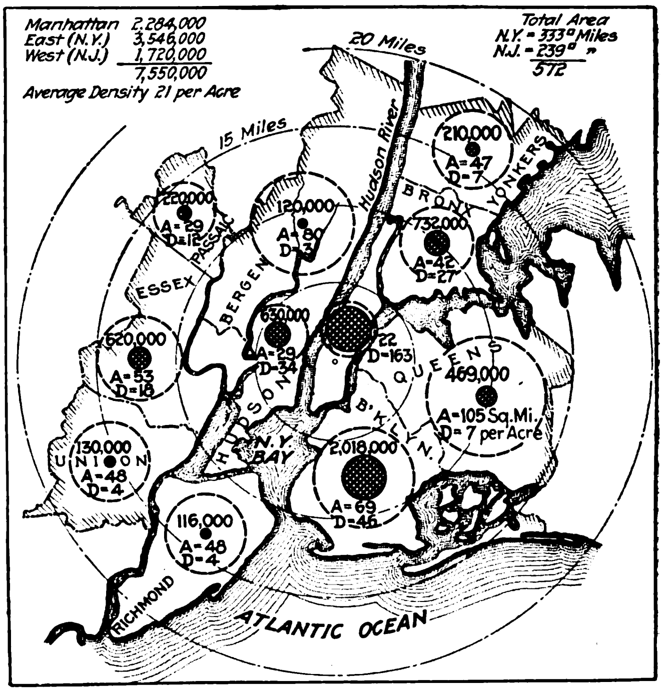


FIG. 1—METROPOLITAN NEW YORK AS DEFINED BY THE CENSUS BUREAU, SHOWING AREA (A) IN SQUARE MILES, POPULATION, AND POPULATION DENSITY (D) IN INHABITANTS PER ACRE

AREA AND DISTRIBUTION OF POPULATION OF METROPOLITAN DISTRICT

Looking at our map we see that the axis of Manhattan Island north and south almost exactly divides this Metropolitan District in two equal parts. In Table I are given the areas in square miles of the boroughs and counties and parts of counties included. In each case the areas not suitable for residence, such as the marshes along the Hackensack River and bordering Jamaica Bay, have been omitted. This division shows New York with 333 sq.miles and New Jersey with 239 sq.miles.

TABLE I—AREA OF BOROUGHS AND COUNTIES IN METROPOLITAN DISTRICT

Manhattan	22 square miles	14,000 acres
Brooklyn	69 square miles	44,000 acres
Bronx	42 square miles	27,000 acres
Queens	105 square miles	67,000 acres
Richmond	48 square miles	31,000 acres
Yonkers (Westchester)	47 square miles	30,000 acres
Total in New York	333 square miles	213,000 acres
Bergen County	80 square miles	51,000 acres
Hudson County	29 square miles	18,500 acres
Passaic County	29 square miles	18,500 acres
Essex County	53 square miles	34,000 acres
Union County	48 square miles	31,000 acres
Total in New Jersey	239 square miles	153,000 acres
Grand total area, Metropolitan District	572 square miles	366,000 acres

Table II shows the population for one hundred years by fifty-year periods of the Metropolitan District and the densities per acre at present.

Two points are important to be noted from this table, *i.e.*, the ratio between the population east and west of the river has been constantiy decreasing during the past one hundred years. The denser and larger population groups were originally located close to the harbor shipping development, but this characteristic is passing with the increase in manufacture and distribution of population by the rapid transit lines. The eastern or New York territory shows particularly the wider distribution and the New Jersey side in points like Newark and Paterson has been affected by the manufacturing distribution.

This means that in the past New York harbor development as a port in a general way confined the location of dense population in districts close to the shipping activities. With the rapid transit development on the New York side came the ability to live at great distances from employment centers which then produced the rush to the Bronx, Queens and Brooklyn.

TABLE II—POPULATION DISTRIBUTION IN METROPOLITAN DISTRICT

	1820	1870	1920	Population per Acre 1920
Manhattan	123,000	942,000	2,284,000	163
Brooklyn	11,000	420,000	2,018,000	46
Bronx	....	....	732,000	27
Queens	22,000	74,000	469,000	7
Richmond	6,000	33,000	117,000	4
Yonkers	1,600	18,000	210,000	7
Total in New York State	163,600	1,487,000	5,830,000	Ave. 27
Bergen County	9,000	30,000	120,000	3
Hudson County	9,000	129,000	630,000	34
Passaic County	....	39,000	220,000	12
Essex County	12,000	133,000	620,000	18
Union County	....	31,000	130,000	4
Total in New Jersey	30,000	362,000	1,720,000	Ave. 11
Total for Metropolitan Area	193,600	1,849,000	7,550,000	Ave. 21
Ratio of New York to New Jersey	5½ to 1	4 to 1	3½ to 1	

TRANSPORTATION GROWTH IN THE METROPOLITAN DISTRICT

When New York was limited to Manhattan Island the transportation lines naturally developed north and south the long way of the city. Generally speaking, business was downtown (south) and the residence sections uptown (north). So long as New York as a city was confined to this long narrow island this characteristic prevailed, but when the population began to overflow and inter-business relations among the neighbor cities grew closer a spreading-out process commenced. The great dual subway system financed by the city of New York followed the north and south idea on Manhattan Island but branched out north, east and southeast into the Bronx, Queens and Brooklyn. We have now the further plans of our public service commissioner, the result of a long study by the chief engineer, Mr. Turner. Hampered by the limitations of state boundaries, he has followed to a logical conclusion the result of distributing further large population increases by lines built exclusively in New York State and leaving the New Jersey side to take care of its own problem.

Mr. Turner predicts that corporate New York (the five boroughs) will grow to nine million population by 1945. He finds by a further development of the idea of north and south rapid transit lines on Manhattan Island that at least two eight-track subway lines will be required. Each of these will have two levels of four tracks in a single street. The total number of north and south subways and elevated tracks on Manhattan Island following this plan will ultimately be forty-eight. This is shown to be necessary in providing for continued distribution of population along rapid transit lines in Bronx, Queens, Brooklyn and Richmond Boroughs on these general lines.

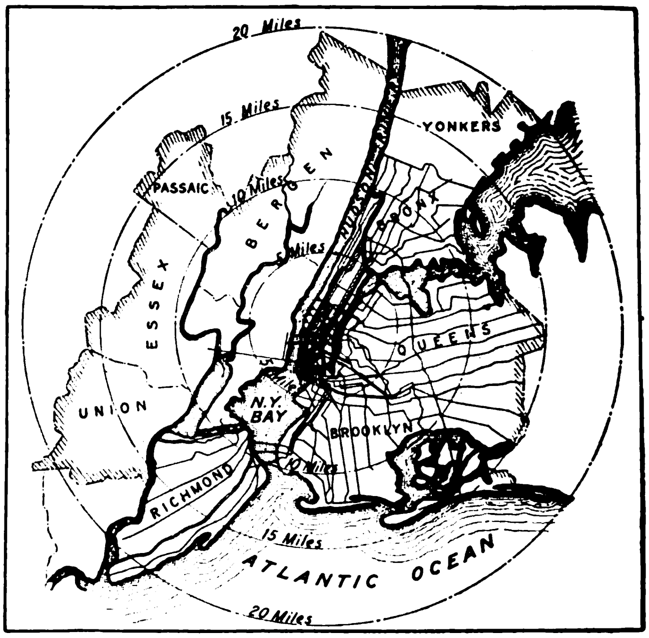


FIG. 2—EXISTING RAPID TRANSIT LINES AND LINES PROPOSED FOR CONSTRUCTION BY NEW YORK TRANSIT COMMISSION

Turning to our population charts we see that from the standpoint of Manhattan Island as a delivery district sparsely settled areas are available west of the river at shorter distances than to the east, which should warrant their consideration.

From a general economic standpoint the fact is apparent that the vital necessities for the maintenance of a great city population, food, fuel and water, come to this Metropolitan District from the west and that the cost of transporting the two former from the west side of the district to Brooklyn and Queens is almost as great as hauling from Pittsburgh to Newark.

PROVIDE MORE TRANSPORTATION WEST OF THE HUDSON

This line of thought naturally leads to the suggestion that from the Metropolitan standpoint at least a portion of future population increases should be provided for west of the Hudson. This can most readily be accomplished by east and west rapid transit lines running from Queens or Brooklyn to Bergen and Hudson counties in New Jersey and passing right across Manhattan Island. This is warranted and would bring about a better distribution of population relatively to Manhattan as the center of the whole Metropolitan area.

A rectangular system with transfers at the intersections would tend to distribute the business development more evenly across Manhattan Island instead of the great local congestion which must result along the avenues from four and eight-track subways built exclusively north and south. A shorter average haul to the delivery district would also be obtained and more balanced two-way traffic developed than by forcing the population growth entirely to the east.

On map Fig. 3 a general suggestion for such lines is shown to convey the idea of a gridiron system in sub-tion to the whole Metropolitan area. These east and west rapid transit tracks could be fed by the transfer from the present or new surface lines.

The upper line crosses Manhattan at 125th Street, penetrating Bronx Borough in one direction and Bergen County, New Jersey, in the other.

The next line utilizes the Queensboro Bridge and reaches Flushing and vicinity, while in the west, after crossing the Hudson River, it crosses the southern part of Bergen County and extends to Paterson.

The third line from the north is located as an extension of the Steinway Tunnel across Forty-second Street, then under the Hudson and west to tap the territory of Bloomfield and Montclair.

A more southerly line connects with the B. R. T. Broadway Elevated and runs on the Williamsburg Bridge, thence across Manhattan to Jersey City, to Newark and the Oranges.

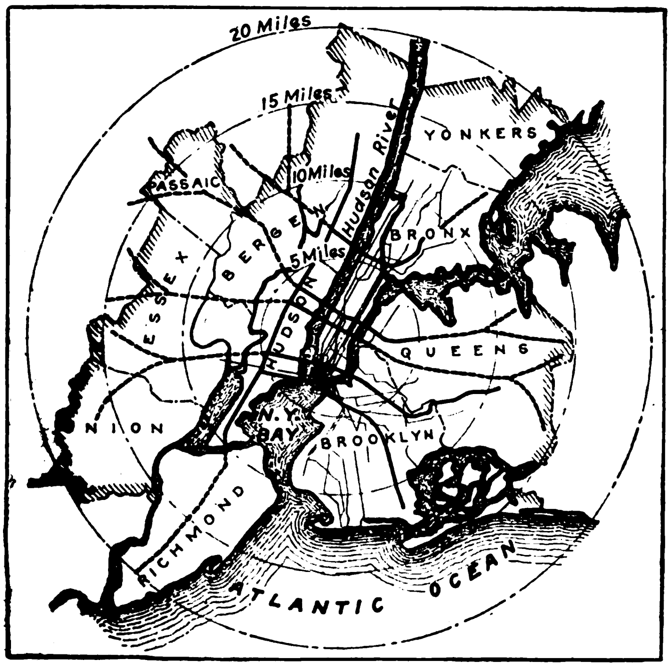
TABLE III—CLASSES OF TRANSPORTATION AND THEIR DAILY TRAFFIC, NEW YORK METROPOLITAN DISTRICT

	Per Cent of Total for Whole Met. District
Buses:	
Fifth Avenue Company and City Buses	2
Steam railways entering New York	4
Ferries	5
Surface lines	35
Rapid transit:	
Elevated and subways	54

The lowest line is shown running from one of the Brooklyn lines across the tip of Manhattan Island and striking Jersey at the Central Railroad of New Jersey stations.

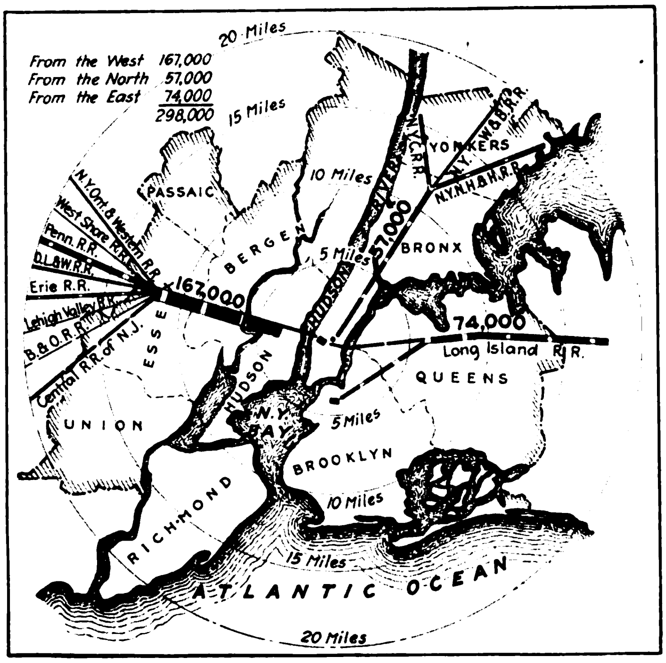
On the Jersey side is shown a north and south line intended as a connecting and distributing line to divert as far as possible north and south transfer from Manhattan and allow of operation into and across the city from many districts. This line reaches from some point on Staten Island under the Kill von Kull, then by elevated north probably west of Union Hill.

The general idea is short trunk lines east and west with feeders from a constantly widening area.



20 Miles
15 Miles
10Miles
5Miles
YONKERS
PASSAIC
BERGEN
Hudson River
BRONX
ESSEX
HUDSON
QUEENS
UNION
N.Y. BAY
BROOKLYN
RICHMOND
ATLANTIC OCEAN

FIG. 3—PROPOSED RAPID TRANSIT SYSTEM TO DEVELOP METROPOLITAN NEW YORK REGARDLESS OF STATE BOUNDARIES



From the West 167,000
From the North 57,000
From the East 74,000
298,000
20 Miles
15 Miles
10 Miles
5 Miles
PASSAIC
N.Y.Ont.&Western R.R.
West Shore R.R.
Penn.R.R.
D.L.&W.R.R.
Erie R.R.
Lehigh Valley R.R.
B.&O.R.R.
Central R.R. of N.J.
167,000
BERGEN
ESSEX
UNION
HUDSON
HUDSON RIVER
57,000
N.Y.C.R.R.
YONKERS
N.Y.W.&B.R.R.
N.Y.N.H.&H.R.R.
BRONX
74,000
Long Island R.R.
QUEENS
N.Y. BAY
BROOKLYN
RICHMOND
ATLANTIC OCEAN

FIG. 4—AVERAGE DAILY ONE-WAY PASSENGERS INTO MANHATTAN OVER THE TRUNK LINE RAILWAYS

PRESENT TRANSPORTATION MEANS

More interesting to the average man than the future is the question of how he is to get to and from his work now. Having analyzed the general conditions and pointed out broad lines for thought upon the general scheme, we can turn to our own troubles of today. Upon what transit facilities are we now dependent in Metropolitan New York? In the reverse order of their importance by volume of passengers handled daily they are as shown in Table III.

This subdivision of traffic is peculiar to New York. In London the rates are as follows:

	Per Cent of Total
Bus	33
Surface cars	27
Rapid transit	40

In Chicago the situation is different again, the rapid transit lines being less developed:

	Per Cent of Total
Surface cars	73
Rapid transit	21
Steam suburban	6

Turning to the map Fig. 4 of our Metropolitan District we are shown the passengers delivered to the central (Manhattan) delivery district by the "steam" railway lines from the west, north and east. To make the chart effective and easily read all the lines entering from the west are shown by a single band, and similarly for those from the north and from the east. The width of the bands in each case indicates the number of passengers per average weekday.

PASSENGERS DELIVERED TO MANHATTAN BY STEAM RAILWAY LINES ON AVERAGE WEEKDAY

From the west	167,000
From the north	57,000
From the east	*74,000
	298,000

*Including those delivered by the Long Island Railroad to Brooklyn and Queens.

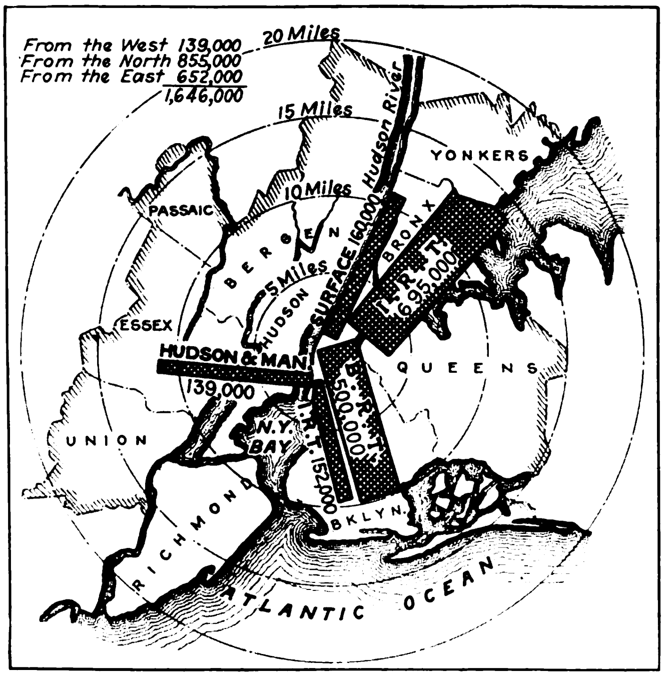


FIG. 5—AVERAGE DAILY ONE-WAY RAPID TRANSIT PASSENGERS IN METROPOLITAN NEW YORK

The total traffic carried to Manhattan by ferries from all sources is shown in the table below. The number of passengers carried by these ferries originating in the districts adjacent to the ferries or brought to them by trolley or bus lines is shown in the second column of the following table. The attempt has been made to separate this travel from that shown as of "steam railway" origin. The various railroad companies have separated their ferry traffic for us in that manner.

FERRY TRAFFIC TO MANHATTAN
(One Way)

	Total	Local
From the west	142,000	67,000
From the east	29,000	29,000
From the south	30,000	30,000
	201,000	126,000

Map Fig. 5 shows bands to a uniform scale totalizing the previous figures and showing about two million passengers entering Manhattan below Fifty-ninth Street in a week day.

CENTRAL DELIVERY DISTRICT

Into lower Manhattan, *i.e.*, below Fifty-ninth Street, or an area of 10 square miles, there are daily poured two million people. This means almost doubling the population of the island. Judging from the fact that the resident population as shown by the recent census has decreased 50,000 in the past decade the influx of daily non-residents may be conceived of as forcing the residents off the island.

This daily inflow to lower Manhattan is equal to one-fourth of the population of the Metropolitan District, but of course a portion come from upper Manhattan and a small number from suburban territory beyond the limits selected. A study of the rate at which this centralized traffic has increased and the fact that it had developed largely coincident with the great rapid transit development of the past twenty years is cause for careful consideration before we adopt either the rate of increase shown or the growth of the traffic itself.

We know that the old law thought to be fundamental during the period of development of electric traction, that the riding per annum per capita of population increased as the square of the population, cannot be applied to an increase from 1,000,000 to 5,000,000, for instance. In dealing with this matter quantitatively we must, therefore, be on our guard.

Subcenters, like the retail district of Brooklyn and Newark, will grow in importance and a reaction must set in against such continued increased concentrations. Such a subcenter development will mean more local traffic of a type quite different from that carried by our long rapid transit lines.

COMPARATIVE COST OF PASSENGER CAPACITIES OF DIFFERENT TYPES OF TRANSPORTATION

The most expensive type of transportation used by urban and suburban travelers in the New York Metropolitan District is the steam railway penetrating to the heart of Manhattan and using a large terminal station. Fortunately for the later solution of the problem the volume of this travel is relatively small compared to the rapid transit and surface lines.

It is a fact, however, not generally realized, that as a city grows not only does its own local and suburban traffic into these great "steam" railway terminals increase, but the long distance travelers grow in number also at an equal or even greater rate. With limited track capacity for carrying these two classes of traffic both cannot increase indefinitely. One or the other must ultimately give way. From this type of transportation we cannot hope for present relief. On the contrary, part of their load may soon have to be taken over by city rapid transit lines.

A little consideration will show that subways cost per mile of single track thirty-five times as much as a bus line and can haul only seven times as many passengers per hour. This would seem a strong argument for buses. To try to haul a full subway load, however, on a bus system requires seven lines of buses in each direction, or a street twice as wide as Fifth Avenue at Forty-second Street. The cost of widening such a street would be fabulous and far more than the cost of a subway.

This simply illustrates by a comparison of extremes that each type of transit has a peculiar field of its own, and if we attempt to handle bus travel on a subway we

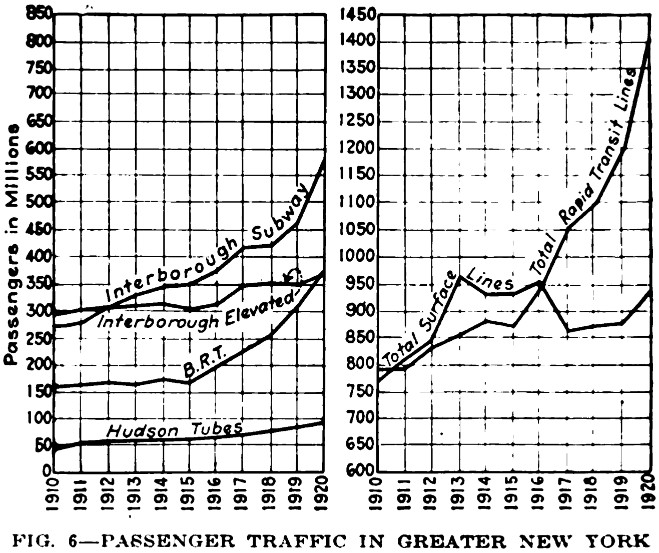


FIG. 6—PASSENGER TRAFFIC IN GREATER NEW YORK FOR PAST ELEVEN YEARS

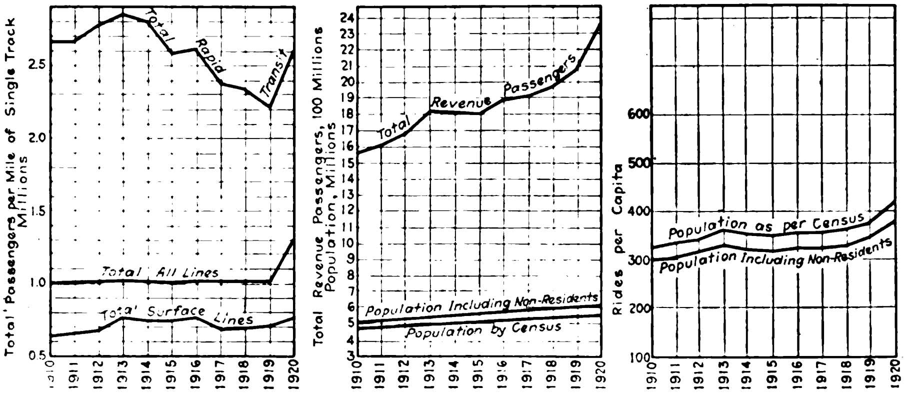


FIG. 7—LEFT-HAND CHART SHOWS TOTAL PASSENGERS PER MILE OF SINGLE TRACK IN NEW YORK CITY, MIDDLE CHART SHOWS TOTAL REVENUE PASSENGERS AND POPULATION OF NEW YORK CITY, CHART AT RIGHT REVENUE RIDES PER CAPITA IN NEW YORK CITY. STATISTICS ARE GIVEN FOR THE PAST ELEVEN YEARS

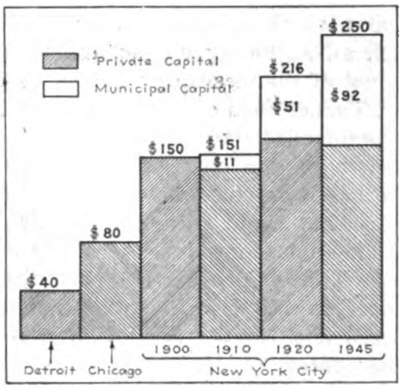


FIG. 8—INVESTMENT IN TRANSPORTATION FACILITIES PER CAPITA OF POPULATION FOR DETROIT, FOR CHICAGO, AND FOR NEW YORK, EXISTING AND PROPOSED

will be just as wrong as to attempt to carry subway long-haul crowds on buses.

GROWTH OF DIFFERENT TYPES OF TRANSPORTATION IN GREATER NEW YORK

During the past ten years the miles of single track have doubled on the rapid transit system of Greater New York. The surface lines have increased their trackage only 5 per cent. This is explained by the great rapid transit program which has been put through in this time. As a result the rapid transit lines have taken practically all the passenger increase during this period and hence have produced an unusual division of travel as between different types of equipment.

The fact is that taking the whole district into consideration the best service to the public can be obtained by a unified co-ordinated system in which each type of transportation will function to the best advantage and as part of a well balanced whole.

This is a pretty big order, but as compared to the process of disintegration and dismemberment which is now taking place it is plainly the right direction in which to work.

The nearer we can approach to a single system distributing its load among its constituent parts in the most effective way for both service and economy the nearer we will attain to 100 per cent economy and 100 per cent service.

More subways are of course inevitable, but let us build them as long-haul trunks and feed them with surface lines and buses. Thirty-five per cent of the passengers in the Metropolitan District use surface electric cars today because they are the most convenient. A study of the needs of the Metropolitan District as a whole suggests a necessity for a combined system cheap enough in its outlying sections to permit of wide distribution of travel. If the engineers can put out such a plan then it will be up to the lawyers, city officials and bankers to solve their part of the Metropolitan transportation problem.

FINANCIAL SITUATION

Accompanying chart, Fig. 8, is made up as illustrating the tendency of cost of transportation in the Greater New York district to increase more rapidly than the population. In other words, the cost per capita has an alarming upward tendency. This tendency is of course inevitable when we go into the period of city development requiring such expensive means of transit as subways. The desirability of carefully canvassing the possibility of utilizing the cheaper forms of surface and bus transit is obvious.

The chart also shows the great preponderance of private investment, so called, which is subject for thought. The comparison of smaller cities is also interesting. Detroit with about one million population and nothing but surface cars has a per capita investment of $40. Chicago with an elevated railway rapid transit system and a very extended surface car system shows $80 investment per capita. New York with its subways doubles this latter figure and seems headed higher.

THE POLITICAL QUESTION

We have analyzed here together the physical, the operating and the financial features of this subject, but I have purposely omitted mentioning the one great stumbling block in the way of a logical, sane solution of this Metropolitan problem, the political question.

Right down the center of the Hudson River we have an artificial political Chinese wall, the boundary between the State of New York and the State of New Jersey. Almost one hundred years ago an engineer designed a steamboat that could plow right across this Chinese wall on the surface of the Hudson. More recently engineers have built railway tunnels under this wall and river, and today engineers stand ready to build bridges over this wall and across the Hudson River.

As an engineer, let me point out to our political friends how this Chinese wall can be finally and forever removed. Let us add a forty-ninth state to the union and name it the State of Manhattan. Let it include the New York Metropolitan District as a single sovereign state; let us leave New York City, Jersey City, Newark, each with its own mayor, its own local government; but let us place matters of common interest to the whole Metropolitan area, such as transportation, water, sewerage and port development, in the hands of a governmental body representing the people of all Metropolitan New York.

Discussion on Mr. Brinckerhoff's Paper

THE first speaker to discuss Mr. Brinckerhoff's paper was Daniel L. Turner, chief engineer Transit Construction Commission, New York. He complimented Mr. Brinckerhoff on the presentation of the topic and acknowledged that there was a Metropolitan District, but he declared that there was no metropolitan authority to deal with the problem from such a standpoint. Until such an authority was established, the problem had to be met of the increasing transit needs of New York City. Mr. Turner then outlined the main features of his recent recommendations, designed to accommodate the traffic growth of the city within the next twenty-five years and based on the following principles:

1. That rapid transit lines should precede the population—not follow it.

2. That a prospective passenger should not be required to walk a much greater distance than half a mile to reach a rapid transit line routing toward the business center.

3. That all transit lines should enter and traverse the center and thus afford the same degree of accessibility to it.

4. That the transit plan should form the real basis for the city plan.

5. That the question of obtaining sufficient revenue to produce a direct profit upon the entire cost was a secondary matter—the indirect profit which would accrue to the city was assumed to be the most important consideration.

These principles, in Mr. Turner's opinion, mean that municipal passenger transportation is a public function —not a business proposition.

His "comprehensive" plan would increase the existing rapid transit mileage by 830 single-track miles and in twenty-five years approximately 5,000,000,000 passengers per year must be accommodated in the city's traffic, most of them on rapid transit lines. This means that enough new rapid transit lines must be constructed to serve about 2,600,000,000 more passengers.

Based on this traffic requirement, the twenty-five-year building program which has been developed (1) provides for approximately fifteen separate extensions to the existing lines; (2) furnishes two new four-track trunk line subways (both double-story subways) traversing Manhattan north and south through the center, one on the East Side, the other on the West Side; (3) includes three moving platform subways crossing Manhattan east and west through the center; (4) adds six single-track tunnel crossings connecting Manhattan with Brooklyn and with Richmond; (5) increases the existing rapid transit mileage by 200 single-track miles, and (6) assumes that the maximum capacity of the existing facilities, which advances in the art demonstrate to be practicable, will be developed by reconstruction and by new equipment.

The construction cost of the new lines, at present prices, will approximate $350,000,000, plus $90,000,000 for interest, administration, engineering and superintendence during the period of construction. This means an annual expenditure of about $20,000,000. The twenty-five-year cost for equipment would amount to about $260,000,000.

Mr. Turner declared himself in favor of public ownership and private operation, as at present, for carrying out this program. He then pointed out that there are two ways in which the money may be obtained, as follows:

1. Assuming a "give and take" modification of the dual contracts, the fare could be increased enough so as immediately to take care of all fixed charges, and thus secure the exemption from the debt limit of the existing rapid transit bonds. This would make available the necessary funds to an amount of $270,000,000. Additional exemptions would make more money available as new lines became self-supporting. Under this arrangement the entire burden of municipal transportation would be imposed on the passenger, although the public at large as a community benefits from adequate transit service as much as the passenger as an individual does. For this reason it does not seem to him equitable to impose the whole burden upon the passenger.

2. The new construction funds needed may be obtained by taxation, the necessary cost each year being assessed against the enhancement in value of city real estate. This would assess the construction cost against those chiefly benefiting. Under this plan, the building program could be financed without imposing any large burden upon the real estate holders of the city and would only be making use of a very small portion of the increase in value which the city has produced. The money for equipment should be furnished by the operator, and the revenue from the passenger fares should amortize it. Then the public at large, as a community, would pay the construction cost, and the passengers, as individuals, would pay the operating expenses and the equipment cost. This, the speaker declared, was the most equitable arrangement and the one he favored.

DISCUSSION BY J. V. DAVIES

The next speaker was J. V. Davies, of Jacobs & Davies, Inc., consulting engineers, New York, who pointed out that suburban traffic of today may be urban traffic of tomorrow. This illustrates the absurdity of running a large number of rapid transit lines to the city limits and stopping them at those points. The suburban railroads, he declared, are not equipped for, nor are they the proper means to fulfill, the function of conducting urban transportation. These roads have other uses and necessities for their terminal facilities than to carry on urban transportation.

In speaking of New Jersey, Mr. Davies pointed out that its transportation needs had been ignored by the New York transit authorities on account of the political and fiscal boundaries, yet he pointed out the recommendation of the commission that future connections with Staten Island should be made by way of Hudson County. He queried how the Public Service Commission contemplated building and operating such a line and whether passengers from Bayonne and Jersey City would be accepted.

He then described the development of the Hudson & Manhattan Railroad, which in less than two years after it began operations had developed more traffic between Manhattan and Newark than had been handled between those points by all the railroads serving the territory on their through business. During the past year 21,500,000 through passengers were carried between Manhattan and Newark on this one artery alone. The future in sight for this transportation, in Mr. Davies' opinion, is a reproduction of this joint service over the Pennsylvania and Hudson & Manhattan railroads but applied to the other great arteries of suburban service. Connection through from Hudson & Manhattan terminals to points on the eastern side of Bergen Hill would enable the suburban traffic operated over the steam railroads to be intercepted in the same way that traffic is now handled at Manhattan Transfer with the Pennsylvania Railroad and that traffic delivered through into the city of New York. However desirable and necessary such connections may be, the amount of money needed for the construction and equipment of such lines will be enormous. The Hudson & Manhattan Railroad, even with its increased fare, can hardly afford to make them. At the same time such facilities are of vital importance to the steam railroads as they are up to the limit of their capacity now for through passenger and freight business and ought not to be called upon to devote any more of their terminal facilities and irreplaceable waterfront properties to their suburban passenger business.

In discussing the Brooklyn situation, Mr. Davies pointed out that there were some inconsistencies in the plan presented by the Transit Construction Commission. Thus, there are statements indicating the desirability for developing community centers, but the plan projects every line of traffic for now and for the future, into or through the congested section of the Borough of Manhattan. The speaker said that the New Jersey example showed the advantages of the distribution of community centers. Indeed, he doubted whether, when transportation systems were planned, it would not be better to check and retard the riding habit of the people by the building up of community centers over the territory as this would lessen the extraordinary growth in recent years in the riding habit.

Such community centers would have their own homes, places of amusement, markets, factories, offices and business, so that those resident within the community would not be under the constant necessity of spending hours each day riding to and fro to carry on their business. The Brooklyn Rapid Transit Company had urged the construction of some lines which would tend to serve Brooklyn in this way, but it had never received the favor of the commission.

DISCUSSION BY GEORGE MCANENY

George McAneny, formerly president of the Board of Aldermen, New York City, was the next speaker. Referring to Mr. Brinckerhoff's paper, he said that the author had put his finger on the vital points in the New York transportation problem. The consideration of the Metropolitan section as a whole is ideal, but there are difficulties in the way. These must be overcome by patient efforts, which will take time. If the business and industrial interests on both sides of the Hudson River will accept the fundamental principles outlined, much can be accomplished.

Recent developments have shown that the State of New Jersey is alive to its community of interest with New York City, because joint consideration is being given to such matters as sewerage, the development of the port and the vehicular tunnels. In New York City the "City Fathers" have at least considered the desirability of getting the mayors of the cities interested to meet and consider their common problems. The fact that so many hundreds of thousands of people come into New York from outside the city daily makes this very desirable. A joint commission might well be appointed to consider the whole situation.

Meanwhile, the city must continue to develop in its own way, although co-operation will help. As to the rapid transit lines, the dual system first applied the radial idea and invited the development of new community centers. This in part corrected the tendency toward concentration at the lower end of Manhattan Island.

The degree of concentration already attained is indicated by the fact that if all the buildings south of Chambers Street on Manhattan Island were emptied at once, the people in the street would be five deep from building line to building line. The original Interborough Rapid Transit line could not carry off the population of the Woolworth Building in less than one hour. Concentration brought about an impossible condition, so that lines were laid out to take people away from the congestion center, some going into such sparsely settled regions as to be nicknamed "cornfield lines."

Mr. McAneny expressed approval of Mr. Turner's scheme for developing the rapid transit system, but would have liked more cross lines, giving the plan more of the appearance of patchwork.

A practical difficulty in the way of rapid transit expansion is a financial one. Until the $270,000,000 already invested is removed from under the debt limit, due to the subways becoming self-supporting, financing problems will be acute. However, the engineers should keep on planning for the future.

DISCUSSION BY FRANK HEDLEY

Frank Hedley, president Interborough Rapid Transit Company, pointed out that New York City is already committed to public ownership of subway rapid transit lines and has used a substantial amount of its credit to build them. Hence, it was difficult to see where the city credit would ever be used to construct lines that would build up territory in New Jersey, especially when within the present limits of New York City there were many acres of vacant or undeveloped land. The policy of the city has been to have a single, uniform car fare within its boundaries because it encouraged the building up of the undeveloped areas.

The city of New York and the rapid transit lines are partners in business and they should both work together to make the transportation for the people satisfactory and sufficient. Public officials and representatives of the operating company must co-operate and work together with the view of making a success out of the enterprise, for the investing public will not put new money into railroad lines unless they are assured of fair and decent treatment on the part of public officials and a return on the capital invested.

DISCUSSION BY FRANK J. SPRAGUE

Accord with Mr. Brinckerhoff's general point of view was voiced by Frank J. Sprague, consulting engineer, New York, who said that a development which ignores the great railway and residential territory to the westward of Manhattan, and which unduly intensifies localized routes and trackage, will invariably increase congestion, with all its attendant grave dangers. In his opinion it would be better to force a distribution of business activities instead of making rapid transit lines, which by their very existence build up traffic, unnecessarily tributary to concentration of real estate activities.

Mr. Sprague declared that the present system of three rapid transit lines was far from ideal, each being laid out with an eye to its own advantage, largely regardless of the city's needs. Even now, when there should be a whole-souled attempt by every public official to plan the future with an eye single to the good of the city, personal ambitions stand as a bar to constructive effort, while transportation is made the football of politics.

There is only one logical and sound method of development. It must begin with unity, which means that not a single foot of unnecessary trackage shall be laid down, but that a single system shall be developed without the introduction of engineering handicaps which will prevent whatever additions may be necessary in the future, and that all trackage shall be used to its limit. The basis of such a development are longitudinals on Manhattan Island on one level, with such loops and terminal extensions as may be necessary, but with transverse routes on a different level, some local to Manhattan and others reaching into the heart of the territory to the east and west. Transfer of passengers should be via double-level stations, stairway connected at the junction points of the routes. This plan would make it possible to add longitudinals and transverses at will, while maintaining the maximum possible facility of movement as a whole, and if there were a fair basis of transfer with surface lines, car and bus, much of the short-haul underground traffic would be eliminated and these lines be more available for cross-river transportation. Almost every one seems to look at the rapid transit problem on the basis of the requirements of hours of morning and evening business traffic, forgetting that facility of traffic to and from a limited area induces greater concentration of business buildings and employment in congested localities, whereas the better decision is to help make such localization of activities unnecessary.

Mr. Sprague then recommended for the operation of such rapid transit lines cars of the largest practicable size and carrying capacity, arranged for the most rapid loading and unloading and with a motor on every axle.

DISCUSSION BY L. B. STILLWELL

L. B. Stillwell, consulting engineer, New York, sent a contribution which was read by Col. F. A. Molitor. It described particularly a new type of moving platform proposed for the crosstown services on Fourteenth Street, Forty-second and Fifty-seventh Streets. The three elements will move respectively at 3, 6 and 9 m.p.h. with working widths respectively of 27 in., 27 in. and 57 in. The third platform carries seats for two passengers seated side by side, the seats occupying 36 in. of the platform width, while the remaining 21 in. is reserved as a walk or passageway. The seated capacity of the platform, therefore, is 31,680 passengers an hour in each direction.

The 3-mile and 6-mile elements of the platform will each consist of a continuous train of cars approximately 12 ft. long and 28 in. wide, each car comprising a channel arch steel plate filled with agasote with an anti-slip tread of the length and width named and approximately 1½ in. in thickness, resting at one end upon a two-wheel truck or bogie equipped with wheels provided with ball bearings and running upon suitable rails in a track of 18-in. gage. The other end of the 12-ft. plate will be supported by the truck attached to the next adjacent car or unit of the platform element to which it will be connected by a bolt or king pin, permitting each car to take its proper position in rounding a curve. The high-speed platform overlaps the medium-speed platform and the medium-speed platform overlaps the low-speed platform. To secure the difference in elevation of the different platforms, 6-in. wheels are used on the low-speed, 7-in. on the medium-speed, and 8-in. wheels on the high-speed platform.

The system of propulsion comprises the elements of an alternating-current induction motor, but the circular form is abandoned and the secondary, consisting of the usual steel laminæ and short-circuited windings which need not be insulated, is extended horizontally and suspended beneath the truck directly above the center of the track.

The primary elements, each consisting of steel laminæ rigidly supported by a suitable casting, the upper face of the assembled laminæ being in the same horizontal plane, have insulated windings supplied through suitable circuits with three-phase alternating current. The clearance between the upper face of the primary elements thus assembled and the lower face of the continuous secondary carried by the moving platform is approximately $\frac{3}{16}$ in. The primaries being energized by currents supplied thereto from the source of power, currents are induced in the windings of the continuous secondary and the elements of the platform to which it is connected are moved by continuous and progressive magnetic attraction and repulsion. The elements of this system, Mr. Stillwell declared, have been subjected to thorough tests upon a commercial scale and there is no question that it will function as intended. The primaries are spaced beneath each element at distances depending upon the speed and therefore upon the energy required. In the case of the 3-mile platform the primaries will be approximately 400 ft. apart, in the case of the 6-mile platform 200 ft., and in the case of the 9-mile platform 60 ft. apart.

Mechanically, Mr. Stillwell said, this system is obviously ideal. Simplicity of design and construction can go no farther. From the electrical standpoint, the comparatively large air gap implies a rather low power factor, but the energy required for the operation of the platform is so little that the increase in electrical losses due to low power factor is negligible. The weight of the moving platform (all elements) per seated passenger is less than 400 lb., while that of a subway motor car is about 1,800 lb. It is estimated that the moving platform 10,500 ft. in length which has been proposed for installation on Forty-second Street will require for its operation less than 300 kw., say about 3,000,000 kw.-hr. per annum.

DISCUSSION BY DR. WILCOX

Dr. Delos F. Wilcox, the next speaker, made a plea for municipal ownership and operation of the transit properties. In doing so he declared that the demands made by private capital at the present moment as the price of embarking upon electric railway enterprises puts the use of private credit as the principal source of capital for the extension and equipment of future rapid transit lines quite beyond the pale of serious discussion. He explained that in taking this position he did not mean that the job of operating the unified transportation facilities of the Metropolitan District should be thrown at the head of Mayor Hylan or of Public Service Commissioner Barrett some fine morning without any preparation on the part of the community or on the part of these officials to make their successful performance of this function possible. He did not assume either that public operation means the discharge at the outset of every transportation man who has learned his job in the school of experience, whether as manager or as motorman, and the recruiting of an entirely new personnel from the ranks of those who are profoundly ignorant and inexperienced in transportation matters. His reasons for favoring public operation may be summarized as follows:

1. Local transportation in a great urban community has come to be recognized as a public function; that is to say, the service rendered and the rates charged

ought to be determined primarily on the basis of public need, not upon the requirements of private profit. This does not imply that in any particular instance the service should be rendered free or below cost, but it does imply that the extent and quality of the service and the rates charged for it shall be controlled ultimately by social considerations growing out of the community's policy of self-help and self-government.

2. The state commission plan involves the assumption by the regulatory authority of so great a responsibility for service, rates, financial policy and methods of operation with respect to the street railways under commission jurisdiction as to make the proper exercise of the regulatory function more difficult, in his opinion, than the efficient operation of the transit lines through a direct public agency. All of the dangers of ignorance, political pull and inefficiency which the opponents of public operation foresee as incidental to the adoption of that policy already beset the exercise of the regulatory power through commissions. Yet, so vital is the public interest in the operation of urban transit facilities that no one at this stage of municipal evolution seriously proposes that the hand of public regulation shall be withdrawn from the transit lines. In this matter a backward step is impossible.

3. As a means of protecting the private investments in transportation facilities, and as a means of procuring a readier response to the transportation needs of the community, the service-at-cost plan has been devised. Yet this plan, and state regulation as well, logically carried out, cut the heart out of the motive upon which the success of private operation and its alleged superiority over public operation are supposed to depend. The result is that private enterprise is paralyzed, while public initiative seeks to accomplish through indirect and circuitous methods the things which could be more easily accomplished directly.

4. The vital importance of transportation facilities increases with the increase in area and population of the urban community concerned. The very social and economic life of the community depends upon continuity of service. This means that more and more the function of fixing wages and the hours and conditions of service in the public transportation business is recognized as a function to be performed through some public agency. This involves another important encroachment upon the field of private operation.

Continuing, Dr. Wilcox said that when we consider that construction, equipment, the issuance of securities, the rates charged, the service rendered, the expenses incurred and the labor policy followed are all inevitably being brought under public control, it is obvious that those who oppose public operation on principle base their argument on assumptions that are now quite out of date. Moreover, the public cannot and will not permit the transportation service of a great community to be operated by private agencies under terms that will make successful private operation possible under present conditions or under conditions that will hereafter prevail. The job is too big and too important for any agency less than the municipality itself to handle.

DISCUSSION BY O. B. WILLCOX

The next speaker, O. B. Willcox, vice-president Bonbright & Company, bankers, New York, took the position that the development of rapid transit in New York should be under private ownership and operation, and as nearly as possible brought under one control and direction. Private construction, ownership and operation of utilities, he said, require such earnings as will not only pay charges and a fair return on the capital invested but also attract new money for expansion. The permissible rate of return has a dual function—the protection of the existing investment and the attraction of new money for expansion. The function of regulation of utilities in the public interest is to create such conditions as will provide adequate and efficient public service. This means that it must provide such conditions as will attract capital for expansion through the purchase of not only bonds and other fixed obligations but also the corporate stocks of the enterprises.

Government or municipal ownership and operation of public utilities are not desirable in the public interest and, measured by economic and financial standards, have not been successful. The field of politics; that is, of government, is mainly the regulation of conduct and the protection of rights. The field of economics is the production and utilization of material things. Utilities are economic and financial enterprises. Politics or government ownership does not approach the problem with the economic outlook and invariably has resulted in failure. The principal advantage claimed for public ownership, that new money can be raised more cheaply on public credit than on private corporate credit, would largely disappear if municipal securities become subject to taxation, as is now widely urged.

Mr. Willcox said he could not agree with the conclusion of one of the earlier speakers that private operation of utilities in America has been a failure. On the contrary, in provision of adequate service at reasonable rates for the convenience of the public and for the development of industry, lowering the costs of production and in every measure of successful service, privately owned and operated utilities in America have been a pronounced success. In many cases they have been limited in their usefulness and in their ability to expand and to provide the best service and to reduce further the costs of production through the application of labor-saving devices by the failure of public regulation to permit such earnings as would establish the financial conditions and credit necessary for the attraction of capital to continue expansion.

Referring to the New York situation, Mr. Willcox declared that the public interest required: (a) A fare that will pay charges and sinking fund on city money invested, as well as a return on private capital invested, and (b) a fare that will give the operating companies such credit as will attract new money for required expansion through the purchase by investors of the company's securities.

Mr. Willcox then raised the point of the desirability of the concentration of population in cities, which, he said, was encouraged by local utilities of all kinds, as these utilities provided, as compared with smaller communities, cheaper living in relation to income and opportunity and easier, softer and pleasanter living conditions. A survey might show the economic limit of population of cities without such transportation and public service facilities at perhaps 1,000,000 or 2,000,000. This is about the population of the great and old cities of Constantinople, Calcutta and Pekin, and many others, all located with comparable natural advantages and in countries of much denser population. But in a modern city provided with ample transportation and other public utility service this same economic limit does not exist.

Continuing, Mr. Willcox said that while it is true that large cities create and offer opportunities to individuals, there does not seem at a cursory glance to be any decided advantage to the body politic, to the interest of the public as distinguished from the interest of individuals, in such artificial concentration of population. Its disadvantages are obvious. There is enormous economic waste in the transportation of large numbers of people long distances from home to work, often in both directions; in transporting and distributing water, food, fuel and other necessities, and in the overcrowding itself, which conceivably could become so great that eventually workers would be in each other's way or could not all find room on the city's streets. Such congestion is accompanied by great perils, as from contagion and epidemics, from famine and failure of essential supplies, from fire, panics and war, and notably from strikes, the entire population being at the mercy of a number of small fractions of the population engaged in purveying necessities. These disadvantages and perils must increase with increasing concentration, obviously in some unknown ratio to the population. Whether the increase of New York's population is largely artificial, not brought about by natural causes, but stimulated and made possible by all kinds of utility service, and particularly the rapid transit systems, is a question worthy of scientific survey and study.

The most conspicuous feature of New York's rapid transit systems brought out clearly by Mr. Brinckerhoff's discussion, as well as in the report of Mr. Turner, is the delivery of an enormous number of passengers daily from the outlying parts of the Metropolitan District to the heart of the city of New York below Fifty-ninth Street, and the resulting concentration on Manhattan Island of tremendous business activities in financial, manufacturing amusement and other enterprises. Without its rapid transit system the same population in the Metropolitan District, assembled in a number of communities, self-contained and adequate in provision for all social and business activities, might and doubtless could accomplish the same production and it may well be without the economic waste and loss and without the perils of the present and the progressive daily congestion in Manhattan Island.

Should the tendency to congestion in Manhattan be checked and can it be checked? Economists have sought in vain for some means to discourage the growth of cities at the expense of the rural districts so that the supplies of raw materials out of the earth may keep pace without excessive cost with the increase in the world's population. If it be true that the enormous growth of such cities as New York results not from natural causes but from artificial conditions such as rapid transit and other public utility service, permitting and inviting congestion, then perhaps some artificial checks to concentration must be found. Thus, it is conceivable that an increase in the cost of local transportation would operate as such a check, and indeed that it may be necessary in the public interest that such a check be established against the increasing tendency to concentration of population in such great centers.

In New York an increase of local rapid transit fares to 10 cents would probably not check congestion; it would, however, give the operating companies better credit for necessary expansion, besides greatly improving the city's credit position. A gradual rise in rapid transit fares above 10 cents must eventually meet a point where unnecessary traveling would cease and local centers would develop, self-contained, more economically supplied with necessities, safer in the assurance of a continuous supply of water, fuel, food and the like, and where work could be found near home, obviating many of the dangers and perils of great and increasing congestion; existing rapid transit might be sufficient for necessary travel between the several community centers of the Metropolitan District; a rapid increase in rapid transit facilities would probably be unnecessary; the further growth of the city would continue in and about the new centers without loss of economic capacity and political, financial and industrial power of the Metropolitan District; manufacturing could find sites and labor within walking distance not drawn away by cheap transit fares to the excitements of intense concentrated city life, and saner and more natural conditions should prevail in all the relations of life.

Engineers, Mr. Willcox concluded, may very well study not only how New York's transportation can be expanded with the inevitable growth of population of the city at the expense of the country and also the inevitable congestion in the heart of the city, but also the data on which some opinion may be formed as to whether the advantages or disadvantages of such congestion preponderate; whether we should seek a sound way to check this growth or continue to expand the population of the city through the expansion of its utility and rapid transit facilities.

DISCUSSION BY MR. PARSONS

R. S. Parsons, general manager Erie Railroad, took up the discussion of transportation in the Metropolitan District from the standpoint of New Jersey. He said that this State should awaken to its rights in the matter. The New Jersey section of the district contains fifty small municipalities, more or less, and if these would unite, they could exert a powerful influence. Stretched along the Hudson from Bayonne to Fort Lee are ten of these municipalities.

As to the relation of the steam roads to local transportation, Mr. Parsons said that the steam roads were never built for suburban business. Their function is long-haul passenger and freight traffic. At first they naturally took on suburban business for the reason that when lines were installed for freight and through passenger service they could serve commuters at low rates of fare with profit to themselves. However, this resulted in the opening up of communities which in time became powerful enough to demand increased service. This was unprofitable, but it has been impossible to increase commutation rates sufficiently to make them remunerative.

Referring to the local situation, Mr. Parsons said that the only thing that has prevented expansion west of New York City is the state boundary, but, like Mr. McAneny, he saw signs of co-operation which might in time eliminate this obstacle.

One thing urgently needed locally is a bridge across the Hudson River at 125th Street, a physical connection between two important sections which would assist in eliminating one of the main obstacles to good suburban traffic. This is the reluctance of passengers to change from one transportation agency to another. The steam railroad terminals in Jersey City and Hoboken are greatly overcrowded. Suburban traffic must be removed from them as much as possible. One suggested plan is the placing of a large union terminal in the Hackensack Meadows to serve as a terminal for the suburban traffic now taken to Jersey City, Hoboken and Weehawken on the various steam railroads, with a moving sidewalk connection to and across New York City.

DISCUSSION BY MR. WOODWARD

P. H. Woodward, general passenger agent Long Island Railroad, the next speaker, first quoted statistics on passengers in and out of New York during 1919 as follows:

PASSENGERS HANDLED IN AND OUT OF NEW YORK CITY

Long Island Railroad Three terminals: Pennsylvania Station, Flatbush Avenue (Brooklyn), and Long Island City. To and from subway and elevated lines at Woodside and Hunters Point Avenue	48,786,000
New York Central	25,361,499
New York, New Haven & Hartford	14,886,158
Pennsylvania Railroad	13,940,000
Central Railroad of New Jersey	16,720,600
Delaware, Lackawanna & Western Railroad	20,400,000
Erie Railroad	25,116,849
New York, Westchester & Boston Railroad	3,750,806
New York, Ontario & Western Railroad	538,692
Lehigh Valley Railroad	408,000
Baltimore & Ohio Railroad	510,000

The Pennsylvania Railroad, in addition to the 13,940,000 passengers carried in and out of the Pennsylvania Station and the ferry terminals at Cortlandt and Desbrosses Streets, handled during 1919 4,420,000 passengers at its Jersey City Terminal and transferred to and from the Hudson & Manhattan Railroad at Manhattan Transfer a total of 22,640,000. This would make a grand total for the Pennsylvania of 41,000,000 passengers. The Staten Island Rapid Transit handled on Staten Island a total of 10,205,000.

It is estimated that 50 per cent of the passengers of the Delaware, Lackawanna & Western Railroad transferred to and from the Hudson tubes at Hoboken, and that 60 per cent of the passengers of the Erie Railroad transferred to and from the Hudson tubes in Jersey City. The Hudson & Manhattan Railroad handled 92,571,928 passengers during that year.

A summation of these figures, after duplications are deducted, show for the roads mentioned a total during 1919 of more than 250,000,000 passengers. In 1920, if all of the lines enumerated showed the same increase as the Long Island, or 14 per cent, the total would be 285,000,000. This compares with the rapid transit systems for 1919 as follows:

Interborough:	
Subway	529,471,097
Elevated	348,577,398
Total	878,048,495
Brooklyn Rapid Transit	726,738,213

Of course all of the passengers handled by the steam roads are not daily commuters, but this traffic is growing enormously, yet this short-haul traffic blocks terminals and hinders the expeditious handling of through passengers, to say nothing of the congestion it causes to freight traffic. This situation presents an economic problem hard to solve. A steam road, such as the Long Island, cannot adjust its rates so as to make ends meet, due to this short-haul traffic that is continually demanding lower fares, which today are unremunerative. The terminal cost alone to handle a passenger is more than a standard subway or elevated fare.

Another thing to consider, according to Mr. Woodward, is that when the steam roads introduced the cheap rate commutation ticket, they expected to profit by collateral earnings, such as members of families and visitors traveling at a higher rate of fare, freight, express, mail, etc. The elevated and trolley lines, the motor trucks, the delivery to residences from all the department stores have taken away practically all of the collateral earnings outside of coal and building materials, leaving to the railroads only the commuter at a low rate, with nothing to carry the loss, and when the revenues derived from through freight and passenger business are too small to absorb such losses, poor service and slowing down of development is the natural result. Therefore, the remedy for the railroad is to be relieved of this near-by traffic and build up the sections beyond the rapid transit zones.

DISCUSSION BY MR. HARWOOD

George A. Harwood, assistant to the president of the New York Central Railroad, the final speaker, first described the development of the New York & Harlem Railroad from a horse railway to a steam and electric railroad. He agreed with Mr. Brinckerhoff that the most expensive type of transportation for urban and suburban travel within the Metropolitan District is the steam railway. This is due largely to the expensive terminal on highly valuable land, which often results in fixed and operating charges per passenger exceeding the total rate per ride paid by the pasenger, excluding entirely the fixed and operating charges for handling him between the terminal and his destination. The fact that most of this business has to be handled in morning and night peak loads still further adds to the cost of this transportation.

But the financial waste in this business is perhaps not the most serious aspect of the difficulty, because the continued increase in suburban travel ultimately prevents the steam railroad from performing its most important function, namely, providing the long-haul transportation for the city. In the period from 1909 to 1919 there has been an increase of approximately 60 per cent in the number of passengers handled in the Grand Central Terminal and in that same period an increase in suburban travel of over 100 per cent. In 1916 41 per cent of the passengers using the terminal were suburban travelers, and in 1919 56 per cent. As the long-distance travelers want also in general to arrive and depart in the morning and evening, the peak load of this service coincides with that of the suburban service, and it is only a matter of time, and a relatively short time, when a terminal such as the Grand Central, with its elaborate provisions for the separation of suburban and long-distance travelers, will be prevented from delivering the amount of long-distance transportation which the growth of population will require.

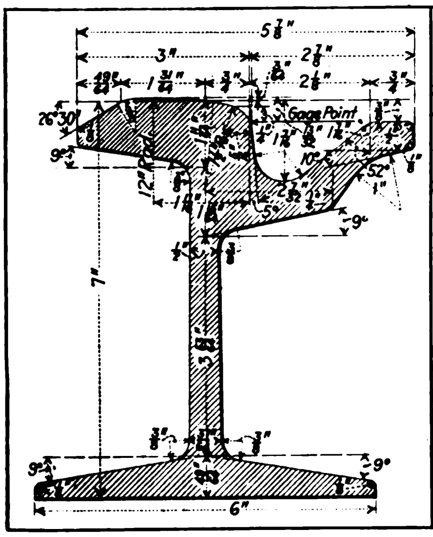
Some relief, Mr. Harwood said, can no doubt be provided by the introduction of transfer stations at outlying points where the railroad may deliver its load of rapid transit passengers to the strictly city lines. Thus, provision has been made in the plans of the New York Central Railroad, in conjunction with the Public Service Commission, for such a transfer point to be located in the vicinity of Mott Haven. This, however, can never solve the substantial part of the problem. It will take care of a portion of the travel going to the more northerly parts of Manhattan Island, but it can probably never be made sufficiently attractive to entice away from his seat the passenger whose destination is Forty-second Street or south thereof.

The solution, therefore, seems to be in the development of the rapid transit system of the city, not only to the city limits but to such distances into Westchester County as may be accommodated within the limits of reasonable running time which such a rapid transit line may provide. Mr. Turner, in his recommendations covering the extension of the present rapid transit system, estimates that such distance is 18 to 20 miles from the center of the city, providing sufficient tracks are constructed so that express service is permissible, but with improvements in the art it may not be unreasonable to suggest that these extensions ultimately should go to distances of 22 to 30 miles. Such initial extensions would enormously benefit the present situation. In conclusion, Mr. Harwood made definite recommendations in regard to certain of the routes proposed by the Transit Commission.

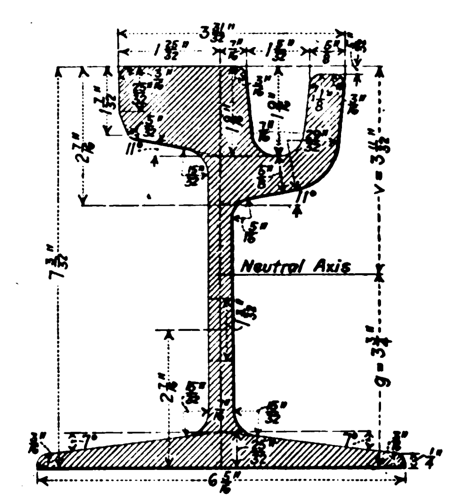
Two Recent Foreign Standard Rail Sections

New Australian and French Standards Are in Opposition as to the Curved Head—Notable Joint Plate Design

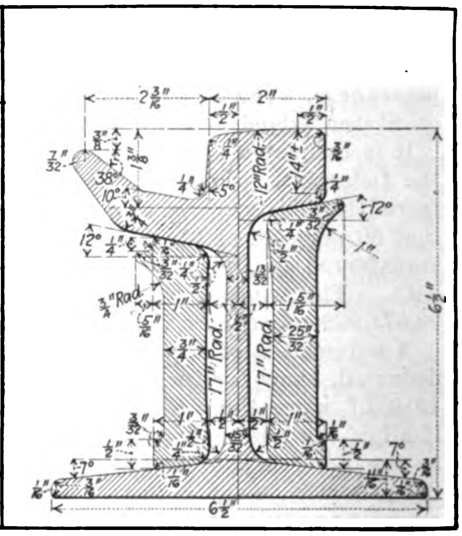
THE conference of electric tramway engineers held in Sydney, N. S. W., during May, 1918, for the purpose of developing a standard girder grooved rail has resulted in the adoption, recently, of the standard rail shown in the drawing herewith. In the issue of this paper for Sept. 21, 1918, the principles laid down for guidance in preparation of the design were published. Notable among these were the agreement that the form of groove and guard of the rail should follow the designs of the American Electric Railway Engineering Association and that the tread of the rail head should be curved or convex.



NEWLY ADOPTED AUSTRALIAN RAIL SECTION



NEW FRENCH STANDARD EMBODIES FLAT HEAD



A. E. R. A. STANDARD 7-IN. GIRDER GROOVED RAIL

The resultant design differs considerably from the American standard, but in the main the principles of the American design are followed. For instance, the tapered web and curved head are adopted, although the curved head does not follow the compound curve recently added to the American standard. The very wide base will be noted. This follows a recent designing principle governing British rails which calls for a width of base substantially equal to the height. The shape and width of the bottom of the groove varies from the American design considerably. The increased width here is to give more room for wheel flanges when the head is worn down.

The width of the head is much less than that of the American rail, but it follows British practice closely. The head width is largely dependent upon the width of the average wheel tread in use and no doubt this suits the Australian wheel conditions.

The design of the joint plates is notable because provision is made in the top edges for electric arc welding by providing places upon which to lay the welding rods.

NEW FRENCH STANDARD GIRDER GROOVED RAIL

The French Light Railways Association has recently adopted the new standard girder grooved rail shown in the illustration. In common with most recent British and other foreign designs the tendency to increase the depth or thickness of the head is noted.

The most striking feature is the return to a horizontal flat tread, in contrast to the combined horizontal and convex tread. In former designs the head surface was level for about half the width from the back of the head toward the gage line, thence leading downward into the groove by means of a curve of about 12 in. radius.

The return of the French standard to a level flat head design is in line with arguments advanced in favor of such a procedure by several British engineers at the recent meeting of the Tramways and Light Railways Association. However, the British engineers do not agree on this by any means and the tendency in Great Britain is toward standardizing upon some form of convex tread. The difficulty in determining upon a standard seems to be that each tramway engineer in the British Isles wants his own particular wear conditions met in the design. Naturally the British standards committee is having trouble in satisfying such claims.

For the purpose of comparison a drawing of the recently revised American standard 7-in. girder grooved rail, which has the new convex tread design, is reproduced.

The Motor Truck Association of America has announced that a highway transportation show will be held in New York City from Jan. 3 to 8, 1921. The show will be held in the Twelfth Regiment Armory, Sixty-second Street and Columbus Avenue, and First Field Artillery Armory, Sixty-eighth Street and Broadway. The combined floor space is about 50,000 sq.ft.

Compromise Joints in Electric Railway Trackwork

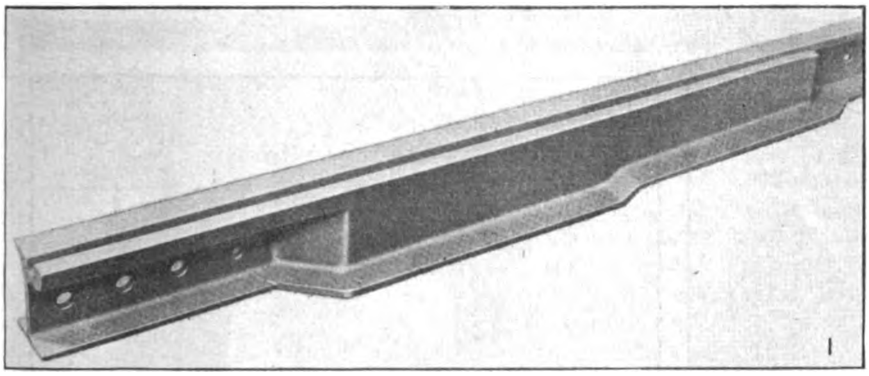
The Author Outlines Some of the Difficulties Which Have to Be Met in Joining Rails of Different Cross Sections and Shows How These Difficulties Have Been Overcome

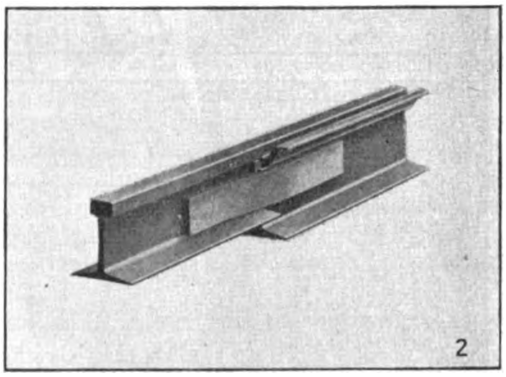
BY R. C. CRAM
Engineer Surface Roadway Brooklyn Rapid Transit Company

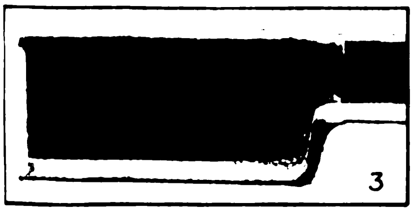
THE joining of two rails of unlike cross section is by no means an easy task and the difficulty in successfully doing so is increased when either one, or both, of the rails is worn. The wear which adds to the trouble can take place in the head surface, in the sides or undersides of the heads and sometimes in the tops of the bases. If we add to these items the contour or sectional differences we have a problem of no mean order when we attempt to make up the joint. It is thought that, in proportion to the number of compromise joints on any one electric railway as compared with regular joints, one of the former will cause more maintenance expense than several hundred of the latter.

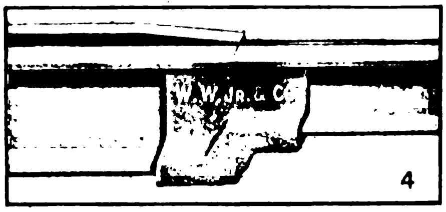
As a matter of fact the joining of two rails of the same cross section (mechanically, at least) has presented a problem which has not yet been solved to the entire satisfaction of track engineers. One of the difficulties lies in the minute differences and discrepancies in the "fishing section," which are found in what appear to be the most perfect of new rails and the angle bars or joints designed to fit them. These differences and discrepancies tend to magnify the compromise joint problem.

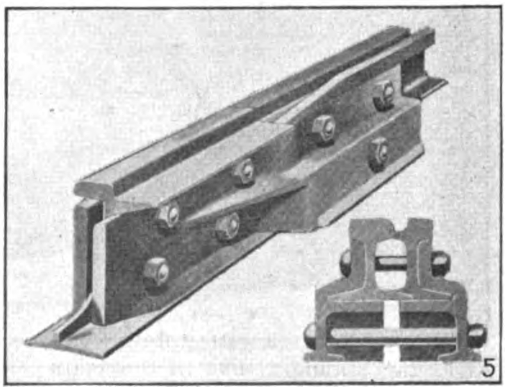
A compromise is an adjustment of differences by mutual concessions, and, since this is just what happens when rails of different sections are joined, the joint plates or splice bars which are used for this purpose are called "compromise" joints. These, by the way, must not be confused with "compromise" rails, to which reference will be made later. Compromise joints are sometimes called "combination joints," "taper joints," or

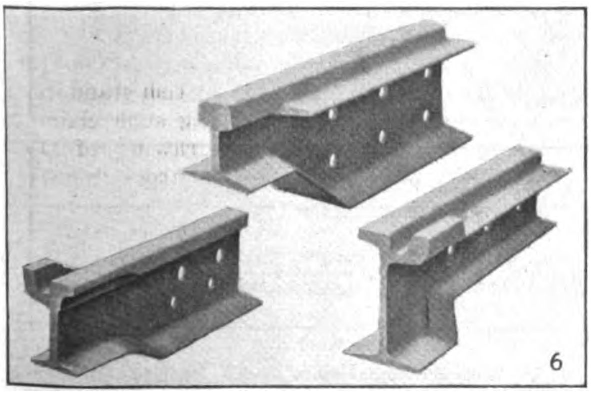


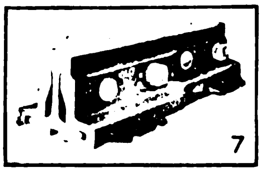












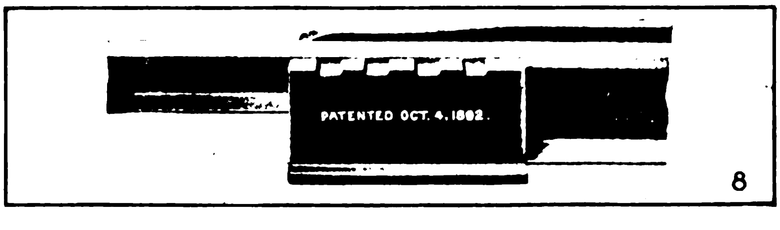
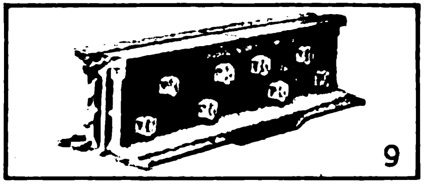


Fig. 1—Cast-steel combination rail.
Fig. 2—Electrically welded combination rail.
Fig. 3—Thermit-welded combination rail.
Fig. 4—One make of cast-welded compromise rail.
Fig. 5—Cast-steel combination joint.
Fig. 6—Cast-steel combination rail.
Fig. 7—Continuous step joint.
Fig. 8—Another make of cast-welded compromise rail.

Several Types of Compromise Joints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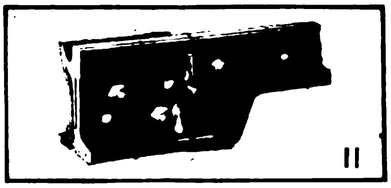
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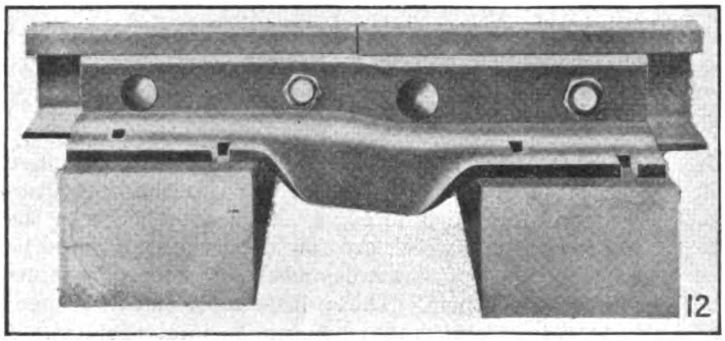
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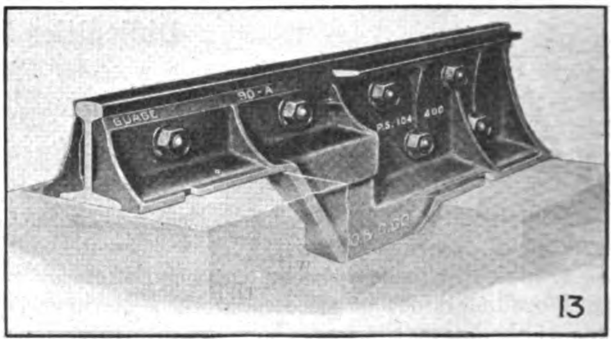
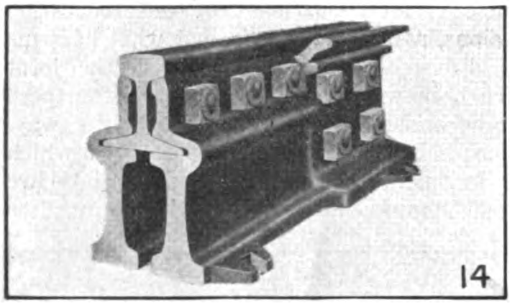

GUAGE
RO-A
P.S. 104 400
13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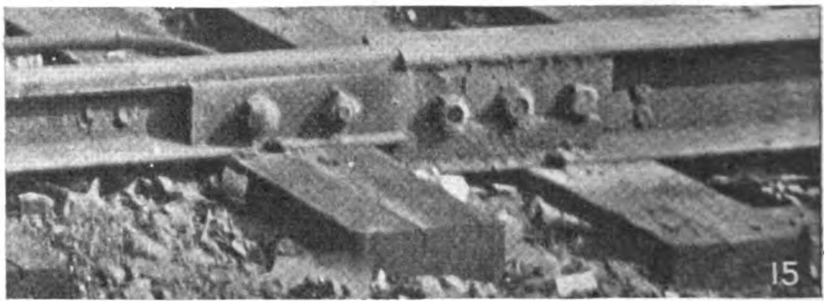
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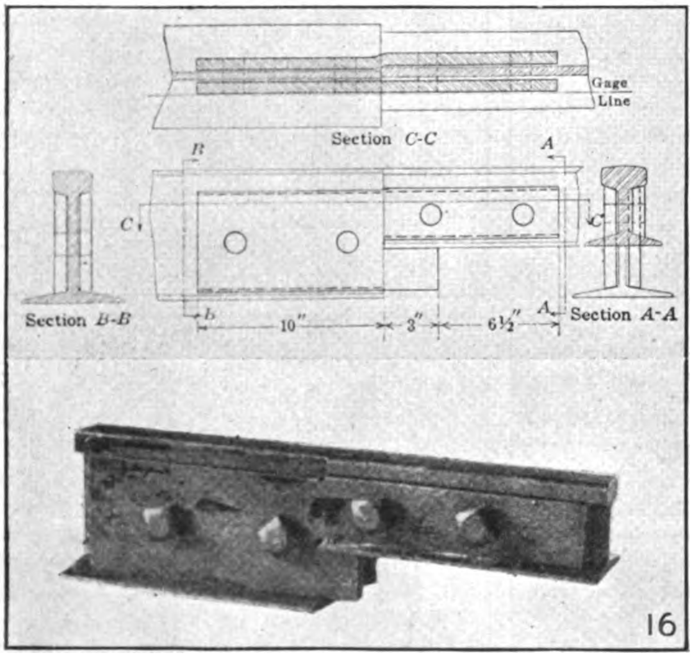
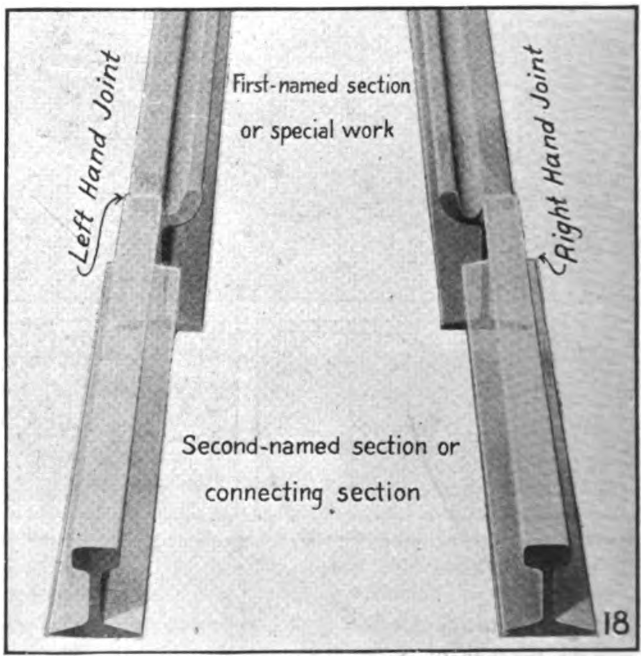

Gage Line
Section C-C
B
A
C
C
Section B-B
b
10"
3"
6½"
A
Section A-A
16


Left Hand Joint
First-named section or special work
Right Hand Joint
Second-named section or connecting section
18

17

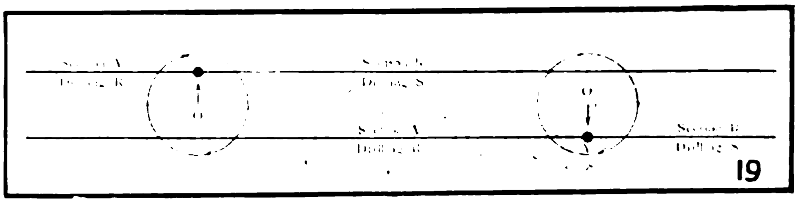

Section A
Drilling R
Section B
Drilling S
Section A
Drilling R
Section B
Drilling S
19

Fig. 9—Reading cast-steel compromise joint.
Fig. 10—Trasco compromise joint.
Fig. 11—Cast-steel step joint.
Fig. 12—Bonzano rolled-steel step joint.
Fig. 13—Cast-metal step joint.
Fig. 14—Continuous compromise rail joint tee and girder rail.
Fig. 15—R. P. Williams' compromise joint.

Fig. 16—R. A. Willson's compromise joint.

Fig. 17—"Joggle plates," as the British term compromise or step joints.

Fig. 18—Manufacturers' method of determining "hand" of compromise joints.

Fig. 19—A. E. R. E. A. method of designating compromise joints.

"step" joints. Our British friends are apt to call them "joggle plates."

Compromise joints are confined mainly to special trackwork, where they are used to connect the guard rails and other special rails used in special trackwork with the adjacent rails in tangent or connecting tracks. Compromise joint troubles have emphasized the desirability of having guard rails "fish" with the rails used in tangent tracks and there is a marked tendency in this direction, which has been accelerated by the efforts of maintenance engineers to adopt rail standards for their systems. It will be noted that the American Electric Railway Engineering Association took good care to provide standard guard rails which would "fish" with the rails which the association adopted for tangent tracks.

There are at least ten different types of compromise joints or means for accomplishing the same purpose which have been used with more or less success. The earliest forms consisted of the regular splice plates or angle bars, upset and offset in the field or in the shop by the blacksmith. With T-rails where the sectional differences were not great, such joints gave fair service provided the smith was good at retempering the bars and had fair skill at reproducing the fishing angles and fairly true surfaces. With a job of connecting a 4-in. T-rail and a 9-in. tram girder rail, however, such a joint has several objections, and is particularly difficult to make even when it takes the forms of special cast steel bars or of bars planed from flat bar steel stock. Nevertheless the old custom of making such joints by cutting and smithing deep plates prevails to a large degree. Although the arc welder and the acetylene welding and cutting torch are more and more coming into use for this purpose, there is little doubt that in many cases the skilled blacksmith will never be entirely supplanted. Mention should be made here of the machine devised by C. H. Clark for upsetting joint plates, which greatly facilitates this sort of work. This device has had its greatest use on overhauling or rehabilitation work on old tracks, where a great number of plates of the same shape require upsetting. This work is quite similar to regular compromise joint work, since plates must be upset and sometimes offset in order to take up wears and head pounds or dishes.

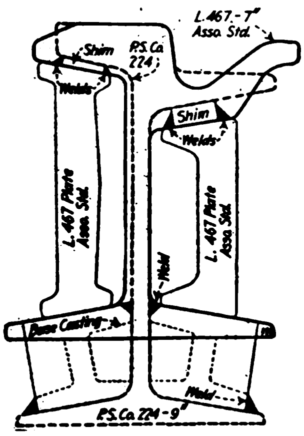


Fig. 20—R. P. Williams' compromise joint

Incidentally, the rail grinder has greatly aided in the work of making satisfactory repair joints of this type, by facilitating the detail of finishing the head surfaces to a true level.

COMPROMISE RAILS

Compromise rails present another means of connecting dissimilar rail sections. They usually consist of two pieces of rail, one of each section to be joined and each having a length of from 4 to 5 ft., which are joined by some form of welding so that they present a length over all of from 8 to 10 ft. (Sometimes they may be only 6 ft. long over all, as when made entirely of cast steel conformed to each of the rail sections to be joined or compromised.) A compromise rail of this type is shown in the figure on page 1107. Compromise rails are quite often used at special trackwork where the outside pieces join the tangent track rails. In some cases, as in crossings, the outer arms of the frogs may consist of compromise rails, and this method of making connections between the T-rail arms of railroad crossings and adjacent girder rails in tangent tracks is quite often used as one of the best ways of making up such connections. The particular feature of compromise rails which commends them is that they permit the use of the regular joint plates or angle bars in making connections with the two dissimilar rail sections which are to be joined. They are quite often used in making connections between plain girder and groove girder rails in tangent tracks. Another use is for making temporary connections between new and old rail sections, which are dissimilar during the progress of reconstruction work.

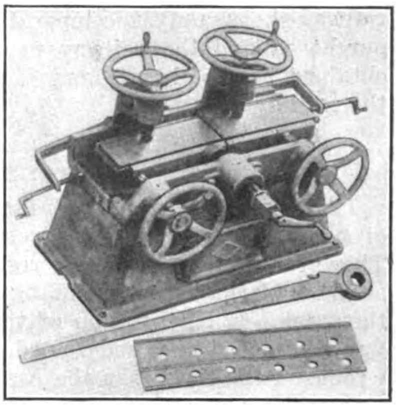


Fig. 21—Machine devised by C. H. Clark for upsetting joint plates

The three general types of compromises are as follows: (a) Welds, (b) cast-steel or composite, and (c) plates or bars. The weld type may be cast, thermit, electric-bar or electric arc. The cast steel or composite type may be made of cast steel or a combination of cast iron fillers and regular bars or plates. The plate type includes all such joints made up by the use of bar steel planed and upset or regular plates and angle bars upset and offset by forging. The accompanying figures on pages 1107 and 1108 show the general details of most of these types.

It should be remembered that the manufacturers of most of the patented joints for regular service in tangent tracks are prepared to furnish compromise joints which retain the general features of their regular joints. Some of these are also shown on page 1108, but it is not

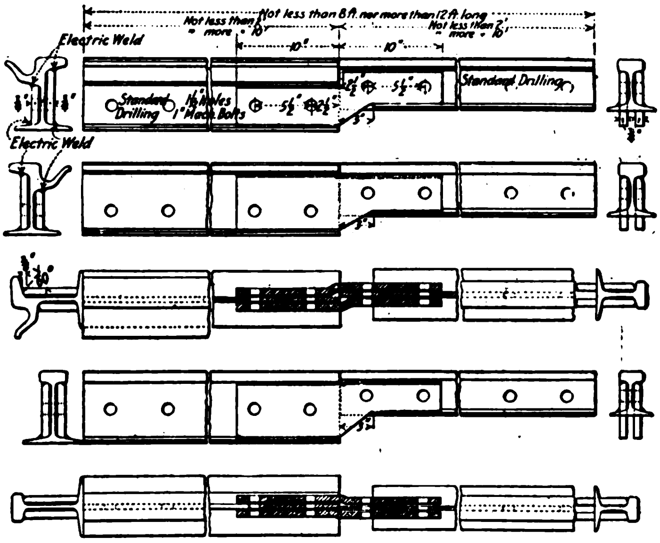

Not less than 8 ft. nor more than 12 ft. long
Not less than 2' " more " 10'
Not less than 2' " more " 10'
Electric Weld
10"
10"
Standard Drilling
1⅛" Holes
1" Mach. Bolts
5½"
2½"
5½"
Standard Drilling
3"
Electric Weld
3"

Fig. 22—Taper rails as developed by Pacific Electric Railway

to be assumed that the writer favors any particular joint shown or that these are all that are available. Mention is only made of the manufacturers' joints because it will quite often be found more economical to purchase them than to attempt to make them up in the railway shops, and the comparative costs as between the purchased and the railway product should always be obtained before the attempt is made to make them in the railway shops.

HOW THE "HAND" OF COMPROMISE JOINTS IS DETERMINED

There is more or less confusion in the designation of compromise joints with respect to their make-up. They are usually designated "right hand" or "left hand," as the case may be, depending upon their position in the track. If the position of the sections of rail to be joined is not clearly understood, something usually goes wrong. For this reason the American Electric Railway Engineering Association has recommended the method of designating compromise joints shown in the figure on page 1108. The manufacturers of special trackwork are prepared to follow this practice, although their own method, if thoroughly understood and followed, will produce the same results. This method, which is an old and long-established practice, is given in the illustration on page 1108.

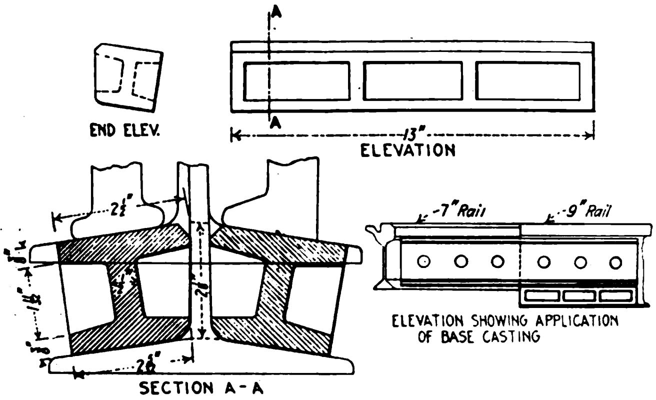
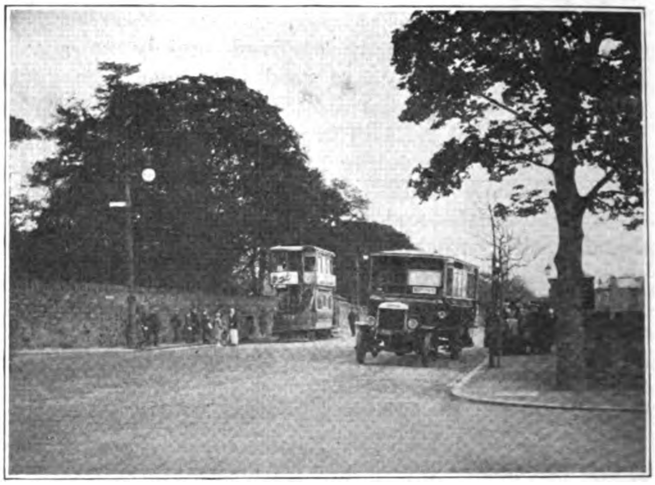

A
END ELEV.
13"
ELEVATION
2½"
2⅛"
SECTION A-A
-7" Rail
-9" Rail
ELEVATION SHOWING APPLICATION OF BASE CASTING

Fig. 23—R. P. Williams' compromise joint

Pennsylvania Railroad Awards Prizes for Good Maintenance Work

THE recent award of prizes for track maintenance by the Pennsylvania Railroad to section supervisors brings to attention the practice of this road in inspecting track and rewarding good work on the part of maintenance forces. To secure data upon which the track prizes are awarded a committee of officers goes over the line once a month in a special car attached to a regular train. To make the record accurate a specially designed machine is used to register every movement of the car, either horizontally or vertically. From the record thus made, together with close observation of the inspection committee and allowance made for relative speeds, an acccurate estimate can be made of the riding qualities of the different sections of track. The first prize amounted to $800 for the supervisor and $400 for the assistant. There were three other premiums of $800 each, of which $600 was for the supervisor and $200 for the assistants, and a special "improvement" premium of $1,000, of which $700 went to the supervisor and $300 to the assistant for having shown the greatest improvement in the line and surface of a supervisor's section of track for the year.



CABLE CAR TERMINUS AT MURRAYFIELD, SHOWING TRANSFER OF PASSENGERS FROM CABLE CAR TO BUS

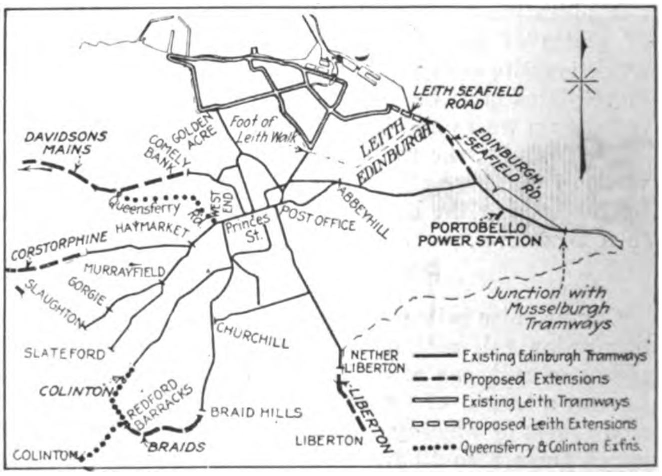
Change to Buses Progressing Rapidly in Edinburgh

Buses to Be Substituted for Cable Cars on Northern Routes and on Ardmillan Terrace-Slateford Line

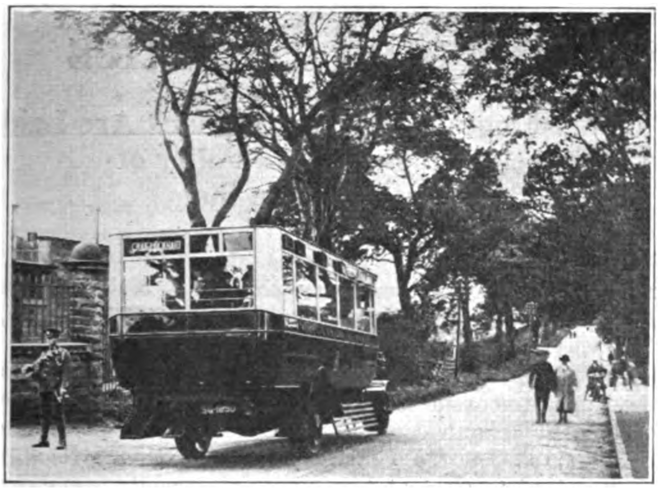
SINCE the municipality of Edinburgh took over the Edinburgh & District Tramways in June, 1919, it has had to solve the problem of what to do with the existing cable system. The factors that determined the electrification of the through runs to adjacent cities and steady traffic lines and the use of motor buses for light traffic were discussed on page 680 of the Oct. 2, 1920, issue of the ELECTRIC RAILWAY JOURNAL.

About Nov. 1 the cable cars running on the northern routes were scrapped and buses similar in type to those running between Easter Road and Ardmillan Terrace were substituted. Between twenty-five and thirty buses will be required to give an adequate service on these northern routes, and it is the intention of the tramway committee of the Edinburgh Corporation to scrap all of the cable cars on these routes the moment sufficient buses are delivered from the manufacturers.

One factor which had to be considered in regard to the adoption of buses on these routes was the inferior carrying capacity of the bus compared with the tram-


LEITH SEAFIELD ROAD
DAVIDSONS MAINS
COMELY BANK
GOLDEN ACRE
Foot of Leith Walk
LEITH
EDINBURGH
EDINBURGH SEAFIELD RD.
Queensferry Rd.
WEST END
Princes St.
POST OFFICE
ABBEYHILL
PORTOBELLO POWER STATION
CORSTORPHINE
HAYMARKET
MURRAYFIELD
GORGIE
SLAUGHTON
Junction with Musselburgh Tramways
CHURCHILL
SLATEFORD
NETHER LIBERTON
COLINTON
REDFORD BARRACKS
BRAID HILLS
LIBERTON
BRAIDS
COLINTON
Existing Edinburgh Tramways
Proposed Extensions
Existing Leith Tramways
Proposed Leith Extensions
Queensferry & Colinton Extns.

MAP OF EDINBURGH CORPORATION TRAMWAYS AND PROPOSED EXTENSION UNDER ELECTRIFICATION PLANS



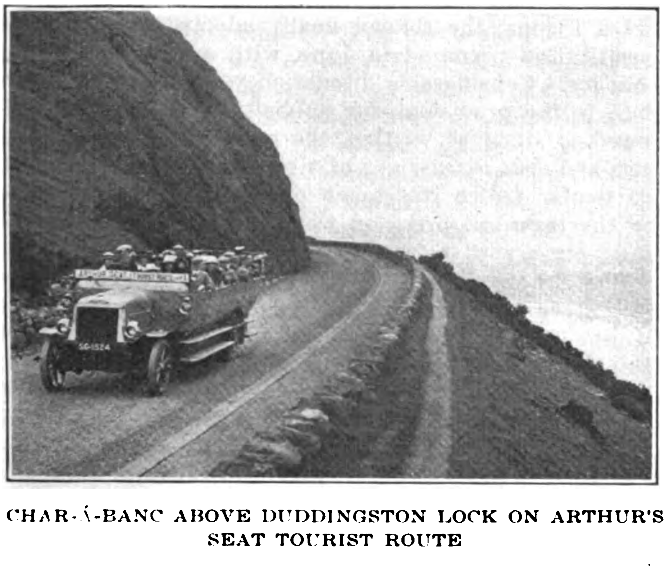
EDINBURGH CORPORATION NEW MOTOR BUS SERVICE FROM CABLE CAR TERMINUS AT CRAIGLOCKHART TO COLINTON

car. This difficulty, however, has gradually been overcome by designing the buses to carry a larger number of passengers. This, at the same time, helps solve the problem of financial difficulty in the way of their general adoption. The problem is still easier where the double-deck buses with their larger seating capacity are already in use. Because of the steep grades on certain routes of the city the tramway committee has not favored the operation of double-deck buses for Edinburgh streets.

As a solution for this difficulty, R. S. Pilcher, tramways manager, has been designing a bus body which he thinks will suit the needs of Edinburgh. It is a "single decker," but can seat thirty-nine passengers, or nine more than the buses at present running in Edinburgh. An extraordinary feature of the design is that the passengers enter the bus at the center instead of the end. Should this design accomplish the results hoped for, the city's transportation problem will be rapidly approaching solution.

THE SLATEFORD BUS LINE

The tramway committee has proposed that the electric cars should be taken off the Ardmillan Terrace-Slateford route and motor-bus service instituted. This proposal was contained in an interesting report drawn up by Mr. Pilcher and was given careful consideration by the committee. In the course of the report the tramway manager states:



CHAR-À-BANC ABOVE DUDDINGSTON LOCK ON ARTHUR'S SEAT TOURIST ROUTE

> The Slateford route was constructed in 1910 at a cost of £13,287. The length of the route is 1¼ miles. This route is isolated, and the passengers who use these cars are required to change either from the cable cars or the motor buses when traveling to or from the city.
>
> The break in the journey at Ardmillan Terrace is very inconvenient, and acts adversely on the traffic; the consequence is that this route, taken by itself, has never paid its way since it was constructed. At the present time the cost of operation on the cable system may be said to be 23.9d. per car-mile, and the cost of this electric line is certainly not less than 20d. per car-mile.
>
> The committee is aware that the motor-bus route from Easter Road Station runs to Ardmillan Terrace, where it forms a junction with both the electric line and the cable line from Gorgie.
>
> The natural route for this bus line would be to continue west via Angle Park Terrace and Slateford Road, and to connect up Slateford Village and Juniper Green to the city. If this were done, it would make an admirable route, and would be more economically run than by having the electric line with a break at Ardmillan and a break at the Slateford terminus. Such a route as indicated would form a quick and convenient means of transportation for the residents in the new housing estate and the new city suburbs of Clinton and Juniper Green.
>
> The facilities given by a direct bus route to Slateford Slaughter Houses and Markets would be better, from the public point of view, than the present system.
>
> The abandoning of this tramway is not a serious question, as the present high value of the overhead equipment and rails would warrant their being removed and utilized elsewhere. The Slateford route, if worked as a through route connected with the Easter Road route, could be made to pay its way; whereas, if it is continued as a separate route, it is not likely to pay for many years to come.

This report of Mr. Pilcher's was cordially approved by the committee, and it was agreed to run the buses to Slateford as soon as convenient. The electric cars, it is understood, may come in useful on the Leith system when once it has been taken over by the city.

The Edinburgh Corporation Tramway Department is now operating char-à-bancs for the benefit of sightseeing visitors, making a tour around Arthur's Seat. As this is located at an elevation of nearly 300 ft., from it an excellent view of Edinburgh, the neighboring towns, and the Forth can be obtained. These tours are made only from 10 a.m. until dusk, so that there is a possibility of using the buses to handle the morning rush if necessary.

2,200-Volt Line in Austria

According to *Elektrotechnik und Maschinenbau,* the highest voltage direct-current line on the continent of Europe is a road recently put in operation between Peggau and Uebelbach, Austria. The pressure on the trolley wire is 2,200 volts, obtained from a 220-kw. motor-generator operated from the Peggau central station. The generator end of the motor-generator set has 12 poles and a commutator about 2 ft. 3 in. in diameter, with 483 segments in the commutator.

The electrical equipment for the single combination passenger and baggage car in use at the time of the publication of the article included four motors, permenently connected electrically in couples, so that each had a maximum operating voltage of 1,100. A dynamotor supplies 220 volts for the brake and other auxiliary equipment. The electrical equipment was supplied by the Austrian branch of Brown, Boveri & Company.

Herbert Hoover Heads Federated Societies

American Engineering Council Holds Meeting in Washington Nov. 18-20—Plans Are Laid for Nationwide Industrial Survey—The Engineers Adopt a Broad Policy of Public Service and Elect Herbert Hoover President to Guide the New Organization's Destiny

THE election of Herbert Hoover to its presidency, the adoption of a program involving a huge national survey in industrial conditions, and the selection of Washington for its headquarters were outstanding features of the first meeting of American Engineering Council held in Washington last week. Representatives of some twenty-two societies with an aggregate membership of approximately 50,000 constituted the official members of American Engineering Council and started the newly-formed Federated American Engineering Societies on an ambitious program. There were fifty-one authorized representatives, of which fifty were present. Since the representation on the council is proportionate to membership of the societies, some of the twenty-two societies represented sent from six to twelve delegates to the meeting.

It will be recalled that last June there was an organizing conference in Washington attended by some 141 delegates representing practically the entire body of engineers of the nation. At this organizing conference a tentative constitution and by-laws were drawn up, as reported in ELECTRIC RAILWAY JOURNAL for June 12, 1920, page 1213. Since that time the various engineering associations, both local and national, have been invited to become charter members of the Federated Societies and up to the time of meeting last week twenty-two have taken advantage of this invitation. There were present in Washington representatives of many other societies who are at the present time considering the invitation to join as charter members, some of whom have already taken favorable action but could not yet take final action due to constitutional limitations. The council at its session last week authorized the invitation to become a charter member of the association to be held open to any society until July 1, 1921.

"SERVICE" TO BE THE WATCHWORD

The formal sessions were opened by Richard L. Humphrey, chairman of the joint conference committee, which has been intrusted with the detailed steps of organization and with administering the affairs of the Federated American Engineering Societies between the organizing conference in June and the meeting last week. Mr. Humphrey spoke at some length in relating the history of the movement which has resulted in the organization and laid special stress upon the progress of the organization whose underlying policy is "service." Mr. Humphrey said in closing: "Indeed, the organization by the preamble adopted at the organizing conference, at which it was created, is dedicated to the service of the city, state and nation. In living up to this you should carefully guard each act and each step in the progress of the organization, to the end that the Federated American Engineering Societies shall stand for the highest possible ideals and shall enrich the glorious traditions of the engineering and allied technical professions."

E. S. Carman, American Society of Mechanical Engineers, was elected temporary chairman, and William E. Rolfe, Associated Engineering Societies of St. Louis, Mo., was elected temporary secretary.

The chief business accomplished the first day was the appointment of necessary committees to effect the permanent organization, and the decision to place the headquarters of the council in Washington. It was also decided to elect at this time only twenty members of the executive board rather than the twenty-four provided by the constitution, who with the six officers constitute the executive board of thirty. This provision was made to allow societies which become members between now and July 1, 1921, to have an opportunity to have representation on the executive board.

TRANSPORTATION AND HIGHWAYS DISCUSSED

J. Parke Channing, chairman of Engineering Council, which will turn over its affairs to American Engineering Council on Jan. 1, 1921, made an address outlining some of the work done by Engineering Council. Other addresses were given by E. Ludlow on conservation of fuel, L. W. Wallace on conservation of labor, and L. B. Stillwell on transportation. Mr. Stillwell devoted most of his remarks to the question of highway transportation and emphasized the fact that the variables of highway engineering are at present unknown. He further pointed out that out of every 100,000 motor vehicles, 7,000 of them are heavy trucks in excess of 4½ or 5 tons, and that these 7,000 are the chief agencies in destroying the highways. One of the problems which American Engineering Council can profitably take up is to try to determine the economic radius of truck transportation and its relation to railway and railroad transportation and as a result of this to guide the government in appropriations for, and regulation of, the highways. He pointed out that his home state, New Jersey, builds wonderful highways but allows private companies to wear them out with a few trucks to the great advantage of private capital.

On Friday, the council finally adopted the tentative constitution prepared in June, with a few very minor changes. Considerable discussion was held with reference to the provisions for publicity, but they were allowed to stand as written, the principle of open meetings and open discussions of all matters being sustained. Particular notice was taken of the helpful work done by the technical press as well as the publicity in the daily press with reference to the new organization.

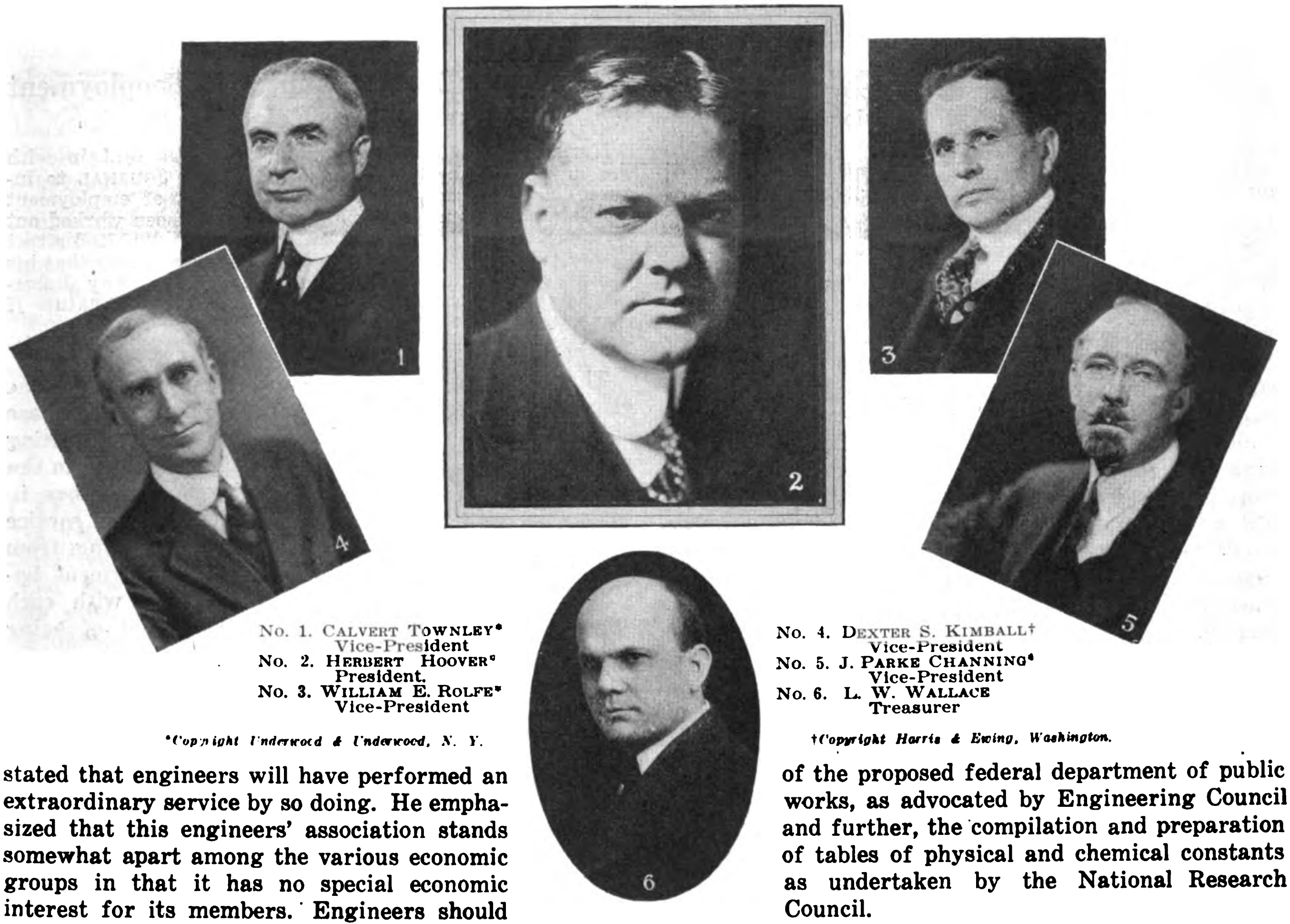
The following six men were elected to be officers of the council: Herbert Hoover, American Institute of Mining & Metallurgical Engineers, president; Calvert Townley, American Institute of Electrical Engineers; William E. Rolfe, Associated Engineering Societies of St. Louis; Dexter S. Kimball, American Society of Mechanical Engineers, and J. Parke Channing, American Institute of Mining & Metallurgical Engineers, the four vice-presidents; L. W. Wallace, the Society of Industrial Engineers, treasurer.

In accepting the presidency, Mr. Hoover said that he recognized the position meant responsibility and work, but that he could not refuse a call from his engineering associates wherever that call meant useful service.

At the evening session, Mr. Hoover made an address in which he discussed the problems growing out of American industrial development and suggested that "engineers, with their training in quantitative thought, with their intimate experience in industrial life, can be of service in bringing about co-operation between these great economic groups of special interest," and stated that engineers will have performed an extraordinary service by so doing. He emphasized that this engineers' association stands somewhat apart among the various economic groups in that it has no special economic interest for its members. Engineers should be able to take an objective and detached point of view. Their calling in life, he said, is to offer expert service in constructive solution of problems to the individuals in any of the various groups. The wider vision is group service of engineers to group problems.

He pointed out that the majority of the membership of organized labor are individualists in their attitude of mind and in their social outlook, and that the expansion of socialist doctrines finds its most fertile area in the ignorance of many workers, and yet the labor organizations as they stand today are the greatest bulwark against socialism. He did point out, however, that some labor leaders overlook the fact that if we are to maintain high standards of living or productivity, it can only be in a society in which we maintain the utmost possible initiative on the part of the employer and that we can expand only by a steady increase of production.

The Officers of American Engineering Council



No. 1. CALVERT TOWNLEY*
Vice-President
No. 2. HERBERT HOOVER*
President
No. 3. WILLIAM E. ROLFE*
Vice-President

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No. 4. DEXTER S. KIMBALL†
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No. 6. L. W. WALLACE
Treasurer

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Mr. Hoover then referred to the public statement of the officials of the American Federation of Labor that they desire the support of engineering skill in the development of methods for increasing production, and it is following this that Mr. Hoover suggests that the definite program of the new American Engineering Council include a complete investigation of industrial waste and the elements contributing to low production or low activity on the part of large employed groups.

The executive board at its meeting on Saturday passed resolutions in support of the project above mentioned as proposed by Mr. Hoover and also in support of the proposed federal department of public works, as advocated by Engineering Council and further, the compilation and preparation of tables of physical and chemical constants as undertaken by the National Research Council.

According to the constitution as finally adopted, the executive board will hold regular meetings, at least bi-monthly, to carry on the direction of the work of the council. The council, itself, will hold annual meetings with no restriction as to place of meeting. As a matter of fact, there is no restriction as to the place of meeting of the board, either, the action taken by the council merely locating the official headquarters at Washington.

An executive secretary, to whom will be intrusted the active organization of the various lines of work, will be chosen soon so that American Engineering Council will be able to take over the functions of Engineering Council on Jan. 1, 1921, as well as to undertake its own program. Meanwhile, L. P. Alford, American Society of Mechanical Engineers, one of the members of the executive board, is acting as secretary. Active work to interest other societies not yet members will be continued.

Letters to the Editors

Motor Bus Versus Trolley Car in Passenger and Freight Transportation

INTERNATIONAL MOTOR COMPANY
NEW YORK, Nov. 10, 1920.

To the Editors:

I have read the editorial in the Nov. 6 issue of the ELECTRIC RAILWAY JOURNAL to the effect that "Mr. Graham's Address Should Be Read by the Automotive Industry." It may interest you to know that at least one truck manufacturer has already taken measures to advise its various sales departments of its policy toward the electric trolley. Immediately after the convention at Atlantic City the International Motor Company sent a letter, copy inclosed, to its branches in which it was stated that the company was in accord with Mr. Graham's principles and believed that electric railway service is essential to meet transportation needs.

There is one feature of this matter, however, which should not be overlooked: With the granting of authority to increase fares the trolley companies are showing a tendency to abuse the privilege and overcharge the public. For instance, in Connecticut the Connecticut Company is charging 10 cents on routes radiating not more than 1 mile from city centers. The public considers this charge unreasonable and naturally turns to the motor bus for relief. It may be well at times for the trolley to have the motor bus as a competitor in order to save the trolley from itself.

With reference to your other editorial on the question "Shall We Turn the Freight Business Over to Motor Trucks?" I am sure there is an opportunity for considerable discussion on this point. At present we agree with Mr. Graham that the freight transportation is essentially the field of the motor truck just as urban passenger transportation is essentially the field of the electric trolley.

L. D. MILLER,
Sales Engineering Department.

[*Copy of International Motor Company Letter*]

INTERNATIONAL MOTOR COMPANY,
NEW YORK, Oct. 15, 1920.

TO ALL BRANCHES:

Yesterday, at the American Electric Railway Association Convention held at Atlantic City, George M. Graham of the Pierce-Arrow Motor Car Company gave a talk on "The Motor Vehicle—Ally or Competitor of the Trolley," in which he stated the following principles:

> That the problem of surface transportation of passengers in cities is best solved by the existing trolleys, and that the proper field for the motor bus is to augment the trolley service. The motor bus is an ally, not a competitor of the trolley.
>
> That the trolley companies do not possess the goodwill of the public because of insufficient service during rush hours and that a step toward gaining this goodwill would be to augment the trolley service by the operation of motor buses, even though such service might not be financially profitable.
>
> That the trolley companies have no legitimate field in handling freight. This is essentially the field of the motor truck, and the trolley companies should apply their energies and resources elsewhere.

This company is in entire accord with the foregoing principles and they will constitute the sales policy of the company relative to motor buses and freight handling by trolley.

The statements made by Mr. Graham were accepted enthusiastically by the trolley men present, especially his statement that the bus was essentially an ally of the trolley, not a competitor, and thus bus service could be used to advantage in offsetting public criticism of lack of service during rush hours.

You are, therefore, requested to get in touch immediately with the representatives of the local trolley companies in your territory who attended the convention and who heard Mr. Graham's speech, advising them of the intention of this company to co-operate with them in solving their transportation difficulties, mentioning the twenty-five-passenger steel body motor bus which we exhibited at the convention and which they, no doubt, saw and examined. Advise them that we are advocating a better type of motor bus which will last as long in service as the one-man safety car. Assure them that we are not in sympathy with uncontrolled jitney service, which is, at the present time, eating into their resources, but which, for evident reasons, cannot survive indefinitely. In other words, approach these people in a sympathetic attitude and see if we can help them.

That the motor bus is a live issue with the trolley companies was apparent to all who attended the convention and observed the way the remarks of Mr. Graham were received. Every effort should be made, therefore, to push motor buses while the incidents of the convention are still fresh in the minds of those who attended.

R. E. FULTON,
Vice-President.

Centralizing Responsibility for Employment and Labor Relations

NOTE.—The following communication was sent in with the suggestion that it be published in the JOURNAL to induce discussion on this important subject of employment and labor relations. The plan related has been worked out for and is about to be inaugurated in a medium-sized street railway and power company. The author requested that his identity be not disclosed for obvious reasons. Any discussion of the subject will likewise be run without signature if requested.—EDS.

To the Editors:

The establishment of an employment bureau on the ground floor, centrally located, taking over every phase of employment from all departments and centralizing all of this effort in one place, is the first essential in the effort to bring about correct employment relations in the public utility. All employees should enter service through this central bureau, and all separating from the service should leave through this employment bureau. Private interviews should be had with each applicant, by a person trained to the point of being a specialist in employment matters.

To function properly, the employment bureau should start out by preparing, through conferences with the department heads and foremen, the specifications covering every job in the entire organization and placing these in its files. This will be needed later when requisitions come from department heads for additional employees to fill certain jobs. The employment interviewer then fits the applicant and the specifications together.

Any interruption of service to the public is against public policy and tantamount to being illegal; therefore, every applicant for a job with a public utility should be told, in the employment bureau in private interview, that he is applying for a position to serve the public, and if sincere in his desire to serve the public he must agree in advance to an understanding that he is willing to sacrifice to some degree his freedom of action and subscribe to continuous service without interruption. He must agree to forego the privileges and right to strike, as the public demands continuous service. And if he is not willing to become a party to these agreements, then he must seek employment that does not require him to serve the public nor give up his right to strike. Acceptance by the applicant of employment with a public utility on these conditions places him where he may or may not become a member of a union. If he becomes a member of the union, he is pledged to arbitration in lieu of strikes. If he works as non-union, then the public utility should provide for him an employees' association as a means for collectively negotiating with the company that will prevent the union employees from having any advantage over the non-union employee.

If the association of employees is properly conducted and covers every department, it should cost vastly less than the union and give the employees a great deal more in the way of sick and death benefits, ample medical advice both for prevention and cure to the employee and family, ample service from a trained nurse, and a centrally located food emporium that should sell, under the cash and carry plan, all of the necessities of the average family at cost to employees only.

An honestly conducted plan of employment relations along this line will soon swing the loyalty of the employees to the employer. There should also be two other separate and distinct organizations, namely, the safety department and the building and loan association. The latter should be not only self-sustaining but it should be mutual.

This plan for new employment relations should not be heralded by an orator from the stage to the mass of employees, nor should it be put over in anything like the manner of pressing a button to flood the room with light. On the contrary, its installation should consume from one to two years in accomplishment, and many weeks of preparation should be put in before any headway is apparent that would disclose a desire on the part of the employer to commune a little closer with his employees. EXECUTIVE.

Theory and Practice at Harvard

HARVARD now offers opportunity for third year mechanical, electrical and civil engineering students to receive practical training along with their theoretical school work by means of a co-operative arrangement with more than fifteen large industrial establishments.

Students electing the co-operative program are divided into two sections, which alternate in two-month periods between the industries and school from September to September, with a vacation allowance of six weeks in the summer.

The students are placed in those industries for which they express a preference and for which they seem to have the necessary qualifications. In each industry they are placed in the various departments of the industrial organization in order to give them a broad perspective of the human, economic and engineering features of the business. Each student is supplied with a prepared list of questions upon entering each department and he is asked to answer these questions. In addition he is required to submit a semi-monthly technical report of some particular phase of the work which he has done.

Upon his return to school he reports twice a week to a class where he describes to his fellow students what he learned on his job. An instructor guides the discussion and questions in this classroom work. The student is supervised in his industrial work by the faculty, but is on an employee status in the industry and receives wages in accordance with his ability.

The industries have heartily indorsed the plan, as it fits in with their apprenticeship courses, permits them to size up promising material for their business and brings them and the colleges into closer relations with beneficial results.

Association News

Mid-Year Meeting in Chicago

Association Sets the Date for Feb. 10—Committees Are Actively at Work

THE mid-year meeting of the American Electric Railway Association will be held in Chicago on Thursday, Feb. 10, 1921. This announcement was made at association headquarters this week. The papers to be presented at the meeting will deal largely with problems relating to the financing and refinancing of electric railway companies. This topic was selected because, in the opinion of the subjects committee, it is one which is of great general importance and interest at the present time. The committee on subjects, of which J. D. Mortimer is chairman, expects to be able to announce soon the names of those who will present discussions on this subject. The meeting headquarters in Chicago will be at the Drake Hotel.

The program of the mid-year meeting will also include a banquet in the evening, at which it is expected there will be addresses of unusual interest. A meeting of the committee on arrangements for the dinner was held in Chicago on Nov. 18. The chairman of this committee is L. E. Gould. The other members of the committee are: B. I. Budd, F. R. Coates, Henry A. Blair, F. W. Brooks, H. E. Chubbuck, A. T. Perkins, H. L. Monroe, C. C. Peirce, H. J. Kenfield, John A. Benham, E. F. Wickwire, T. J. McGill, Edwin D. Meissner, D. W. Smith, R. P. Fisher, W. J. Pine, W. T. Butler, F. C. J. Dell, W. H. Sawyer and D. B. Dean. At the meeting on Nov. 18, sub-committees were appointed with chairmen as follows: Sub-committee on hotel arrangements, L. E. Gould; on speakers, H. A. Blair; on invitations, W. P. Butler; on ladies' entertainment, John A. Benham; on publicity, H. J. Kenfield; on seating arrangements, F. C. J. Dell; on transportation, R. P. Fisher, and on reception, F. R. Coates.

New York City's Subways Achieve World's Safety Record

NEW YORK CITY'S subways during the past sixteen years have achieved a world's record for safety. Three times the population of the globe have traveled on the lines of the Interborough Rapid Transit Company since the opening of the first route in 1904. In all that time accidents have resulted in seven deaths, or one to 614,400,000 passengers. The original subway was built to carry 400,000 passengers a day. By March, 1913, it was carrying 1,000,000 and now 2,000,000 persons often travel on it in a single day. Passenger service has increased during this period about 325 per cent.

The company's first line was only 17 miles long, with 62 miles of single track. Now the subway is 75 miles long and has 220 miles of single track. The employees during the first full year of operation numbered 2,600 and the wages amounted to $1,671,500. For the last fiscal year 9,000 men were employed and the cost of paying them had increased to $11,406,600. The coal bill during that period increased from $426,000 to more than $3,000,000.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

City Still Unyielding

Duluth Authorities, Following Defeat of Fare Plan, Seek to Force Service Increase

The City Council of Duluth, Minn., is again seeking a solution of the transportation muddle in that city growing out of the refusal of the Duluth voters to allow the Duluth Street Railway to increase its fare. The Council on Nov. 15 asked the city attorney for an opinion as to whether the company could be required to improve its service.

RELIEF TWICE REFUSED

The city attorney replied that the Council had the power to order the company to increase the service on various lines as well as to order the making of extensions. He further stated that, if the railway refused to comply with the Council's demands the city would have grounds for asking the courts for a writ of mandamus.

The present situation has been brought about by the refusal of the Duluth voters to allow the company to raise its fare from 5 cents to 6 cents. Several months ago the Council passed an ordinance providing for a 6-cent fare. At a referendum election held soon after, the proposition was rejected. The carmen, who had been promised an advance in wages contingent upon the raising of the fare, then went out on strike to force the city's hand.

To bring about a settlement of the strike the Council agreed to repass the fare ordinance. This, substantially in its original form, was resubmitted to the voters at a special election on Oct. 4. The proposition was again turned down, in spite of a warning by the railway that it could not continue to maintain its standard of service at a nickel fare.

SERVICE MUST BE REDUCED

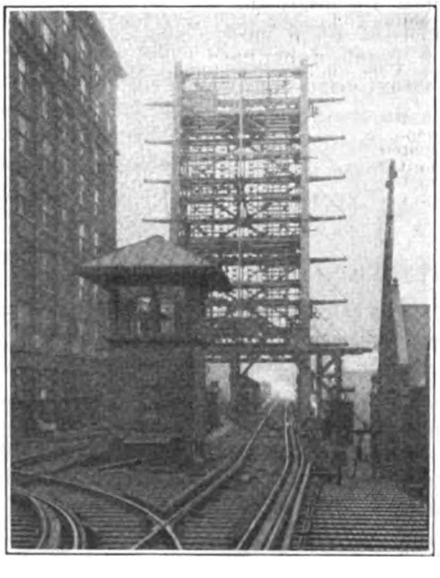
Immediately following the election Herbert Warren, general manager of the railway, announced that a substantial reduction in service would be made at once. Non-rush-hour service was reduced to a minimum and "owl" service was eliminated. At the same time a number of crews were laid off. The wages of the men retained on the payroll were increased 10 per cent.

In answer to the demands of the city authorities, officials of the company contend that they are unable under present conditions to put on additional cars. Mr. Warren, in discussing the railway's predicament, said recently:

> We are giving the best service possible on a 5-cent fare. I have said this before and it is as true now as when the statement was first made. We are willing to meet the City Council and will promote any plans for the betterment of the service that are possible considering the reduced income of the company. When the meeting takes place I will endeavor to have Mr. Robertson (president of the Duluth Street Railway) here with me so that we may be able to give a decision on whatever plans the Council lays before us.

Another Double-Deck Bascule Bridge in Chicago

Chicago already has two double-track bascule bridges in use. A third one is now under construction across the Chicago River at Wells Street to replace the present double-deck swing bridge, which carries the elevated trains above and the surface cars and heavy vehicular traffic below. The new bridge is being built over and around the old one without interruption to traffic. As it stands, reaching up into the air, the section of the new bridge shown in the accompanying illustration would appear to be long enough to span the river alone, but there is another half just like it on the opposite bank.



WELLS STREET BRIDGE WITH BASCULE RAISED. PHOTOGRAPHED FROM LEVEL OF ELEVATED LINE

A previous undertaking of similar nature was the replacement of the Lake Street bridge, which carried both surface and elevated cars, with a bascule bridge three years ago. In this case traffic had to be stopped for only a night while the old bridge was removed. The Wells Street bridge is an even more important link in the transportation systems of Chicago than the Lake Street bridge, as it carries all the through north and south elevated trains. It is expected that the delay to traffic incident to putting the Wells Street bridge into commission, however, will not be prolonged for more than one night.

Co-operation Essential

Judge Mayer, Discussing New York Transit Situation, Calls on Civic Bodies to Aid

Settlement of a city's transportation problems calls for the co-operative effort of local civic and business organizations. This is the opinion expressed by Judge Julius M. Mayer of the United States District Court in an address to the Flatbush Chamber of Commerce, Brooklyn, N. Y., on Nov. 18. In the course of his remarks Judge Mayer declared that "once the people are aroused to the pressing importance of the situation, they will be impatient at insincere obstruction and will insist on a prompt and fair solution of problems already too long unsolved."

As judge of the Federal Court he is in charge of affairs of a number of roads now in receivership, including the Brooklyn Rapid Transit Company and the New York Railways. Referring to the local situation he declared that, "nothing can be gained from the kind of controversy which has for its ultimate purpose the accomplishment of some political end."

CONSTRUCTIVE ACTION NECESSARY

The transit problem, said Judge Mayer, should be approached "with good temper and with the single purpose of arriving at a solution which will be fair to the public and fair to the investors."

Judge Mayer said further:

> For nearly two years the B.R.T. and the New York Railways have been in the hands of receivers. Both the court and the receivers would be happy if they could be relieved forthwith of their responsibility.
>
> During these two years the receivers and the companies have been compelled to litigate certain questions of law, but not one single constructive act, in the way of the solution of the transit problem, has been contributed by the officials having any power in the premises. On the contrary, everything seems to have been done to embarrass and delay a solution of the problem.
>
> It is not a fact that there is a universal 5-cent fare. The financial condition of the surface lines has compelled disintegration, both in your borough and in other boroughs, with the result that the public is paying in some instances 10 cents and 15 cents where heretofore they paid 5 cents for a similar ride. In some sections of your borough and other boroughs surface line service has been temporarily discontinued and such steps have been necessary in order to make it possible to run other parts of the system.
>
> The subway systems have been greatly handicapped in regard to increased equipment and questions of maintenance and have not made the progress which could have been made, if the subject had been fairly and intelligently treated.
>
> The problems are so vital to the welfare of the city and its people and so difficult and varied that, on an occasion of this kind, I cannot do more than refer to them. The health, welfare and happiness of the people at large and the growth and prosperity of the city, as a municipality, demand that there should be immediate effort to deal with the problem in a broad high-minded and statesman-like way.

Collective Bargaining on B. R. T.

Court and Receiver Work Out Plan Whereby Employees Will Deal Directly with the Management

An employees' representation plan intended to create an organization to take the place of the Brooklyn locals of the Amalgamated Association of Street and Electric Railway Employees of America, was announced on Nov. 18 by Lindley M. Garrison, receiver of the Brooklyn (N. Y.) Rapid Transit Company. The scheme provides for the election by the employees of representatives who will deal directly with the management. The election is to be by secret ballot, and the votes will be canvassed by Alfred M. Barrett, Public Service Commissioner of the First District, and Transit Construction Commissioner John M. Delaney. Through the new organization the employees will be able to bargain collectively with the receiver.

JUDGE Julius M. Mayer of the United States District Court co-operated with Mr. Garrison in the preparation of the new plan. Judge Mayer, in whose hands the affairs of the B. R. T. system now are, has steadfastly declined to recognize or have any dealings with the Amelgamated Association. He stated his willingness, however, to treat with a committee representing the employees as employees. On Sept. 2 he declared that "the court will see to it that the right of collective bargaining will be carefully safeguarded and that representatives of their own choice shall have direct dealings with the management."

STRIKERS ARE BACK

Unable to secure recognition for the Amalgamated, the strikers returned to work as individuals. The strike was officially declared "off" when three hundred former employees, the last to give in, applied for their former jobs and were taken back. Employees who are members of the Amalgamated Association will not be permitted to vote in the election of representatives, or to act as representatives. To be eligible for membership in the new organization, each employee must sign the following pledge:

> I am not a member of the Amalgamated Association of Street and Electric Railway Employees of America, and I will not become a member while in the employment of any of the above (companies), and I agree that while I am so employed I will not make any effort among the other employees to induce any such employees to become members of said Amalgamated Association of Street and Electric Railway Employees of America.

ENTIRE SYSTEM INCLUDED

The new plan will apply to all employees of the entire Brooklyn Rapid Transit System and the Brooklyn City Railroad who at the present time are not represented by committees under working agreements. A primary election will be held on Nov. 29, and an election of representatives on Dec. 13. That there may be no suspicion that the management is attempting to control or to influence the choice by the employees of their own representatives, the management has requested Messrs. Barrett and Delaney of the Public Service Commission to supervise the primary at which the nominations will be made. These officials have consented to act.

Under the new plan the employees will be divided into voting units, each of which will be entitled to one or more representatives. Any matter which in the opinion of any employee requires adjustment, and which the employee has been unable to settle with the foreman or official in charge of the work on which he is engaged may be referred to the representative or representatives of the voting unit in which the employee works. The method of procedure to be followed in such a case is outlined as follows:

> Such representative, or representatives, if they consider the matter worthy of attention, will then take it up for discussion and adjustment with the foreman or official in charge of the work. If such representatives and such foreman or official in charge of the work, cannot adjust the matter, then such representatives may take the matter up with the head of their particular department. If the matter is not then adjusted, where there is more than one voting unit in a group, and the representatives feel that it is of general interest to employees of that group, the matter may be referred to the representatives of that group, who may then take it up with the head of the department. . . .
>
> If the representatives of a group or department, or the executive committee of such representatives, as above provided, fail to adjust the matter with the head of the department, they may then take the same up with the management.

MANAGEMENT ASSUMES EXPENSE

Each representative will be free to discharge his duty in an independent manner without fear that his individual relations with the company may be affected by any action taken by him in his representative capacity. It is further provided that each representative shall have the right to appeal in person or through the other representatives of his group, to the head of the department for redress in respect to anything alleged to be a personal discrimination on account of acts performed in a representative capacity. If a satisfactory decision is not then forthcoming from the head of the department, the representative may appeal directly to the management. Failing of an agreement in this case, the plan provides that an appeal may be taken to the Public Service Commission.

The management will assume all necessary expense of the nominating primaries and elections, and will also provide places at which the primaries, elections and meetings may be held. The management will further pay the employees at their regular rates for all time directly and necessarily lost by them on account of time devoted to their duties as representatives.

Representatives shall be elected for a term of one year and shall serve until their successors are elected. They shall be eligible for re-election. A representative shall be deemed to have vacated office upon ceasing to be an employee of the company, or upon permanent appointment to the position of inspector, foreman, assistant foreman, or other position in the supervisory forces of the company. The qualifications for voters are as follows:

> At the first nominating primary and election, every employee who has been in the employ of the company for the sixty consecutive days prior to the date of the primary and who is not a member of the Amalgamated Association of Street and Electric Railway Employees of America, shall be eligible to vote at the nominating primary and at the election, in his or her particular voting unit, provided, however, that no inspector, foreman, assistant foreman, or other member of the supervisory forces of the company shall be able to vote at the primary or election.

Nominations and elections shall be by secret ballot and shall be so conducted as to avoid any undue influence upon, or interference with voters in any manner whatsoever, and to prevent any fraud or mistakes in the casting or counting of ballots. At each primary there shall be elected inspectors of election who shall conduct the ensuing election and the next primary election thereafter. There shall be elected one inspector for each voting unit, who shall serve with a representative of the company and the election officials.

DETAILS OF ELECTION PROCEDURE

No more than three times the number of names to be voted for as representatives at any election will be placed on the ballot for that election. Those receiving the highest votes at the primaries up to that number, will be placed on the ballot. For example, if a unit is to elect two representatives, the six names receiving the highest number of votes at the primaries will be placed on the ballot for the election. The names of the nominees for election shall be conspicuously posted for a reasonable time before the day of election.

Toledo Wants Commissioner

Applications to Be Held Open Until Dec. 4—Engineer Not Essential—Mixed Bus and Car Service

The board of control of Toledo's street railway system under the new service-at-cost commission was called together for a meeting on Nov. 18 for the purpose of organizing and to take a preliminary look at the problems confronting it in getting the new franchise plan into working order. Henry C. Truesdall, banker and attorney, was elected to be chairman, and W. W. Knight, business man, to be secretary by unanimous consent.

Mayor Cornell Schreiber sat with the members of the board on account of the fact that the appointments are not legally effective until the ordinance has been formally accepted by the Toledo Railways & Light Company, and assignment of its rights made to The Community Traction Company, created by the ordinance. The Mayor also wanted to sit with the board of control so that a mutual choice might be made for transportation commissioner.

At the meeting it was decided to hold applications open for the position of commissioner until Dec. 4. The applications are to be addressed to Henry C. Truesdall, Northern National Bank, or Mayor Cornell Schreiber, Toledo. They will be considered strictly confidential in order to protect any men who may apply.

ENGINEERS NOT NECESSARY

The board members made it clear at their meeting that an engineer will not necessarily be appointed to the position. It was felt that a business executive with a good record of service and able to appoint qualified assistants to gather engineering and financial technical data might be appointed to the position.

The appointment is to be made by the board of control but must be confirmed by the Mayor. All applications will be considered jointly so that there will be no delay in the selection of the transportation commissioner.

Toledo engineering bodies and some luncheon clubs have expressed themselves as favoring the appointment of a Toledo man for the position. One group has publicly backed Harry C. McClure, city engineer under Board Member David H. Goodwillie, for the place. Cecil Rood, county surveyor, and several others have been named as applicants.

The board of control at its meeting also looked into several provisions of the ordinance in respect of their duties. They were practically unanimous that crosstown service should be provided as soon as possible.

After selecting the commissioner the board must prepare a plan as provided in section ten of the ordinance:

> For the rearrangement of the street railway system in the city of Toledo, with a view of giving the best service to the city with the highest operating efficiency and economy. Such proposed plan shall also contain provisions for a crosstown line or lines.

Members of the board expressed themselves as favorable even to a mixed service of buses and street cars to make some sort of crosstown service available as soon as possible. They will probably begin on this question as soon as the transportation commissioner has been selected.

NEW ARRANGEMENT OF LINES

The new arrangement of the railway lines approved by the board of control will have to be submitted to the Council for final approval before it is put into effect.

City Clerk Albert Payne and the Mayor have construed the ordinance provision requiring acceptance to be filed within ninety days after passage to mean that this time limit shall begin to operate from the date when the ratification by the people was certified to the city clerk. In this case the final date for putting the cost-of service plan into effect may be about Feb. 15, 1921. At the will of the company it can be put into effect at any time before that date.

Referendum to Be Taken

National Chamber of Commerce Plans Nation-Wide Vote on Transit Facilities and Submits Report of Its Public Utility Committee

Declaring that equitable readjustment and not past performance is the immediate problem confronting the electric railways, the public utilities committee of the United States Chamber of Commerce in a report made public on Nov. 24 urges the retention of the principle of private ownership with public regulation. The report, devoted to a discussion of the present status of the traction industry, recommends a more constructive attitude on the part of the people at large and asks that electric railways be relieved of burdensome costs not directly connected with the rendering of service. The recommendations of the committee will be submitted to the members of the United States Chamber of Commerce in the form of a referendum.

EIGHT propositions will be submitted to the members for approval. These are:

1. Existing traction facilities should be conserved.
2. The attitude now taken toward street railway problems should be based upon the present and future needs of the community.
3. The attitude which is taken toward street railway problems should contemplate private ownership and operation.
4. Regulation should everywhere be instituted that will promptly follow changes in the situation of the companies rendering service of local transportation.
5. Provision should be made against the consequences of unfair competition.
6. All burdens unrelated to the service performed should be removed from street railways.
7. Official responsibility should be definitely fixed for the application of regulation.
8. Each company should seek to have available for the public at all times the facts as to the results of operation and should have resident responsible executives wholly conversant with local requirements.

EXHAUSTIVE STUDY MADE

The committee's report follows an exhaustive study of the electric railway situation. Those signing the report are: Lewis E. Pierson, chairman, board of directors Irving National Bank, New York City; Henry G. Gradlee, president, Stone & Webster, Boston, Mass.; Arthur W. Brady, president, Union Traction Company, Anderson, Ind.; F. B. DeBerard, director of research, Merchants' Association, New York City; E. K. Hall, vice-president, American Telephone & Telegraph Company, New York City; Albert W. Harris, president, Harris Trust & Savings Bank, Chicago, Ill.; Charles L. Harrison, president, Sinking Fund Trustees, City of Cincinnati, Cincinnati, Ohio; J. W. Lieb, vice-president, New York Edison Company; H. L. McCune, of the firm of McCune, Caldwell & Downing, Kansas City, Mo.; P. N. Myers, president, St. Paul Association of Public and Business Affairs, St. Paul, Minn.; John W. Van Allen, of the firm of Wilcox & Van Allen, Buffalo, N. Y.

This will be the thirty-third referendum of the chamber's membership. With each ballot put out there goes the report of the committee making the recommendations, and in addition extensive references to arguments in the negative.

The committee finds that one great cause for public indifference to the situation of local street railways lies in widespread belief that in the earlier history of many traction companies there was financial mismanagement. Even in cases where this has been the fact, however, it becomes relatively unimportant at this time, says the report, inasmuch as the problem should be approached from the point of view of the value of the property used for the public service rather than from the point of view of the outstanding securities. On this point the report says:

> If it be conceded that the public interest is to obtain good service at lowest cost and that street railways are essential and necessary, then the sensible way to deal with the problem is to permit existing organizations and present properties to earn a sufficient sum over their operating expense to induce investment of capital for extensions and improvements to existing facilities. It is not a question of past financing but of present earnings and there should be provided a margin sufficient and cheapest service to patrons of utilities and to the public in the communities served. Believing that this position is in the highest public interest the committee recommends that the attitude which is now taken toward street railway problems should be based upon the present and future needs of the company, and not upon earlier conditions. Equitable readjustment and not past performance is the immediate problem.

With regard to ownership the report states that a canvass of every consideration that has been brought forward in support of public ownership has resulted in the committee's finding it "no solution of present problems or means for meeting future requirements." The committee therefore recommends "that the attitude which is taken toward street railway problems should contemplate private ownership and operation of local transportation facilities."

REGULATION SHOULD BE REASONABLE

The committee recognizes regulation as a necessary corollary to private ownership and operation. Regulation should have for its purpose the conservation of the public interest which "centers in adequacy of service at reasonable cost." It is further stated that:

> As adequacy of service is possible only from an enterprise that can command capital with which to provide the facilities the public interest requires, regulation must in this regard contemplate the situation of the companies that are regulated. Both for the present and the future, elasticity should be substituted for rigidity. Through public authority provision can be made on the one hand to adjust charges for service to yield revenues that are adequate for proper conduct of the utility. Moreover adjustments through regulation must promptly follow the conditions that call for them; for every delay in the application of a remedy that bears upon a matter of public interest is detrimental to the public itself.

Regulation in whatever form involves duties on the part of the public as well as on the part of the companies, continues the report. One of these duties is to protect a company serving the public from unfair competition from any source. This does not mean that local transportation as it now exists should be perpetuated regardless of advances that may be achieved in the art of transportation or in the science of regulation. It does mean, however, that a company which is rendering service and should be developed in efficiency should not be subjected to competition from any other source which is not under corresponding regulation and obligations. Continuing, the report says:

> The whole purpose of regulation implies that the companies subject to regulation should be responsible only for performing the service they have undertaken. Their efficiency and the reasonableness of their rates of charge are the matters which should have undivided attention. Reasonableness in rates should be decided only with reference to the service that is rendered. In other words the rates charged for street railway transportation should not be made an indirect method of taxation for the community. A street railway company should be taxed only on the basis of other comparable taxpayers. Your committee recommends that all burdens placed upon street railway companies and unrelated to the performance of the service they render the public should be discarded.

A SINGLE AGENCY NECESSARY

Both the public and a company which serves it, says the report, should be able to look to a single agency of the public, whether a local official, or a board, or a public utilities commission, as directly and solely responsible for the application of regulation. Responsibility for exercise of the public function involved in finding facts and applying to them the principles which have been laid down by the public, should be clearly located. In matters of public importance there should be no division of authority; for division of authority is almost invariably followed by escape for everyone from responsibility for performance of the public function. The committee recommends that official responsibility should be definitely and unmistakably fixed for the application of the regulation.

Adequate provision for having the public informed regarding the company and its operations and for having the company acquainted with the needs of the community, the committee points out, will serve to prevent controversies that may have little relation to facts and to concentrate attention upon the one question which is of paramount importance to the company and to the public—adequate and efficient service at the lowest rates consistent with the maintenance of such service. To this end the committee recommends that a company providing local transportation should seek to have available for the public at all times the facts as to the results of its operation.

Twenty-five Miles for Five Cents

The Utica Avenue (Brooklyn) extension of the Interborough Rapid Transit Company's rapid transit lines was opened on Nov. 21. The extension is less than 2 miles long. It extends from Utica Avenue and Eastern Parkway to Livonia Avenue and Junius Street, East New York. With the opening of this extension it is now possible to ride for a single 5-cent fare from 241st Street and White Plains Avenue in the Bronx to the Brownsville section in Brooklyn, a distance of about 25 miles.

Kansas City Undisturbed

Receivers Function in Harmony With Previous Management—Plea for Co-operation of Public

The receivers of the Kansas City (Mo.) Railways are continuing the operation of the system with the organization as they found it. Because of their relation to the public, the city, the company and the employees, the receivers are apparently able to bring about results which the company alone found it difficult to achieve. The most striking instance of this kind is the success so far attending the installation of the rerouting program.

BEELER PROGRAM TO BE CARRIED OUT

This plan had been worked out by the company long before the advent of the receivers, but it waited for introduction on action of the City Council. The receivers now plan to introduce in full the Beeler program, completed several months ago, few of the isolated suggestions of which have up to the present been put into effect by the company. The comprehensive system of routing is comprised in an ordinance which the receivers have discussed thoroughly with the city officials and Aldermen.

The receivers have said that they expect the Beeler program to effect a substantial improvement in service. They installed a new schedule on one of the lines on Nov. 10, increasing the headway in rush hours, and showing a gain in revenue from $3.44 to $3.68 per car-hour. They are studying the data which the departments of the company have been collecting, and are inclined to put into effect promptly orders based on conclusions from such study and recommendations of officials.

Colonel Fred. W. Fleming is giving close personal attention to all reports filed by departments, as indeed is Francis M. Wilson, the other receiver. They have offices in the executive suite of the railway building. There seems to be slight if any disturbance of routine because of their control of the property, all officials and heads of departments functioning practically as before. Colonel Kealy, president of the company, acting as adviser of the receivers, and other heads are performing their duties very much as usual. There has quickly developed a sense of confidence in the continuity of the organization, which has done a great deal to preserve the morale and stimulate the energy of the personnel.

GOODWILL PROMOTED

The receivers have held meetings with department heads to learn the previous program as to building of morale and to make suggestions along this line. Other meetings of groups are planned. The receivers have said that they wish to promote especially such conduct of employees toward the public as will best cultivate goodwill.

In the direction of cultivating goodwill and a complete understanding of the company's situation with reference to giving service, Mr. Wilson addressed one of the community improvement associations recently. He presented a statement of the financial affairs of the railway, and gave details as to equipment used. He also declared that the improvement of service was "up to the public."

CITY OVER-SERVICED

The receivers are impressing upon the public of Kansas City the fact that Kansas City is already receiving an unusually high grade of service. One of the receivers said recently that the city was over-serviced with cars. He declared Kansas City had almost exactly the same trackage as Cleveland, with only half as many people.

A specific instance of the scrupulous maintenance of the organization already operating the railway is the use being made by the receivers of the machinery of the board of control. This board, consisting of P. J. Kealy, president, representing the company, and Colonel E. M. Stayton, representing the city, formerly had authority to institute certain matters; under the receivers the board continues to work practically as before, except that when authority is required the receivers supply it through their own orders.

CONTRACTS SOON TO COME UP

Action regarding certain contracts, particularly that for the construction of the Twenty-third Street viaduct, may be taken soon. The Federal Court had postponed decision until the receivers could familiarize themselves with the matters. On Nov. 19 the court issued an order relative to the viaduct. This was to the effect that the receivers should have an opportunity to secure modification of the existing contract, under which modification different terms of payment might be prescribed and the railway might have actual property interest in the viaduct when completed. Negotiations are under way with the contractor, the city, and other parties at interest. If these are successful the receivers may adopt the contract.

Urges Hydro-Electric Development

The California Railroad Commission in its last report declares that what California needs most at this time is the development of its unused water powers. The commission states that the utility consumer, utility owner and utility labor through just distribution and proper co-operation can best bring about this state development.

The commission further states that of all utilities, electric railways have borne the greatest burden within the last few years due to rapidly advancing costs. Still, it contends that they are a utility that could not be dispensed with even though jitney and automobiles have perhaps become a more important factor in transportation in the State of California than in any other state in the Union.

Des Moines Case Put Off

Company Going Behind, but Fears Effect of Further Advance in the Rate of Fare

The hearing of evidence looking toward a solution of the electric railway controversy at Des Moines, Ia., was started during the week ended Nov. 20 before the three masters appointed by Federal Judge Martin J. Wade. The masters in the case are John A. Guiher, member of the Iowa Railway Commission, E. D. Perry, attorney, and Paul Beer, engineer.

COMPANY GOING BEHIND FOR MONTHS

Attorney Gamble for the Des Moines City Railway introduced evidence to show that the company had been running behind for months and that the total deficit for the fiscal year ended Sept. 30 was $22,407. According to the figures introduced by Mr. Gamble the gross returns for the year were $1,989,328. Operating expenses were $1,612,212, leaving net earnings of $362,116. Fixed charges, including interest on notes, were shown to be $384,623. Counsel indicated that with the deficit of $22,407 no account was taken of depreciation. Neither did the figures just cited take into account a sum of $56,844 due the employees for back pay. This amount was originally $72,878, but a number of payments have been made reducing it to the above figure. A payment of $12,389 was made on the back pay in October.

The company further showed that on the basis of the experience of the past two years, even considering a continuation of the present 6-cent fare, the deficit for 1921 would be $19,000.

Two possibilities were presented by the company as a remedy for the present financial difficulties—a further increase in fare or a considerable cut in the service now being furnished.

Attorney Gamble outlined the plans of the company as a way out of the difficulty to include an 8-cent fare for adults, 5-cent fare for children and continuation of the present 10-cent fare on lines extending beyond the city limits. The company is apprehensive, however, that in the event the higher fare were granted traffic might fall off to such an extent that there would still be financial questions to meet. Even the 6-cent fare has reduced traffic over what it was under the former rate. In the event the higher fare is granted, however, the company outlined material increases in service, but stated that if the 6-cent fare was continued it would mean a service cut to the minimum.

HEARING CONTINUED TO NOV. 24

Before the company completed its evidence the hearing was continued until Nov. 24 by reason of the fact that W. E. King, of the engineering firm of Toltz, King & Day, which recently made the appraisal of the railway property for the city could not be present at the hearing until that time.

Officers of the union of railway employees announced that they would make no attempt to force payment of the back wages until such time as they could be met by the company, as they realized the present financial troubles which the company was facing.

Akron Ordinance Advanced

The proposed new contract between the Northern Ohio Traction & Light Company, Akron, Ohio, and the city of Akron for the operation of the company's local lines, referred to at length in the ELECTRIC RAILWAY JOURNAL for Nov. 20, page 1072, came up for second reading before the Council last Tuesday. It is necessary that the ordinance shall be presented for third reading before the Council passes finally upon the matter.

According to the provision of the city charter the ordinance will then have to pend for thirty days, during which time a referendum may be called. In order that there may be a referendum 10 per cent of the registered voters must file such petition within thirty days of the passage of the measure. The city clerk has ten days following the presentation of any referendum petition to check the referendum. If the matter does go to a vote, it may be ninety days before the ordinance is finally submitted to the people for their approval.

The ordinance has been reprinted in pamphlet of thirty-two pages. It is being distributed very thoroughly among the residents of the city. The head of practically every family will receive a copy of the ordinance by mail at his home for his careful consideration.

Interurban Men Accept Award

The motormen and conductors employed on the interurban lines of the East St Louis & Suburban Railway, East St. Louis, Ill., have voted to accept the wage increase of 13.41 per cent awarded recently by a board of arbitration.

The carmen are not satisfied with the increase granted, according to W. L. Perry, president of the local union, but he said they would accept because of an agreement entered into previously to the effect that they would accept the ruling of the board of arbitration.

The board was composed of David M. Walsh, representing the men; C. E. Smith of St. Louis, representing the company, and Henry F. Bader, former Mayor of East St. Louis, representing the public. Messrs. Bader and Smith signed the award, the union representative dissenting. The increase brings the salary of crews on two-man cars to 60 cents. Men on one-man cars will receive 66 cents an hour. The award is retroactive to May 1, 1920, and is effective until May 1, 1921. D. E. Parsons, general manager of the system, said about seventy-five men would be affected by the award and that each would receive about $100 back pay.

The city men in East St. Louis are now receiving from 70 to 73 cents an hour. That scale was decided upon by another board of arbitration.

News Notes

City Asked to Arbitrate.—Representatives of several labor unions in Trenton, N. J., have appealed to the Trenton City Commission to intervene in the dispute between the New Jersey & Pennsylvania Traction Company and its employees. The carmen are now on strike, demanding higher wages. The commission is asked to act as a board of arbitration in the case.

Saginaw Men Still Out.—The situation at Saginaw, Mich., with respect to the strike of the trainmen of the Saginaw-Bay City Railway, was unchanged on Nov. 15. The men were still out then and no cars had been run in Saginaw since Oct. 31. The men still refuse to work for the former rate of wages. They want an advance of 10 cents an hour. This the company finds itself unable to grant with the fare now in effect. On the other hand, the company has been unable to recruit men to take the places of the strikers at the rate of wages in effect prior to Sept. 30. So far as the situation over fares between the company and the city is concerned that remains deadlocked. The conditions leading up to the strike were reviewed at length in the ELECTRIC RAILWAY JOURNAL for Nov. 13.

Crosstown Transit Line Advocated.—A transportation improvement plan for the Borough of Brooklyn has been outlined recently by M. T. Donnelly. Deputy Public Service Commissioner. In his opinion the Queensboro Plaza-Crosstown Route, plans for which were adopted and approved in 1914, is now of vital necessity to the development of Brooklyn. In a review of the transit needs of Brooklyn and Queens, he says: "The aim is to run a line as nearly straight as practicable from Queensboro Bridge Plaza to the Brighton Beach division of the Brooklyn Rapid Transit System. A crosstown rapid transit route is the only improvement needed to round out the development of Brooklyn. Such a crosstown route would connect with 7 miles of the four-track Brighton Beach line and the Astoria and Corona elevated lines—a rapid transit route from the Atlantic to Long Island Sound."

Program of Meeting

New York Railroad Club

The New York Railroad Club will hold its second annual dinner at the Hotel Commodore, New York, on Dec. 16. The program includes a prominent speaker, a friendly crowd, music and chorus singing under the direction of Miss "Bobby" Besler. Charles R. Ellicott is chairman of the dinner committee.

Financial and Corporate

Brazilian Companies Do Well

Rio de Janeiro and Sao Paulo Tramway, Light & Power Companies Show Highly Satisfactory Results

The seventh annual report of the Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., for the year ended Dec. 31, 1919, shows that the company's financial position has been strengthened. The gross earnings from operations in Brazil for 1919 were about $30,320,000. This was an increase of $4,450 000, or 17 per cent over 1918. Net earnings from operations in Brazil amounted to $15,655,477 in 1919, compared with $13,236,477, or 18.4 per cent. The miscellaneous revenue and non-operating income, together with the operating income, increased the gross income to $16,118,408 in 1919. In 1918 the gross income was $13,440,627, so the increase of 1919 over 1918 was $2,677,781, or 20 per cent. After all charges for bond interest, depreciation, sinking funds, etc., had been deducted, the gross revenue of the company for 1919 was $8,877,000, an increase over 1918 of $2,625,540, or 42 per cent. Expenses of the company, taken as a whole, increased 20.5 per cent from $832,800 in 1918 to more than $1,000,000 in 1919. The net revenue left for dividends and other deductions was $7,873,967, an increase over 1918 of $2,454,295, or 45 per cent.

245 MILES OF RAILWAY

More than 245 miles of track in Brazil are operated by the Rio de Janeiro Tramway, Light & Power Company. This line in itself had gross earnings of $9,375,000 in 1919, an increase of 28.6 per cent over 1918. The net earnings increased from $4,120,000 in 1918 to $5,270,000 in 1919, or about $1,150,000. The car-miles for 1919 were 27,677,655. In comparison with 1918, this was an increase of more than 11 per cent. The total number of passengers carried was 256,165,076, an increase of 36,127,706, or 16.4 per cent over 1918. The operating ratio remained practically unchanged. Twenty-four passenger cars and twenty-three passenger trailers were added to the company's equipment during 1919.

Another subsidiary of the Brazilan Traction, Light & Power Company is the Sao Paulo Tramway, Light & Power Company. The gross earnings were $6,940,000, an increase over 1918 of 21.6 per cent. For 1919 the net earnings were $4,445,000, an increase of $645,000, or 17 per cent. More than 143 miles of single track are operated. The total car-miles were 10,821,370, an increase over 1918 of 6 per cent. Over 12,658,000 more passengers were carried in 1919 than in 1918, an increase of 20 per cent. The operating ratio changed only 2.6 per cent.

The revenue of the companies is received in Brazilian currency—milreis—and the exchange rates prevailing between Brazil and London or New York determined the revenue expressed in dollars in the tables.

INCOME STATEMENT—BRAZILIAN TRACTION, LIGHT & POWER COMPANY

Year ended Dec. 31	1919	1918	Percentage Change
Gross earnings from operation in Brazil	$30,320,000	$25,870,000	+17.1
Total expenses of operation in Brazil	14,664,523	12,533,777	+16.8
Net earnings from operation	$15,655,477	$13,236,223	+18.4
Miscellaneous revenue	86,160	74,354	+15.9
Operating income	$15,741,637	$13,310,577	+18.3
Non-operating income	376,771	130,050	+190.0
Gross income	$16,118,408	$13,440,627	+20.0
Deductions from gross income:			
Bond interest, etc	$4,143,517	$4,377,310	—5.4
Reserve for depreciation and sinking fund	3,097,886	2,810,854	+10.2
Total deductions of subsidiaries	$7,241,403	$7,188,164	+0.7
Gross revenue of Brazilian Traction, Light & Power Company	$8,877,005	$6,252,463	+41.9
Total charges Brazilian Company	1,003,038	832,791	+20.5
Net revenue	$7,873,967	$5,419,672	+45.2

STATISTICAL INFORMATION RIO DE JANEIRO TRAMWAY, LIGHT & POWER COMPANY

Year ended Dec. 31	1919	1918	Percentage Change
Gross earnings from tramways	$9,375,000	$7,285,000	+28.6
Net earnings from tramways	$5,270,000	$4,120,000	+27.8
Miles of single track	245.62	243.34	+0.9
Car-miles	27,677,655	24,829,807	+11.4
Number passengers carried	256,165,076	220,037,370	+16.4
Statistics per car-mile:			
Gross earnings per car-mile (cents)	33.9	29.3	+15.0
Net earnings per car-mile (cents)	19.0	16.6	+14.4
Number passengers per car-mile	9.26	8.86	+4.5
Car-miles per passenger	0.108	0.113	—4.3
Operating ratio — per cent	43.7	43.4	+0.3
Rolling stock owned:			
Passenger cars	553	529	+4.4
Passenger trailers	480	457	+5.0
Freight cars	85	85	......
Freight trailers	126	126	......
All others	15	14	+7.1
Total equipment	1,259	1,211	+4.0

STATISTICAL INFORMATION SAO PAULO TRAMWAY, LIGHT & POWER COMPANY

Year ended Dec. 31	1919	1918	Percentage Change
Gross earnings	$6,940,000	$5,710,000	+21.6
Net earnings	$4,445,000	$3,800,000	+17.0
Miles of single track	143.43	142.85	+0.6
Car-miles	10,821,370	10,218,314	+5.9
Number passengers carried	76,087,246	63,429,063	+20.0
Statistics per car-mile:			
Gross earnings per car-mile	64.2	55.8	+15.8
Net earnings per car-mile	41.1	37.2	+10.5
Number passengers per car-mile	7.3	6.2	+17.7
Car-miles per passenger	0.142	0.161	—11.8
Operating ratio—per cent	64.0	6.6	—2.6
Rolling stock owned:			
Passenger cars	305	304	+0.3
Passenger trailers	56	48	+16.7
Freight cars	56	58	—3.5
Freight trailers	36	37	—2.7
Total equipment	453	447	+1.3

Lower Interest Rates Here, Says Banker

Public utility corporations are now able to obtain loans at rates considerably lower than was the case a few months ago, according to a recent statement by E. W. Niver of Halsey, Stuart & Company, New York bankers. Regarding the general outlook for utilities, Mr. Niver said:

At this time banking houses are purchasing long-term securities of high-grade companies to sell on a 7.5 to 8 per cent basis that they could not have considered five months ago owing to market conditions which existed at that time. One of the best indications of the present trend is the increasing demand on the part of investors and dealers for utility securities. While the present market cannot be termed a "utility market," there is, nevertheless, a very noticeable inclination on the part of investors to favor this class of security rather than other issues which have been popular during the past two or three years.

An electric utility which might have had difficulty six months ago in putting out securities at a net cost of 10 to 12 per cent can now obtain money at approximately 9 per cent, and in case of a long-term issue of two or three million dollars the net cost would be somewhat lower. In other words, money is costing 2 to 3 per cent less than last spring, when the utilities could do only short-term financing, for which they paid as high as 13 per cent in some instances.

There is no one particular reason to which can be assigned the improved demand for the issues of electric utilities. The fact that public service commissions are granting rate increases and inserting coal clauses in contracts has strengthened the position of the companies. Another important factor is the work which the utilities themselves have done in improving public relations by putting their case squarely before the public. The policy of customer ownership has been the best thing that they could have adopted. It has resulted in the sale of millions of dollars' worth of preferred stock widely distributed, and many of these small preferred stockholders are now buying utility bonds.

With the increasing demand for utility securities investment bankers are able to give more favorable consideration to new issues, and the natural result, as has already been shown, will be cheaper money for the public utility companies.

Decision Against Original Cost Theory

Judge Van Valkenburgh Considers Present Fair Value Correct Basis for Rate Making

Judge Arba S. Van Valkenburgh in the Federal Court at Kansas City, Mo., granted an injunction on Nov. 10 restraining the Public Service Commission of Missouri from enforcing its order fixing fares on the railway lines of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo. The grounds of the court's opinion are the wrong methods used by the commission in valuation—specifically, the use of original cost figures, and standards of prices of a past period, and of a pre-war period. The Missouri Public Service Commission is said to be preparing to appeal to the Supreme Court from Judge Van Valkenburgh's finding. Members of the commission are quoted as saying that if this opinion is allowed to stand the whole system of rate making by the commission, affecting many utilities, must be made over.

IN HIS opinion Judge Van Valkenburgh points out vital discrepancies in the order of the commission as based on its valuation. He suggests that the company's funded debt is $5,805,000—practically the amount on which 5.4 per cent earnings is permitted by the commission. He goes at length into a discussion of the "present fair value" as the correct basis for rate making and concludes that since present fair value was not sought by the commission its resulting computations necessarily reduced the total valuation so substantially as to make the rates based thereon inadequate and practically confiscatory.

CASE STARTED IN 1919

In the summer of 1919 the St. Joseph Railway, Light, Heat & Power Company filed with the Public Service Commission an application for an order allowing it to charge a straight 8-cent fare in lieu of the 5-cent fare then charged and collected by it. It also asked permission to charge increased rates for steam heat. The company made no request for an increase in its light or power rates.

On Oct. 1, 1919, the commission heard evidence in support of this application. A further hearing was held on Oct. 10, 1919. The matter having been submitted to the commission upon the evidence heard and upon the briefs of counsel the commission on Nov. 20, 1919, made its report and order allowing the complainant a maximum cash fare of 7 cents, with ticket fares of two for 13 cents and for passengers between five and twelve years of age a cash fare of 4 cents, or ticket fares of eight for 26 cents. The commission refused to allow any increase in the complainant's rates for steam heating.

VALUATION PLACED AT $5,800,000

The commission's engineers and accountants valued the applicant's property as a whole at $5,784,883; its railway department at $3,388,436; its light and power department at $1,786,814; its Savannah Interurban property at $33,250, and its steam heating department at $276,360. Substantially adopting these figures the commission in its report and order fixed the value of complainant's property as a whole for rate-making purposes at the sum of $5,800,000; its railway department at the sum of $3,395,000, and its steam-heating department at $197,500. Upon this valuation the commission said in its report:

> Table No. 6 shows that the property as a whole earned an amount during the year ended June 30, 1919, equivalent to 2.67 per cent on $5,800,000 for return, surplus and contingencies.
>
> It is estimated that under the increase in fares granted herein the property as a whole will earn an amount equivalent to 5.4 per cent on $5,800,000 for return, surplus and contingencies. We are confident that this return can be increased through increased operating efficiency of the generating plant, and by the increased use of one-man cars.

Against the values found by the commission just noted the company has an authorized capital stock of $6,000,000, consisting of $2,500,000 of preferred stock and $3,500,000 of common stock. It has a funded debt comprising first mortgage bonds, first and refunding bonds and car service trust certificates aggregating $5,805,000.

In its interpretation of the facts before the court Judge Van Valkenburg ruled as follows:

> It may be stated in passing that a return of 5.4 per cent, which must provide also for surplus and contingencies, has not been regarded by courts and commissions generally as a reasonable return for a public utility, and still less so now under existing conditions. The commission apparently looks for some indefinite increase of this percentage through changed methods of operation suggested by the commission. This is, of course, entirely speculative, and the principle falls nearly, if not quite, within the disapproval of the Supreme Court and of this court as constituting an invasion of the right of the company to conduct and manage its own affairs, subject to a proper exercise of the power of regulation. (Kansas City, C. C. & St. J. Ry. vs. Barker, 242 Fed. 310, and cases cited.)

VALUES DIFFERED BY $5,721,639

> The engineers and accountants for complainant, as shown by the record, valued the complainant's property as a whole at $11,521,639; the railway department at $7,195,333; the Savannah Interurban property at $5,888,392; the light and power department at $3,228,362, and the steam heating department at $509,552. We thus find a difference in total valuation between $11,521,639, tendered by complainant, and $5,800,000, adopted by the commission for rate making purposes, or $5,721,639.
>
> The complainant's figures are arrived at upon the basis of present day reproduction cost without depreciation. The commission took the original cost when obtainable, and when not obtainable average prices for a fixed period of five years before war prices prevailed; going back approximately to the year 1910. It also allowed cost price for additions and betterments made since present prices have prevailed, but it appears that no improvements or betterments of consequence have been made since that time. It will be observed that the valuation fixed by the commission barely exceeds the complainant's funded debt; so that the return expected by the commission to be earned by complainant at 5.4 per cent, if realized, would substantially cover only the interest upon such indebtedness.
>
> There was no substantial difference of opinion between complainant's engineers and accountants and the engineers and accountants for the commission except as to the method of valuation and as to the question of what would constitute a reasonable return upon any given valuation. It was conceded at the argument that complainant's figures were correct upon their theory, and that the commission's figures were substantially correct upon the theory upon which they proceeded; therefore, while complainant's valuation may be too high, because no allowance is made for depreciation and elements of reduction uniformly recognized, nevertheless there must remain a very large amount of valuation to which complainant would be entitled unless the standard adopted by the commission is the correct one, which would have a decisive effect upon the reasonableness of the return possible from the rates allowed by the commission.

VALUATION THE ONLY CONSIDERATION

> It seems unnecessary to consider any phase of this case except that of valuation, because, in my judgment, that consideration is conclusive upon the reasonableness of the present rates. Complainant, in its bill, charges that the same are inadequate, unreasonable and confiscatory, and prays injunctive relief against their enforcement. Of course the power of this court is limited to an adjudication upon this point, it being invested with no rate making power.
>
> It is my judgment that the great weight of authority is against the adoption of a standard of original cost as a controlling basis for determining present value. The present fair value is the object to be attained. Nor do I think it permissible substantially to restrict the inquiry to a period antedating present cost prices. In Joplin & Pittsburg Railway vs. the Public Service Commission of Missouri, et al, in this same division of this court, before Stone, Circuit Judge, Wade, District Judge, and the writer of this opinion, we said:
>
> "It appears upon the face of the report (of the commission) that great, if not undue, emphasis was laid upon the original cost of the property * * * at a period greatly antedating that with which this investigation must deal; nor can we say that the present period of high prices is so temporary or abnormal that it may practically be disregarded in arriving at the value of complainant's properties. No one can say what degree of depression may ultimately come, but it is reasonably certain that the cost of the properties now under consideration will never again approximate figures prevailing in the years before the world war."
>
> The Supreme Court of New Jersey, in an opinion filed on Aug. 7, 1920, in the case of Elizabethtown Gas Light Company vs. Board of Public Utility Commissioners, still further elaborates this view, citing Lincoln Gas Company vs. Lincoln, 250 U. S. 256 in support of its conclusions.
>
> "In the very recent case of the United States ex rel. Kansas City Southern Railway vs. Interstate Commerce Commission, decided by the Supreme Court on March 8, 1920, it appears that Congress has given legislative recognition to this same principle, and the court ordered the commission to make its valuation in compliance with the act of Congress. While the decision in that case was predicated upon the express provisions of the act, nevertheless we find in it a recognition, both by Congress and by that court, of the necessity of adapting the standard of rate making bodies to conditions existing at the time the power is to be exercised."
>
> It follows that the method of valuation adopted by the commission in the case at bar was wrong, and that the resulting computation necessarily reduced the total valuation of complainant's property so substantially as to make the rates based thereon inadequate and practically confiscatory. For this reason it will be unnecessary to resolve other questions presented by the briefs. By common consent this was deemed the crucial question. The court does not undertake to lay down any hard and fast rule in the premises. Many elements must enter into the final determination of a question of this nature. It is sufficient that the procedure disclosed by this record leads unavoidably to the conclusion that the relief prayed must be granted. It is so granted.

The issuance of the injunction has been the source of some confusion as to the position in which the St. Joseph fares stand. Company officials assumed that the injunction permitted them to charge a higher rate than 7 cents, and preparations were therefore made to install a straight 10-cent rate on Nov. 18.

When it became known on Nov. 17 that the company purposed to charge 10 cents, beginning Nov. 18, the city officials, speaking in the name of the prosecuting attorney of Buchanan County, with his consent, brought a petition for injunction to Judge Allen of the State Court. Late in the afternoon of that day the injunction was granted, restraining the company from charging more than the rate established by the Public Service Commission (setting forth these rates specifically and not stating that they were the rates established by the commission), the injunction to prevail until further ordered by this court or by the Public Service Commission. This action stopped the steps toward immediate fare increase based on the Federal Court opinion.

COMPANY SOUGHT TEN-CENT FARE

Meanwhile representatives of the city suggested that the commission put into effect a temporary rate, lower than the proposed 10-cent fare. A majority of the commission responded to this request with a formal statement that the commission maintained the justness of its processes of ascertaining values for rate-making purposes. Chairman Busby of the commission dissented from this opinion, however, and in a statement intimated his belief that in view of the Federal Court's opinion the commission should proceed to fix a new rate.

Some time previous to the issuance of the injunction by Judge Van Valkenburgh, the company sought a 10-cent fare from the Public Service Commission. After the injunction was issued the company renewed its petition to the commission for hearings looking toward the fixing of higher fares. The matter was now becoming so complicated that both the city and the company were eager to discover an expedient for avoiding continuous passages in courts. A compromise was therefore proposed under which slightly increased fares might be charged pending the further consideration of the matter by the commission and the hearing of the commission's appeal from Judge Van Valkenburgh's decision to the Supreme Court. It had also been suggested that the Federal Court's opinion might be so modified as to enable the Public Service Commission to fix a new rate without technically incurring a charge of contempt of court and without entirely revising its methods of valuation.

Further steps in St. Joseph depend, it is reported, on the consent of the company's owners in New York to the acceptance of a fare lower than 10 cents. The utilities commission is said to be ready to grant an immediate hearing in case Judge Van Valkenburgh's order is so modified that the commission would not be in contempt by fixing a higher rate without a new valuation. Judge Van Valkenburgh would, it is reliably reported, modify his order to allow a new rate to be fixed as suggested though such order would not be a recession from his finding as to the commission's wrong basis of valuation, and the commission would proceed with its appeal from the present injunction order to the Supreme Court. The city officials of St. Joseph, the members of the commission and the attorneys of the company are said to have agreed on the wording of a new order acceptable to them, but such modified order has not been presented to Judge Van Valkenburgh for action by him.

Passenger Receipts Decrease

An analysis of the reports of Howard C. Foss, receiver for the Savannah (Ga.) Electric Company, shows an apparent falling off in passenger receipts since the 7-cent fare went into effect. Passenger receipts for August were $72,396 and ticket sales were $23,927, a total of $95,423. For the month of September passenger receipts were $70,610 and ticket sales $22,468, a total of $93,979, which shows a decrease of $1,785 in passenger receipts and $558 in receipts from ticket sales.

Following is the detailed report of the receiver for the month of September:

Receipts:		
Cash on hand and in banks Aug. 31, 1920		$155,608
Passenger receipts	$70,610	
Ticket sales	22,468	
Freight and express receipts	427	
Light and power receipts.	67,286	
Accounts receivable, miscellaneous	3,413	
Miscellaneous	2,970	161,177
		$322,786
Expenditures:		
Salaries and wages.....	$47,676	
Supplies	7,724	
Supplies, fuel	17,044	
Accidents account	3,887	
Taxes	8,104	
Sundry interest	8	
Refunds on deposits....	258	
Other miscellaneous operation	27,305	112,008
Cash on hand and in banks Sept. 30		$210,777

NOTE — This is a cash statement and makes no provision for even the large items, such as payrolls, taxes and interest on bonds until actually due and paid. No provision whatever is made for the interest on coupon notes, bank notes, etc., nor for dividends on any stock nor extraordinary items, depreciation, replacements and obsolescence.

Glasgow Has Small Surplus for Quarter

An interesting statement on the finances of the Glasgow (Scotland) Corporation Tramways was made on Sept. 29 by Councillor Kelly, convener of the tramways committee. The revenue from the increase of fares had, he said, exceeded expectations. During the first quarter of the current financial year, from June 1 to Aug. 31, the revenue amounted to £559,770. The working expenditure for the same period was £444,585, leaving a gross balance of £115,185. Deducting from this depreciation and renewal allowances, income tax, etc., there remained a surplus for the three months of £45,165. From this there had to be deducted, however, a quarter of last year's deficit, amounting to £27,000, and an additional sum to renewals fund of £14,700, so that the actual surplus was only £3,915. The top of the working expenses had not been reached, as demands for increased wages were coming forward. If concessions were made, the fares would have to be further increased.

Electrification Urgent

Great Growth of Traffic Makes Immediate Action Necessary in New South Wales

The latest report of the New South Wales Government Railways & Tramways shows such heavy gains in both steam suburban and local street railway traffic that the matter of electrifying the former lines, comprising 400 single-track miles, has become acute. Plans for electrification, as described in the ELECTRIC RAILWAY JOURNAL for March 3, 1917, have been held up because of the war, but it is expected that construction will begin at an early date. The necessity for this may be judged from the fact that the steam traffic increased from 77,817,452 passengers in the fiscal year ended June 30, 1915, to 101,428,991 in the year ended June 30, 1920, or roughly 30 per cent. So, too, the local electric street railway traffic (City & Suburban Lines only) increased from 240,545,317 to 269,255,935, or about 12 per cent.

As a matter of fact, the tramways had a severe slump during part of the war, but the recovery has been rapid, judging from the fact that the City & Suburban Lines had carried but 222,111,451 passengers in the fiscal year 1919, so that the 1920 figures show an increase of more than 20 per cent. This increase occurred in spite of a fare rise on Jan. 1, 1920.

CITY AND SUBURBAN LINES PROFITABLE

The City & Suburban Lines, which constitute the principal street railway system of Sydney, compare as follows for 1920 and 1919, figures for the latter year being in parentheses: Trackage, 207.1 miles single track; revenue passengers as above; car-miles, 21,811,695 (20,094,167); gross earnings, £2,370,309 (£1,832,911); operating expenses, £199,070 (£1,481,332); earnings per car-mile, 26.08d. or 52.16 cents (21.89d. or 43.78 cents); expenses per car-mile, 21.90d. or 43.8 cents (17.69d. or 35.38 cents); operating ratio, 83.96 per cent (80.82 per cent); return on investment, 5.86 per cent (5.48 per cent).

However, the actual tramway mileage in the Sydney district is greater than the foregoing would indicate, as there are lines at North Sydney and in various thinly settled suburbs. Subtracting the returns of the Newcastle, Broken Hill and Maitland lines, which are not in the metropolitan district, gives a total of 300 miles single track. Passengers for the combined tramways were approximately 95 per cent of the grand total of 324,884,651 (268,797,814). About 94 per cent of all tramway mileage (26,889,077 car-miles in 1920, against 24,674,306 car-miles in 1919) was made in the Sydney district. While the City & Suburban Lines made money, as indicated, the result of all tramway operations, including sparsely patronized steam lines, was a deficit of £8,449 on £2,881,797 gross earnings. The number of rides per inhabitant per annum exclusive of ferries is now close to 500.

Financial News Notes

Seeks $5,000,000 Stock Issue. — The Pacific Gas & Electric Company, San Francisco, Cal., has applied to the State Railroad Commission for permission to issue stock for $5,000,000, the proceeds to be used for hydro-electric power plant construction and development work.

Voters Approve P. R. T. Loan. — A municipal loan to the Philadelphia (Pa.) Rapid Transit Company has been approved by the voters of the city. The loan will make available $3,500,000 for completing and equipping the Frankford elevated line, now under construction. The city is still negotiating with the Philadelphia Rapid Transit Company with a view to the operation of the new line by the company.

Ten-Year Notes Offered.—Bonbright & Company, Inc., New York, N. Y., are offering for subscription at 96 and accrued interest, yielding more than 8.60 per cent, $2,250,000 of ten-year 8 per cent bond-secured sinking fund gold notes of the Pennsylvania-Ohio Power & Light Company, Youngstown, Ohio. The bonds are dated Nov. 1, 1920, and are due Nov. 1, 1930. The securities are among the issues included in the plan for the recapitalization of the utility properties at Youngstown, dealt with at length in the ELECTRIC RAILWAY JOURNAL for Nov. 6, page 985.

May Allow Abandonment.—The Ohio Public Utilities Commission has served notice on the city authorities of Findlay that, unless they can come to an understanding with the Toledo, Bowling Green & Southern Traction Company, Findlay, before Dec. 17, the company will be permitted to abandon service on its local lines. The railway some time ago notified the city officials that it must have financial relief. An ordinance was then passed granting the company an increase in fare from 5 cents to 10 cents. This measure was subsequently repealed. The company then applied to the State Public Utilities Commission for authority to discontinue service.

Betterment Funds Not Available.—In a recent opinion Assistant Corporation Counsel Robert H. Evans of Seattle, Wash., ruled that the use of the betterment fund moneys for reconstruction of cars for one-man operation and for the replacement work at Second Avenue and Pine Street is not authorized under the bond ordinance creating the fund. D. W. Henderson, superintendent of railways, had considered using the betterment fund cash to pay for these two items, totaling about $60,000, but the ordinance did not specifically refer to these improvements and an opinion was asked.

Additional Payment Contested. — Judge Johnson, sitting in an equity session of the United States District Court in Boston, Mass., has been hearing a case to set aside an award of $250,000 to Patrick McGovern, a New York contractor, against the city of Boston and the Boston Transit Commission for additional expenses incurred over original estimates in the construction of the Dorchester tunnel. The award was made by Judge Remick, sitting as master for the Federal Court. The case now up was originally brought in the state courts, where a decision was made against payments to Mr. McGovern. This was reversed in the Federal Court, however, in an opinion handed down last January.

Public Service Shows Deficit.—The operation of the Public Service Railway, Newark, N. J. for the month of September shows an actual deficit of $104,495, without making allowances for depreciation. Gross receipts totaled $2,280,500, while operating expenses totaled $2,384,996. During September the company's cars traveled 4,988,062 car-miles and carried 38,082,527 passengers. Wages in the transportation department alone amounted to $148,700 more than during the same month a year ago; power cost $72,651 more than in September, 1919, while taxes exceeded those for the same month of last year by approximately $24,000. The deficit of the company for the last three years, including allowance for renewal of equipment, is given as $888,323 for 1918, $1,514,735 for 1919, and $1,247,217 for this year, November and December figures being estimated. The total for the three years is shown to be $3,650,276.

"L" Payment Protested.—The constitutionality of the act of the Massachusetts Legislature of 1918 which provided for public operation of the Boston Elevated Railway for a period of ten years, is attacked by the city of Boston. The city is seeking to recover $2,905,930 paid to the Commonwealth under protest on Nov. 15, 1919, as its proportion of a deficit of about $4,000,000 declared to have existed on July 1, 1919. It is claimed by the city that in ascertaining the deficiency the trustees charged for depreciation in the twelve months ended June 30, 1919, about $2,000,000 for maintenance and repairs notwithstanding that the average amount charged by the company for depreciation during the ten years prior to July 1, 1918, was about $98,000 per annum, and that the deficit of $4,000,000 is therefore unreasonable and excessive. The case was argued recently before the full bench of the Supreme Court.

Colorado Company Sells Bonds.—H. M. Byllesby & Company are offering for subscription at 96 and accrued interest to yield more than 8 per cent an issue of $1,400,000 first and refunding mortgage 7.5 per cent bonds of the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., due Nov. 1, 1931. These bonds are a direct obligation of the company and are secured by a first mortgage on the entire property, subject only to an underlying issue of $1,647,000 in bonds on that part of the property formerly owned by the Pueblo & Suburban Traction & Lighting Company. A sufficient amount of the 7.5 per cent bonds has been set aside to retire the underlying bonds which mature Oct. 1, 1922. At that time the new issue will become an absolute first mortgage on the entire property. These bonds, together with $600,000 in 8 per cent notes, will provide funds for extensions and improvements to the property and will retire $1,684,900 in other obligations.

$2,000,000 Issue of Gold Notes.—Bonbright & Company, Inc., New York, N. Y., are offering for subscription at 97 and interest to yield about 8.45 per cent $2,000,000 of ten-year 8 per cent bond-secured gold notes of the United Light & Railways Company, Grand Rapids, Mich. The notes are dated Nov. 1, 1920, and are due Nov. 1, 1930. It is explained that the company operates nineteen public utilities, mainly electric and gas, which it owns or controls, supplying without competition fifty-five prosperous manufacturing and agricultural communities, located in the heart of the Middle West. These notes will be the direct obligation of the company and will be secured by first and refunding mortgage 5 per cent bonds of the company, due on June 1, 1932, in the ratio of 133⅓ per cent of bonds to each 100 per cent of notes outstanding, or by cash equal to the face amount of the notes.

$4,200,000 of St. Louis Certificates.—The Guaranty Company, New York, N. Y., is at the head of a syndicate of bankers which offered for subscription on Nov. 23 at 97.48 and interest to yield about 8 per cent $4,200,000 of United Railways, St. Louis, Mo., receiver's three-year 7 per cent certificates of indebtedness. The certificates are dated Oct. 1, 1920, and mature Oct. 1, 1923. The present issue is known as Series A. The proceeds will be applied toward the payment of $1,900,000 of St. Louis Railroad first mortgage 4½ per cent bonds due May 1, 1920, and to reimburse the receiver for funds used to retire $2,300,000 one-year 6 per cent certificates of indebtedness of the receiver of the United Railways paid on Sept. 2, 1920. These certificates are to be a first and prior lien on 277 miles of street railroad, of which 79 miles were formerly mortgaged by the St. Louis Railroad and the Union Depot Railroad. They are also to be a lien, subject to $10,600,000 divisional bonds all maturing before this issue, on the remaining property and franchises of the United Railways including 184 additional miles of track. These certificates rank prior to $30,300,000 of first general mortgage 4 per cent bonds of the United Railways and $9,790,000 junior bonds, upon which interest has always been paid. The United Railways controls without competition all the local electric railways operating in St. Louis.

Traffic and Transportation

One-Man Cars Approved

Massachusetts Board Refuses to Bar Rebuilt Double-Truck Cars—Carmen Seek Injunction

Double-truck one-man cars can be legally operated in the State of Massachusetts, according to an opinion handed down on Nov. 8 by the Massachusetts Department of Public Utilities. The department has dismissed a petition that the operation of such cars by the Eastern Massachusetts Street Railway, Boston, be prohibited. The company and all other railways having cars of this type in use are directed to install safety devices on all such cars before May 1 next. The department has prescribed a number of regulations to be followed by the railway in car operation.

William J. Murphy and other members of the joint conference board representing the employees of the Bay State system, have applied to the State Supreme Court for an injunction to restrain the company from operating cars of this type. The Bay State management has announced that it will discharge all men detected in the act of spreading propaganda against the one-man cars.

MEN OPPOSE OPERATION

The operation of rebuilt double-truck cars by one man has for some time been a disputed question between the management of the Eastern Massachusetts system and its employees. The men have contended that the use of such cars endangers both the car operators and the public. They also strongly object to the introduction of the one-man cars on the ground that many of their number are thus deprived of work. A majority of the cars now in service are operated by one man.

The most vehement protest came from the carmen of the company's Fall River division. A controversy arose some time ago when the company first proposed to install cars of the rebuilt type. The men did not object to the use of one-man cars with but a single truck, but did object to double-truck cars being turned into one-man cars even with such apparatus installed as would be necessary to make the scheme feasible. Several meetings of the employees were held to decide on the policy the union would follow should the cars be placed on the lines, and at a meeting held about Oct. 15 it was decided to strike. On Oct. 31 another meeting was held, at which James H. Vahey, counsel for the Amalgamated Association, urged the men to reconsider their action. It was later decided to postpone action pending a ruling from the Department of Public Utilities.

In refusing the petition the department said:

> The petitioners allege that the cars now operated are a "menace to public safety." With this we do not concur. Safety is a relative term and just how far safety devices should be required at a particular moment and just how much the car rider should be called upon to pay for that insurance is a practical question dependent upon actual conditions as they exist. We feel it our duty, therefore, to say affirmatively that the one-man cars in question are not in our opinion "menaces" as characterized in this petition and that we do not think that either passengers or operators should, until the rules mentioned above go into effect, feel apprehensive as to the safety of the cars as now operated.

SAFETY REGULATIONS PRESCRIBED

Summarized, the regulations for safety are as follows:

Every (subway) car or train shall be equipped with a lighted headlight, together with a reflector, so as to illumine the roadway in advance of the car or train.

Every street railway car operated on a surface line shall be equipped with wheel guards across the front and rear of each truck.

Every street railway car shall be equipped with hand brakes, at all times in good working order, effective when applied from either end of the car.

Every car operated on the surface lines shall be equipped with mechanical devices for distributing sand on the rails, maintained so as to be of immediate service to the operator of the car at any time.

Every one-man car shall be equipped with one or the other of the following devices: One so designed and maintained that upon the release of the controller of the car by the motorman the motive power will be cut off and the brakes will be applied; together with a device, located in a conspicuous place and accessible to passengers, by the operation of which a door at the rear of the car will be unfastened. Another, located in a conspicuous place and accessible to passengers, by the operation of which the motive power will be cut off, the brakes applied, and a door at the rear of the car unfastened.

Instructions as to the location of the safety devices accessible to passengers and their use in an emergency must be posted in a conspicuous place in the car.

Emergency lifting jacks must be installed.

May Grant Eight-Cent Fare

An ordinance is now under consideration by the City Commission of Grand Rapids, Mich., providing for an increase in the fare of the Grand Rapids Railway from 7 cents to 8 cents. Under the terms of the measure the company will be permitted to sell four tickets for 30 cents and fifteen for $1. The railway recently applied to the commission for a 10-cent cash fare with four tickets for 30 cents.

Counsel for the company, testifying at a recent hearing before the commission, declared that the company was not seeking for a return on its investment but only for revenue to meet current operating expenses. He said that the loss for the period from June 30 to Sept. 30 was about $17,000. The total deficit now approximates $204,000. Beginning on Sept. 1 last the railway increased the wages of its employees 9 cents an hour, thus adding $9,000 monthly to the operating cost. The carmen are now receiving 60 cents an hour.

Terminal Increase Sought

Indianapolis Street Railway Seeks Advance in Trackage Rates Paid by Interurbans

The Indianapolis (Ind.) Street Railway on Nov. 17 filed with the State Public Service Commission a petition for a readjustment of the rates paid by interurbans entering Indianapolis for the use of tracks and terminal facilities owned by the company. The petition does not ask for a specific increase, leaving the fixing of equitable rates in the hands of the commission.

The city of Indianapolis recently applied to the commission for authority to withdraw its petition for a service-at-cost franchise for the Indianapolis Street Railway. The railway immediately asked the commission to allow it to charge 2 cents for each transfer. The company now states that the city has indicated that it will oppose the granting of a transfer charge on the ground that the rates received by the company from the interurbans are inadequate.

INTERURBANS' TERMINAL RIGHTS

It points out that the interurbans entering Indianapolis are dealt with on equal terms, that each company has the use of the passenger and freight terminal and of certain lines of track for all passenger, freight and express cars entering the city. The petitioner points out that contracts are made with the companies under a special act of the State Legislature and with the approval of the city. The contracts are to continue in force until April 7, 1933, when the railway's franchise expires.

Attached to the petition are extracts from contracts with the interurban companies, which show that 4 cents is charged for each passenger on interurban lines, except the Broad Ripple and the Beech Grove lines. On the Broad Ripple line a charge of 2 cents is made for each passenger and a charge of 3 cents is made on the Beech Grove line. In addition 4 cents is charged for each piece of baggage for which the passenger pays transportation. The freight charges are 75 cents a round trip plus 15 cents a car-mile.

An attached statement shows the revenues from these charges totaled $310,644 in 1919 and $239,367 during the first nine months of 1920. The 1919 revenues are divided by companies as follows: Union Traction Company, $101,827; Terre Haute, Indianapolis & Eastern Traction Company, $135,727; Interstate Public Service Company, $42,386; Indianapolis & Cincinnati Traction Company, $24,143; Beech Grove Traction Company, $6,559.

The revenues received from the interurbans for the first nine months of 1920 were divided as follows: Union Traction Company, $63,406; Terre Haute, Indianapolis & Eastern Traction Company, $117,315; Interstate Public Service Company, $33,157; Indianapolis & Cincinnati Traction Company, $20,446; Beech Grove Traction Company, $5,041.

New York Commission Overruled

Interstate Commerce Commission's Order Raising Intrastate Passenger Fares Hailed as Blow at States' Rate-Making Powers

A decision of far-reaching consequence for all carriers under the jurisdiction of the Interstate Commerce Commission was handed down by that body on Nov. 18. The commission overruled an order of the Public Service Commission for the Second District of New York, refusing to allow the increase on intrastate passenger rates granted to interstate carriers under the terms of the Esch-Cummins act. The federal commission directed that passenger fares on intrastate traffic be raised to the same level as those on traffic crossing the state line. This is taken to mean that roads operating wholly within a state may charge the same rates as those engaged in interstate business. The ruling of the Interstate Commerce Commission will be immediately appealed by the New York commissions. The National Association of Railway and Utilities Commissioners is also expected to ask leave to intervene in the litigation on the ground that the power given the state commissions by their Legislatures to control public service corporations is in peril. The case will ultimately reach the United States Supreme Court.

THE opinion of the federal commission, which will soon be followed by similar decisions in cases from Illinois and other states where intrastate rates have not been raised to the level of the new interstate tariffs is expected to precipitate a great legal battle to test the right of the federal government through the Interstate Commerce Commission to interfere with the prerogative of the individual states to deal with intrastate rates. The action of the federal commission challenges the right of the states to deal with railroad rates, for it takes the position that under the provision of the new railroad act, state commissions and state laws fixing intrastate rates are subordinate to the mandate of Congress that rates shall be allowed which will yield 5½ to 6 per cent return.

STATES' RIGHTS AT ISSUE

If the Interstate Commerce Commission is sustained by the Supreme Court in this, the first decision of such a sweeping character involving a claim of broader power over the rates of roads wholly within state lines, the difficulty will be remedied which is confronting the roads in their efforts to obtain sufficient revenue to meet increased costs, without bringing the return to the roads below 5½ to 6 per cent on their investment. But if the court fails to sustain the commission and holds that those states which have failed to bring all their freight and passenger rates up to the new interstate commerce levels, were justified in such refusals, then the individual states will be able to install lower rates on traffic wholly within their borders.

Under the ruling of the federal commission, the roads in New York State will raise their intrastate passenger rates to 3.6 cents a mile, this being the level at which interstate passenger rates have been permitted by the commission for interstate passenger travel. The state commission has already granted the increases in intrastate freight traffic, except milk.

The Interstate Commerce Commission refers in its opinion to the decision in the Shreveport case, which held that it had power over intrastate commerce, so far as it affects interstate commerce. While this principle, upheld by the Supreme Court, "continues to be our guide," the commission says, it considers the New York case in the light of the fact that the commission's position has "been put in the form of a mandate" by the Esch-Cummins act. The commission holds that "most cogent reasons" for an extension of authority have been supplied by the situation in which the transportation interests of the country have been placed.

COMMISSION'S STAND EXPLAINED

The commission points out that the decisive factor in this case is "whether the rates under consideration injuriously affect intrastate commerce." It shows that Congress directed that rates be allowed which would yield 5½ to 6 per cent return on the value of the property. The commission continues:

> There can be no doubt of the power of Congress to devise and provide for carrying into effect a plan for assuring the nation's interstate railroads a fair return on the value of their property; and the full control of Congress in this matter is not to be denied on the ground that the carriers' aggregate earnings are a combining of intrastate revenue and interstate revenue.

Of passenger fares, the commission says that the record leaves no doubt as to the "unduly preferential character of the intrastate fares and charges now in effect in the State of New York." The commission says further:

> The record shows beyond question, that there are no transportation conditions in the State of New York that justify lower rates or fares on the whole than those applicable in neighboring states, or lower than the interstate rates and fares between points in New York and points in other states.

COMMISSIONER BARRETT PROTESTS

Alfred M. Barrett, Public Service Commissioner for the First District of New York, declared that the decision of the federal commission "is one of the greatest blows the doctrine of state rights has ever received." He contended that if the decision be upheld on appeal, it will be possible for the Interstate Commerce Commission to regulate any rate in the state where the claim is made, either that the railroad is engaged in interstate commerce, or that the rates of a local road are lower for a similar service than a line engaged in interstate commerce.

James M. Walker, secretary of the New York commission for the First District, and secretary of the National Association of Railway and Utilities Commissioners, also issued a statement. Mr. Walker pointed out that the ruling of the federal commission struck at the root of the states' powers.

Legislative Action Urged

At the annual meeting of the Connecticut Chamber of Commerce in New Haven on Nov. 10, recommendations regarding the state electric railway situation were made to the board of directors of the organization. The public utilities committee advised that the state chamber suggest to the Connecticut General Assembly that laws be enacted to bring about:

1. A new system of taxation for trolleys and jitneys so that all common carriers doing a similar business shall be similarly taxed.
2. Abolition of paving requirements imposed on electric railways.
3. Abolition of bridge building and maintenance requirements.
4. Supervision by municipal authorities subject to appeal to the Public Utilities Commission of jitneys as to routes, schedules and fares.
5. Authority for trolley companies to abandon certain lines which cannot hope to be self-sustaining.
6. Authority for municipalities to make service-at-cost contracts with electric railways after state appraisal.
7. Authority for municipalities to subsidize electric railways by a general municipal tax or by assessment upon property immediately benefited.

Seven Cents Not Enough

The Houston (Tex.) Electric Company, operating the electric railway system in Houston, is not earning the 8 per cent return authorized under the decree of the United States District Court that held the former fare ordinance of the city of Houston insufficient and confiscatory. This fact was disclosed by Luke C. Bradley, district manager for Stone & Webster, in a formal statement recently before the City Commission. W. E. Wood, manager for the Houston Electric Company, substantiated Mr. Bradley's statement. The company is now charging a 7-cent fare under authority of the court.

Mr. Bradley disclosed that during August the company earned 6.8 per cent on the agreed valuation, which, he said, left a deficit of $5,699 from the authorized return of 8 per cent. This means a deficit of $68,400 for the year, he said. At the same time, he declared, maintenance costs have advanced $313,000 for the year.

Mr. Bradley intimated that either the fare must be increased from 7 cents to 8 cents or possibly 9 cents, or the city must enact legislation to halt the operating of the jitneys. Jitneys have continued to operate in Houston despite all legislation directed against them, and they have cut deeply into the revenue of the railway. When the fare was raised to 7 cents, the jitneys continued to charge only 5 cents and as a result the traction company has lost many passengers. After the meeting with Mr. Bradley, Mayor A. E. Amerman told the City Commission that the jitneys must be restricted.

Commission Backs Railway Against Buses

Connecticut Board Upholds Right to Suspend Service If Competition Continues—Cars Run in Waterbury Pending Settlement

The question of whether the Connecticut Company may legally withdraw service from any city in the State because of jitney competition, came before the State Public Utilities Commission for decision at a hearing in Hartford on Nov. 23. The commission had intervened to halt the summary suspension of trolley service in Waterbury on Nov. 17. Following the hearing the railway agreed to continue service in Waterbury for a period of not more than ten days pending action by the city authorities looking to the removal of bus competition. Richard T. Higgins, chairman of the commission, indicated that, unless the city took steps to regulate the jitneys, the utilities board would not oppose the withdrawal of the electric cars. Chairman Higgins declared that "a regulatory body is not warranted in compelling a utility to continue to supply service at an absolute loss."

LUCIUS S. STORRS, president of the company, presented data to the commission showing that the company had suffered a loss in the operation of its Waterbury division totalling $1,146,215 for the entire year of 1919 and the first ten months of 1920. The loss for the ten months of this year was $31,348 more than the total loss for 1919. This total loss for the twenty-two months includes an item of $902,475, the 8 per cent return on the investment. The daily average passenger receipts during November show a continual decrease as the month progresses. The week ending Nov. 5 averaged a daily income of $809 or 18½ per cent less than the receipts for Nov. 1.

JITNEYS CAUSE BIG LOSS

President Storrs told the commission that it was the desire of the trustees to bring to a head in the state the whole question of jitney and trolley competition before cold weather. The company wanted to obtain from the cities of Connecticut an answer to the question of whether or not the jitney should be permitted to run on streets served by trolleys. It was for this reason that the order for withdrawal of Waterbury service was issued last week, Mr. Storrs asserted.

Mr. Storrs summed up the case for the Connecticut Company in the following statement:

For the period beginning with the day 7-cent fares were collected and extending to the day the original ordinance was made effective the average daily revenue was $3,923 on the whole division. For the period in which the 7-cent fare was collected and the jitneys under regulation the daily average was $4,137, an increase in revenue during that period of the year when earnings are falling off from the higher summer receipts. For the one day the 10-cent fare was collected with full jitney regulation the receipts were $4,372 or $449 per day more than during the summer. Since the jitneys have been fully operating the receipts have averaged but $3,762, or $610 per day less than Nov. 1 and about $160 less than during the summer.

As the summer revenues were not enough to pay for operations at that time it is clear that lower receipts at the period of higher costs will not permit long continued operation. It has, therefore, been necessary to bring the issue to a conclusion now rather than wait for the mid-winter period, when the street car service is so much more necessary and have it fail at that time due to lack of funds.

Chairman Higgins, in outlining the views of the commission, said:

Possibly at this point the commission would make a suggestion, which is only a suggestion. Some question might arise in this case as to the ultimate jurisdiction of the commission, which we hope will not arise or that the occasion will not arise to bring it up. The commission has already assumed jurisdiction over the subject matter. Having done so we make this suggestion, but first I want to state that the compelling by a state tribunal of a utility company to render service must of necessity depend upon the return to that company being sufficient to warrant its operation. In other words, no tribunal can compel a utility commission to continue service at a continuing loss.

On the other hand this company is chartered to render service in Waterbury and the surrounding territory. The importance of that service to Waterbury and connecting communities is without question. If possible the service ought to be continued. The city of Waterbury passed an ordinance recently which it claims is a restriction upon the jitney competition. The company does not think it is a proper restriction. The ultimate result of that ordinance is not yet known.

FURTHER TRIAL ASKED

Therefore the commission suggests that the company for a limited time continue its operation under the new ordinance, and, if by virtue of jitney competition it is unable to receive sufficient revenues to warrant its operation, then that a request be made either through the commission or directly from the company—the commission will be willing to act as intermediator in the matter—upon the city of Waterbury for further restriction of jitney competition.

If this is ultimately brought about then it may result in continued street railway service, at least until some possible permanent remedy or regulation may be prescribed by the incoming Legislature. If the losses to the company are going to continue under the ordinance and the city would not make any change we will not pass upon the question other than to say that under the laws pertaining to regulation a regulatory body is not warranted in compelling a utility company to continue to supply service at an absolute loss. This is informally expressed, but the thought is that possibly the company and the city might get together under an arrangement whereby the company shall for a limited time continue service under the ordinance which goes into effect today and see what the result will be, and if that result is not satisfactory to see if some other ordinance may not be passed.

EFFECT OF 10-CENT FARE

To show the effect of the 10-cent fare the company has offered the following figures of gross revenue on the Hartford division of the company's lines. In connection with these statistics it is to be remembered that the 10-cent fare went into effect on Nov. 1 but that the jitneys continued to operate until Nov. 8 as indicated by the increased revenue since Nov. 8. The table follows:

Oct. 1-10	$95,835
Oct. 11-17	64,425
Oct. 18-24	65,257
Oct. 25-31	63,434
Total	$288,954
Daily average	9,321
Nov. 1-7	70,710
Nov. 8-14	73,316
Total	$149,026
Daily average	$10,644

Meanwhile the city of Waterbury is without jitney service. Following the passage by the Board of Aldermen of an ordinance barring the buses from certain streets, the operators withdrew their cars, announcing that no buses would run until the measure had been repealed. They intimated that if further restrictions were imposed by the city they would seek an injunction to restrain the municipal authorities from interfering with their "right" to operate where they chose. The ordinance passed by the Aldermen on Nov. 15 failed to exclude the buses from certain streets containing trolley tracks.

St. Joseph Rate Case Followed Closely

Public utility companies at Kansas City, Mo., are watching carefully the developments in the St. Joseph Railway, Light Heat & Power Company's rate case, in which the method of valuation by the Missouri Public Service Commission is the cause of an injunction restraining the commission from enforcing an order increasing fares.

While attorneys are inclined to agree that the Federal Court cannot fix rates, there is much discussion of the power of the court to allow a utility to charge more than permitted by the commission, such increases to be within reasonable limits—the limits possibly to be set by the Federal Court.

A case is pending affecting a water company, in which the Federal Court set a limit of charges higher than those allowed by the commission. This is in the matter of the Missouri Public Utilities Company, a concern with headquarters at St. Louis, owning and operating many utilities; and affects its Webb City water service property.

The company filed revised schedules with the commission, involving higher charges. The commission "suspended" these. The company sought an injunction against such suspension, and the injunction was granted. The hearing produced evidence and testimony regarding the need for larger revenue, and the petition specified the rates that had been filed with the commission. The order of the court, therefore, put into effect the higher rates. The ruling directly provided that no rates higher than those specified should be charged. These higher charges have been collected since June 29, 1920, without opposition from the commission.

"Safeties" for Springfield

The first of seventeen one-man safety cars to be installed by the Springfield (Ill.) Consolidated Railway has arrived in Springfield and the other sixteen are expected to arrive soon. They were purchased at an expenditure of $117,000. According to announcement of the management the adoption of these new cars will result in no reduction of the present working force, but will reduce the present twelve-minute schedules to one of ten minutes.

Transportation News Notes

Ten Cents on Another Line.—The Maine Public Utilities Commission has authorized the Fairfield & Shawmut Railway, Fairfield, to raise its fare from 7 cents to 10 cents. The commission has directed the company to permit school children riding to and from school to continue to pay the 7-cent fare.

Wants More in Walla Walla.—The Walla Walla Valley Railway, Walla Walla, Wash., has filed with the State Public Service Commission a new schedule of rates, under which it proposes to raise its fare from 5 cents to 10 cents, beginning Nov. 20. The company proposes to charge a 10-cent fare in each of the zones into which its line is divided.

No Decision on Albany Fares.—The Public Service Commission for the Second District has taken under advisement the petition of the United Traction Company, Albany, N. Y., for an increase in fare to 10 cents. At the final hearing before the commission, witnesses for the company testified that the total replacement valuation of its property was $18,646,195.

Ten Cents in New Albany.—Effective Nov. 1, the new fare charged by the Louisville & Northern Railway & Lighting Company and the Southern Indiana Traction Company, both of which operate between New Albany, Jeffersonville and Louisville, was raised to 10 cents. Protests against the increase were filed with the Interstate Commerce Commission. The new schedule will abolish the book-buying privilege.

War Veterans Pay Less.—Disabled war veterans taking vocational training in or near Seattle, Wash., will in the future be permitted to ride for a 3-cent cash fare on the lines of the Seattle Municipal Railway. The Seattle City Council recently voted to allow such men to ride at the same rates as those charged to school children. By buying tickets they may have two rides for 5 cents. There is no restriction as to hours during which the reduced fares will be in effect.

Six Cents in Each Zone.—The Massachusetts Department of Public Utilities has authorized the Berkshire Street Railway, Pittsfield, to raise its fare from 5 cents to 6 cents in each zone, except on its Lenox Branch where a 10-cent fare has been approved. C. Q. Richmond, general manager of the company, recently informed the commission that the railway must have an immediate increase in revenue if it was to continue operation. The new rates have already gone into effect.

Would End Skip-Stop.—An organization of citizens of Fort Worth, Tex., known as the non-partisan league, has started a campaign for the elimination of the skip-stop system on the local lines of the Northern Texas Traction Company. At a recent meeting the league passed resolutions calling upon the City Commission to take action looking to the improvement of the service furnished by the railway. The company recently raised its fare from 6 cents to 7 cents.

Mr. Jackson on Zone Fares.—Walter Jackson has an article on zone fares for electric railways in the *National Municipal Review* for 1920. He urges that the zone fare is not the dominant cause of congestion in cities, comparing cities with high population density where the unit fare prevails with cities of low population density where the zone fare is in use. In conclusion he says that the spirit of scientific research of merchandising service and of the relation of transportation to community welfare must be studied by the managements of today as it never was by their predecessors in the carefree period of electric railway development.

Needs More in Spokane.—The Washington Water Power Company, Spokane, Wash., will have to raise the fare on its Spokane city lines if it is to continue to furnish service of the present quality. Announcement to this effect was made by the officials of the railway in making public the cost of operating the system for October. The net revenue for the month totaled $2,188, a decrease of $3,865 compared to that for October a year ago. This was in spite of the fact that the number of passengers increased by 131,203. The company has been operating at a loss for several months. The fare is now 6 cents.

Disputes High Fare Claim.—In answer to the complaint of patrons on its Holliday line that the present fare from Salt Lake City to Holliday is excessive, the Utah Light & Traction Company, Salt Lake City, Utah, denies that the fare is unjust or excessive. The company points out that the round trip covers a distance of 19 miles for a charge of 37.5 cents, or at the rate of 2 cents a mile, which is lower than that exacted in other localities. The average length of ride on the system is about 2 miles, for which 3⅛ cents per mile is paid. The company further claims that the Holliday territory is sparsely settled, and that this rate does not bring an adequate return.

Service Cut Approved.—Judge Julius M. Mayer, in the United States District Court, has granted an injunction to Lindley M. Garrison, as receiver of the Brooklyn (N. Y.) Rapid Transit Company, prohibiting the Public Service Commission, First District, from taking steps to compel the restoration of service on various trolley lines in Brooklyn that have not been operated since the recent strike. The injunction, as served upon Commissioner Alfred M. Barrett, is similar to the one that was served some weeks ago upon his predecessor, Lewis Nixon. The last of the company's striking employees have voted to return to work.

Mayor Asks Aid for Railway.—A special committee has been appointed by Mayor Freeman of Springfield, Mo., in an attempt to solve the Springfield traffic problem arising out of the controversy between the Springfield Traction Company and the jitneys. Bus lines were established in Springfield during the carmen's strike three years ago. The public appears to have acquired the jitney habit to such an extent that although the traction company has obtained a 7-cent fare it is said to be losing between $4,000 and $5,000 monthly. Recently the jitney lines established a universal transfer system. Railway officials say that unless something is done to relieve the company of the jitney competition street railway service may have to be suspended.

More Cars for Holiday Crowds.—By placing all available rolling stock in use and by keeping the number of cars in the shops and carhouses at the very minimum for emergency needs, the Los Angeles (Cal.) Railway has been able to add eighty cars to handle the Christmas holiday season travel. The first additions to service were made early in November and in some cases will be maintained permanently. The railway, co-operating with merchants' organizations, appealed to the public through the newspapers advertising for early Christmas shopping. It was pointed out that street congestion in Los Angeles and the heavy influx of people together with the extra holiday travel made the need for even distribution of traffic more important than ever. Shoppers were urged to make purchases in the downtown section between the morning and late afternoon rush hours.

Service at Cost Favored.—The Indiana Service Corporation, Fort Wayne, Ind., which operates the city line in Fort Wayne and a number of interurban lines radiating from that city, is compiling reports on the first sixty days' operation under a 7-cent fare. During September half of the month was on the old basis of 5-cent fares and half on the new rate. The month showed a total revenue of $73,256 with operating expenses of $56,265. During the month of October 1,218,052 passengers were carried, while in the same month of last year the number of passengers carried was 1,201,537. The revenue for October of this year was $79,851. Officials of the company are fairly well satisfied with the results of the new fare, but are of the opinion that a better plan is the service-at-cost method. They are said to feel that there is a probability of its being adopted. The Indiana Public Service Commission granted the company permission to charge 7 cents for a period of sixty days. It is considered certain that upon the submission of reports by the company at the end of this period the commission will extend the time during which the company can operate on a 7-cent basis.

Personal Mention

George H. McFee Promoted

Arthur E. Stone, general manager of the Boston & Worcester Street Railway, Framingham, Mass., has resigned to take a responsible position with Gilmour, Rothery & Company, insurance brokers, of Boston and New York. Mr. Stone will continue to act in an advisory capacity for the railway and as treasurer of the Boston & Worcester Electric Companies.

George H. McFee, superintendent of transmission, has been appointed general superintendent of the Boston & Worcester.

F. C. Lewis has been made general freight and passenger agent. Mr. Lewis was formerly general freight agent of the railway.

L. J. Miller has been appointed chief engineer in charge of track, line and power. Mr. Miller was formerly roadmaster of the system.

Mr. McFee gained his early experience in the transportation field with a steam road. From 1894 to 1901 he served as telegraph operator and train dispatcher of the Boston & Maine. He then joined the Boston Elevated Railway as a tower-man on the elevated division. He became connected with the Boston & Worcester Street Railway shortly after the opening of that road in 1903. In 1913 he resigned to enter the employ of the United Fruit Company in Panama. Four years later he returned to the Boston & Worcester, assuming the position of superintendent of transportation. He is a Canadian by birth.

J. J. Kress, Superintendent

John J. Kress, formerly general manager of the Arkansas Southwestern Railway, has been appointed superintendent of the railway department of the Pine Bluff Company, Pine Bluff, Ark. Mr. Kress retired from steam railroading a number of years ago. Entering the banking business at that time, he helped to organize the Merchants & Planters Bank in Arkadelphia, Ark., and was for a number of years vice-president of that institution. He also served as Mayor of Arkadelphia for several years.

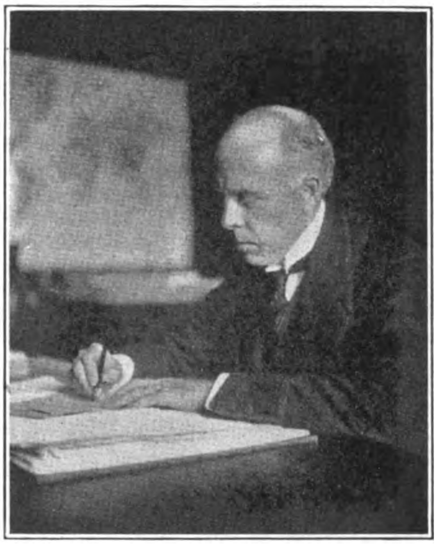
Mr. Kress was born on June 18, 1856, at Starkey, N. Y. He entered railway work in 1872 as an agent with the Pennsylvania Railroad. Six years later he was made assistant dispatcher of the same road, but resigned shortly thereafter to become superintendent of telegraph and chief dispatcher of the Ohio Southern Railway. From 1883 to 1886 he served as chief dispatcher and trainmaster of the Cleveland, Lorain & Wheeling Railway and the Pittsburgh & Western Railway.

In October, 1899, he became general superintendent of the Texarkana, Shreveport & Natchez Railway. He was appointed general manager of the Arkansas Southwestern Railway in 1901, resigning ten years ago to enter private business.

Lord Ashfield's Views

Chairman of London Underground Discusses Transportation Problems Before Institute of Transport

Among the numerous organizations that have been formed in Great Britain as a result of the war, focusing attention more directly upon the commercial and industrial problems of the day, is the Institute of Transport. This organization was established in 1919, "to promote and encourage knowledge of transport science in all its branches, and the means and appliances connected therewith; and to provide facilities for the study of and exchange of information and ideas on traffic problems and all means and methods of transport."



LORD ASHFIELD

The first president of the Institute was Sir Eric Geddes, the British Minister of Transport, who has been succeeded by Lord Ashfield, the chairman and managing director of the London Underground Railways and formerly, as A. H. Stanley, manager of the Public Service Railway of New Jersey. During the war Lord Ashfield occupied a post in the British cabinet as President of the Board of Trade.

The first meeting of the 1920-1921 session of the Institute was held in London on Oct. 18 last, when Lord Ashfield delivered a very instructive and comprehensive address upon the importance of transport in the welfare of mankind and on the need for promoting the higher education of the administrative staffs of transport undertakings. According to Lord Ashfield, transport has rendered practicable that specialization of function which is at the bottom of the success of the material progress of mankind. Thus, Greater London can support a population of more than 10,000 and Greater New York of more than 17,000 to the square mile, because the inhabitants can be fed by distant agricultural workers.

Transport, he said, was not a science so much as the practical application of many sciences to the solution of a special problem. There entered into it engineering in all its branches, economics in their most liberal extension, statistics and the imaginative treatment of figures, psychology in its modern social applications. Up to but recently only little attention had been given to studies leading up to a special understanding of transportation problems. This was the purpose of the Institute of Transport.

Part of its scheme, continued the speaker, was to provide for lectures, the holding of classes and examinations, the award of certificates, medals, scholarships and diplomas in connection with traffic and transportation. But education in this line was never finished. It was not once or twice that one needed the provocation of an altered post, a new position. It was throughout life, if one should seek to come out at the top and be a leader in transportation.

Frederick S. Pratt, superintendent of the Springfield (Vt.) Electric Railway, has been appointed auditor of the company. Mr. Pratt will continue to serve as superintendent.

E. S. French has been elected president of the Springfield (Vt.) Electric Railway. Mr. French succeeds Edward C. Crosby. The company is now in the hands of a receiver.

J. B. Moran has been elected president of the Escanaba (Mich.) Traction Company to succeed the late John J. Stack. Mr. Moran has been identified with the company for several years.

Edwin F. Zuehlke, superintendent and electrical engineer of the Escanaba (Mich.) Traction Company, has been appointed general manager of the company. Mr. Zuehlke succeeds P. L. Utley, deceased.

Frederick M. Abbott, who has been special investigator and safety inspector for the Public Utilities Commission of Utah for the past three years, has tendered his resignation. Mr. Abbott, in addition to his investigating work, has had charge of enforcing the commission's rulings with regard to general safety conditions. His work has attracted the favorable attention of the claims departments of some of the larger railroad lines and he has received several offers of positions with them. He has not yet announced his future plans.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Stocks of Poles, Crossarms, Etc., Good

Pole Buying Has Been Quite Heavy and Better Conditions Are Looked for This Winter in the Woods

Crossarm stocks have built up to the extent that plentiful supplies are on hand in local Mid-Western yards. Coast yards, it is reported, can make immediate shipment in any reasonable quantity. Certain jobbers are promising three weeks' delivery. There is not very much movement of crossarms around the Chicago territory, but in the neighborhood of St. Louis they are moving fairly well.

The season for pole buying is ending with a heavy demand in the Northern territory, which has been well taken care of. Stocks now, though, are very low. Farther south jobbers are having some difficulty getting the right kind of cars in which to ship poles, their stocks in yard are good and demand is falling off as the season advances. At the same time indications point to a good labor supply in the woods this winter and ample supplies at perhaps lower figures next year.

Base prices at mill of poles are quoted in St. Louis at from $11.35 on Western cedar 8-in., 40-ft. to $20 on the Northern white cedar 8-in., 40 ft. size. Locust pins are quoted there as follows: 1½ in. x 9 in. $60 per 1,000 in lots of 5,000, and the 1¼ in. x 8 in. pins $30 per 1,000. Large stocks are being reduced with difficulty.

Easier Market on Bolts, Nuts and Spikes

Slack Demand and Cancellations Have Reduced Back Orders—Tendency of Prices to Weaken

Since the market conditions reported a few months ago on track bolts, nuts and spikes, to the effect that demand was heavy and manufacturers far behind on filling orders, the market has taken a complete reversal of form. The steam railroads following their rate increases were especially heavy buyers of this class of material during the fall. Exceptionally mild weather and an easier supply of common labor were factors in the large amount of track material consumed.

At present, even though this is normally the dull season in this line, conditions have probably eased up more than ordinarily. Cancellations are reported numerous, especially in the bolt industry and from foreign consumers too. Demand, both domestic and foreign, has slumped badly, in the latter case largely due to a continuance of unfavorable exchange rates. Manufacturers of bolts, nuts and spikes are just now catching up with their back orders, however, and no surplus stocks have accumulated as yet.

Favorable conditions in the raw material and labor markets are leading to heavier production. Deliveries have greatly improved. Shipments of bolts, which last summer were ranging as long as six months, can now be obtained in one to two months on the standard sizes and spikes can be delivered in two to four weeks. Some softening of prices has occurred on bars, but on the finished product, while a slight shading of the level of independents is reported, there has been no decided change in price. A further price trend is largely dependent upon labor and raw material prices, in the case of spikes more directly upon the latter and with bolts more directly upon the labor costs. A representative independent's price at present on standard railroad spikes, 9/16 in. x 5½ in., is 4½ cents in car lots and 5¼ cents in smaller quantities. On track bolts the quotation is 6 cents in car lots and 7 cents in quantities less than that.

The outlook for 1921 business is held to be excellent because of the fact that both electric and steam lines have not yet entered the market nearly as heavily as their needs for track material would seem to require.

Big Demand for Rails Foreseen in 1921

Present Buying Curtailed by Price Uncertainties and Level of Foreign Exchange—Production Increasing and Deliveries Improved —Prices Not Yet Set

Domestic buying of steel rails, while not extra large at present, is said to be about average by several producers. Orders for 1921 are being placed, with price to be set later when the schedule for 1921 is announced, which is expected to be some time in December. Foreign demand, both from electric and steam railroads, is not up to standard.

A survey of the situation reveals the fact that inquiries from abroad are many, but actual orders placed are few. This indicates that the need for rails in foreign countries is strong, but adverse factors are holding up buying. Chief among these is the present foreign exchange situation, which makes it very expensive for consumers in other countries to buy in the United States. Furthermore, electric traction companies abroad are said to have suffered even more severely from depressing war conditions than those in this country, with a consequent curtailment of buying power.

These circumstances, it is hoped, will be improved next year. Certainly all present indications seem to point to one of the biggest buying years in the rail business for both foreign and domestic trade. In fact, it is pointed out that the known rail requirements of electric and steam roads in this country for 1921 are sufficient in all probability to curtail greatly the tonnage available for export shipment. Thus far the buying of steam railroads has not been up to expectations following their general rate increases three months ago.

A considerable number of unfilled orders for rails is reported on hand and in several cases there is quite a large tonnage awaiting shipment. Back orders are rapidly being reduced, however, and the recent order of the Interstate Commerce Commission releasing more gondola cars to general service is expected to aid considerably. Independent mills are still booked ahead with rail orders sufficient to carry them well beyond the first of the year. Production conditions have been steadily improving and as a result deliveries can be made in much better time than a few months ago. Chief among the factors bringing this about are decreased demand in many iron and steel lines, a better labor supply, with increased efficiency of workmen, due to the salutary effect of men being released, and less transportation difficulty in obtaining raw material. Considerable complaint is still heard of the fuel supply, however.

PRICE SCHEDULES UNCERTAIN

No rail prices, so far as can be learned, are definitely outlined for 1921, and this uncertainty is undoubtedly reflected in the buying market at present. A representative independent producer reports having accepted some orders for standard rails at $57 per ton and rumors are current of other quotations being made at $62, but these prices merely indicate the probable trend. The opinion is given from an authoritative source of information that the future level of independents' prices, when set, will not represent much change from the market level in the recent past.

The statement of Judge Elbert H. Gary, chairman of the board of the United States Steel Corporation, to the effect that base prices on products of the corporation will remain unchanged at this time unless changes become necessary to conform to altered conditions, has aroused considerable speculation as to whether this policy will be adhered to on rails. In several quarters is heard the view that the present corporation level of $45 per ton for standard bessemer and $47 for open hearth rails will be revised upward for 1921 to conform to increased costs of production. The present corporation prices on rails are the base selling prices mutually suggested by iron and steel interests with representatives of the United States government in March, 1919. The independent producers have gradually drifted further and further away from that level.

Linemen's Tools Becoming Available

Needed Labor and Raw Material Now Back in Market—Sixty to Ninety Day Delivery Anticipated

Jobbers and others who have been discouraged by their inability to get linemen's tools except on deliveries of from twelve to eighteen months will be able to get pliers in sixty to ninety days by January or February of next year, according to the estimate of one of the foremost manufacturers of this line. The war cut off the foreign supply of these tools, and the necessary skilled labor became so scarce that up to a few months ago the manufacturers of linemen's tools were getting further and further behind with their orders.

Pyramided orders have been canceled and all the needed labor and material have been obtained, so that the delivery not only on pliers but on connectors, climbers, etc., is being gradually reduced. This is especially true of climbers, which are intermittently obtainable from manufacturers' stocks.

Buying of Cattle Guards Curtailed by High Cost of Steel

Sales of cattle guards are not especially heavy at present. The volume of buying on the whole, it is stated, may still come up to the standard of other years, however. Ordinarily the installation of cattle guards by interurban lines is large at this time of year. Farmers take advantage of the additional grazing space afforded by the harvesting of crops and allow their cattle greater freedom in grazing, up to the time snow flies. Consequently, more protection is needed along rights-of-way. With the high cost of the special steel sheets from which guards are fabricated, however, both electric and steam roads have been holding off buying to some extent. Recently, it is true, steam roads have been buying cattle guards more briskly, possibly as a result of their improved financial condition, but this circumstance has not affected the supply materially. One manufacturer who specializes in Central and South American trade has been very successful in placing American products and reports good sales.

Some traction companies have adhered to wooden guards because of their lower cost, but these have been found less effective in operation. Even on the wooden product the price has been very high because of the great cost of lumber. In comparison with the number of steel guards placed in operation, the total of wooden guards used is said to be small. Raw material is apparently occasioning no trouble and manufacturers maintain a surplus supply sufficient to care for the needs of all customers. Deliveries are reported as satisfactory.

Buying of Electric Headlights Has Been Good

Better Deliveries Now With Improved Labor and Raw Material Conditions —Demand Slackening Recently

Manufacturers of electric car headlights report a very substantial increase in buying over last year on the part of electric railways, ranging as high as 100 per cent in some cases. The replacing of the old type metal reflectors on street cars and the large numbers of new safety cars that have been equipped with headlights are said to be strong factors in the demand. During the past few weeks, however, producers have been finding the market falling off, orders in some cases being as plentiful in number but much smaller in the quantity of headlights bought. Lamp manufacturers have felt the increase in new electric headlight installations this year, as evidenced by the increasing sales of incandescent lamps of this type reported by a leading producer.

Production conditions have gradually improved since midsummer, when transportation congestion and material shortages curtailed the supply of raw material with some manufacturers as much as 50 per cent and caused deliveries to range as long as eight to ten weeks. Labor troubles that were experienced, especially in the foundry field, now seem to be past, raw material in general is coming through nicely, and though deliveries vary all the way from almost stock shipment up to six or eight weeks' time, back orders are being steadily cut down.

Prices are steady, according to manufacturers, with no early reduction apparently contemplated. Recently, as a matter of fact, some talk was heard of a possible advance in quotations on the 1921 product, depending upon the trend of labor and material costs, which have been high. An encouraging view is taken of the prospects for future business in the electric headlight field, as it is hoped that current fare-rate increases will have their effect upon equipment buying, and that steam roads too will order substantially. In fact the electric headlight buying of steam railroads is said to have been far larger than usual of late.

Present Cost of Materials Compared With 1915

An interesting comparison of the cost of materials used by a public utility between July 1, 1915, July 1, 1918, and July 1, 1920, was brought out in a recent hearing before the Railroad Commission of Georgia. The accompanying table includes the costs of materials which were recognized by the commission as greatly increasing operating expenses over pre-war times.

COSTS OF COMMODITIES AND MATERIALS
F.O.B. ATLANTA

	1915	1918	1920
Coal, per ton...........	$2.56	$5.01	$11.80
Gas oil, per gal..........	0.046	0.091	0.14
Copper, per lb..........	0.23½	0.27½	0.24½
Steel wire, per lb........	0.024	0.037	0.039
Standard poles, each, set.	10.50	14.00	20.00
Crossarms and brackets..	0.58	0.94	1.67
Yellow pine lumber, per 1,000 ft..............	16.00	34.00	55.00
Insulators..............	0.95	2.24	2.80
Creosoted ties, each.....	0.69	1.07	2.02
Cement, per bbl.........	1.25	2.18	4.50

Coal Shortage Still Serious Condition with Many Utilities

Despite a gradual improvement in the general coal situation many public utilities are in very bad condition. This is particularly true of those dependent on the gas-coal region served by the Louisville & Nashville Railroad and those using Monongahela gas coal. Utilities drawing their supplies of coal from the central Pennsylvania region are now getting better deliveries.

Rolling Stock

The Detroit (Mich.) Municipal Railway, mentioned in the Nov. 13 issue as placing an order for twenty-five safety cars, has let the contract for the cars at a cost of $6,745 each. General Electric motors and Westinghouse airbrake and safety equipment will be used.

The Northern Texas Traction Company, Fort Worth, Tex., has received the thirty-five safety cars recently ordered, and these have been placed in service. Purchase of these cars was one of the improvements in service promised by the company when it increased fares from 5 cents to 6 cents.

Recent Incorporations

Union Traction Company, Morgantown, W. Va.—The Union Traction Company has been chartered. The capital stock is $50,000. The incorporators are: James H. McGrew, Aaron J. Garlow, David H. Courtney, Frank Cox and George C. Baker, all of Morgantown. The charter authorized the company, in addition to maintaining an electric railway, to sell artificial gas, generate electricity and maintain water works in the city of Morgantown.

Track and Roadway

Detroit (Mich.) United Railway.—The Detroit United Railway has opened a new extension in the city of Pontiac known as the Sanford-Huron line.

Indianapolis (Ind.) Street Railway.—A comprehensive improvement plan for 1921 for the Indianapolis Street Railway has been outlined by the Board of Public Works which would require the expenditure of several million dollars. Several lines are to be rebuilt, among them the Shelby, Prospect and Virginia Avenue. In addition a new power plant and several substations are needed in various parts of the city. These would cost about $700,000.

Atlantic City & Shore Railroad, Atlantic City, N. J.—The City Commission has refused permission to the Atlantic City & Shore Railroad to build a loop at Boston and Atlantic Avenues, Atlantic City. The company has presented a petition to the commission asking permission to build a loop on Providence Avenue.

Northern Texas Traction Company, Fort Worth, Tex.—The Northern Texas Traction Company is constructing a single-track line on Commerce Street from Sixth to Weatherford. When this line is completed some of the cars now routed on Commerce Street will be rerouted via Weatherford, which will relieve the congestion of traffic on Commerce. George H. Clifford, general manager, reports material on hand to complete this line.

Dallas (Tex.) Railway.—The Standard Traction Company, which owns and operates a shuttle car line connecting with the line of the Dallas Railway, proposes to turn over the Mount Auburn line to the Dallas Railway. Last July the equipment of this line was offered to the Dallas Railway with a cash bonus for the construction of a new line to Mount Auburn, but the matter is still open. The Standard Traction Company, through its president, has announced that a considerable saving in the cost of electric power would be the result of the railway taking over the line.

Power Houses, Shops and Buildings

Northern Ohio Traction & Light Company, Akron, Ohio.—The Northern Ohio Traction & Light Company contemplates building an $18,000,000 to $20,000,000 power plant to supply the demand for industrial power in northern Ohio. Construction of the plant, however, is held up for the present because certain industries in Akron are undergoing important readjustments and until these are completed the Northern Ohio Traction & Light Company will not have signed up all the contracts necessary for the starting up of this construction. An option has been secured upon a site for the plant, which according to present plans will have an initial capacity of 120,000 kw. and will form part of a loop of power plants serving northern Ohio industries. The site of the plant is on the Muskingum River near Coshocton, Ohio, and was selected because of the proximity of coal and water supplies.

Trade Notes

The Black & Decker Manufacturing Company, Baltimore, Md., manufacturer of electric drills, etc., has awarded contract for the construction of a one-story machine shop, to cost about $50,000.

W. S. Quigley, president of the Quigley Furnace Specialties Company, New York City, has just returned from Europe after an extensive trip made in connection with large installations of the Quigley powdered-coal system in Italy and Belgium.

The Ohio Grease Company, Londonville, Ohio, announces that R. W. Beardsley has been elected treasurer. The capital stock has been increased from $250,000 to $500,000 and a large addition to the factory has been finished which will triple the capacity.

Belden Mfg. Company, Chicago, Ill., manufacturer of electrical wires, cable, etc., through the action of its stockholders has rescinded the increase in capital stock from $2,000,000 to $4,000,000 that was recently granted and has voted to increase the capitalization to $3,000,000.

The Economy Electric Devices Company, Chicago, Ill., has made a complete installation of watt-hour meters on the eighty cars of the Buffalo & Lake Erie Traction Company in Erie, Pa. These meters will be supplied with the special dials for inspecting equipment on the kilowatt-hour basis.

The Economy Fuse & Manufacturing Company, Chicago, Ill., announces that C. B. Merrell, who has been for a number of years in the general offices of the company, has been appointed district sales manager of the Philadelphia office, 523 Widener Building, vice E. J. Watson, resigned.

The Mason Regulator Company, Dorchester Center, Boston, Mass., has recently made a $150,000 addition to its pressure regulator factory, permitting the permanent housing of machinery which has been operated in wooden buildings during and since the war.

The Conveyors Corporation of America, Chicago, Ill., formerly the American Steam Conveyor Corporation, has appointed the J. B. Engineering Sales Company its Connecticut sales agent. The latter is also sales agent for the Terry Steam Turbine Company and the Griscom-Russell Company in Connecticut.

The Moloch Company, Kaukauna, Wis., recently incorporated with a capital stock of $750,000 to take over the plant and holdings of the Moloch Automatic Stoker Company, has awarded contracts for the first unit of its machine shop and erecting floor 60 ft. x 120 ft. Considerable new equipment will be installed.

Fairbanks, Morse & Company, Chicago, Ill., have purchased the entire business, consisting of all stock on hand, goodwill and liabilities, of the Luster Machine Shop & Railway Equipment Company, 917 Arch Street, Philadelphia. The Fairbanks-Morse company has opened a new branch at this address under the management of D. W. Dunn and will sell its complete line of engines, motors, pumps, etc. The entire personnel of the Luster Machinery Company has been retained by the new company.

E. T. Chapin Company, Spokane, Wash., announces the appointment of J. E. Slimp as manager of sales of the district including all of the United States and Canada east of the Dakotas and Winnipeg. Mr. Slimp's headquarters will be at 127 North Dearborn Street, Chicago. The Chapin Company is a large manufacturer of Western red cedar poles, piling and posts. Mr. Slimp has been selling supplies and equipment to power and electric railway companies for the last twenty years and is well known in the district to be covered by his office. He was connected with the Ohio Brass Company for a number of years.

Clifford F. Messinger has been appointed general sales manager of the Chain Belt Company, Milwaukee, to succeed L. C. Wilson, who has resigned to become secretary of the Federal Malleable Company. Other promotions announced are: C. E. Stone, assistant to the vice-president, and J. A. Monahan, purchasing agent. Mr. Messinger, for the last two years assistant to the vice-president, is a graduate of Yale and has been connected with the Chain Belt Company since 1911. Recently he was elected chairman of a group of nationally known construction machinery manufacturers associated for the purpose of developing export business.

New Advertising Literature

Commutation.—Bulletin No. 516 on "Commutator Troubles and Their Elimination," has just been issued by the Baylis Company, Bloomfield, N. J.

Gas Engines.—The C. & G. Cooper Company, Mount Vernon, Ohio, has issued a forty-page bulletin on its horizontal double-acting, four-cycle, single and twin tandem types of gas engines.

Oil Engines.—The De La Vergne Machine Company, foot of East 138th Street, New York City, has recently issued bulletins Nos. 176, 177-5, M-5-19, 178 and 153-No. 40, describing and illustrating its different types of oil engines for power plants, etc.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

Volume 56 New York, Saturday, December 4, 1920 *Number* 23

Our Films Must Entertain—Not Preach

THE round-table discussion now going on in our columns on film publicity, scenarios and distribution is, for the most part, an encouraging indorsement of our suggestion that the "movie" be used to reinforce railway publicity work. It is rather a pity that electric railway endeavor in the use of this all-pervasive medium of publicity and propaganda has been so very limited. Safety films were the earliest to get some circulation, and they were most effective. The safety-car picture was the first attempt to use the film in a national way, yet this film was considered by many operators to have too much "love interest" in it. For all that, a film that has some "love interest" is the one sure magnet to draw the public.

In any case, all electric railway films except one or two that we have seen have been obviously "preachy" in character. It is a cruel fact that people don't like to be preached to, and they become restive whenever a downright educational celluloid, such as "Snowshoeing in Siberia" or "Making Codliver Oil at Lofotem," reels beyond a few hundred feet. If they feel that way about the strange and distant, we must give them something well-sugared indeed when the familiar, commonplace electric railway is to be "put over." It must be a film "story" first and contain information incidentally.

The motor-truck people have sponsored such a lot of good pictures that we shouldn't be ashamed to study and emulate, if not imitate, their clever methods. The following account of one film which we paid real money to see on Broadway, and which we enjoyed, too, will explain without any preachments on our part what we have in mind:

Sam Mucilage has evolved a motor truck that can do anything, apparently, except sign contracts for its sale in large quantities. He has a dozen trucks or so on hand with no takers. Finally, he has no use for his beautiful daughter's sweetheart because the latter is more fond of driving racing automobiles than demonstrating motor trucks. It's the night before Christmas when word is flashed to town that the waters of the great dam in the mountains are ready to flood the valley. Our racing hero leads a cavalcade of Mucilage Motor Trucks through a most terrifying ordeal of bad roads, stiff grades and tropic rainstorms. Of course, he arrives with the dynamite, etc., just in time to rescue the dam and his sweetheart, who is at a mountain party. Both trucks and suitor have made good. Father gets that long-sought-for order from the Pink Pickles Company. Everybody is happy, including the audience, which goes away with this psychic complex in its mind: "Rotten roads; useful motor trucks; better highways are absolutely essential to all."

Electric railways also can do this sort of thing. However, they will not only have to co-operate for that purpose because of the expense involved, but must also be willing to listen to what the professional amusement purveyor has to say in confirmation of Pope's dictum that "men (and women and children, too) must be taught as if you taught them not."

Are Our Cities Too Big?

ARE our cities too big, and in our cities are we attempting too great concentration of business and living in certain preferred districts? These were pertinent questions raised at the recent meeting of the New York section of the American Society of Civil Engineers, at which the transportation plans of New York City were discussed. The connection between these subjects and transportation is obvious, because if it was not for cheap and rapid transportation it would be impossible for large numbers of the workers in the offices and factories of our modern cities to live any considerable distance away from their places of employment. In fact, it is rapid transportation which has made possible such a condition as exists in lower Manhattan or the central business districts of any large city with skyscrapers each housing thousands of workers.

Independent of whether such a development is desirable and marks a step forward in social economies or not, it is well that questions of this kind are raised. Too often there is a tendency in municipal development, as in other things, blindly to follow custom, especially when it may coincide with individual gain, rather than to consider the matter from the broad standpoint of the whole community.

It must be recognized that some cities have already taken steps to prevent congestion of this kind through a limit set on the height of buildings. Primarily this limit may have been placed so that no building will deprive neighboring property of too large a proportion of its light and air and possibly also because of the fire risk. Nevertheless, this limit on building height does have the effect of spreading out a district and reducing the concentration. Again, there is a growing tendency among modern community dwellers to establish their places of business in different parts of the city according to industries, and presumably there is an economic reason for such a practice. If so, would it be a backward step to go back to small communities or community centers where this association of like workers could not prevail?

The problem is one which can well receive the attention of the experts on this subject, the city planners. This much, however, might be said in connection with transportation so far as it relates to this subject. So many good reasons may be urged against concentration in our large cities that any settled policy under which transportation is supplied at less than cost to encourage concentration should be adopted only after careful consideration. In other words, if the passenger pays the full fare which it costs to produce the transportation which he uses, concentration at least is not being subsidized through the transportation system.

Let's Have Fair Dealing and an Era of Co-operation

WE REFERRED last week to the new and constructive attitude taken by labor as evidenced by the remarks of Matthew Woll and others in Washington during the week ended Nov. 20. That there should be a beneficial result from this invitation of labor to the engineers to work for the solution of the industrial, or the labor-capital, problem is to be hoped by all. That labor is taking the initiative is most important.

While one cannot but note that this friendly attitude did not come so long as labor was in a dominant position, it is of particular importance now that employers should not take advantage of their increasingly favorable position. In times past capital has had its day, and, to be candid, it was then little less selfish in its motives than labor has been during the last few years. Now that each has had its turn is it not about time that employers as well as employees should honestly try to be perfectly fair in all their dealings? It is certainly true that the attitude of labor in the past has been partly inspired by the earlier near-oppression of some employers. But now that there is a demand for work and employers have more of an opportunity than for some time past to set a standard of dealing it should be on such a basis as will serve for a time when there will be another tremendous labor shortage. It is evidently with a desire for the establishment of a basis of fair play to all concerned that General Atterbury issued his recent statement this week in regard to the open shop on steam railroads. He warns that in this readjustment of conditions labor, too, should not try to secure more than its fair share in the determination of a program.

But it seems obvious that now is a propitious time to begin the upbuilding of a labor-employer relations structure that shall be so substantial as to endure any storm. The desire to begin a new era which labor manifested at the recent meeting of the American Federation of Labor is probably typical of the thinking of workmen in all lines. The receptive expressions of the American Federation of Labor, the dropping of John J. Fitzpatrick and William Z. Foster from the executive council of the federation, thus ridding it of radical leadership, and the notable speech of Herbert Hoover before American Engineering Council on labor relations are incidents indicative of the present interest of labor in the setting up of groundwork for a firm establishment of mutual confidence. This new attitude holds out promise of greater stability of industry and greater prosperity and it should be fostered and made the most of by employers generally.

In the electric railway field in particular is an era of labor peace desirable; first, because of the importance of avoiding interruption to service, and, second, to avoid the excessive loss that always accompanies a strike whether won or lost. The preservation of this peace may be difficult when the time comes for the inevitable readjustment of wage scales to lower levels, yet we hope not. Trainmen have known all along that the conditions prevailing since the war could not last indefinitely, but like most normal individuals they took all they "could get while the getting was good." This holds true in the street railway field as in other lines of work, and just as in other trades where the wages have been pushed higher there will they have to start coming down first. Conversely, at those places where wages were last to be increased there they should be last to be decreased.

The basis of the recessional movement will probably be the same as that upon which fair wages were established during the war. If that basis was fair for a rising market, it must be fair for a receding market. The irresistible laws of supply and demand will control, and they should be permitted to take a natural course. In other words, the "vicious circle" about which we heard so much during the war is still with us, but it has become a welcome circle, each basic reduction passing on around in influence and accruing to the advantage of railway employees, for wage reductions will lag far behind commodity reductions. The point is that even with reduced wages trainmen will have a bigger sum to put in their savings accounts at the end of the month than they did last year.

The thing to be guarded against by the railway managements is that no "rough work" be permitted in bringing down wage scales. The movement must come, but it must come naturally and gradually, perhaps first by lengthening out the periods of service at the lower wages in the scale for new men coming on or with an entirely new lower scale for new employees, leaving the older men at the higher scale as long as possible, and thus putting a special reward on continued service.

How soon wage reductions may be expected is very problematical, but there is one thing that may be said at this time with definiteness, and that is that any further increases in the wage level in the electric railway field would be untimely and uncalled for. In reference to the larger city properties where the closed shop is firmly implanted it is to be expected that a downward revision will be fought with demands for increases over the present scale upon the expiration of present contracts next spring. Yet from the signs of the times and the wage and even salary reductions now reported in other industries there is good reason to believe that the men will consider themselves lucky if they succeed in retaining the present scale. But when we commence to make the break toward a lower level, toward a return to normalcy, let's keep the relations absolutely fair. Then there can be no basis for trouble.

Improvement in Service Should Be an Immediate Result

PERHAPS more important than the future wage scale agreements which will be worked out between railway managements and employees, and certainly more immediately pressing, is the effect which this newly expressed attitude of labor may have on service conditions in the electric railway field. Present wages and fares have an inter-relation which complicates a modification of either, but if labor means what it says and if management is at all able to capitalize upon this and gain the complete co-operation of labor there are improvements in service conditions which should be immediately possible.

To be concrete, we know of at least one group of properties on which the average speed of cars was raised by constant effort to approximately 11 m.p.h., but with the letting down on the part of labor, coupled with the attitude of the platform men that this increase allowed the company to remove a few of its cars and with them a few men (the accuracy of this last complaint is questionable), this speed has been reduced to something over 9 m.p.h. only. There is no inherent reason why the former speed should not be maintained, and possibly an even higher speed than that. If labor is sincere in its statements, here is one way in which platform men can co-operate without waiting for any investigation by the engineers of the country.

A word to the management at this point may not be amiss in connection with increasing schedule speeds. When an increase in speed has been made such that one of the cars on a given route can be eliminated without reducing the capacity of the line, a careful study should be made to determine whether it is not possible to increase the traffic because of this very increase in speed. People want rapid service, and this desire should be capitalized to the fullest extent everywhere. Here is where the employees can help. The double effect of increased schedule speed and better "merchandising" of rides by the platform employees, through giving better service in other ways, will usually mean that all the cars can be kept on the route.

Another specific means of co-operation on the part of employees, looking toward better service, is in connection with the adoption of one-man cars on a property. The expressed desire to co-operate for more efficient and better service can be made concrete in this connection, surely. Whenever the application of one-man cars on a property is justifiable from the standpoint of service and revenue, it is surely to the advantage of labor itself to co-operate in their use. And we feel sure that, following the newly expressed program of the labor leaders, which indicates a real and straight-thinking co-operation looking toward the most efficient operation or production, this will be one way in which electric railway labor will evidence its faith in this program.

The Motor Bus and Immediate Capital Expenditures

THAT the motor bus has a place in the development of business in outlying and new sections of territory not now served by rail is a fairly well accepted statement. As to how far that usefulness extends and as to what the economic balance between motor bus and rail extension is there is by no means any agreement. But that the bus may have a greatly enlarged field today, irrespective of later developments, was indicated by R. S. Pilcher before the British Municipal Tramways Association in September. An abstract of Mr. Pilcher's remarks is given in this issue.

The point is just this: Most of these areas, in almost every community which is not now reached by rail nor served by a dependable transportation agency, have been built up since the day when it was possible to secure the capital to provide the necessary additions to permanent way. Now, however, that the war is over and the public is demanding that it be given reliable transportation and not have to depend on private automobiles, errant jitneys or pedestrianism, the problem arises as to what to do. If the transportation companies are really to do their full duty, they must provide this service.

The bus comes forward as a means of providing it. There is no doubt that capital cannot be secured today to construct the additions to rail systems, even if it were certain that that was the way to do it in each case. But with the initial investment in motor buses equal to less than one-half the initial investment in a rail system, there seems to be a way out, temporarily at least. The seriousness of permanent additions is double now on account of the high cost of almost everything. True, the buses probably cost more now than they will later, although there have been reductions in most automobile prices, and buses cost more to operate than electric cars, in most instances, but they save extraordinary capital expenditures, they allow service to be given, traffic to be built up and the community developed, and finally, they can later be moved to other territory when permanent extensions are practicable. The arguments and figures presented by Mr. Pilcher will bear close study by many American railway men.

Be Ready to Advise Your Chamber of Commerce

DURING December an unexampled opportunity will be presented in practically every city in the United States for explaining to the leading men in the community the way in which a city should treat its public utilities. This opportunity comes about through the referendum which is to be taken during December by the Chamber of Commerce of the United States on the policies which should govern the relations between communities and their public utilities. Technically this is known as "Referendum 33." Every member of the national chamber is entitled to vote on the eight questions submitted, and this vote must be received at the headquarters of the national organization in Washington on or before Jan. 3, 1921.

Under the rules of the national chamber the ballot submitted to the members has to be accompanied by a statement giving the principal reasons for and against each of the questions submitted. In this particular case the reasons supporting the "yea" side of the eight questions proposed are contained in a report submitted by the chamber's "Special Committee on Public Utilities," which includes among its members several prominent electric railway operators. An abstract of this report was published in last week's issue.

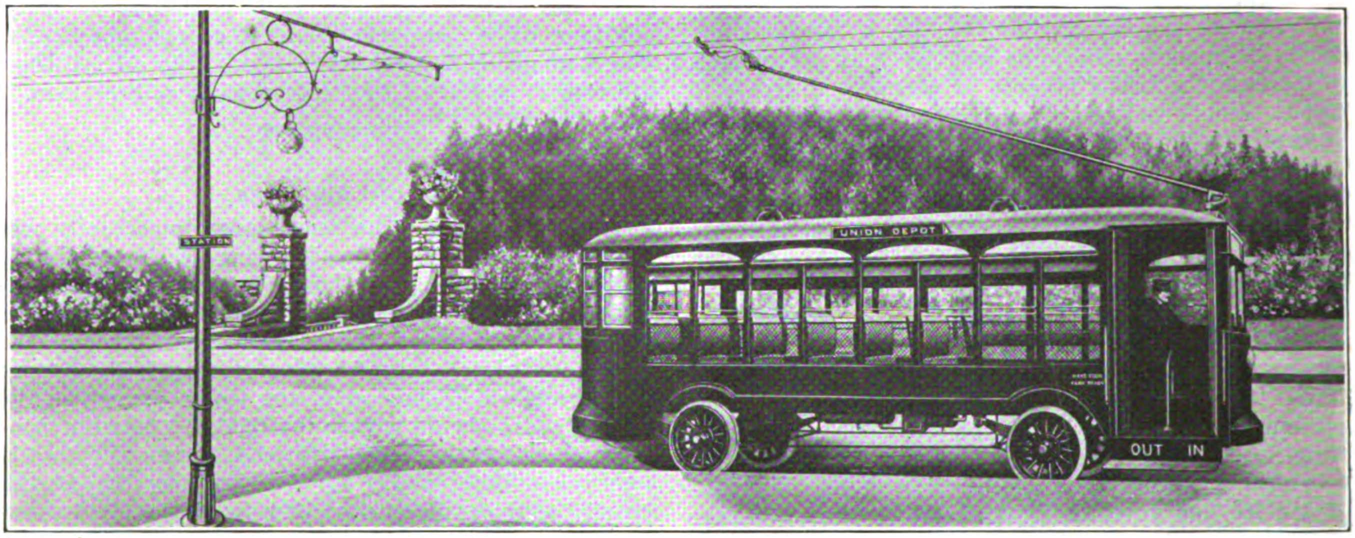
Every chamber of commerce and every board of trade in the country, member of the national chamber, will be called upon to vote on this question and should have as much information from the local utility as is necessary as a guide for its action. The report of the general committee is an excellent one, but it is no reflection on this report to say that it should be supplemented by local data at every meeting where the question is taken up. There are individuals in every community who, while perhaps willing to admit that certain policies generally should prevail, always have reasons why this policy should not be followed in the case of the local corporation.

Again, it is unsafe to assume that the needs of an enlightened policy toward the electric railway companies of the country are so self-evident as to require no argument. Obviously these truths are self-evident to railway men, who have a constant association with them, but this does not mean that they are equally clear to every one else. Electric railway managers will make a mistake if they let the vote on these questions in their own city go by default simply because they think that no sensible man could vote in any way except in favor of a liberal treatment toward the utility. The occasion also offers opportunity for publicity by car cards and in other ways.

The Possibilities of the Trackless Trolley

The Author Presents a Digest of the Development of the Trolley Bus and Gives Suggestions as to the Field Which Is Open to It

By H. L. ANDREWS
Railway and Traction Engineering Department, General Electric Company, Schenectady, N. Y.



DESIGN FOR A 10,000-LB. TROLLEY BUS FOR THIRTY-FOUR SEATED PASSENGERS

IN EUROPEAN countries trackless trolleys have been successfully operated for many years. In England today there are twenty companies with more than 100 miles of trackless trolley installations operating or authorized, while Italy has eight companies comprising a total of 43½ miles of route, and Germany has eight installations for passenger and freight traffic. France, Sweden and Austria have a number of installations which have given satisfaction.

In view of the present high cost of electric railway construction and of the competition with the motor bus, it is desirable that consideration be given to the trackless trolley in connection with proposed extensions of railway lines and the furnishing of transportation to communities not now served by street railways. The trackless trolley is promising in its small required initial expenditure, as compared with the electric railway, and in the reasonable operating expenses.

In comparing the operation of the trolley bus with the gasoline-operated bus, it would seem that such items as maintenance of way, transportation, traffic, general and miscellaneous accounts would not differ greatly as between the two. However, by substituting an electric motor for the gasoline engine, collecting the current from overhead wires, a great reduction should be made in maintenance, power and depreciation. The first cost of the installation would be very little greater than if gasoline-propelled buses were used.

EUROPE HAS HAD CONSIDERABLE TROLLEY BUS EXPERIENCE

There are in use in Europe three general systems, the Mercedes Stoll, the Filovia and the Max Schiemann. These differ in the method of drive employed and in the plan used for collecting current. A few details of each will be given.

The Mercedes Stoll system is essentially a four-wheel drive, although two-wheel drive installations have been made. The driving motor is built into and is a part of the driving wheel, the armature being keyed to and mounted on the driving axle. The total weight of the motor chassis, which is constructed of pressed steel, is approximately 3,000 lb. The weight of four wheels with motors and tires is approximately 2,450 lb.

The control is arranged to give six speeds and three electric brake positions. When used with two-wheel drive the motors are connected in series for the first three points and in parallel for the last three. The arrangement for the four-wheel drive differs from that for the two-wheel drive only in having the two front wheel or the two back wheel motors connected in series.

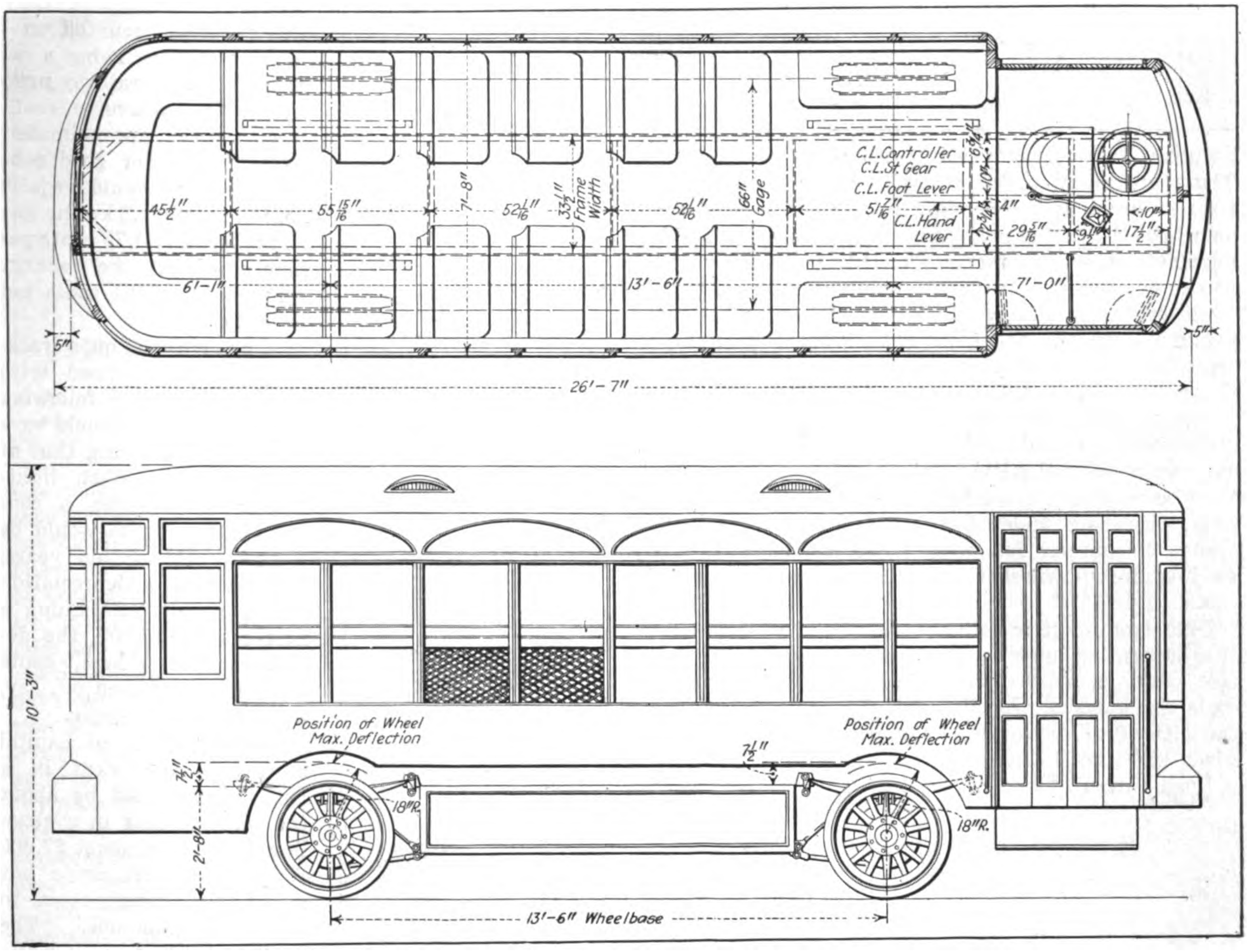
The collector used with this system is of the overrunning or carriage type. The current collector at the trolley end is composed of a frame having two small grooved wheels with ball bearings on each side, one for running on each wire. A cable with a double wire hangs from the center of this frame or trolley and has a weighted pendulum, which keeps the wheels well pressed down on the wires. This collector allows considerable movement from the trolley wire and extreme movement is taken care of by means of a cable and reel on the car which allows 25 or 30 ft. radius from the center of the trolley. When vehicles operating in opposite directions meet, the drivers exchange collectors and plugs, which are readily detachable and within easy reach.

This system of collection of current has proved successful, but has the disadvantage of requiring special overhead construction. In case the carriage leaves the trolley wire and falls to the street it is considerably damaged.

The arrangement of motor mounting requires the use of low-speed machines with low efficiency and considerable weight. The maintenance of the motors is more costly than it would be if they were spring supported, because they receive all of the hammer blows from the road.

A number of the Mercedes Stoll installations were made in Austria between 1907 and 1909, using buses weighing about 6,000 lb. without load and having a seating capacity of twenty-five. In some few installations larger cars weighing more than 11,000 lb. complete were used. One installation was equipped to handle motor and trail cars, the motors seating twenty-two and the trail cars twenty.

The Filovia system, which is in operation on more than 40 miles of route belonging to eight different companies, has proved very successful. This system adheres to a two-motor drive, each motor being mounted on the chassis and geared to a back shaft on which a sprocket wheel is mounted. Transmission of power to the rear wheels is by means of chain drive. Each car is equipped with two 12-hp. motors. The collectors used are similar to those described above, except that they are carried on a rigid pole mounted on the bus.



SEATING PLAN OF BUS AND ELEVATION OF PROPOSED TROLLEY BUS PICTURED IN FIG. 1.

The Max Schiemann system has been employed extensively in Germany for both passenger and freight service. There are eight or more installations, three of which are for passenger service only, four for freight traffic only, and one handles both passenger and freight traffic. This system uses a two-motor drive, each motor being mounted on the truck chassis and geared to a back shaft by means of bevel gears. Power is transmitted to the rear wheels by a chain drive.

Three methods of collecting current are used with this system, namely, two trolley poles under-running on the trolley wire, one trolley pole with a double head carrying two trolley wheels, and an over-running carriage as already described.

TRACKLESS TROLLEY PRACTICE IN ENGLAND

The application of the trolley bus in Great Britain has followed somewhat different lines from any of the three systems described. In that country two motors are used, each mounted on the truck chassis and connected to a jackshaft through worm gearing. The jackshaft carries a sprocket wheel and power is transmitted to the driving wheels by means of a chain drive. The controllers are arranged to give nine points with five running positions.

In the more recent installations two motors are mounted directly on the chassis, but the jackshaft and chain gearing are omitted, the motors being directly connected to the driving axle, through worm gearing, each motor driving one of the rear wheels. It is of interest to note that this is also the arrangement used on the trolley buses in Shanghai, China.*

Table III shows some general operating data for tramways and trackless trolleys operated under the same respective managements. While these data are not in terms of present-day costs, they are of value for comparison of the two transportation systems.

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*See issue of ELECTRIC RAILWAY JOURNAL for July 10, 1920, page 76.

MAINTENANCE OF TRACKLESS TROLLEY EQUIPMENT

In making estimates of the cost of maintaining the trolley bus under conditions existing in the United States, the experience which has been had with the gasoline-propelled bus and the electric vehicle, depending upon the storage battery as the source of motive power, should be of assistance.

First, as to the matter of tires. The maintenance of equipment, including tire cost and renewals, for the gasoline bus averages about 9½ cents per bus-mile. There are many variable results covering the cost of tires, a great deal depending upon the types of roads on which the bus is operated and also whether solid or pneumatic tires are used. The larger motor bus companies equip their buses with solid tires on all wheels, while others operate solid tires on driving wheels and pneumatic on the front wheels. Solid tires are preferred, as the liability to delays from punctures and blowouts is eliminated.

TABLE I—TIRE COSTS FOR ELECTRIC VEHICLES

Capacity	Road Conditions	Tire	Cents per Bus-Mile
4,000 lb.	Good	Solid	2.62
6,000 lb.	Good	Solid	7.35
7,000 lb.	Excellent	Solid	2.9
10,000 lb.	Very Good	Solid	7.8

One of the largest gasoline-bus companies, operating under excellent road conditions, uses solid tires throughout and obtains the low cost of 0.95 cent per bus-mile for tire renewals. Another large company, using solid tires, operating under less favorable road conditions, spends 2 cents per bus-mile. When pneumatic tires are used on all four wheels the average may be taken at 7.85 cents.

Data from electric delivery wagons of various capacities operating under different road conditions show tire costs as given in Table I. Corresponding tire costs for gasoline-propelled vehicles of the same rated capacities and similar road conditions may be taken as given in Table II.

Road rather than load conditions influence the cost of tires to a large extent. From information obtained from several sources, general averages for tire renewals under various road conditions will vary from 7.6 cents to 8.9 cents per bus-mile for poor roads to 1 cent to 2.6 cents per bus-mile for excellent roads.

TABLE II—TIRE COSTS FOR GASOLINE BUSES

Capacity	Road Conditions	Tire	Cents per Bus-Mile
4,000 lb.	Good	Solid	3.2
6,000 lb.	Excellent	Solid	4.1
7,000 lb.	Good	Solid	3.3
10,000 lb.	Very Good	Solid	7.92
13,000 lb.	Excellent	Solid	5.72

Trackless trolleys would require reasonably good roads, and the tire costs under good or excellent road conditions would vary from 1 cent to 3.4 cents per bus-mile, depending upon the type of road service. As a general average over a good brick, macadam or asphalt road a conservative figure would be about 2.5 cents per bus-mile.

The equipment maintenance on the controller, motors, chassis and body should be materially less than for corresponding items on a gasoline bus. A conservative figure for this item would be 1.5 cents per bus-mile, making the total maintenance for the trackless trolley, including tires, 4 cents per bus-mile.

TABLE III—COMPARATIVE DATA FOR BRITISH TROLLEY CAR AND TROLLEY BUS OPERATION

	Rotherham Corporation		Ramsbottom Urban District Council		Keighley Corporation		Stockport Corporation		Bradford Corporation		Dundee Corporation		Leeds Corporation		Aberdare Urban District	
	Tramways	Trackless Trolley		Trackless Trolley	Tramways	Trackless Trolley	Tramways	Trackless Trolley	Tramways	Trackless Trolley	Tramways	Trackless Trolley	Tramways	Trackless Trolley	Tramways	Trackless Trolley
Miles of route operated.........	11.22	4.61	Tramways Not in Operation	3.3	3.44	1.8	14.62	1.7	62.59	1.26	16.94	1.26	62.05	3.66	2.78	2.98
Number of cars................	37	6		4	12	1	50	3	245	3	56	2	315	4	10	8
Number of car-miles per annum.	852,639	128,685		43,412	241,917	17,114	1,490,116	44,856	6,206,239	49,639	1,347,614	40,366	9,192,265	75,066	121,443	10,918
Car-miles per car..............	23,044	21,447		10,853	20,143	17,114	29,802	14,951	25,331	16,546	20,419	20,163	29,181	18,766	12,144	1,385
Car-miles per mile of route.....	75,980	27,914		13,155	70,034	9,508	101,923	26,386	11,985,237	56,042	79,552	32,012	168,262	20,509	43,677	3,639
Energy consumption kilowatt hrs.	1,731,184	120,303		52,058	263,763	10,952	966,094	53,653	99,289	41,024	2,483,270	37,200	18,605,532	66,466	156,248	11,058
Kilowatt-hours per car-mile....	2.03	0.97		1.19	1.09	0.64	0.66	1.19	1.93	1.13	1.84	0.92	2.02	0.88	1.28	1.01
Number of passengers per annum	9,874,231	471,690		162,955	3,606,216	98,264	12,375,755	212,618	67,258,805	416,361	18,889,425	152,919	98,319,648	360,126	1,031,147	85,208
Passengers per car-mile.........	11.6	3.7		3.75	10.7	5.7	8.3	4.9	10.6	8.4	14.02	3.79	10.7	4.8	8.5	7.8

SOME OTHER FINANCIAL FACTORS

One of the most promising features of the trackless trolley is the moderate cost of power for operation. A trolley bus seating twenty-five persons, mounted on a modern chassis, using a car body following railway practice with transverse seats, would weigh approximately 8,000 lb. Under good road conditions it would require approximately 1.2 kw.-hr. per bus-mile, or at 1.75 cents per kilowatt-hour, the energy cost would be 2.1 cents per bus-mile.

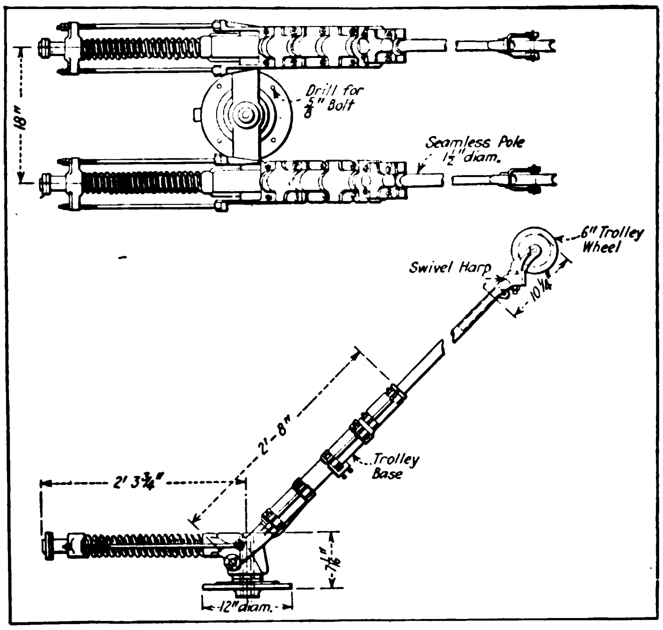
As to depreciation, a trackless trolley equipped with motors and control, following railway practice, should have a life approximating that of a street car. With lightweight construction a conservative estimate would be a useful life of ten years, equivalent to a depreciation of 8 per cent. Assuming a first cost of $7,000, the depreciation would be 1.9 cents per bus-mile, based on, say, 37,500 miles per year.

In the matter of capital cost, the investment in a trolley bus would be about the same as that in a gasoline-driven bus, about $7,000 for a two-wheel drive bus seating twenty-four to twenty-six persons. The cost of repair shops for the two types of vehicle would not vary greatly. One advantage of the trolley bus is that it can be stored in the open with no harmful results so far as the operation is concerned, as it contains nothing that can freeze in the winter.

The trolley bus system requires overhead construction, which will cost approximately $9,000 per mile, assuming one line to be used for each direction of traffic and cross-span construction poles to be employed. The cost would be $7,000 if only one line were used, but in this case it would be necessary for buses to draw to one side and stop while passing each other.

To illustrate the cost of installing and operating the trackless trolley systems with assumed conditions, the following calculations will be of interest:

Consider that an extension of 2 miles is to be made, that ten-minute service is required and that a trolley line will be installed for each direction of traffic. A schedule of 8.5 m.p.h. could be made, requiring from twenty-eight to thirty minutes for a round trip. Three buses would be needed for this schedule, but four would be purchased to provide a spare. The buses would then cost $28,000 and the overhead, 2 miles at $9,000 per mile, $18,000, a total of $46,000.



TWO-POLE CONTACT DEVICE FOR USE ON TROLLEY BUS

Further, assume sixteen hours of service per day, 365 days per year, calling for 50,000 miles of annual operation for each bus, or an average for the four buses of 37,500 miles. Assume fixed charges less depreciation at 10 per cent, or $4,600. This is 1.23 cents per bus-mile.

Under these assumed conditions the operating cost would be 8 cents per mile for maintenance, power and depreciation, and 1.23 cents for fixed charges less depreciation, a total of 9.23 cents per mile.

The type of trackless trolley recommended for operation would have a seating capacity of from twenty-four to twenty-six persons, with transverse seats, front entrance and exit, arranged for one-man operation.

The standard automobile truck chassis could be used, substituting electric motors for the gasoline engine, mounting the motors directly on the truck chassis and connecting to the driving axle through worm gearing and a differential drive. Instead of this a four-wheel or a two-wheel drive could be used, utilizing a direct motor drive similar to the Mercedes Stoll system, except that the motors would be connected to the driving wheel through planetary gearing and internal gearing on the wheel hub. This system has been in general use on storage battery trucks for a number of years and has proved successful. For operation where no severe winter or grade conditions are to be met the two-wheel drive is all that is required. For the northern sections, where snow conditions and grade conditions are more severe, it may be advisable to use the four-wheel drive.

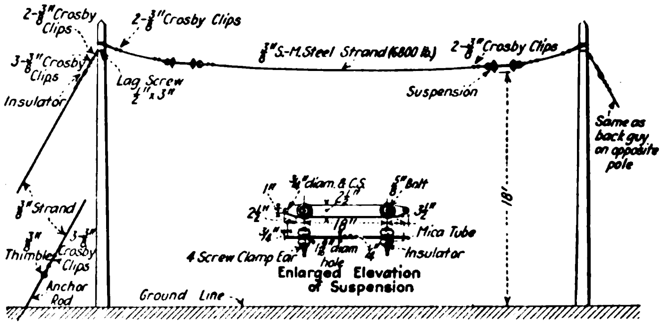
A four-wheel drive bus seating thirty-four passengers is illustrated on page 1136. It has a seating arrangement, floor plan and elevation as shown on page 1137. It weighs approximately 10,000 lb. fully equipped and costs about $10,000. A similar bus seating twenty-four persons could be handled with a two-motor drive and would weigh not more than 8,000 lb. and cost $7,000. This type of bus follows railway design and is arranged for one-man operation. If a body similar to that used on most gasoline-propelled buses was submitted for the one shown the weight and first cost would be materially reduced.

TRAMWAY PRACTICE HAS DEVELOPED MOST OF THE REQUIRED DETAIL PARTS

The bus shown on page 1136 is equipped with an under-running current collector controlled from the driver's seat, with sliding shoe contact. With this type of pole it is unnecessary for the driver to leave his seat in removing the pole from the wire for a passing bus. By means of an indicator and a mirror, the operator is able to replace his collector.

Another type of collector similar to that used much in Europe is shown herewith. This consists of two insulated trolley poles mounted on the same base, each carrying a swivel loop and standard trolley wheel. Where two trolley lines are used, one for each direction of traffic, and loops are provided at the end, this type of collector should give excellent results. It has the advantage of allowing standard trolley overhead construction and can be constructed to provide a sufficient lateral movement to permit the vehicles to pass without excessive side pressure on the trolley wires. It also has the advantage of permitting running over the same route as the street railway without the installation of additional wires, by locking down the negative trolley pole, using a trailing shoe to run in the groove on the rail.

On the trackless trolley bus controllers and motors should follow standard railway practice. Overhead construction should be as nearly standard as possible. The use of vehicles equipped with electric motors drawing power from overhead trolley wires is not limited to passenger transportation. There are in this country many established truck lines handling definite loads between definite points and operating over established routes. Many of these could be economically operated by the same method as that described for passenger buses.



SPAN-WIRE CONSTRUCTION FOR USE WITH TROLLEY BUS

A suitable trolley line could be installed between the city limits of any definite haul and storage batteries could be used to obtain a cruising radius in each city to enable the truck to pick up and deliver its load. This battery could be carried over the entire haul, and charged direct from the trolley, or storage battery stations could be established at the end of the trolley section and the batteries installed and removed at this point. For short hauls from the main lines of travel a storage battery could be employed or an overhead collector and cable reel.

A number of trucks operating over the same route under different ownerships could use the same overhead structure, the energy used by each truck being metered and arrangements made for paying for the storage battery on a mileage basis. The type of drive on these trucks could be made to suit operating conditions as in the case of the passenger buses. This method of handling freight has been in successful operation in Germany for years.

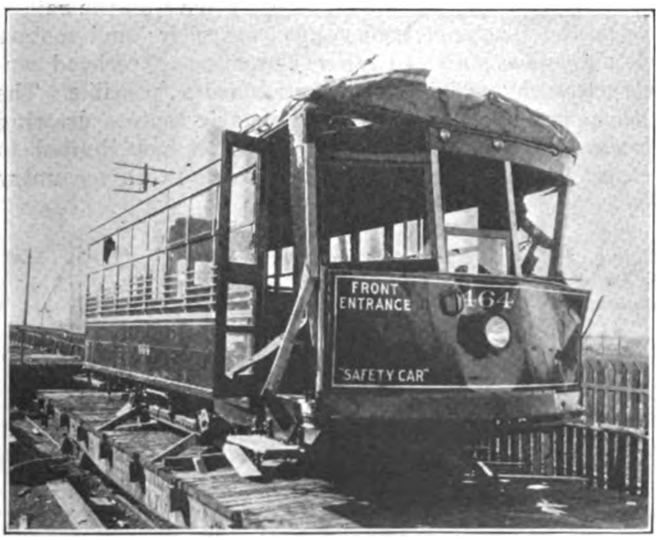
Rebuilding a Safety Car

Damaged Car Is Rebuilt by Using Parts Stripped from the Original Car for Fabrication Wherever It Is Possible

By E. M. Walker
General Manager Terre Haute, Indianapolis & Eastern Traction Company

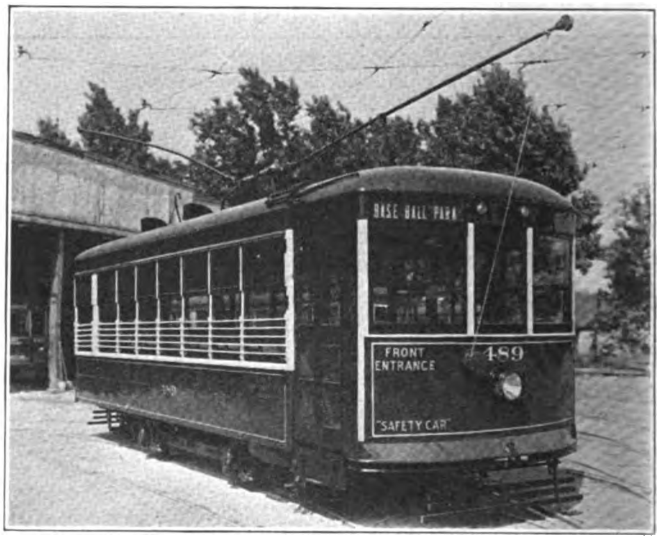
Much has been said and written about the structure of the safety car and its light weight and arguments have been made, pro and con, as to its durability. An interesting commentary on this question is furnished by the case of the car illustrated in the accompanying photographs. The car was originally built by the American Car Company of St. Louis as car No. 464 and was shipped to Terre Haute, Ind., along with a half dozen other cars, as the first shipment of safety cars to come to Terre Haute during the latter half of November, 1918.

All the cars came through safely with the exception of this one, which, being located in a freight train between two box cars, was jammed in a collision en route. So badly was the car damaged that the transportation company immediately returned it to the builder and provided for a new car to take its place. In building the new car, which was also numbered 464, everything was stripped from the wrecked car which could possibly be used in the fabrication of a new car, including truck, motors, safety devices, seats, etc. After the car was so stripped, the body was obtained from the car builder and shipped to Terre Haute, where it was rebuilt in the Terre Haute division shops of the Terre Haute, Indianapolis & Eastern Traction Company. The missing parts to make a complete car were supplied by purchase.



SAFETY CAR AFTER EXPERIENCING A DECIDED SHAKE-UP EN ROUTE TO TERRE HAUTE

Deliveries of the supplies needed were necessarily very slow during the spring and summer of 1919, and consequently the car was treated as a sort of odd job, to be worked on when there was plenty of available time, so that it was not completed and ready for service until Nov. 24, 1919, practically a year after the day on which it was wrecked. It came out of the shops as car No. 489, which is illustrated. The complete cost of building car No. 489 was approximately $4,500, of which $750 was for labor.



THE SAME CAR AS SHOWN IN THE PRECEDING ILLUSTRATION, BUT REVAMPED AND RENUMBERED

The car was placed in service on Nov. 24, 1919, and continued in regular service until the first of June, 1920, during which time it had operated 21,293 car-miles. At this time it was scheduled to go through the paint shop for a general overhauling, inspection and repainting, which was done about the middle of June, at a shop expense of $10.47, and paint shop expense, including labor and material, of $29.02, or a total of $39.49. The car was replaced in service in June. 1920, at about the middle of the month, and has been in regular, continuous service ever since.

The photograph of car No. 489 was taken on the day the car re-entered regular service. The other photograph, of the exterior of car No. 464, was taken by the builder of the car in St. Louis, about the first of December, 1918.

Of interest in connection with the electrification of the railroad which is under way in France is a bulletin issued by the French commission in New York City regarding the development of water powers in that country. The total available power is estimated at 9,000,000 hp., of which 1,165,000 hp. is in use. About 500,000 hp. additional is being equipped. In about fifteen years 6,000,000 hp. more should be realized. When the fifteen-year program has been carried out it is estimated that France will be third among the nations in water-power development.

Public Officials on Service at Cost

Four Addresses at Session of National Municipal League in Indianapolis Devoted to Service at Cost for Electric Railways—Views of the Operation of These Franchises Are Given from the Standpoint of the Authorities

A SPECIAL session of the annual meeting of the National Municipal League, held in Indianapolis, Nov. 17-19, was devoted to the discussion of the topic "Service at Cost for Street Railways—Panacea or Nostrum." W. F. Hodges, Mayor of Gary, Ind., presided at the session and abstracts follow of the papers presented. The titles given are those under which they were scheduled in the official program.

"Service at Cost in Boston," by James F. Jackson, Chairman Board of Trustees, Boston Elevated Railway

THE first speaker at the meeting in Indianapolis was James F. Jackson, chairman board of trustees, Boston Elevated Railway. He first described how the Boston Elevated Railway came under State control on July 1, 1918, the State agreeing to pay a rental of 5 per cent for the first two years, 5½ per cent for the next two years, and 6 per cent for the remaining six years of the term. According to the speaker, three factors in the transportation situation in Boston had influence in bringing about this decision. The first was that the usefulness of the street railway had come to be fully understood. The public appreciated as never before that the street car is not alone a poor man's carriage but that of the public official, the professional man, the man of business; that it was directly or indirectly the carriage on which every one relies and that no jitney or other kind of omnibus could be substituted. It must be preserved. The second factor was that the railway in Boston represented an honest investment under a public supervision that had prevented excessive issue of stock or bonds and that there was no call for reorganization to eliminate watered stock. The third was that the new capital which was indispensable to sustain this service must be obtained by buying it at market prices as other necessities are bought; in other words, that investment must have its secure return.

To the legislative mind the problem for experience to solve was whether or not a public management could be efficient, that is to say, conducted without waste and without loss of ambition or pride in achievement. It was thought that a trial was worth while. The basic plan for this experiment was that which the speaker believed is the best for any street railway enterprise—a service at cost—meaning, of course, proper or necessary costs.

The speaker then reviewed the financial situation of the company following the increases in fare, a situation which has recently been reviewed in the financial columns of this paper. He spoke of the deficit which occurred in July, August and September of this year, but said that it was expected and that unless some extraordinary event intervenes this deficit will be readily absorbed before next July, leaving at the close of the fiscal year, as at that of last year, no deficit. Mr. Jackson then explained that there have been two principal causes for increased expenses. One is the increase in labor and the other that of coal. The company also charged off to depreciation last year about $2,000,000. Proper charges to depreciation, the speaker said, are not made to build up the properties at a full measure of the original investment for the benefit of stockholders, but to maintain it in good operating condition for the benefit of the public. This means that the old-fashioned notion of maintaining a railway by hand-to-mouth methods with large expenditures in prosperous years and small expenditures or none at all in lean years is a thing of the past. Sound policy today takes care that out of every day's receipts something is put aside to meet the wear and tear that is constantly taking place in the property.

Mr. Jackson then touched on the question of flat fare vs. zone system, saying that the former was still used in Boston, but that there are advocates there of zone fares, and the trustees are studying the comparative merits of the two systems in the light of experience in this and other countries. He also spoke of experiments with short route cars on which a 5-cent fare is charged and said that while some of these experiments had proved failures, two of the lines are now in successful operation. He also referred to the large expenditure for subways whose annual rentals now amount to nearly $2,000,000, or ½ cent upon each ride.

HOW THE BOARD WAS ORGANIZED

When the trustees assumed office in 1918 they worked out a general plan of improvement involving a total outlay during a period of five years of about $18,000,000, chargeable in about equal proportion to capital and replacement. The board acts in a way very similar to a board of directors with committess of two assigned to administrative departments to report from their several spheres of activity at stated or special meetings of the board. The operating staff has at its head a general manager, Edward Dana, and the confidence reposed in him has been amply justified in what he has accomplished. His ability, energy and untiring devotion to the work and his harmonious relations with the trustees and subordinate officials and employees have proved invaluable. In conclusion the speaker said:

"I have long been acquainted with the men who have had charge of the railways in Massachusetts and in New England. They have been men who are held in the highest esteem in the communities where they live. Through the stress of all these years they have kept at their posts undismayed. The record is one of ability, loyalty to public interests and unblemished honor. Nor are they unlike the men who have managed street railways elsewhere.

"Under the conditions which prevail today we may all of us feel a new zeal, a new confidence in the success of the work at which they have labored so long. My last word, then, is one of optimism. But the struggle is not over. Fares are not yet adjusted. There is the fight against the jitney and the contest with the private automobile; the search for new economies to meet higher cost of operation; the effort to restore credit and inspire new confidence in capital. So it is an up-grade and a long pull that lies ahead, but the street car is bound to win."

"Service at Cost and Efficient Management," by Hon. Fielder Saunders, Street Railroad Commissioner, Cleveland, Ohio

IN THE opening part of his address Mr. Saunders said that while the Cleveland franchise possibly has not proved a panacea for the ills of railway service, it has certainly not proved a "nostrum." He then sketched the history of the adoption of the Cleveland franchise and quoted its preamble, which included among its objects "that the rate of fare may be reduced" and that "the best street railway transportation might be secured at cost, consistent with the security of the property and the certainty of a fixed return thereon, and no more." In the speaker's opinion the franchise has resulted in a great civic benefit and this is also the conclusion reached after long study conducted during the first half of this year by a board of arbitrators appointed to consider the question of return to the company. This board was made up of the city commissioner of light and heat, the president of one of the largest banks in Cleveland and the federal judge of the district. This board said in part: "The franchise and the amendments thereto have been shown by ten years of trial to be sound in principle, practical in operation, and of great benefit to the Cleveland Railway Company and its stockholders and to the public" and "have resulted in giving to Cleveland the best street railway service at the lowest cost of any city in the United States."

Mr. Saunders said that while it is true that the fare has almost doubled, every other commodity has practically doubled its price in the last ten years, and he pointed out that the wages of the trainmen had increased from 26 cents to 75 cents per hour or in even greater ratio. In the meantime the rolling stock has been increased from a seating capacity of 36,100 in 1910 to one of 74,800 in 1920. The total standing capacity has been increased from 44,000 in 1910 to 80,460 in 1920. The miles of track have increased from 246 to 303, many modern carhouses and substations have been built, and shops have been erected at the cost of $1,300,000.

Another way, Mr. Saunders said, of determining whether a contract has carried out its purpose is to consider the attitude to it of the contracting parties. The Cleveland franchise has been criticised at various times because of the so-called lack of incentive in it. Nevertheless, the people of Cleveland are satisfied. Thus, when the first period of the grant expired on May 1, 1909, it was necessary before that time for the city government to renew the franchise for a period of twenty-five years or permit the property to continue in the hands of the company without city control of the service, or to exercise its option to buy it and put in force municipal ownership. A series of meetings was held by a committee of the Council having the decision to make and the matter was widely advertised in the newspapers. Nevertheless, all the amendments suggested as being desirable came from the city street railroad commissioner. No public sentiment was manifested for municipal ownership nor for any particular change in the grant, except on the part of a few councilmen and a few public officials who had been in very close relationship with the railway company and its day-to-day operation. No amendment was offered by any civic society of Cleveland, nor by any newspaper nor by the Chamber of Commerce nor by any of the various clubs interested in public matters. The railway company refused to accept the amendments suggested and said that it was satisfied with the franchise as it stood. It immediately became evident that the public also was satisfied with the franchise, and the City Council renewed the agreement in identical terms for a further period.

The one serious problem pending at present relates to the return to the stockholders, which is limited in the franchise to 6 per cent. Extensions to the property have always been financed by the sale of new stock, but for more than a year it has been impossible to sell Cleveland Railway 6 per cent stock at par in Cleveland, and the franchise forbids the stock being sold for less than par. Although extensions are needed, the people evidently thought the proposed change to 7 per cent too far-reaching and failed to approve it at a popular vote, so that at present, so far as this is concerned, matters are standing still, but the speaker said he had no doubt the problem would be worked out satisfactorily in a mutual spirit of co-operation, as have so many of the previous difficulties.

The speaker said that most of the criticism of the service-at-cost plan as developed in Cleveland in the last ten years was as to the lack of incentive, but he pointed out that this is really directed at some of the conditions in the franchise and not at the working out of the franchise as shown in operation. The speaker then explained at length why these conditions had not proved objectionable in Cleveland.

THE INCENTIVES IN THE CLEVELAND FRANCHISE

In the first place he pointed out that the Cleveland Railway is not under absentee ownership. The management is largely represented among the stockholders, and some of the present success is undoubtedly due to that fact. The management also has the benefit of daily counsel and criticism of the city commissioner; not monthly or annually as is granted by public service commissions; nor has the criticism been selfish, partisan, or political. It is true that during the past two years it has become the practice to write into service-at-cost franchises a so-called incentive by which the stockholders of the company may get additional and varying returns under certain circumstances, as in the Cincinnati sliding scale, the Montreal budget system, and the new Rochester franchise. The speaker said he had no particular quarrel with such provisions at this time, but personally he had serious doubt whether in practical operation any of these ideas will produce any tangible lasting good, and he wanted to wait the test of experience.

When the present franchise was being considered in March, 1909, by Mayor T. L. Johnson and President Horace E. Andrews with various councilmen, one suggested a sliding scale of interest, so that the return to the company would increase with decreases in the fare, on the ground that it would be an incentive to the stockholders to make the fare as low as possible. Mayor Johnson replied that it would also be quite as much an incentive to skimp the service, and Judge Tayler ruled that a fixed return would be better. On this point Judge Tayler expressed his belief that it was fundamentally wrong to pay a man a bonus for doing that for which his salary is supposed to compensate him, that a bonus could not be a legitimate part of the cost and that therefore such an arrangement would mean service at more than cost, and that the people were entitled for the salary they paid to the officers of the railway to intelligent and efficient management and that they ought not to be taxed any more.

Mr. Saunders said that he agreed with this statement of Judge Tayler and added that the bonus idea is not only fundamentally wrong but that practically it would not work because it would create an incentive on the part of the railway company to keep down its expenses by skimping the service. Under the present service-at-cost plan, the company has no desire to do this. Within the limits of its power to earn 6 per cent, it makes no difference to the company how much or how little service is run. But any temptation of an added dividend would create a tendency on the part of a company operating under such a franchise to encroach on the city's prerogative as to service and to render a cheaper and more unsatisfactory service even though ostensibly complying with the city's order.

There would also be an incentive for the management not to keep the property up, because the lower the maintenance charges the lower the rate of fare and the higher the returns of the stockholders. There would also be an incentive to keep down the maintenance by increasing the capitalization by charging repairs and replacements to capital.

Again, some financial experts maintain that there is a connection between current interest rate and the price of commodities, that they rise and fall together. If this is the case, Mr. Saunders said, as the cost of labor and materials used in railways go down, the return on the money invested should not go up, but under the present "incentive" service-at-cost franchises the return to the stockholder will go up as the fare goes down, instead of going down as it should if the rule just mentioned is correct. Moreover, such an arrangement is likely to be a bad one from the public standpoint, if we have reached the peak of high prices, because under the sliding scale, as prices go down the returns would go up. But even if all of these conclusions are wrong, any scheme of incentive so far suggested is open to the criticism of lack of effectiveness because of the remoteness from and lack of direct application to the actual executives. From the speaker's knowledge of what had happened in the last five years he believes that, after all, the real incentive to efficient management is to give the man at the wheel, the man who actually operates, sufficient compensation to keep his best interest in his work and then to have an efficient city administration to act as the watchdog, to criticise, advise and sit on his neck day by day as is done in Cleveland to see that he earns his salary.

"Indianapolis and the 5-Cent Fare," by Hon. E. T. Lewis, Chairman Public Service Commission of Indiana

IN THE opening part of his address Mr. Lewis said that the day is past when financial distress of the street railway industry can be looked on as of concern only to the industry. He then sketched the recent history of the local railway in Indianapolis, which, while asking for temporary relief—a transfer charge and readjustment of payments by interurban companies for trackage and terminal facilities to tide the company over the coal crisis—has indicated no desire for a higher basic fare than 5 cents. This is because the company believes that a higher basic fare than 5 cents, at least in Indianapolis, would cut down the most profitable part of its business, *i.e.*, the short-haul patronage.

In 1918, on a decision of the Supreme Court of Indiana, the Public Service Commission assumed jurisdiction over the property and eliminated fares of less than 5 cents. In December, 1918, the company applied for a 6-cent fare, but this increase was denied, largely as the result of four changes which improved the financial condition of the company. One of these was the introduction of prepayment cars; the second was the simplification of the corporate organization company by which a holding and operating company, the Indianapolis Traction & Terminal Company, was eliminated, reducing the securities approximately 30 per cent; the third was a change in the sinking fund provision, and the fourth was a renewal of the local industrial activity following the war. In 1918 the Indianapolis street cars transported 70,003,795 revenue passengers; in 1919 the traffic jumped to 84,061,850 passengers; in 1920 it will probably pass the 94,000,000 mark.

The speaker pointed out that there are a number of favorable conditions for economical electric railway operation in Indianapolis. These advantages are geographical and social. Thus, the company mines a large amount of its own coal in fields located near Indianapolis, and this means cheaper fuel cost than that faced by most companies. Wages and cost of living all through the war period have been at somewhat lower levels in Indianapolis than those prevailing in the zone of greatest war activities and excesses, which reached back from the Atlantic Seaboard through Buffalo, Pittsburgh, Youngstown, Cleveland and Detroit to Chicago. The speaker also said he wished specifically to disavow any intention of saying that a continuation of the 5-cent fare would have been possible for all companies and cities. Indeed, the Indiana commission had considered it to be its duty to put higher than a 5-cent base fare into six Indiana cities. He did believe, however, that many cities had not thoroughly tried out the possibilities of the 5-cent fare. Nationally, it appears that the peak has been reached in operating costs and that the break is near, although the skies are not clear.

The aftermath of a war also is generally marked by heavy increases in local taxation. Thus, one of the reasons for the inauguration of the 6-cent fare in Cleveland was a $150,000 increase in local taxation falling upon the company. In Indianapolis, he said, at just the time that favorable operating sheets were expected, the same burden fell. Direct taxation, franchise tax and paving costs in Indianapolis, during the coming year, will call for almost 1 cent of the fare paid by street car riders in that city. In the speaker's opinion the financial obligations of utilities which represent real values must be protected.

ADVERSE VIEW OF SERVICE AT COST

The latter part of the address was devoted to a discussion of service-at-cost franchises. Such a franchise was proposed for Indianapolis in April of this year. It was designed to strengthen the credit of the local company and was proposed by the corporation counsel for the city and had received the approval, with possible minor changes, of the attorney of the company. A sliding scale of return was proposed by which efficiency was to be rewarded by maximum returns and inefficient operation was to be penalized. It was decided to make a direct study of the operation of service-at-cost franchises in near-by cities, and a committee of three, consisting of the corporation counsel for the city, the attorney for the company and the chairman of the Public Service Commission, undertook to make such an investigation. The conclusions reached as the result of this trip were unfavorable to the plan. The city filed with the commission a motion to withdraw the proposal, the company did not object, and the commission, without a dissenting voice, voted to act in the affirmative on the motion. The city representative, the author of the original proposal, in his motion for withdrawal, said in part:

"We have been unable to find or agree upon any plan of operation on the basis of service at cost which would furnish the incentive of private ownership and operation of service at cost. The results of our investigation generally have been to raise a most serious question and doubt as to the wisdom of the service-at-cost plan. The inevitable tendency seems to be for the operator or company readily to accept increased cost of operation with the view that it can be passed on to the public by higher fares. Such a course results only in adding to the burden of the public."

Mr. Lewis said that the commission does not mean that it dogmatically cast out service at cost from all future considerations, but it is suspicious of the plan in that it seems to run contrary to human nature, which, at least in business, requires opportunities of a struggle for gain. Again, service at cost is closely connected with city halls, which in turn are closely connected with political organizations, and it is very desirable that electric railways should be kept out of politics. Finally, the theory of regulation of public utilities by commissions is service at cost. These regulatory bodies determine rates by making them only sufficient to cover: (1) Operating costs; (2) the replacement of the wear and tear of the plant—depreciation; (3) taxes—but not individual income taxes; (4) a fair and reasonable return upon the fair value of property used and useful in performing the public service. When the rate is based on these foundations, there is service at cost. In closing the speaker pointed out that none of the Indiana street railways is in the hands of receivers, and that only six of the 600 cities having more than a 5-cent fare are in Indiana.

"Service at Cost vs. Municipal Ownership—Seattle's Experiment," by Charles M. Fassett, Formerly Mayor of Spokane, Staff Member of American City Consultants

IN THE opinion of Mr. Fassett, service at cost for electric railways is a transition stage between private ownership and operation and municipal ownership and operation, a temporary expedient, and one which will be in the long run unsatisfactory to both the owners of the railways and the public. To the owners it will be just a tightening of the chain of public regulation which curtails more and more their freedom of operation, but it will be sought by them in order to fix a value which may form a basis for public purchase later. For the public it has certain advantages in giving further control over the utility, it restrains financial skyrocketing, provides for extensions and betterments, recognizes the street railway business as a natural monopoly, gives the public a little authority in the directorate, enforces adequate accounting and retains to at least a small extent the alleged advantage of leaving the business in private management.

In the speaker's opinion the decision between service at cost and municipal ownership in any city must be influenced by local conditions and particularly by the character of the city government. Up to the last ten or fifteen years the structure of city government in this country was not adapted to public ownership, and where the electorate is heedless, officials change frequently and politics is a game of spoils, public ownership is unthinkable as a business undertaking. But a new light is dawning upon American municipal life, Mr. Fassett said, and in his opinion the voters will ultimately awaken to the necessity of a better form of government in which the officials have more authority and responsibility and a more lively interest in government on their own part. When these things have been accomplished the people will insist upon the ownership of their public utilities, their operation on the basis of the greatest good to the greatest number and the banishment from municipal life of those evil forces which have done so much to corrupt city government in America.

THE SITUATION AT SEATTLE

In commenting on the Seattle incursion into municipal ownership, Mr. Fassett said:

"It is too soon to make a reasonable forecast of the outcome of Seattle's latest experiment in municipal ownership. Inadequate financing was forced upon the city by reason of constitutional debt limitation. It must pay for its purchase in eighteen years and at the same time build up a depreciation reserve of more than $12,000,000, thus placing an enormous burden upon its street car patrons in this generation in order to turn over to the citizens of twenty years hence a street railway fully paid for and adequately maintained. It is a feat which no private company would undertake. A service-at-cost franchise would have called only for the payment of operation, depreciation and interest, and unless there is careful management the fares may be higher during this twenty-year period than they might have been under service at cost. Seattle has not an ideal form of government for carrying on the business of utility management, yet its publicly owned water works and electric light and power plant have been efficiently managed, and the high-class men who are at their heads as superintendents have been there many years, through many changing political administrations. The civic spirit in Seattle is high and I believe that public ownership has a better opportunity there than in many cities which have more modern forms of government."

Investment Bankers' Association Bulletin a "Public Utility" Issue

THE bulletin of the Investment Bankers' Association of America for Oct. 29 is largely a "public utility" issue. It contains a copy of the report of the association committee on public service securities presented at the recent Boston meeting, the address at that meeting on present utility problems by Carl D. Jackson, chairman Wisconsin Railroad Commission, and a copy of the resolution on public service securities adopted by the board of governors of the Investment Bankers' Association on Oct. 3. This resolution was published on page 935 of the issue of this paper for Oct. 30.

Norfolk's Traction Situation—I

Report of A. Merritt Taylor and Charles B. Cooke, Jr., Used as Basis of Solution of Street Railway Problem in Virginia City—Value Determined Upon a "Judicial" Basis —Recommendations Made for a Modern Franchise—Service Rehabilitation and Rerouting Also Considered

IT WILL be recalled by the readers of the ELECTRIC RAILWAY JOURNAL that last spring the city of Norfolk, Va., adopted a broad-gage policy toward public utilities and was upheld in this policy by the Corporation Commission of the State. This was concretely shown in the case of the Norfolk Gas Company, a subsidiary of the Virginia Railway & Power Company, as reported in the JOURNAL for March 27, 1920, page 667, and commented upon in the issue of April 3, page 682, and April 10, page 736. The platform upon which the city of Norfolk officially agreed to treat public utilities within her borders was stated as follows:

> Capital legitimately invested in public utility properties must be safeguarded and protected by municipalities, both as to principal and as to a just and inviting return thereon after reimbursement to the company for expenses incurred in providing service.

Following the conclusion of the gas company case, the more complicated street railway question was taken up by the experts employed by the city, A. Merritt Taylor and Charles B. Cooke, Jr., of Philadelphia. Their report on the railway situation was rendered several weeks ago, as already noted in these columns, and the city is now working on a definite franchise agreement based upon the recommendations of this report. On account of the manner in which some of the subjects of the question are considered, the JOURNAL is giving space to a rather extended analysis of the report of Messrs. Taylor and Cooke.

The report states that, as is often the case, it has been found that the financial troubles which underlie acute service deficiencies have proved to be the logical outcome of a long continued failure, on the part of both city and company, to recognize certain fundamental truths and sound business principles in working out their respective natural rights and obligations in the premises. The present report, however, is an attempt to seek a solution of Norfolk's transportation troubles through practical business methods, unhampered by political considerations, and contains some well-conceived and co-ordinated measures for rehabilitating the property, service and finances of a situation which in several respects is typical of many American cities.

It is rather to be expected that in a comprehensive program of the kind sponsored by Norfolk the settlement of detail parts of that program may not, in all cases, represent the most that either company or city might like to have with respect to that particular detail considered alone and apart from other factors and elements. The report states, however, that the purpose has been to deal out even-handed justice to both city and company.

The report is supplemented with many tabulations showing the detail of the development of income accounts, allocated by routes and zones, and with maps showing the trackage and routing systems as found, and revisions of these necessary to produce required betterment of service. The diversity of subjects covered is indicated by the following section headings: Service and facilities, present and required; delivery district; jitney competition; additions and betterments to railway property; value for rate-making purposes; analysis of earnings, expenses and fixed charges; sources of profit and loss from operation; fares and fare policies; franchises.

These headings divide into three classes or subjects for analysis: Franchise policy; valuation, and fares, jitneys, rerouting and other service improvements. In this issue the first of these is considered and the two other subjects will be treated in subsequent issues.

The report deals at length with the subject of franchises; first, from the standpoint of the legal and economic interests which the city, State and service company have severally in the franchise agreement, and second, with respect to the practical application of basic principles so developed, to the revision of the Norfolk franchises.

ANALYSIS OF BASIC PRINCIPLES

In an introductory statement the report states in effect that the type and terms of a franchise may either destroy or effectively assist in establishing and fostering credit of the grantee and that economically unsound franchise rights and limitations may thus actually block efforts to provide that character of service which the community naturally seeks in granting the franchise to fulfill its aspirations in this direction.

Service deficiencies may be expected to continue so long as franchise contracts "drawn in a period when any real conception of the economic status of public service properties was notoriously lacking, are such as to jeopardize the interest of present and prospective investments therein." Such appears to be the case in Norfolk, and any program for solution of the transportation problem in that city must, in order to be adequate and productive of results, include a forward-looking revision of franchises with such provisions removed as are now obsolete and in conflict with the primary purpose.

The elimination of obsolete types of franchise obligations is stated to be just as important as the removal of obsolete physical equipment, and further, that correction of underlying obsolescence in the franchise accelerates correction of obsolescence in the physical property.

Term franchises frequently fail of their real purpose, due in part to the absence of provisions for the disposition of the property and reimbursement to investors, in the event that the franchise is not renewed. Utility properties under present-day regulation are no longer speculative money makers; investment in them is no longer regarded as a get-rich-quick scheme for extorting so much from the public during the life of the franchise that it is a matter of little consequence what happens to the property upon expiration of its term. The fact is emphasized that the public pays through the nose for the burdensome short-term franchise, first, because companies operating thereunder have to pay, at the ultimate cost of the car rider, high interest rates to meet their capital requirements, and second, because, having no assurance of his equities at the expiration of the franchise, the utility owner under the short-term franchise has naturally not been solicitous for the maintenance of physical property in good service condition.

On the other hand, improper franchise obligations imposed by municipalities in long-term and perpetual franchises, in their earlier efforts to protect the public interest, have been perhaps not less destructive, though as a class the perpetual franchise has furnished a stable basis for financing.

The growth of state regulatory systems which has paralleled development of public service businesses and the extent of results sought and thus far realized through exercise of the regulatory power, in the face of its natural economic limitations and of the obstacles to effective regulation presented by obsolete franchise provisions, is portrayed. The status of the street railway as a vital and fundamental thing in the life of the people is regarded as the basic proposition upon which all constructive thought and effort must build. As to this, the following has application:

> It is also axiomatic that so long as public service is provided with private capital, the character of that service will depend upon the financial results which it produces. If the service be adequate and there is a continuing loss, it will shortly become inadequate through an attempt to reduce the loss. This attempt may be temporarily or partially successful, but ultimately, due to continuing inadequacy, those losses apparently buried in the makeshift expedient of deferred maintenance and deficient service emerge inflated by concealed accumulations, to further depress capacity for that service basically required by public necessity. That public necessity in a given community will, in the end, rule and govern the nature of the agency, public or private, through which it must be satisfied.

As to public ownership, the report says:

> Public ownership and operation of its service facilities will not come as a result of political nostrum nor of academic theory. It may develop, if at all, as an economic necessity through the slow and tedious processes of a century, and would necessarily be preceded by much laborious work and actual accomplishment in the elevation of political standards and in the preparation of adequate foundations for stable and efficient state and municipal machinery, free of improper political influences, required to insure permanent success of the undertaking.

USE OF PUBLIC HIGHWAYS

Highways are defined simply as places dedicated to the use and convenience of the population at large in permitting the transportation of all things generally required in sustaining its social and economic life. The use of highways to carry gas or water underground, street cars on its surface or electricity through overhead wires means that the highway is fulfilling its destiny as the most ancient of all public utilities. The common sense of the proposition as developed is that the getting of an adequate service should be the sole consideration for the rights given as a legal step precedent to its production.

While no inherent value attaches to the base franchise, it may either be made valuable or turn out to be a very costly liability. This risk must be shouldered by the grantee. It is, however, pointed out that:

> If "value," in the sense of developed earning power of the property, arises out of earnings produced by enabling franchise, that value must necessarily exist as a condition precedent to the public receiving its consideration, which is "service," out of the franchise-contract. If there is no value arising through the franchise, from the standpoint of present and prospective earning power of the property, then obviously the public cannot possibly receive the thing for which it made a bargain.

After emphasizing the public interest in seeing the rights given by it in exchange for service acquire and develop value in the sense of earning power, the report goes on to say:

> It is likewise in the public interest that steps be taken to insure the public getting its part of "value" so developed in the form of service betterments and extensions. In these lie the real opportunity for the public to realize a proper share of the company's profits, if profits there be. To attempt to get that share through direct and indirect special levies on the company's income, other than just and non-discriminatory taxes, is to sell a public birthright for a mess of pottage. Such special levies can be made large enough to defeat the very object which is sought from the public viewpoint, *i.e.*, adequate and efficient service. They could not possibly be made large enough to fill any important financial requirement of the city. Thus they are destructive in one direction without accomplishing any important purpose in another.

An analysis of all franchises and ordinances bearing upon the Norfolk property disclosed that practically all of these imposed one or more of the following requirements, which it is stated "react harmfully upon financial resources needed for the building of service":

1. A requirement that railway company shall pay the cost of labor in all original paving and repaving work done between rails and two feet outside thereof.
2. A requirement that railway company shall bear cost of all repairs on track paving including the usual two-foot strip outside of rails, irrespective of what caused the paving fault.
3. A requirement that where tracks are laid in paved streets within the old limits of the city, railway company shall pay the cost of labor in repaving the entire street from curb to curb.
4. A requirement that railway company shall place and maintain culverts under its tracks from building line to building line.
5. A requirement that company shall adhere to certain service schedules on different lines during given seasons and over various hourly periods.
6. A requirement fixing fares and fare zones.
7. A requirement fixing free transfer points..
8. A requirement that all revenue derived by company from sale of transfers as authorized by ordinance be paid to the city, or 10 per cent of the gross earnings in excess of the gross earnings for the corresponding period of the year ending June 30, 1919, whichever shall yield most revenue to the city, but in no case to be less than $3,000 per month, so long as the said rates (6c. fare) are charged.
9. Limitation of the term of the franchise, without provision for purchase of the property by the city, in event the franchise is not renewed upon expiration.

It is then stated that requirements of the order above indicated have been one of the major causes undermining street railway service in Norfolk, and that if allowed to remain in full force and effect, the city cannot hope to escape a continuance of that character of service which has become familiar to its citizens, "damaging alike to a progressive development of their city, and to the company which should take a leading part in that development, as their duly authorized agent for that purpose."

CHARACTERISTICS OF PROPOSED NEW FRANCHISES

Only the principal characteristics of the required new franchises are outlined in the following:

Franchise Period

The State constitution of Virginia provides that no franchise can be granted for a period longer than thirty years, but it further stipulates that a city may become the owner of a public service property either without compensation or upon payment of a fair valuation. In view of the prohibition by state law of long-term or perpetual franchises, the report recommends that franchises be granted for a thirty-year period with the proviso that unless the same be renewed for a like term, the city will purchase the property.

Purchase Clauses

One of the main features of the proposed franchise consists of carefully qualified and protecting clauses, providing for purchase of the property by the city in event of non-renewal of franchises upon expiration. It is specifically stated that the purchase price is to be determined upon the basis of what the company would be entitled to receive in event of condemnation of its property as a going concern by state authority, the amount to be fixed by a board of arbitration whose findings shall be subject to review by the State Corporation Commission. Other principal provisions are quoted as follows:

Service and Property.—No attempt should be made to specify the frequency and capacity or service to be provided on the various lines, the character of equipment to be used thereon, nor the route over which the lines should be operated. In lieu of such futile conditions the new franchise should contain a definite and unmistakable provision "to require proper and adequate extensions of plant and services and the maintenance of the plant and fixtures at the highest practical standard of efficiency" as required by Section 105 of the city charter.

Additions and Betterments to Property and Service.—Franchises should specifically provide for the carrying out of a definite reconstruction, construction and extension program which will be required by the city as a result of this report.

Fares.—No conditions should be imposed establishing fixed rates of fare applicable throughout the term of the franchises, for the power to establish reasonable rates is reserved to City Council under the city charter and is subject to judicial review. Rates of fare, when they come to a test, will be fixed by variable controlling conditions other than franchise clauses, as has already happened in Norfolk.

Paving Repairs and New Paving Operation.—The company should be required to pay the cost to the city of repairing and making good all faults or breaks in street paving for which the presence or maintenance of its track is responsible. Where track exists in present paved or unpaved streets and the city desires either to repave or to construct an original pavement, it (the city) should assume the total cost thereof, holding the company responsible only for faults due to the company's tracks, as above provided. The city should reserve the right to do all paving work in the company's tracks, as and when it may consider this necessary, charging the company for its share of the expense in accordance with the foregoing.

Taxes.—It should be clearly understood by the public that these recommended franchise provisions would not relieve the companies of their obligation to pay the usual city and state taxes, as provided by law.

Uniform Franchise Terms.—It is manifestly to the advantage of the city that all franchises granted by it under which the street railway system is to be operated shall be for equal terms of years rather than to have the franchises for different sections of the system, which are and must necessarily remain integral parts of the transportation machine, expiring in various years.

Terminal at San Pedro Completed

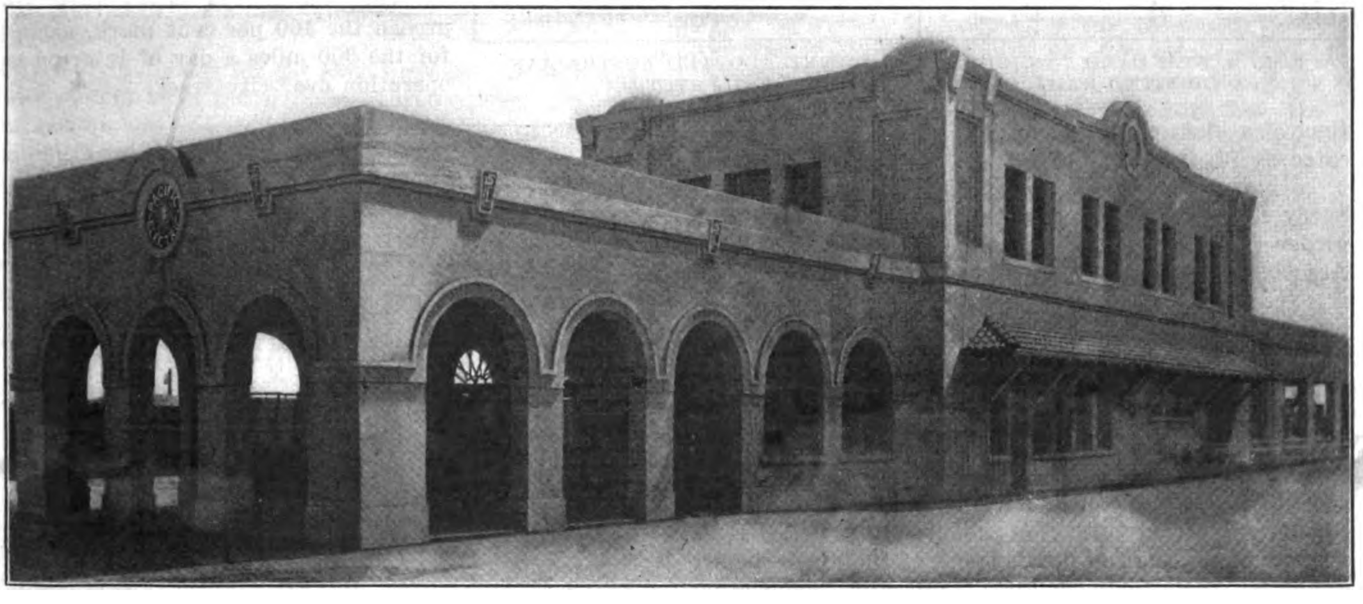
New Station Contains Not Only Ample Waiting Room and Freight Facilities, but Also a Rest Room for Employees

By Clifford A. Elliott
Cost Engineer Pacific Electric Railway

The Pacific Electric Railway has just completed and placed in service at Fifth and Front Streets, San Pedro, Cal., a combination freight and passenger station to serve its patrons in this rapidly growing community. It is designed adequately to serve the company's needs in the harbor district of the city of Los Angeles, San Pedro being the company's terminal point for serving this section. A tremendous growth has taken place in the harbor district during the past five years. To permit keeping pace with this expansion and to render the top-notch service demanded by the public in this locality the immediate erection of a permanent structure for station terminal purposes became imperative. Plans for this building were completed in 1917, but wartime conditions and delays incident thereto have somewhat hampered its earlier completion.

This structure, 28 ft. wide by 190 ft. long, is built with exterior of walls plastered. The main part of the building is two stories high, with a single-story wing at each end. One of these wings serves as an open waiting room, a type of construction extensively used by this company in its station buildings, because of the mild climate of southern California. The other wing furnishes space for an open freight room.

The building is semi-Spanish in its architectural fea-



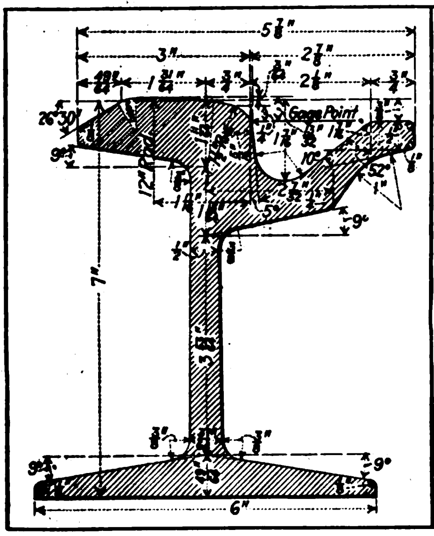
PACIFIC ELECTRIC RAILWAY'S NEW FREIGHT AND PASSENGER STATION AT SAN PEDRO tures. In the design neat appearance as well as utility and convenience were kept in mind. Spacious waiting and rest-room facilities have been provided, which are efficiently lighted with the latest type of fixtures. In the agents' quarters are three ticket windows. The freight business is concentrated at one end so that all business transactions with the public are made at the freight counter located at the side door.

The second story of the new station serves as trainmen's quarters. In the recreation room will be installed a pool table, card tables and other furnishings for the comfort and welfare of the trainmen. At the end of this room is the terminal foreman's office, where the "mark-up" boards, the cashier's office for handling trainmen's receipts, etc., are located. Adjoining these rooms are the toilet facilities and locker room.

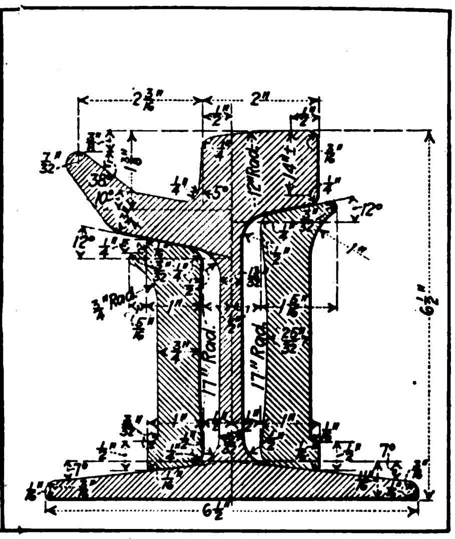
The station as a terminal is conveniently served by two newly constructed passenger loading and unloading tracks, while a new house track has been laid for serving the freight end of the station.

Rail Standards

IN AN article published on page 1106 of last week's issue, descriptive of the standard rail sections in this and other countries, the titles under the drawings showing the Australian rail section and the American rail section became transposed. The new French section, also illustrated in that article, was properly indicated by its title.



A. E. R. A. STANDARD 7-IN. GIRDER GROOVED RAIL



NEWLY ADOPTED AUSTRALIAN RAIL SECTION

To make the matter perfectly clear, sections of the newly adopted Australian rail and of the standard 7-in. girder grooved rail of the American Electric Railway Association are reprinted here.

After a careful survey of the Highland district of Scotland, plans for nine different water-power schemes have been reported. Because of this cheap and dependable source of power, serious consideration is being given by the directors of the Highland Railroad to electrification. One of the schemes could give 38,000 hp. with a capital cost of about £1,742,000, and another 42,000 hp. at an outlay of about £1,580,000. It is estimated that the full development of the nine schemes would be equal to twice the capacity of the existing power, traction, and lighting companies in Scotland. Cheap industrial power will also result.

"Vae Jitnis" at Terre Haute

THE old Roman cry of "Vae Victis" or "Woe to the vanquished" has its modern counterpart at Terre Haute, where the cry might be transmuted into "Vae Jitnis" or "Woe to the jitney"! It will be recalled that the ELECTRIC RAILWAY JOURNAL for Aug. 28, 1920, presented, under the title "The Survival of the Fitter," the success of the safety car in securing ever-increasing business. The great growth of the private automobile has continued—perhaps to the actual advantage of the trolley by getting people eager to ride whenever they see anything that moves—except jitneys. This conclusion seems inevitable from a study of the accompanying progress table prepared by E. M. Walker, general manager Terre Haute, Indianapolis & Eastern Traction Company. This table brings the facts down to Oct. 30, 1920.

Among the interesting facts disclosed are that the traffic for the ten months of 1920 is greater than the high-water mark established by all of 1919, so that even the abatement of pre-election excitement will not prevent 1920 from showing at least 12,500,000 passengers, or some 30 per cent better than the pre-jitney year 1913, when the population was 80 per cent of the present figure. Put differently, the traffic will increase at least 30 per cent compared with the 25 per cent increase in population (60,000 to 75,000) despite the 511 per cent increase in private automobiles (900 to 5,500) within Terre Haute or the 550 per cent increase (300 to 1,950) outside Terre Haute.

As to the jitneys, a count on Wednesday, Nov. 10, showed only twenty-three in use. Of these only seven were in direct competition with the cars. The jitneys charge 10 cents; the cars 5 cents with free transfer.

The drop from 200 jitneys in 1918 to twenty-three of all persuasions in November, 1920, is notable.

Other interesting figures in this report are those showing the continued increase in earnings per car-mile and the decrease in energy consumption per car-mile as the safety cars approach the 100 per cent mark, except for the 300 miles a day of interurban operation over city track.

	1913	1918	1919	1920 (10 mos.)
Population	60,000	68,000	72,000	75,000
Number of autos owned in city	900	4,300	5,100	5,500
Number of autos owned in Vigo County outside of city	300	1,500	1,700	1,950
Miles of city track	30	30	30	30
Revenue passengers carried	9,507,018	8,160,492	10,351,042	10,837,544*
Employees carried	309,515	259,139	302,662	306,771*
Complimentary	66,896	39,694	7,299	315*
Transfers	2,095,372	2,200,114	2,603,427	2,447,050*
Total passengers	11,978,801	10,659,439	13,264,430	13,591,680*
Gross revenue, city lines	$452,736	$394,824	$518,627	$542,710
Jitney buses in operation	0	200	125	23
Car-miles, safety cars	0	77,572	1,428,380	2,204,310*
Car-miles, two-man cars	1,968,400	1,717,597	1,036,802	298,406*
Total car-miles	1,968,400	1,795,169	2,465,182	2,502,716*
Kilowatt-hours	3.87	3.52	2.67	2.21
Earnings per car-mile, all city cars	$0.2300	$0.2109	$0.2103	$0.2168
Earnings per car-mile, safety cars	....	$0.2100	$0.2110	$0.2222
Safety cars operated	0	(Dec.) 18	28	50
Two-man cars operated	29	15	15	3
Total cars operated	29	33	43	53
Rate of fare, cents	5	5	5	5
Tickets	25/$1.00 6/25c.	25/$1.00 6/25c.	None	None

* Ten months only.

British Municipal Tramway Men Meet

Papers Presented at the Annual Conference of the Municipal Tramways Association Discuss Fare Increases, Extra Operating Costs, Repairs, Depreciation and Future Capital Expenditures

AT THE annual conference of the Municipal Tramways Association a good idea of the current expert opinion on economic and financial questions was obtained of the street railway industry in England. Fundamentally the problems and conditions with which the industry is confronted are quite similar to those in this country, although, perhaps, they are of more recent origin. It is realized that to relieve the density and overcrowding of small districts ample transportation facilities must be provided to enable the great industrial population to spread themselves out over wider areas. Whatever form these facilities take, whether the motor bus for light traffic or the tramway, which holds the field where the density is high, the fact remains that the passenger must pay for his passage.

Two papers on tramway fares were presented by Councilor Higham, chairman of the Blackburn Corporation Tramways Committee, and P. Priestly, general manager Liverpool Corporation Tramways. Unfortunately, with the increased cost of producing rides, Councilor Higham stated that the tramway systems have not been able to pass on this increased burden to customers with the same facility as other industries. If places of heavy traffic density cannot be made profitable without increased fare, it can never be hoped to make up the deficit from the riders who travel longer distances. There still clings the old system under which workmen are carried at a reduced fare due to their former low wages. With their greatly increased compensation, it is maintained this condition should no longer be allowed to exist. The opinion also was expressed that wherever a special service was rendered a special fare should be charged, under such circumstances as strangers to a town attending race meetings, football games, etc. Special fares are warranted because of extra accommodations furnished for their convenience.

Some of the blame for the slow increase has been due to the reluctance of the municipal corporations. To prevent too strong reaction on the public, the process of raising fares should be made slow and gradual. Even then traffic will decrease, but this temporary condition is of short duration. However, when the riding public gains the realization that it now costs a transportation system twice what it formerly did to furnish rides the outlook for more flourishing undertakings of this nature and also for more return on capital becomes encouraging.

Many suggestions were offered by A. L. C. Fell, general manager London County Council Tramways, in his paper on operating costs and power expenses to effect a reduction in the cost of power. For the past six years fuel, which represents about 75 per cent of the energy cost, has been expensive and of extremely poor grade. Because of the fuel shortage everything available had to be taken in spite of the fact that most of it, after being shipped long distances, was hardly more than mine refuse, containing as high as 30 per cent ash. Should the whole system regarding the grading of coal be co-ordinated by the shippers so that the poorest grades would be utilized nearest the mines and the better quality shipped the farthest distances a great economy would result. Great benefit can be derived from the economy recently obtained in the generation of power with oil fuel. There is not only the added boiler efficiency but also the economy resulting from more advantageous handling and transportation facilities than are available for coal.

Messrs. James Dalrymple, general manager of the Glasgow Corporation Tramways, and R. L. Horsfield, general manager of the Cardiff Corporation Tramways, both presented papers under the title "Repairs and Depreciations in Relation to Capital and Revenue." Mr. Dalrymple argues that people nowadays seem to have a great aversion for the word "capital" and that many municipal authorities seem quite prepared to pay high wages to employees, but at the same time entirely overlook the fact that in a short time their capital, as represented by the track and equipment, will go out of existence. Mr. Dalrymple contends for a program of keeping the physical property in a complete state of repair, and in addition setting aside a fund representing the depreciation which has taken place during the previous twelve months.

Reporting an examination which he had made into the physical and financial condition of many tramway undertakings, he finds that where there is too little spent in repairs there is also nothing available to meet depreciation and renewal. On the other hand, tramways which maintain a good state of repair also maintain considerable renewal funds. In other cases, renewals are being added to capital, and in still others renewal and depreciation funds are being robbed in order to maintain low rates. In other places plant and equipment are being starved to obviate the necessity for increased rates. In general, the tramway capital is being tampered with in order to meet current administrative expenses of the municipalities. Mr. Dalrymple points out that the renewal of track is a grave matter because track cannot now be installed for less than three times its original cost, and it is therefore extremely important that the track which is now existing should be kept in a high state of repair.

Mr. Horsfield calls attention to the error in announcing a profit without any provision for renewal and without any provision for establishing or building up the "property restoration fund" which is required under the law. The general theme of his paper is to support the building up of renewal funds in order to maintain a properly serviceable equipment.

In the discussion which followed several members argued that the present generation should not have to shoulder the whole cost of maintaining an undertaking, but that if renewals are high today money should be borrowed to maintain the property for the present and future generations.

An interesting paper on the future of capital expenditure was presented by R. S. Pilcher, manager Edinburgh Corporation Tramways. Mr. Pilcher starts by pointing out the oft-repeated comparisons between pre-war cost of permanent way construction and present cost, between pre-war rolling stock cost and present day cost, and some other figures. He states that the question of new capital expenditure would solve itself if the revenue to be derived could be made to increase in the same ratio as working expenses. He points out that the process of increasing the cost of travel must necessarily be slow and gradual if the tramways are to reap the benefit, otherwise they will lose the traffic. If fares are raised gradually, it will not be felt so much by the public. He then discusses the public psychology in its willingness to pay the increased cost of most commodities but not of tramway fares. He expresses hopefulness for the future in this respect and an ultimate satisfactory financial position for the tramways.

He discusses the present situation in its relation to the high cost of new construction and points out that the development of transport as such is not going to be retarded, but says that if tramways, on account of the high cost of permanent way, are to be temporarily restricted, more attention will be given to forms of traction which require the least capital expenditure, namely, such forms as the motor bus and the trackless trolley.

He says that one cannot but see the effect that high capital costs are bound to have upon the development of the bus. There is undoubtedly a great field for this vehicle which can deal with extensions and new routes without any relatively great capital expenditure. He asks how many tramway systems there are in England where certain routes do not pay their way and which have never paid sufficient to justify the laying down of the permanent way. He points out that it is probably cheaper to work these routes than to scrap them, seeing that the capital has already been sunk, but makes the point that in the future when the question of the renewal of the permanent way of some of these has to be considered many such routes will be worked by motor buses or other railless vehicles.

He quotes some interesting comparative figures which he has recently worked out for the new construction of tramways compared with motor buses in the city of Edinburgh, which he gives as follows:

System	Capital Cost	Interest and Sinking Fund Charges per Annum	Interest and Sinking Fund Charges per Mile
Cost of new electric undertaking...	£1,677,600	£109,127	4.547d.
Cost of converting cable system....	£695,700	£56,014	2.334d.
Cost of providing a similar number of buses....................	£456,640	£64,131	2.672d.
Cost of providing buses to give the same seating capacity..........	£729,900	£103,155	2.886d.

Mr. Pilcher then goes on to discuss the figures given in this table and says:

It will be seen that the bus has a considerable advantage in capital expenditure over the figures for a complete new electric system, even providing for the same total seating capacity. On the other hand, of course, it is generally admitted that the working expenses of the bus are higher than the electric car.

Although the total cost of operating motor buses per mile may be higher than it is with electric traction for a city such as Edinburgh, it must be kept in mind that the capital cost per bus-mile remains a constant figure in relation to the number of buses in operation, whereas with electric traction the capital costs per car-mile increase in direct ratio to the decrease in the volume of traffic to be carried, or, the smaller the mileage run the higher the capital cost per mile, and inversely, the greater the car-mileage the less the capital cost per mile. When the suburban routes have been fitted, or routes which have not a heavy traffic, the cost of capital expenditure for electric cars becomes prohibitive. It is in these circumstances that the motor bus will become the cheaper vehicle to operate. The total cost of capital expenditure depends upon the frequency of the bus service. The bus may be made to pay when the service is increasing, the only condition being that the vehicle will require to be fairly well filled with passengers. Future extensions and new routes will probably take the form of motor buses, or other vehicles not dependent on a costly permanent way. New transport will be provided and faster vehicles will be used and development will be cut. I have seen in some districts motor buses running along tramway routes practically in competition with the tramways and worked by the same operating authority. I do not think this is going to help either the tramway or the motor bus. The bus should be used where the tramway cannot be used and the one vehicle made supplementary to the other. I do not think they need be competitive.

It may be of interest to the conference to know that in Edinburgh the intention is to run all the extensions with buses, and at the present time we are closing down four cableways which have not a great volume of traffic, being under £270 per week per mile of route. The tramway rails are worn out and it would not pay to renew the permanent way at present prices. Instead of spending new capital on a tramway where the traffic is not sufficiently heavy to pay the high capital charges motor buses are to be run. Only the future can tell at what point it will pay to lay tramway rails.

In the discussion which followed the presentation of this paper there was much difference of opinion expressed. Specific question was raised with reference to the use of the railless electric vehicle rather than the motor bus, when the question of track removal was the principal one.

Other points in the discussion were that consideration should be given to open track construction for some extensions, which gives advantage not only of lower costs but also of higher speed and reduced maintenance cost.

San Francisco Municipal Accident Record

THE Municipal Railway of San Francisco, Cal., has made public its accident record for the fiscal year ended June 30, 1920. This is reproduced herewith and the corresponding figures for the year ended June 30, 1919, are given for comparison in a parallel column.

ACCIDENT RECORD SAN FRANCISCO MUNICIPAL RAILWAY
(For fiscal year ended June 30)

	1919		1920	
Total passengers carried during the year..................	59,341,253	......	66,169,246	
Car-miles operated[1].........	7,212,762.50	......	7,419,272.33	......
Number of passengers to mile...	8	......	9	......
Number of accident reports filed[2]....................	1,972	......	2,019	......
Number of accidents—fatal....	10	......	7	......
Number of accidents—personal injuries..................	693	......	657	......
Number of claims presented....	472	......	344	......
Number of claims adjusted.....	109	......	104	......
Number of suits instituted.....	18	......	24	......
Number of suits pending.......	24	......	42	......
Number of passengers carried per accident report.........	30,092	......	32,773	......
Number of passengers carried per personal injury report...	85,629	......	100,714	......
Number of passengers carried per fatal accident...........	5,934,125	......	9,452,750	...
Classification:		Ratio		Ratio
Car collisions.................	164	0.0832	112	0 0555
Auto and wagon collisions......	1,100	0.5577	1,231	0 6097
Boarding moving car..........	171	0.0868	157	0 0777
Leaving moving car...........	108	0.0548	126	0 0624
Miscellaneous................	429	0.2175	393	0 1947
Total..................	1,972	......	2,019	
Accidents in per cent of passengers carried................	00.0033	......	00.003	......
Total receipts................	$2,425,761	......	$2,749,651	......
Total amount paid accident claims, office and miscellaneous expense..............	27,070	......	32,830	
Ratio to operating revenue....	....	0.0111	....	0 0119

[1] For 1919 this involves 6,899,677 car-miles and 313,095 bus-miles; for 1920, 7,182,475 car-miles and 236,797 bus-miles.

[2] This includes all reports of accidents happening near the cars in which this railway was not involved.

Application of Electric Traction on Trunk Lines

In Address Delivered Recently in Belgium, Sir Philip Dawson Outlined the World Situation in General and the Belgian Problem in Particular

IN A PRESIDENTIAL address recently delivered by Sir Philip Dawson before the Association of Electrical Engineering Graduates of the Montefiore Technical Institute, Liége, the subject of heavy electric traction was covered in a general way, with special reference to conditions in Belgium. This address is significant because Sir Philip has been serving as a member of the electrification commission of Belgium and he is also a member of the advisory committee on electrification appointed by the Minister of Transport of Great Britain.

Sir Philip said that electric traction is justified only where it will conduce to financial success. This he considered an axiom which must never be lost sight of except under particular and exceptional conditions. It follows that the plan to be adopted in any individual case must be that estimated to produce the largest possible return on the necessary capital, with due regard to all constituent factors directly or indirectly influenced by electrification.

In studying an electrification project three points must be considered, as follows: (1) The total investment required, including all necessary electrical, mechanical and other works; (2) the cost of operation, involving all operating expenses affected by this mode of traction; (3) the cost of maintenance of all parts which are affected by the installation of electric traction.

SOME SALIENT POINTS OF AGREEMENT

Before taking up in detail the application of electric traction to trunk lines Sir Philip reviewed briefly the axioms which, he said, are more or less generally admitted by those who have studied the problem deeply. He stated that the higher the costs of fuel and labor the more is electrification justified and listed a number of items, some of which were as follows:

1. Sixty-cycle turbo-generators cost less than 25-cycle machines.
2. Rotary converters for traction are more satisfactory at 25 cycles than at 60 cycles, and for 1,500 volts it is necessary practically to put two rotaries in series. Motor-generators are at present employed for voltages of 2,400 to 3,000.
3. Three-phase generators cost less than single-phase generators.
4. Direct-current motors of 600 to 1,200 volts are cheapest to install and maintain, and weigh least.
5. There is actually little difference between the cost of a high-tension direct-current equipment (2,400 to 3,000 volts) and a single-phase equipment.
6. To date there is no practical example of multiple-unit trains operating on direct-current lines of 2,400 to 3,000 volts.
7. At the moment there are four systems which have been applied for a period sufficiently long and on a scale sufficiently large to permit studying the results, as follows: (a) Low-tension direct-current lines, with third rail, 600 to 1,500 volts, applicable with multiple-unit cars or locomotives. With locomotives it is necessary at junctions and at classification stations to maintain the continuity of the contact line by means of an aërial line. (b) High-tension direct-current lines, 2,400 to 3,000 volts, with aërial contact wire, on which only locomotives can be used. (c) Three-phase lines, 3,000 to 5,000 volts, 15 cycles, two aërial wires per track, on which multiple-unit cars cannot be employed. This system facilitates regeneration on down grades and in braking. (d) Single-phase lines, 15 to 20 cycles, 11,000 to 16,000 volts, with aërial contact wire, on which it is possible to use both multiple-unit cars and locomotives.
8. The maintenance of the aërial line in the case where there is no steam traction is less costly than that of the third rail, but the presence of the third rail increases the track maintenance cost.
9. The higher the contact-line voltage is elevated, the less will be the cost of substations and distribution.
10. On certain old lines it is possible that the cost of increasing the height of bridges would be great, and this must be taken into consideration in estimating capital necessary for electrification.

PRO AND CON REGARDING SINGLE PHASE

Single-phase current has an unfortunate effect on telegraph and telephone lines in the neighborhood, but this interference can be reduced and nearly eliminated by auxiliary installations more or less costly. As to low voltage direct-current motors, there will not in the future be very great progress in regard to their efficiency or their cost. On the contrary, the single-phase system is subject to very great improvement, as has been demonstrated by recent developments in Switzerland and America.

The necessity for raising the voltage for traction on trunk lines caused the introduction of single phase, and it is this introduction which has resulted in the development of direct current at 3,000 volts and the improvements in the direct-current motor.

First cost, maintenance cost and weight of single-phase equipment are higher than those of direct-current equipment at low voltage, but differ little from those of high-tension direct-current equipment.

Regeneration is easiest with three-phase, but can be accomplished also satisfactorily with direct current and single phase. Also, it is easier to handle the small, high-tension current than the large, low-tension current.

TENDENCIES IN DIFFERENT COUNTRIES

Both Switzerland and Sweden have decided in favor of the single phase for electrification of their trunk lines. Prussia, the Grand Duchy of Baden, Bavaria and Austria had reached the same conclusion before the war. Italy has, up to the present time, preferred the three-phase.

In America opinions as to systems are divided. In all cases it has apparently been decided that for heavy trunk-line traction the aërial conductor is preferable to the third rail.

In England there are no examples as yet of trunk-line electrification, the only electrifications being those of suburban systems. The London, Brighton & South Coast Railway, having always had in view the electrification of its principal lines to Brighton, Worthing and Eastbourne, adopted the single-phase at a time when the only existing systems were direct current at 750 volts and three-phase at 3,000 volts.

The Northeastern has an electrification project regarding its line from York to Newcastle, with direct current at 1,200 volts, third rail and with an aërial wire at junctions, passenger stations and freight stations. In another project the adoption of 3,000 volts with a three-wire system and two third rails is under consideration. The track rail would serve as the neutral wire, and each train unit and locomotive would have the same number of motors on both circuits to maintain a load balance.

In France a commission which has studied the question of system in Europe and the United States appears to have concluded in favor of direct current at 3,000 volts, with aërial wire, at the same time anticipating great possibilities of future development of the single phase. This commission apparently has been influenced largely by the question of telegraphic disturbances and by the fact that the Germans were largely instrumental in the development of single phase.

The application of electric traction to railway trunk lines will have a great effect on the production of electricity, and above all on its application in other domains of industry. This influence will vary according to the case and will have in its turn an influence on the system of electric traction to be adopted.

In considering this point of view, there are certain typical cases which present themselves and which may be summarized as follows: (1) The case of a system crossing an agricultural country without great industries, such as that traversed by the London, Brighton & South Coast Railway on the line to Eastbourne, Brighton and Worthing, and without water powers; (2) a non-industrial country where there is no coal but where there are sources of hydro-electric power, such as certain parts of Switzerland and Italy; (3) a country having coal and metal industries, such as that traversed by the Northeastern Railway; (4) an industrial country with metallurgical resources and hydro-electric power but without coal, such as Sweden.

In the first case the demand for energy for electric traction will form the preponderating part of all electrical energy requirements. In the second case it may be that political and military reasons may force electric traction, as is the case in Switzerland. In the third and fourth cases traction will require perhaps a relatively small part of the total electrical energy produced in the country, but the utilization of electrical energy for traction will improve power plant load factors and reduce the price of the electrical energy.

There are intermediate cases, as in London, where electric traction will aid in the amalgamation of the electricity-producing interests now existing, and the creation of new super-power plants which would not be possible otherwise from the economic point of view. In Greater London, for example, the electrical energy necessary for the lines already electrified, or which must be electrified in the near future, is as much as 1,500,000,000 kw.-hr. per year, while the consumption for all other purposes is hardly 500,000,000. The complete electrification of the suburban systems of the London, Brighton & South Coast Railway will alone absorb 250,000,000. In Chicago, in 1915, the electrical energy absorbed by the traction lines was 680,000,000 kw.-hr., while that utilized for other purposes did not reach 400,000,000, Chicago having a population one-third that of London. A concept of the quantities of electrical energy required for traction can be gained from the statement that in 1918 Great Britain produced 4,000,000,000 kw.-hr., while the United States produced 28,000,000,000.

Obviously in the study of new power plant installations the demands of electric traction will play an important rôle and will render necessary the installation of super-power plants which would not be justified otherwise. This will permit the production of energy in quantity and the furnishing of it for other purposes at a price otherwise impossible. Again, however, the financial return must be considered from the start. A super-power plant will justify itself only when from the start it will have a good load factor. The location of the power plant also plays an important part in this matter.

THE "WHY" OF ELECTRIFICATION

The principal causes which have led to the application of electric traction on trunk lines in the past may be summarized as follows:

1. The difficulties of ventilation of the tunnels, which led to the electrification of the Baltimore & Ohio in Baltimore in 1894, and later to that of the tunnels in Paris, London, Budapest, Berlin and New York, as well as in Switzerland, Italy and other countries.
2. Competition of the electric tramway and the omnibus.
3. Danger of fire from steam locomotive sparks.
4. The greater facility of traction on heavy grades due to the better adhesion and the economies of regeneration.
5. In the case of counties having no coal, independence on foreign countries for transportation.
6. Increase in capacity of existing lines.
7. Economy of coal consumption, estimated at from 50 to 66 per cent.

As to the results obtained from electric traction, experience gained with electric tramways has been confirmed with railroads; the greater the facilities for travel, the greater the number of travelers. Electrification of a part of the suburban system of the London, Brighton & South Coast Railway and of the London & Southwestern Railway has increased the number of passengers and the receipts more than 100 per cent. Of course, it does not follow that the same results will be obtained everywhere; that depends upon the particular circumstances met with in each case.

One of the great successes of electrification results from the facility with which trains may be divided up into multiple units, according to the needs of the public at different times of the day. It is the frequency of the trains, not the necessities of the clock, which encourages passengers in forming the traveling habit.

As regards freight traffic, the electric locomotives are more efficient and economical than steam. They do not consume energy and do not deteriorate, except when producing traction, whereas a steam locomotive is deteriorating and consuming combustible as long as it is in service. One electric locomotive does much more work than a steam locomotive, as for example on the Norfolk & Western in America.

The length of railways in the entire world is about 745,000 miles, of which 264,000 miles is in the United States and 29,000 miles in England. On a single-track basis, these figures become respectively 398,000 miles and 62,000 miles. In the United States there are nearly 8,100 miles of single track operated electrically, employing 675 electric locomotives. The railways of the United States consume about 25 per cent of the coal produced, while the railways in England consume only 6 per cent of the coal produced in England. The latter low figure is due to the great export traffic in coal and to the enormous demands of the British marine. In Europe, while electric operation is limited, the number of electric locomotives employed is not much less than in the United States.

In view of the different systems of traction in existence and the youth of electric traction, the question arises as to whether there is a possibility of a single system which can be adapted to all cases. This is without doubt an attractive ideal, but on account of the divergent views of manufacturers, engineers and administrators it will be realized with difficulty, if ever.

It is clear that in the case of the increases in costs resulting from the war, which will long continue, there would be no financial advantage in changing the scheme of electrification of the large systems electrified at 600, 750 or 1,200 volts, to say nothing of the 2,400 or 3,000-volt systems. For the long distances to be covered by heavy trains, especially in cases where a dense and continuous traffic does not exist, a voltage of 600 to 1,200 is not sufficiently high.

For the present, at least, two systems must be used, one for intense suburban traffic and the other for trunk lines. In the first case 600 to 1,200 volts, direct current, will be employed, with third rail; in the second, overhead conductor must be used with high tension, 3,000 volts direct current or 11,000 to 16,000 volts single phase. The question comes back then to determining which of these systems in the end will be shown to be more advantageous financially. A still more desirable solution would be one permitting both systems to use the same track rails and to take current from the same distributing system.

Electrification and the Super-Power Plant

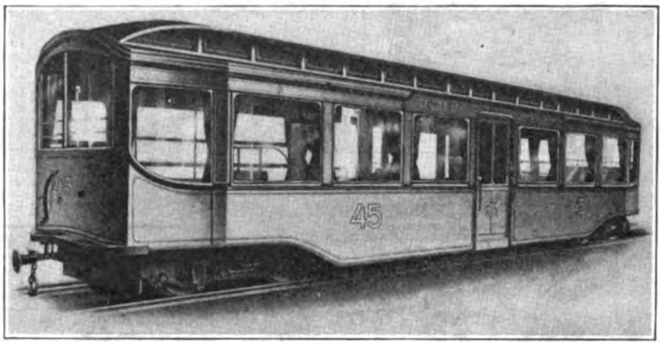
The futures of electric traction and of the super-power plant are intimately related. Unfortunately in England, as well as in the United States, the public press appears to believe that electric traction must be applied universally from now on; that it will lead immediately to great economies and to great financial advantages, and that the only thing to do to obtain energy at a very low price, without consideration of the attendant circumstances, is to build a super-power plant and all will be well.

As to Belgium, in view of its relatively small area, its dense population, its frugal and industrious people, its well-developed metallurgical and other industries, its excellent railroad systems and its fuel resources, its railways can be compared with a vast suburban system. If there is a case where a complete electrification would be justified, that case presents itself in Belgium. Here it is necessary to study fundamentally the electrification of the entire system, in such a way that the sections which are to be electrified now will form a homogeneous part of the whole from the points of view both of traction and distribution. Such a study will be costly, but when millions of francs are involved it seems worth the investment of some hundreds of thousands of francs so as to insure the obtaining of the best possible financial results.

Center-Entrance Cars in Germany

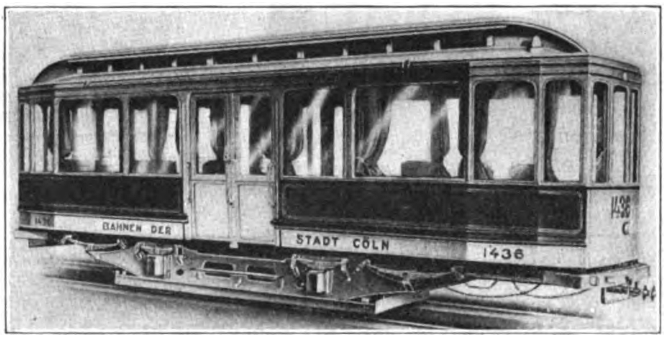
The Construction Details, While Giving a Pleasing Effect, Are More Elaborate Than Would Be Considered in the United States

TWO new types of electric cars for street and interurban service in Germany are shown in accompanying illustrations. The single-truck type is for service in Cologne and has a step as part of the truck construction. The truck has pressed steel sides and an angle-iron framework. This car is 29 ft. long, 7 ft. wide, 10 ft. 10 in. high over roof and has a wheelbase of 8 ft. 6 in. It weighs 15,730 lb. and has a seating capacity of twenty-six passengers and a total capacity of forty passengers.



SUBURBAN AND INTERURBAN TYPE OF CAR

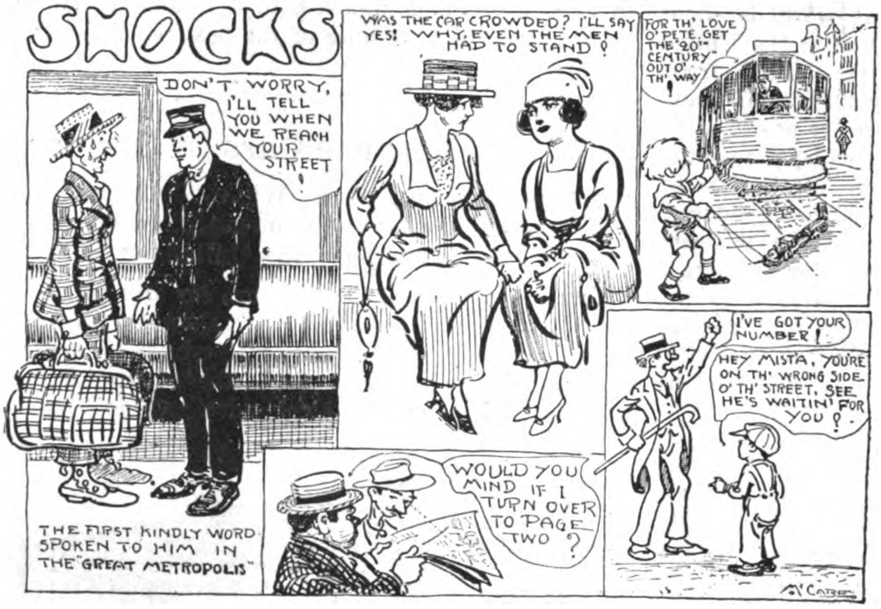
The Bonn-Mehlen interurban car has a well at the center so that passengers may step directly into the car with a single step. There are two steps from the center compartment up into the end compartments. This car is 42 ft. long, 7 ft. 6 in. wide and 9 ft. 10 in. to the top of the roof. The car weighs 27,500 lb. and has a seating capacity of forty-four with a total capacity of sixty-six under normal conditions and a maximum of seventy-eight passengers.

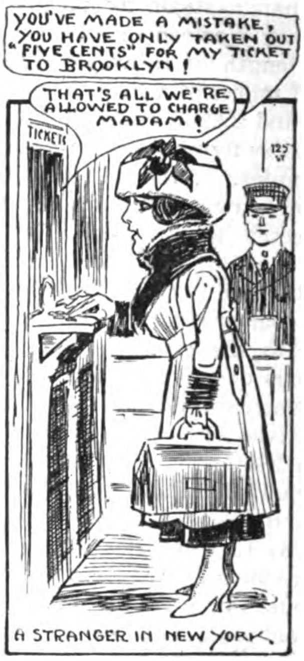


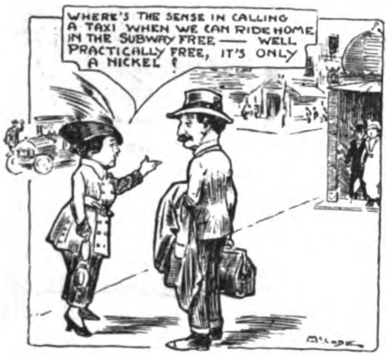
SINGLE-TRUCK CENTER-ENTRANCE CAR FOR CITY SERVICE

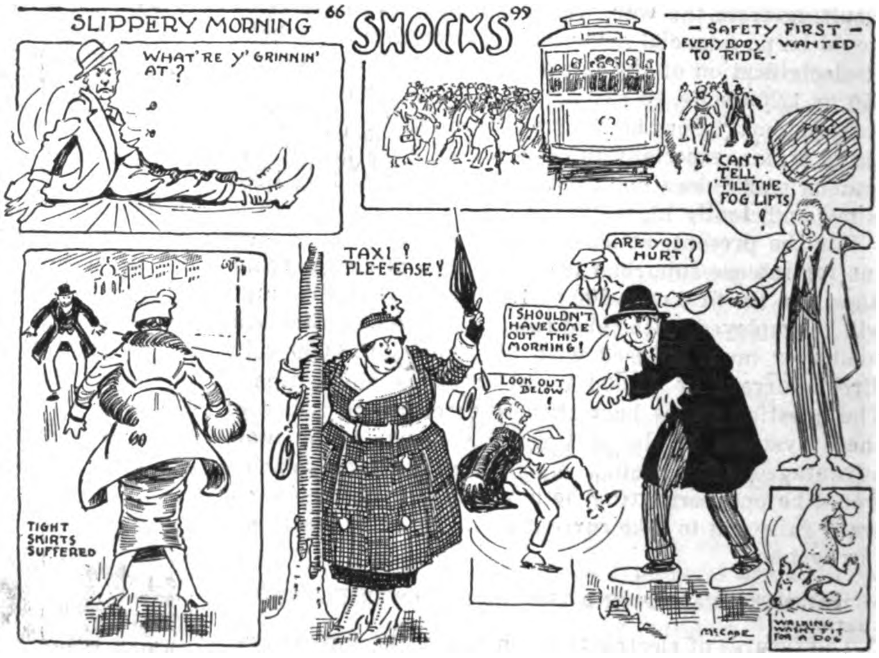
These cars are provided with both longitudinal and cross seats and have electric heaters. All doors slide into pockets and the interior is provided with sliding doors between the center compartment and the end compartments.

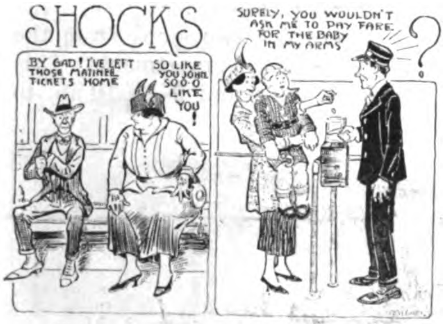
As Seen by the Cartoonist

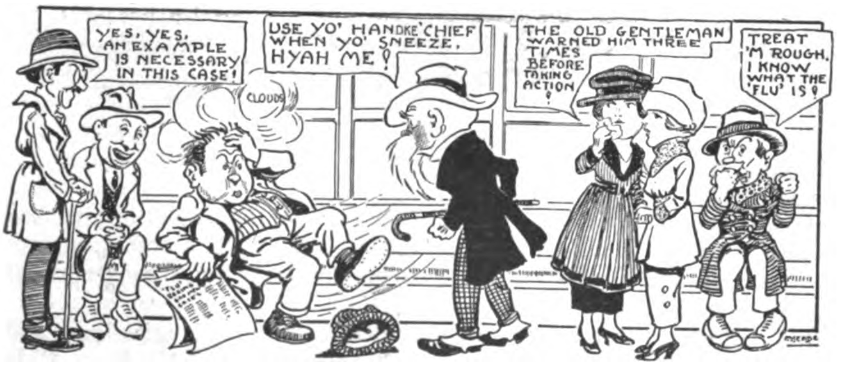

SHOCKS
DON'T WORRY, I'LL TELL YOU WHEN WE REACH YOUR STREET!
THE FIRST KINDLY WORD SPOKEN TO HIM IN THE "GREAT METROPOLIS"
WAS THE CAR CROWDED? I'LL SAY YES! WHY, EVEN THE MEN HAD TO STAND!
FOR TH' LOVE O' PETE, GET THE "20TH CENTURY" OUT O' TH' WAY!
I'VE GOT YOUR NUMBER!
HEY MISTA, YOU'RE ON TH' WRONG SIDE O' TH' STREET, SEE. HE'S WAITIN' FOR YOU!
WOULD YOU MIND IF I TURN OVER TO PAGE TWO?
McCABE

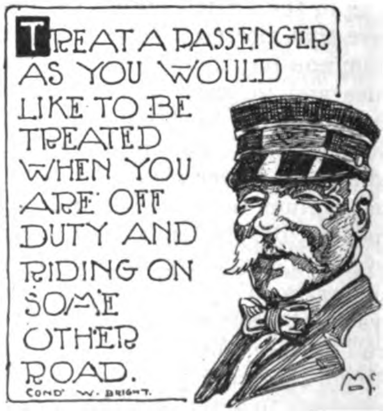

YOU'VE MADE A MISTAKE, YOU HAVE ONLY TAKEN OUT "FIVE CENTS" FOR MY TICKET TO BROOKLYN!
THAT'S ALL WE'RE ALLOWED TO CHARGE MADAM!
TICKETS
125 ST
A STRANGER IN NEW YORK.


WHERE'S THE SENSE IN CALLING A TAXI WHEN WE CAN RIDE HOME IN THE SUBWAY FREE — WELL PRACTICALLY FREE, IT'S ONLY A NICKEL!
McCABE


SLIPPERY MORNING
"SHOCKS"
WHAT'RE Y' GRINNIN' AT?
- SAFETY FIRST - EVERY BODY WANTED TO RIDE.
FOG
CAN'T TELL. 'TILL THE FOG LIFTS!
TIGHT SKIRTS SUFFERED
TAXI! PLE-E-EASE!
ARE YOU HURT?
I SHOULDN'T HAVE COME OUT THIS MORNING!
LOOK OUT BELOW!
McCABE
WALKING WASN'T FIT FOR A DOG


SHOCKS
BY GAD! I'VE LEFT THOSE MATINEE TICKETS HOME
SO LIKE YOU JOHN SOO-O LIKE YOU!
SURELY, YOU WOULDN'T ASK ME TO PAY FARE FOR THE BABY IN MY ARMS
?


YES, YES, AN EXAMPLE IS NECESSARY IN THIS CASE!
USE YO' HANDKE'CHIEF WHEN YO' SNEEZE, HYAH ME!
CLOUDS
THE OLD GENTLEMAN WARNED HIM THREE TIMES BEFORE TAKING ACTION!
TREAT 'M ROUGH, I KNOW WHAT THE 'FLU' IS!
McCABE


TREAT A PASSENGER AS YOU WOULD LIKE TO BE TREATED WHEN YOU ARE OFF DUTY AND RIDING ON SOME OTHER ROAD.
COND' W. BRIGHT.
Mc

This is another group of McCabe's cartoons, taken from recent issues of the "Interborough Bulletin." A previous selection was published on page 974 of the issue of this paper for Nov. 6.

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Two Scenario Suggestions Presented

Work of Two Film Companies Printed Here to Inspire Discussion and Criticism on Use of Film in Publicity Work

THESE pages have carried considerable discussion about the suggestion made on page 604 of the Sept. 25 issue to utilize the splendid educational strength of motion pictures in behalf of the electric railways in their necessity to win public approbation, or at least to dispel public prejudice. Of all the letters received commenting on the idea none has expressed the belief that the use of pictures in a broad national way was impractical, but several have reiterated the thought expressed in the original article that the making of an effective film would be difficult and would require a great deal of thought by a number of able men.

The JOURNAL has endeavored to learn something of the seriousness of this difficulty by enlisting the aid of two prominent film producers, the Rothacker Film Manufacturing Company and the Atlas Educational Film Company, both of Chicago. Three scenario writers of these companies, after several conferences with one of the editors of this paper, each outlined a scenario suggestion which he thought could be used as the vehicle to carry the message desired, as he had interpreted the problem. Two of these scenario suggestions are published herewith, for the purpose of putting before the industry something concrete to discuss and criticise. It is not contended that either of them would meet the requirements, though they do show a good grasp of the problem for so short a study on the part of the authors. It was thought that with these definite suggestions to start one thinking along the line of a scenario for broad street railway use it would be possible to induce a real discussion of the matter out of which would come some sound counsel on what ought and what ought not to go into such a picture, and perhaps some suggested themes for other scenarios. It will be out of such a variety of thought that the final product will crystallize, and the more discussion that can be brought out now the easier will be the task of an official committee later on. The JOURNAL will be glad to receive the thoughts of readers about the scenario suggestions.

Scenario Suggestion No. 1

The writer of this scenario quotes a statement from the report of the Federal Electric Railways Commission as the keynote of the object of this picture as follows:

"The electric railway furnishing transportation upon rails is an essential public utility and should have the sympathetic understanding and co-operation of the public if it is to continue to perform a useful public service."

It is to give the general public this "sympathetic understanding" of the situation confronting the street railways of our land that the story has been written. The story, as it will be unraveled in picture form to the public, begins.

"Boss" Bailey, an unscrupulous political boss of a Mid-West city, learns that the local street railway company has failed to comply with the provision of its franchise requiring it to construct at least three miles of new track each year. The reason for the failure interests the boss not at all, but the possiblity of ousting the present company and granting a new franchise suggests a golden opportunity.

Accordingly "Boss" Bailey calls on Harry Carson, the local prosecuting attorney, who had been nominated and elected through the boss's influence. With apparent indignation "Boss" calls attention to the deplorable service the street railway company is rendering, picturing old style, overcrowded cars and people having to wait, unable to get on the cars.

And then the "Boss," concealing his own ulterior motive under the guise of deep concern in the city's welfare, points out that these abuses need not be longer endured; that the company has technically violated its franchise; and that it is Harry's duty as public prosecutor to oust the company and permit a franchise to be given to a company which will handle properly the local transportation problem.

Harry Plans Ouster Proceedings

The appeal is effective. Harry, intensely conscientious and public spirited (despite the fact that presumably he is one of the boss's men), immediately prepares to start ouster proceedings—to the delight of "Boss" Bailey, who begins laying wires for a grand "killing" for himself and his friends.

But before filing the papers Harry, naturally square and aboveboard, realizes it is no more than fair to talk the matter over with the railway company, so he calls on the president. To Harry's surprise, the president of the company attempts no denial of the wretched service the company is giving. On the contrary, he freely admits this and deplores the company's inability to do better without an increased rate. He explains that the present 5-cent fare and other franchise terms were based on pre-war conditions. That since then wages have increased enormously, likewise the cost of cars and equipment; that for the past two years the company has barely earned the interest on its bonded indebtedness and paid no return to its numerous stockholders, the real owners of the property.

Company Makes Novel Proposal

Then the president puts the matter up to Harry squarely: "If we are put out of business, then what? The city must have street cars; what assurance have you that a new company *can* do what we *cannot* do?"

"It is not a question of ability," retorts Harry, "it is a question of willingness. I am not a street railway man, but to be frank I think you are bluffing. If I had charge of your company for a month I would show you how to give real service." And Harry bangs his fist emphasizingly on the desk.

For a moment the president looks at Harry thoughtfully. From past experience he knows that Harry is wholeheartedly interested in the welfare of the city; that he is a young man of sincerity and moral integrity. Moreover, the president has uppermost in his mind the knowledge that Harry probably has it in his power to oust the company.

"Very well," begins the president slowly, "maybe you are right, although I don't think so, but I'll put you in as general manager with absolute authority. You can employ whatever help you need."

Harry's eyes open in astonishment at the unexpected proposition and he is on the verge of refusing, when the thought occurs to him that perhaps the interest of the citizens can best be served by accepting the offer. For several moments he sits thinking. Then he recalls an intimate friend who is a street railway engineer of considerable experience, whose asistance he could probably enlist.

"All right, I'll take the job," exclaims Harry. "First of all, I'm going to have a valuation made of the entire line; I want to see how much watered stock you have."

The president smilingly agrees: "Go as far as you like, you are in absolute control."

Harry Becomes General Manager

Fortunately Harry is able to secure the assistance of his friend the engineer, a thoroughly competent man, who immediately takes active charge. A valuation of the company's property is immediately started, together with an examination of its books.

All this occurs while "Boss" Bailey is temporarily absent from the city. When he returns and learns the situation he is wild with rage. Rushing over to Harry's office, he angrily demands that Harry's plan be dropped and the ouster suit instituted. But Harry, convinced that he is working for the welfare of the city, refuses. A heated discussion follows, the "Boss" craftily concealing his real reason for wanting the company ousted. But the "Boss'" efforts fail, despite a veiled threat that inasmuch as Harry's term of office is about to expire, if Harry wants to be re-elected, he had better "watch his step." But Harry refuses to be swerved from his purpose and the Boss leaves, wild with rage.

With enthusiastic determination Harry takes up his task. First he turns his attention to the matter of improving the service. In order to secure first-hand knowledge of the actual conditions he goes incognito to a busy section of the city at the rush hour. "First-hand knowledge" he certainly secures, as he watches the shoving, jostling crowd struggle to board the crowded, antiquated cars. Suddenly Harry is horrified to see a girl, shoved by the crowd, slip and fall under a moving car. Leaping forward, he grabs her by the arm and drags her to safety by a fraction of a second. The girl thanks him as much as her shattered nerves will permit, and then gets on the next car and, with a good-by smile to Harry, is gone.

A survey of various sections of the city discloses the same condition everywhere—a woeful lack of cars to handle the traffic. A trip to the carhouses shows that all available cars are in use. There is but one answer—more cars must be purchased—up-to-date, *high-speed* cars which will handle the traffic.

His Eyes Opened to Railway Problems

The following day he sees the other side of the problem. Visiting the carhouse during the dull hours he finds hundreds of cars standing idle, useless, with conductors and motormen likewise idle, drawing their pay while waiting for the rush hours. Even the cars that are running during the dull hours are carrying comparatively few passengers. And then Harry begins to realize some of the problems with which the street railway companies have to contend.

He then investigates the problem of unregulated jitney competition, which his friend the engineer explains can be combated successfully only by new safety cars and frequent headway—involving another expenditure of money.

And so the investigation continues—roadbeds, repair shops, etc., all with the same result. The irrefutable necessity for an increased revenue—*more money*.

Harry then turns his attention to the possibility of reducing operating expenses. An attempt to cut down the men's wages results in a threat of a strike (or perhaps an actual strike). He likewise finds it is impossible to cut down any other items of expense.

Throughout all this investigation Harry has a vague, unexplainable hope that he will again see the nameless girl whom he saved, but never a glimpse of her does he catch.

Harry Meets With Another Surprise

About this time the valuation is completed and Harry eagerly glances at the figure. To his surprise he finds that the company, as the president asserted, has been earning less than 1 per cent on the actual present-day valuation—that there is no watered stock.

Harry and his engineer friend have a long talk. Coolly they analyze the situation. The facts are clear; it is absolutely impossible to give satisfactory service with the present equipment. New, up-to-date cars must be purchased.

"Fortunately, conditions are such that we can use safety cars," states the engineer. "In some localities they cannot be used." Then we dissolve into a series of views showing the operations and advantages of the new type safety car.

"The entire system must be put in first class condition," concludes the engineer, "and all this requires money—the very thing the railway company hasn't got."

He Seeks Aid of Friend Banker

The only solution seems to be to make a loan, and accordingly Harry calls on a banker friend. To his surprise the banker positively refuses to loan the railway company any money.

"Its income is not sufficient to justify it," explains the banker. "I would be criminally negligent to my depositors if I were to loan money to a concern which is earning less than 1 per cent on its investment."

And then the banker goes on to add that big investors, such as insurance companies, savings banks, trust companies, etc., are fighting shy of street railway securities for the reason that in the past they have invested large sums in this class of securities and have received meager or no returns on their money.

Still unconvinced, Harry tries to interest some local investors in the proposition, but they ridicule the idea of investing in a concern which is paying no dividends and is on the verge of bankruptcy. They likewise call Harry's attention to the Federal Electric Railways Commission report that on July 1, 1920, there were 118 companies, with a trackage of nearly 8,000 miles, in receivership.

The Attorney Realizes His Mistake

Harry and his engineer friend have another long conference. Both agree that it is absolutely impossible to improve the service under present conditions.

Accordingly on the following morning Harry calls once more on the president of the street railway company, apologizes for his former criticism, frankly says that he was mistaken; that he and his experts have been unable to work out any betterment of the service; that nothing can be done with the present equipment, and Harry frankly admits that the only solution is an increase in fare, which he promises to use his efforts to assist in securing.

"Boss" Bailey is furious when he hears of this and tells Harry that unless he withdraws from his idiotic position and starts ouster proceedings he will kill Harry politically, to which Harry retorts that he will run independently for prosecuting attorney, while "Boss" Bailey puts up another of his men, Dugan.

Harry Defies the "Boss"

The issue is sharply drawn. Dugan and his crowd stand for ousting the company; Harry and the other independent candidates stand for an improved car service, with new, up-to-date safety cars, fast service, comfort, convenience, safety, extensions, and with necessarily a slight increase in fares, which will be returned many times over in the increased prosperity not only of the community generally but of the individual citizens, to say nothing of their comfort, convenience and safety. Harry makes an aggressive, energetic campaign and wins many adherents to his already considerable following.

As the election approaches, despite the inherent handicap of Harry's platform, which of course advocates an increase of fare, he gains so many new friends that "Boss" Bailey becomes alarmed and calling together his henchmen he plans by hook or crook to insure Harry's defeat.

The Boss Resorts to Trickery

As a result the day before the election, on the front page of "Boss" Bailey's newspaper, there appears, in red headlines, "Reason for Carson's Friendship for Railway Company Revealed."

Then follows what purports to be a statement of one John Baker that Carson has admitted to him that he was "getting his", from the railway company, together with other insinuations to the effect that Harry had been bribed by the transportation company.

When Harry's wrath over the false accusation has cooled he racks his brain for a means to counteract the effect of the newspaper statement. The only solution seems to be to get hold of John Baker, whom Harry knows to be a tool of "Boss" Bailey, and in some way force Baker to admit that his charge is false. A search is instituted for Baker, but the latter is not to be found.

The possibility of Baker being concealed in "Boss" Bailey's office suggests itself to Harry, likewise the possibility of Harry being able in some way to secure some information from "Boss" Bailey as to the whereabouts of Baker. Over to Bailey's office Harry rushes. And then, as he opens the door into the outer office, he stares in surprise, for at a typewriter sits the girl of his dreams—the girl for whom he has been searching—the girl whom he had saved from the car.

Enter the Heroine

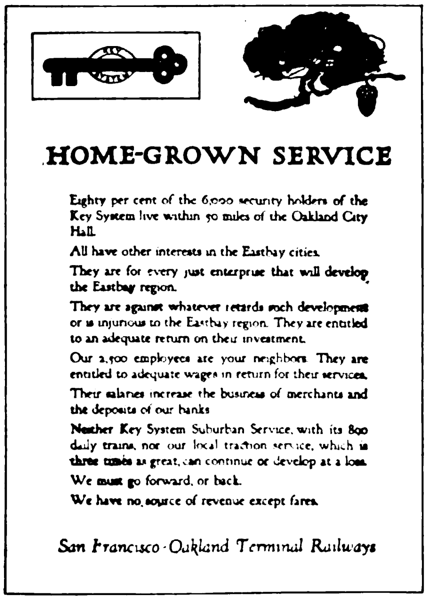
With a smile of delight Betty (for such is her name) comes to meet Harry, and Harry is so pleased that he almost forgets his mission and Betty is just as glad to see him.

But the "Boss" absolutely refuses to see Harry, and Harry is in despair when Betty (into whose sympathetic ear Harry has explained the situation) suddenly recalls having heard the "Boss" and his men mention the "Wayside Inn," a notorious roadhouse.

Two minutes later Harry is in a high-powered motor racing toward the "Wayside Inn." Arriving at the roadhouse, he secures admission secretly through a window.

After a desperate fight with a guard, Harry finds his man, who, terrified, makes a complete confession, including full details of "Boss" Bailey's plans and activities.

How the San Francisco-Oakland Terminal Railway Is Trying to Tell Some Homely Truths About the Intricacies, Detail and Size of the Local Railway Business



HOME-GROWN SERVICE

Eighty per cent of the 6,000 security holders of the Key System live within 50 miles of the Oakland City Hall.

All have other interests in the Eastbay cities.

They are for every just enterprise that will develop the Eastbay region.

They are against whatever retards such development or is injurious to the Eastbay region. They are entitled to an adequate return on their investment.

Our 2,500 employees are your neighbors. They are entitled to adequate wages in return for their services.

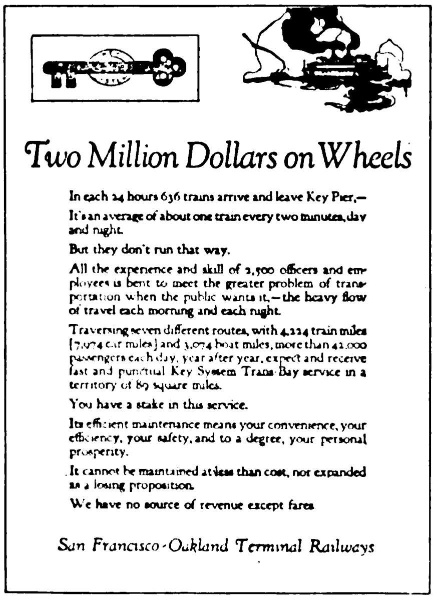
Their salaries increase the business of merchants and the deposits of our banks.

Neither Key System Suburban Service, with its 800 daily trains, nor our local traction service, which is three times as great, can continue or develop at a loss.

We must go forward, or back.

We have no source of revenue except fares.

San Francisco-Oakland Terminal Railways



Two Million Dollars on Wheels

In each 24 hours 636 trains arrive and leave Key Pier,—

It's an average of about one train every two minutes, day and night.

But they don't run that way.

All the experience and skill of 2,500 officers and employees is bent to meet the greater problem of transportation when the public wants it,—the heavy flow of travel each morning and each night.

Traversing seven different routes, with 4,224 train miles [7,074 car miles] and 3,074 boat miles, more than 42,000 passengers each day, year after year, expect and receive fast and punctual Key System Trans-Bay service in a territory of 89 square miles.

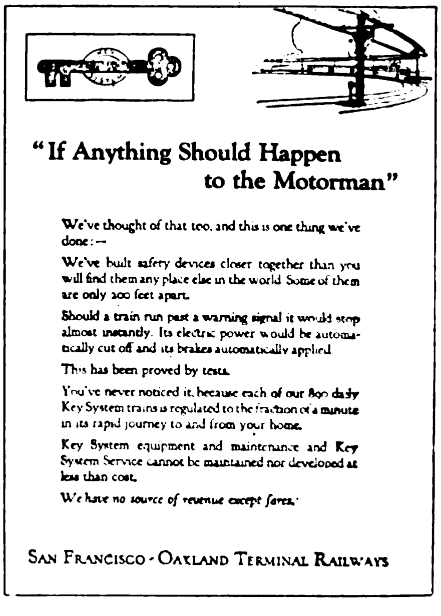
You have a stake in this service.

Its efficient maintenance means your convenience, your efficiency, your safety, and to a degree, your personal prosperity.

It cannot be maintained at less than cost, nor expanded as a losing proposition.

We have no source of revenue except fares.

San Francisco-Oakland Terminal Railways



"If Anything Should Happen to the Motorman"

We've thought of that too, and this is one thing we've done:—

We've built safety devices closer together than you will find them any place else in the world. Some of them are only 200 feet apart.

Should a train run past a warning signal it would stop almost instantly. Its electric power would be automatically cut off and its brakes automatically applied.

This has been proved by tests.

You've never noticed it, because each of our 800 daily Key System trains is regulated to the fraction of a minute in its rapid journey to and from your home.

Key System equipment and maintenance and Key System Service cannot be maintained nor developed at less than cost.

We have no source of revenue except fares.

SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS

Politicians' Plot Exposed

Harry rushes Baker to the evening newspaper offices, where the confession is repeated, and soon thereafter the evening papers are carrying the message to the voters that John Baker admits his statement about Carson is false and was made up at the instigation of Bailey and his candidate Dugan, who are planning to oust the street railway company in order to start another company with a handsome financial profit to themselves.

Baker likewise adds the interesting information that "Boss" Bailey has frequently admitted that he knows that street car service cannot be given for a 5-cent fare, but that it makes good political talk—and "to hell with the public."

The People's Verdict

Naturally the voters are wild with indignation at the "Boss" and his crooked gang, and the following day there is such a revulsion of sentiment that Harry and the rest of the independent ticket are elected.

The inceased rates are speedily put into effect, and the company, being able to secure financial assistance, does its part nobly. The lines are rehabilitated, new modern safety cars are installed and the citizens have a transportation system of which they are justly proud. This situation will all be shown in actual scenes which will vividly contrast with the former wretched service under the inadequate 5-cent fare.

And our picture closes with Harry and Betty taking a ride in one of the new safety cars, their action indicating that their friendship is rapidly developing into mutual affection.

Scenario Suggestion No. 2

The writer of this scenario makes a preliminary statement to the effect that the object of the story is to show the complete dependence of the public on street car systems. This is accomplished by weaving in with the story the Toledo incident of stopping transportation by removing the cars out of the jurisdiction of the city and state authorities. In the adjustment which follows the street railways have an opportunity to present their side of the case and make the people themselves the jury which shall decide the outcome, once they thoroughly understand the situation. The action of the story makes this possible in a natural manner in the working out of the Mayor's "back-to-the-land" idea, by which he hopes to mitigate the crime wave which is sweeping the city. The synopsis of the story to carry out this intent follows:

John Dayton lives with his daughter, Helen (a pretty girl of 20), in a mountainous district a few miles from the nearby city. Dayton owns coal property for which he has tried in vain to get capital to develop. Being far removed from the lines of transportation, he finds it impossible to get the necessary funds to promote it or men to work it. Years of experience in mining makes him confident that the stuff is there and he plugs away in the hope that he will some day succeed in getting it developed.

Helen sympathizes with the old miner, whose life work is tied up in this property. There is a strong bond of affection and understanding between them and her convictions that he will some day succeed give the old man courage to go on.

A Man with a Big Idea

In the nearby city a great wave of crime among the young boys has swept over the community, and ex-Judge Hanlon of the Juvenile Court has been nominated on the reform ticket. His years of work among the boys and girls of the court has convinced him that in order to accomplish any lasting good the youth of the country must be saved from the pernicious influences which have bred such an alarming number of criminals among the young boys.

He bases his hope of reform on the "back-to-nature" idea, to take the children away from the congestion of a big city, to encourage the parents to acquire homes in the suburbs and give their families an opportunity to grow up under the influence of the green grass and blue sky. He knows it is difficult for any one, much less a child, to grow evil when living close to the heart of nature.

Hanlon has a gigantic task before him To accomplish this end it is necessary to have the street railway system extended in every direction. But there has been a long fight on between the street car corporation and the people. However, Hanlon is young and enthusiastic and refuses to recognize any obstacle to his plan.

Railway Forced to Drastic Action

Meantime the fight has resulted in the street railways giving an ultimatum to the Aldermen of the city, who have recently recalled a franchise they promised. The company officials threaten to stop transportation. The Aldermen defy them, not believing they dare. The city is near the state line; by the next morning every car belonging to the company has been transferred across the line and out of the jurisdiction of the state officials.

There is consternation everywhere as the city wakes up to face a general tie-up of the traffic. As the workers are compelled to use the totally inadequate jitneys and every available vehicle they can muster, or walk, they suddenly have a bitter realization of the value of a utility which until now had seemed as much a part of their everyday life as light or food or air.

Angry Mob Threatens

A mob (ignorant of the action of the company in removing the cars) gathers outside the carhouses, threatens to storm the place and run the cars by force. The carhouses are opened to show vast empty spaces where formerly the cars had stood.

Such is the condition which confronts Hanlon on his first day in office. He goes in person to the president of the street railways to force him, if necessary, to put the cars in operation. He finds the cars have been removed from his jurisdiction and there is nothing to be done by means of coercion.

The situation results in a conference between the Mayor and the president, which gives the street car company an opportunity to present its side of the case in a natural manner. The president appeals to Hanlon's sense of fair play, which is in reality the people's sense of justice. He reminds the Mayor that he wants the street railways extended to carry out his "back-to-the-land" idea and to develop the surrounding country, which extension is impossible at the present rate of fare.

To Rid the City of Crime

Hanlon is open-minded and both sides of the question are brought out, apparently with a view of furthering Hanlon's official ambition to rid the city of the crime wave, which can be done only with the co-operation of the street railway company.

In order that the conference will not be too continuous there is shown as parallel action the condition of the city during the absence of transportation. Part of the propaganda is put into the mouths of the people themselves. For instance: A workman waiting in vain for a jitney complains that every half hour he loses costs him 50 cents. A superintendent waiting at the same corner admits that every hour he loses costs the company hundreds of dollars in the loss of time of its men, and the individual losses are made the basis for pointing out the loss to the entire city.

Not a Soulless Corporation

Meantime the conference is going on. The street railway's president makes Hanlon understand the vast capital involved, the number of small investors who must be protected; that he is not dealing with a soulless corporation, but with every working man or woman or widow who has stock in this great interlocking system of transportation. He points out the small amount of each dollar which actually goes to the investors This is accomplished by means of a diagram, which divides the dollar up into proportionate shares, showing so much to the city for franchises, so much to the employees, so much for overhead, for accidents, deterioration, etc. In this division of the dollar the audience learns through the eyes what a small slice actually is left for the man who risks his money.

The picture will show that a utility belongs to those who make use of it. The film will also bring out the thought that the system of transportation will carry a man from 1 mile to 10 for 6 or 7 cents, while the automobile owner with capital invested in his machine, with the added cost of upkeep, pays more than double the amount for gas alone for the same distance. The street car system belongs to the people of moderate means. The electric railways are the capillaries of the body politic, without which it cannot exist.

Public Ownership vs. Adequate Fares

In conclusion the president points out two courses: One is to allow the trolley company an equitable rate of fare which will pay the investors a fair rate of interest (under public regulations of the utilities board there is no longer a chance for larger profits), the other is for the city to buy the electric railway system, run it as a municipal utility, bear the deficit which the present rate of fare entails and make it up in added taxes, same as with the parks, water system, etc.

The latter proposition may seem to the audience at first sight like a solution of the problem. The Mayor explains, however, that no American city of the size has thirty millions of dollars to put into such a utility and run it at a loss; that it would mean an addition of $50 per capita in taxation, besides plunging the city almost hopelessly in debt for the initial expenditure.

The two men are at a deadlock in the conference. The president finally declares that if the people themselves once really understood the situation, if they would discount the ancient bunk of the professional politician, he would be willing to abide by their decision. He further points out that under municipal ownership the lines would be run by politicians instead of by trained experts who know their jobs.

The conference results in a better understanding by the Mayor (and the audience) and he agrees to use his influence to bring about an understanding between the railways and the public.

An Unexpected Caller

Helen Dayton, in her father's little cabin in the mountains, reads of the aims and principles of the new Mayor, his "back-to-the-land" idea and his hope of having the street railways extended. Unknown to her father, she visits the Mayor's office in the hope of getting the car lines extended so that her father's mine may be developed.

In spite of the Mayor's political success he is young enough to be impressionable, and right here the little God of Romance gets on the job. The girl is earnestly explaining the possibilities of the coal mine. Hanlon looks deep into her eyes—"Did you say diamond mines?" he asks absently

When the thread of the story is again taken up the extension of the car lines has been made and what was formerly great stretches of weed-grown land around straggly suburbs has now become a newly built up part of the city which the street car system has brought to its doors.

Becomes a Valued Assistant

The girl has become interested in the Mayor's theory of helping the youth of the city and is now an ardent worker in the congested districts. The people have confidence in Hanlon because he holds out a means to them of helping themselves, and hundreds of workingmen's families who had huddled in the tenements from force of habit now join the exodus to the suburbs so their families may grow up, free from the pernicious influence of the streets. Truck gardens spring up, production increases, the living problem becomes less acute, and the family life which the suburban home engenders bids well for the success of Hanlon's work among the boys.

The new street car system brings John Dayton's mine within easy reach of the city and he is able to secure the long sought for capital for its promotion. The successful development of the mine causes a thriving mining town to spring up and the hitherto well-nigh valueless property becomes the center of bustling activity.

Happiness and Prosperity

Meanwhile, the romance betwen Hanlon and the girl has developed as rapidly as the other activities (also owing to the street car system), and when the little God of Romance sees the ring safely on her finger he lays aside his quiver with a satisfied smile.

The final conclusion is obvious: The people need the big industries as much as the industries require the support of the people. One cannot exist without the other, and it is only through intelligent co-operation that any lasting adjustment of their differences can be accomplished.

Appeal to Business Men

The British Columbia Electric Railway, Vancouver, Points Out How Revived Utility Would Stimulate Trade

THE British Columbia Electric Railway has recently addressed the business men of British Columbia on the advantages of a liberal policy to the utilities. A copy was included of the resolution on utilities adopted at the last annual meeting of the Investment Bankers' Association of America and printed on page 935 of the issue of this paper for Oct. 30. The letter itself, which is signed by the British Columbia Electric Railway, is printed, in part, below:

TO THE BUSINESS MEN OF BRITISH COLUMBIA:

One six-billion-dollar industry with a purchasing power of between $600,000,000 and $700,000,000 a year is virtually out of the buying market.

Another five-billion-dollar industry which ought to spend $750,000,000 a year has its purchasing power greatly curtailed.

Business is losing these orders.

The industries are the electric railways and the electric light and power systems of this continent. Their credit largely gone, unable to raise new capital, these public utilities have stopped growing. They are out of the market for anything but essential maintenance supplies. Except in a few cases where fair rates and fair treatment have been accorded them, expansion has ceased and business generally has been deprived of a customer.

The electrical utilities would again be in the market for supplies for new power plant equipment, wire, rails, ties and other materials, but they cannot attract capital because they have been unable to make a fair return on capital previously invested. Public distrust and antagonism have made public utility securities too risky for investment today, especially when government and other gilt-edged securities are offering 8 per cent interest.

With their purchasing powers restored, public utilities would place more orders for supplies. The expansion of their facilities would mean expansion of other industries dependent upon electric power and transportation. More people would be employed directly or indirectly in Vancouver and their purchasing power would have its effect upon your receipts.

Purchases made by the British Columbia Electric Railway Company for current supplies at present amount to approximately $1,250,000 a year. One California company is starting upon a program of development which requires an expenditure for new construction of a million dollars a month for fifteen years, provided funds can be obtained. Construction work by our company would mean millions of dollars in increased business to local firms.

The annual payroll of this company exceeds $4,000,000 a year. The major portion is spent immediately upon the every-day requirements of life. Every merchant directly or indirectly obtains some of this $4,000,000. Similarly a large part of any construction work would mean wages which would be added to this total.

Do you realize how your interests are affected by the financial condition of your public utilities and how your business will suffer by the inability of your public utilities to attract new capital? Other businesses, realizing that the public utilities' interests are their interests, are actively taking up the case of the street railway and lighting company against public antagonism.

It is good business for them. Why not for you?

Novel Publicity Pamphlet by Bankers

FROM time to time it has been suggested that the banker, who has in the past recommended the purchase of public utility securities, should now appear in public and aid the security holders in telling the actual state of affairs of the utilities so that the public may know. This program was urged by several of the state railway and utility commissioners in their convention at Washington recently, for, they said, the banker has the confidence of the community and he can make people appreciate the relation of the welfare of the community to the welfare of the utilities which serve it.

In apparent recognition of this sense of duty and opportunity for public service, one of the Seattle banks has recently put out the following article in unique wording in pamphlet form:

The Chariots that Run Through the Streets

FOR behold the city of Seattle flourished and the number of its inhabitants was very great.

And the inhabitants of the City were wont to go about the City in Chariots, called street cars, which were possessed by the Puget Sound Traction, Light & Power Company.

Moreover the people paid a fare to the Company for riding in its Chariots.

And it came to pass that the people sought to purchase for their own possession the Chariots which ran through the streets, for they were displeased with the Company. And a certain agreement was made between the City and the Company whereby the City did purchase the Chariots, agreeing to pay therefor so much, and bonded itself to make certain payments. And when the City had possessed itself of the Chariots for a season, there were serious murmurings among the people.

And some said the possession of the Chariots was proving a curse.

And much criticism was heard and some even said concerning the Chariots that the people's last state was worse than their first.

Now there was a certain man named Mayor Caldwell, a ruler of the Seattleites, and when he had reigned *two hundred and five days* he divined that the Chariots which the City had bartered for and purchased, even the Chariots which ran through the streets of the City, were profiting the city nothing, but were a great burden upon the whole people.

And behold in the tenth month on the fifth day of the month of the first year of his reign, being the year nineteen hundred and twenty, Caldwell arose before the multitude gathered together at the Municipal League and cried with a loud voice saying:

"Wot ye not, my people, that it is a human impossibility for the City successfully to navigate the fatuous course we are now embarked upon. . . and I have no hesitation in saying to you it cannot be done."

And he brought forth figures to show the children of Seattle that the Chariots were profiting them nothing and there were none to say where-with-all the payments for the Chariots which were promised could be made, nor yet could it be discerned how the City could with honor escape the payments according to the agreement into which it had entered with those who beforehand had owned the Chariots.

And when the news was spread abroad among the people, many there were who heard and believed the words of the Ruler and marveled that their eyes, and the eyes of the people had not been opened and their understanding enlightened before they took possession of the Chariots.

And they spake among themselves saying, "Is it not so that they that beforehand possessed the Chariots, even the Traction Company, suffered greater burdens than we have suffered; verily were they not taxed, also required to pay a tribute of 2 per cent of gross earnings which we have escaped, and yet we being relieved of the taxes and tribute and having increased fares are yet unable to make profit?"

And the people remembered that the Traction Company in times past had complained bitterly and were sore distressed, but none was there to offer them succor.

Moreover they remembered that the councilors of the Seattleites and those in authority showed no mercy, refusing to grant its petition for increased fares or to offer other relief.

And the people began to be awakened and many false doctrines were preached.

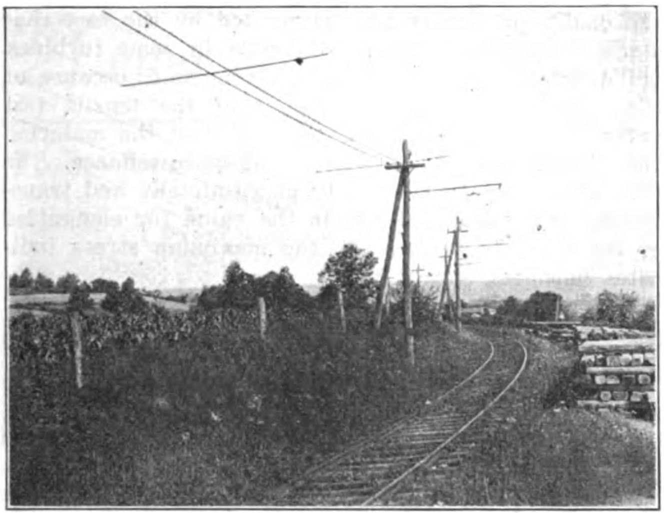
Also men in authority sought to fasten each upon the other blame for the troubles that beset the City by reason of their desire to secure unto themselves the Chariots.

For they were loath to confess that their undertaking had come to nought, not-withstanding that the record of other Cities showed that Cities profit not by the possession of the Chariots that run through the streets.

—*Relgnaps*

Aligning Trolley Wire on Curves

THE Northampton Traction Company of Easton, Pennsylvania, has a number of curves on its lines where the pole lines are on the inside of the curve. In order to line up the trolley wire with the track, a special type of construction, consisting of "push-overs" with pole brackets, was devised by Edward Welch, line foreman of this railway, and is shown in an accompanying illustration. Pole brackets are installed at their usual location on the poles, and between these from one to two push-overs are used in each section. A guide wire is strung along the inside of the poles to which the inside ends of the push-overs are fastened. The length and spacing of the pushovers is adjusted to meet conditions, so that the trolley wire will line up with the track. This road has a number of curves with this type of construction which have been in service for between six and seven years with satisfaction and its use has saved the expense of installing a pole line on the outside of these curves.



TRACK CURVE WITH INSIDE POLE LINE

New Line of Insulated Tapes

TAPES of various kinds have been used for insulation purposes for a long time because of their facility of application to irregular shapes of coils, cores, etc., upon which it would be difficult to place insulation in sheet form. These tapes are either woven from fibrous materials, and are known in such case as stays, or webbings, or they may be cut from treated or untreated fabrics.

The General Electric Company will soon place on the market a complete line of such tapes, including several varieties cut from black or yellow varnished or oiled cloth which are adaptable for winding armature or field coils, transformer coils, etc. The ordinary white cotton tape has selvedged edges, an open structure, smooth surface, and medium strength, and may be used to tape armature coils to form a basis for varnish. Asbestos tape contains a small percentage of cotton to facilitate the spinning of the yarn and is adaptable for use on windings where heat-enduring insulation is required.

Another class of tapes is what is known as friction, or splicing tapes, generally used to cover joints which are exposed during splicing or connecting of conductors. One type, known as splicing gum, is an all-rubber compound containing no cloth and made from fine para rubber. At ordinary temperatures the heat of the hand is sufficient to cause the tape to unite, forming a solid, water-tight joint. Gum-faced tape is made of a layer of 98 per cent pure rubber on a backing of unvulcanized high-grade rubber compound containing only fine para. It is valuable for taping joints on underground rubber-covered cables or other places where high insulation and tightness against water is necessary. Joints made from this tape may be vulcanized if desired. Temporary binding tapes, or friction tapes, are made of an unbleached cotton cloth, coated and filled with either black asphalt, or rubber compounds. They are slightly adhesive at room temperatures and form temporary bindings for ordinary purposes.

Largest Circuit Breakers to Be Installed in Hell Gate Station

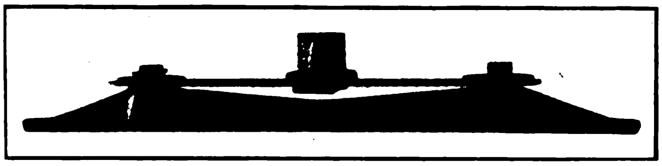
THE heaviest circuit breakers ever designed for 13,200-volt service will be installed by the United Electric Light & Power Company, New York, in its Hell Gate Station, which supplies power to the New York Connecting Railroad. There will be 120 of these solenoid-operated type "04" Westinghouse circuit breakers, having an interrupting ability of 58,000 amp. at the arc (1,500,000 kva). The disconnecting switches are gang-operated and their operating mechanisms are interlocked with the oil-breaker mechanism so that the disconnects cannot be moved unless the breaker is not in operating position, thus assuring safety to operators.

These oil-breakers are unique in that the phase elements will be in separate rooms, approximately 30 ft. apart, with the operating mechanism on the floor above, thereby preventing the possibility of a bus bar short circuit and minimizing the effects of a ground.

Flexible Spring Trolley Ear

THE Drew Electric & Manufacturing Company, Cleveland, Ohio, is manufacturing a new trolley ear, especially adapted to viaduct, tunnel and bridge work, as it is so constructed that it offers a flexible path to the trolley wheel passing over it. This is desirable for this class of service, since due to the small overhead clearance the trolley pole is usually forced down under the highest tension when crossing a bridge or passing through a viaduct or a tunnel.

The ear proper is 15¾ in. long and is suspended from a spring by two bosses 9 in. apart. The spring is 1¼ in. wide and made of No. 14 gage steel. A slot in the spring at one point permits a lateral movement which gives flexibility when the trolley wheel strikes the ear. The entire ear is suspended by a boss, which screws on to any standard hanger. The base of this boss is corrugated to make a positive lock when it is screwed tight against a washer. The ear can be readily taken apart and the spring and boss used again after the contact part wears out.



FLEXIBLE SPRING TROLLEY EAR

Wooden Wheels Eliminate Noise

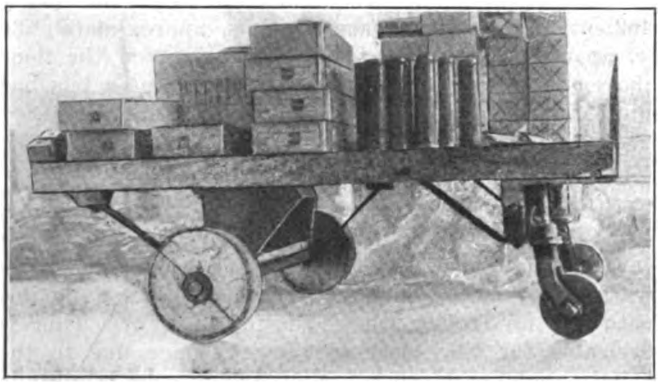
BY CLIFFORD A. ELLIOTT

Cost Engineer Pacific Electric Railway

THE Pacific Electric Railway recently placed in operation its new store at Torrance in conjunction with the recently completed shops. It was soon found that the warehouse trucks, equipped with cast-iron wheels, when rolled over concrete floors caused too great annoyance to the office forces. It was almost impossible to carry on a conversation in the office. Patent rubber-tired iron wheels not being available locally, wooden wheels were substituted for the excessively noisy cast-iron ones.

ORDINARY HAND TRUCK EQUIPPED WITH WOODEN WHEELS

These wooden wheels, of the same dimensions as those discarded, were made from A-1 select maple lumber in the company's wood mill. A wheel 6 in. in diameter and 2 in. deep was used on the ordinary two-wheel truck. For the 3-ft. x 5-ft. platform warehouse truck rear wheels 12 in. in diameter and 2 in. in thickness were made. The casters in front were replaced by 6-in. wooden wheels. Excellent life is being obtained from these practically noiseless wooden wheels. Although not intentional, the substitution of these new wheels will result in considerable economy over rubber-tired trucks, the tires of which have already given evidence of needing early replacement.



WAREHOUSE PLATFORM TRUCK CONVERTED FOR NOISELESS OPERATION

Mechanical Properties of Turbine Steel

AT THE British Electrical and Allied Manufacturers' Association it was decided to conduct investigations to determine what auxiliary tests might usefully be added to the specifications for turbine steel as a supplement to existing information. Practically all commercial tests were performed on two turbine disks and two shafts forged by three large producers, besides an exhaustive examination of the composition, microstructures and mechanical properties. The forgings were placed in service and at some future time their performance will be compared with that indicated by the test.

A second course of tests was conducted on specimens which had been successful and unsuccessful in service to determine how much the metal under examination was affected by usage. The general conclusions reached indicate that the various mechanical tests performed displayed quite accurately the properties of commercial forgings, although the effect of varying amounts of forgings on the characteristics is not yet sufficiently defined. The tests generally indicate that commercial forgings are of moderately good quality, but that the qualities which can be induced in small masses are not obtained, nor are they to be expected, in large masses. That design may be a factor of greater importance than the quality of the steel is suggested by the fact that similar steel has given good results in some turbines while not in others. It can safely be said, because of the various tests on forgings, that the tensile test gives a good indication of the quality of the material, though perhaps not sufficient for absolute reliance. The difference between ductibility longitudinally and transversely is generally shown in the value for elongation or reduction in area, while the maximum stress indicates hardness.

Association News

Hotel Arrangements for Meeting

SECRETARY BURRITT of the American Electric Railway Association announces that arrangements have been made with the Drake Hotel in Chicago to reserve a number of rooms for delegates to the midyear meeting of the Association. This meeting, as published last week, will be held on Feb. 10 in Chicago, with headquarters at the Drake Hotel, which is located at the corner of Michigan Avenue and Lake Shore Drive, or about a mile from the Blackstone Hotel. Although the Drake Hotel has 800 rooms, hotel accommodations in Chicago during the winter are at a premium, and those who expect to attend this meeting from out of town are urged to make reservations early.

The prices for the accommodations vary from single room with bath when occupied by one person, which is from $6 to $8 a day, to a double room with bath, when occupied by two persons, which is from $8 to $14 per day.

For the banquet of the association in the evening, the sub-committee on hotel arrangements has reserved the main restaurant and Avenue of Palms in the Drake Hotel. This restaurant will seat 1,500 persons. The program for the technical sessions during the day and the banquet in the evening will probably be made public next week.

November Bulletins Now Available

THE following list of compilations and reports has been prepared by the Bureau of Information and Service during the month of November and is available to member companies upon request:

Wages of Employees in General Maintenance and Operating Departments. Based on replies to general letter sent to member companies.

Recent Official Valuations. Based on decisions of Public Service Commissions during the last year.

List of Companies Receiving Relief from Paving Requirements. This includes special exemptions allowed companies under existing franchises and also the limited requirements provided under new franchises including service at cost agreements.

Standard Blank Forms. Copies of existing forms used by companies in all departments will be loaned to member companies upon request. As the number of copies is limited members are requested to indicate only the departmental group desired and to return the forms at the earliest convenience.

In addition supplements have been prepared to bulletins on subjects of wages of trainmen, cost of living, fares, and automobile accidents, bringing these up to Dec. 1.

Letter to the Editors

Trolley Versus Motor Truck for Freight Handling

EAST PITTSBURGH, PA., Nov. 27, 1920.

To the Editors:

In the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 16, page 795, you printed an abstract of the address of George M. Graham, vice-president of the Pierce-Arrow Motor Car Company, presented at the Atlantic City convention.

After admitting that the motor vehicle cannot replace the street railways in the handling of passengers from either a service or an economy standpoint, Mr. Graham makes a number of assertions with reference to freight haulage on electric lines which might be taken by the casual reader as evidence that the electric line cannot successfully compete with the motor truck in the handling of freight.

While his statement is true that the income from freight handling represents only 9 per cent of the total revenue of electric lines now engaged in the transportation of commodities, it should be borne in mind that practically all interurban roads were originally planned and constructed for passenger service only and that they have hardly begun to develop their possibilities in the way of transporting freight.

By some method of analysis, the basis of which is not divulged, the conclusion is reached that in handling freight, the electric lines are "handicapped"; that "freight haulage is not their field"; that "electric lines should not figure too hopefully on freight revenues," and that "sound business would indicate the withdrawal of freight facilities where they cannot successfully compete with steam railways and motor trucks"; also that "in short distance transit of package shipments up to 100 miles they cannot compete with the motor truck."

None of these assertions is substantiated nor can they be reconciled with the facts. While it is true that the electric lines are handicapped in the handling of freight, this handicap consists principally in the lack of adequate terminal facilities and equipment, which could be secured with a much smaller investment than would be necessary to provide motor trucks to handle the same amount of tonnage. All who have studied the electric interurban railway situation agree that there are immense possibilities for freight handling; that this branch of service has hardly been touched, and that the actual results already obtained, even with inadequate equipment and facilities, more than justify the service in net financial results, and this from the transportation of goods distances of from 20 to 200 miles.

Statistics which have been gathered covering actual motor truck operation prove conclusively that motor trucks cannot be operated profitably, or with a reasonable return on the investment, for distances over 20 miles, even under ideal conditions as to weather and roads, if they charge on any basis less than American Railway Express rates. At a recent meeting of members of trucking associations, covering the states of New York, Massachusetts, Connecticut, Rhode Island and eastern Pennsylvania, and including several large trucking companies in New York, Boston and Philadelphia, this basis of rates was decided upon. This meeting also developed that trucking companies operating between New York and Boston found it unprofitable to haul by truck all the way, and they are now merely picking up or delivering shipments at either terminal and loading them into steam road freight cars to be forwarded each night as solid carload shipments and at the much lower freight rates, in order to secure quickest possible delivery and make their operations pay.

As against this, electric lines are handling freight at rates less than half of those charged by the American Railway Express Company and in most cases on a parity with steam road rates, and are rendering better and more dependable service than would be possible with trucks, with less liability of loss and damage, and assuming all the responsibilities that go with freight operation by a common carrier.

Mr. Graham cites the fact that the average revenue received by nine typical electric lines for transporting freight amounted to $4.89 per ton, or 94 cents per freight car-mile operated. What he failed to state was that the expense of handling this same tonnage was $3.462 per ton, or $0.5928 per freight car-mile, leaving a net profit of $1.428 per ton, or $0.3472 per car-mile, or, in other words, an amount equal to approximately 15 per cent on the investment for freight facilities and equipment used.

Truck operators in Middle Western states have also made a study of the cost of freight handling and have found that they must receive at least $1.25 per truck-mile for 5-ton trucks. Compare this with the average cost of $0.5928 per car-mile on electric railways, each car carrying from two to three times the tonnage of a motor truck.

Surely there is nothing in these figures which would warrant the statement that "sound business would indicate the withdrawal of freight facilities on trolley lines," or that they cannot successfully compete with motor trucks. There is no question but that the motor truck has its place in the transportation problems of the country and that it will continue to handle a large amount of tonnage, but in view of the facts it cannot be conceded that the motor truck is either more efficient or more economical than the electric railway. The greatest factor which has prevented electric lines from establishing or increasing freight service has been the lack of funds to provide the necessary equipment, terminals and other facilities. Recent developments, however, indicate that a brighter outlook and a more favorable consideration on the part of the investor are looked for in the marketing of electric line securities. With adequate facilities, it is not difficult to foresee gross freight revenues equaling if not exceeding passenger revenues and with much greater net returns per dollar of investment.

T. H. STOFFEL,

Vice-chairman 1920 Committee on Express and Freight Traffic Facilities and Costs, American Electric Railway Transportation & Traffic Association.

Recent Happenings in Great Britain

Tramway Employees Still Restive—Strike Narrowly Averted in Glasgow—London Council Raised Fares None Too Soon

From Our Regular Correspondent

The insatiable demands of tramway employees in Great Britain were continued in the end of October, when application was made for an increase in wages of 12s. a week for adults and 6s. for those under eighteen years of age. It was as recently as last spring that a large advance was granted. Following this tramway fares were further increased all over the country. The breaking point must soon be reached. The application came before a special meeting of the National Joint Council for the tramway industry on Oct. 26. The council consists of representatives of municipal tramways, company tramways, and employees.

THE companies cannot, like the municipalities, fall back on the rates to make good deficits. Accordingly it is not surprising that their representatives announced that they could not entertain the application. They thereupon retired from the meeting. Subsequently the representatives of the municipalities and of the employees agreed to institute an inquiry through their secretaries as to the increased wages and bonuses that have been received by the employees in comparison with the increased cost of living, the effect that the increased fares have had on the financial position of the tramway undertakings and the rates of wages paid to tramway employees as compared with those paid to other classes of labor in municipal undertakings. The result of the inquiry had not at the time of writing been made known.

WAGE INCREASE IN GLASGOW

A strike of all the employees of the Glasgow Corporation Tramways which was to have been declared on Oct. 22 was averted at the last moment by the corporation agreeing to grant an advance in wages of 4s. a week. The increase will add £60,000 a year to the expenses of the undertaking, so all calculations as to the financial results of the recent increase of fares are blown sky high. The fares in Glasgow, however, are still lower than the fares in many other towns, so a margin in that direction is still available. It has also to be said that tramway wages in Glasgow have been lower than in many of the large towns in England. Glasgow did not come within the national tramway wages scheme, but settled its own affairs.

I mentioned last month the dispute in the coal-mining industry. The negotiations which were in progress at the time of writing failed, and on Oct. 16 all the coal miners in the country went out on strike. Paralysis of other industries immediately began, coal was rationed, railway services and in some cases tramway services were reduced. Negotiations were resumed and on Oct. 28 an agreement was reached by the government, the coal owners and the miners' executives. Under this arrangement employers and employed are to use all possible means to increase output and the miners get the 2s. per shift increase which they demanded, but only for a short time. Thereafter for a time the wage is to be regulated in proportion as the profits of the industry rise above or fall below those of the September quarter. The owners' share of the profits is to vary correspondingly.

NATIONAL WAGE BOARD PROPOSED

A National Wages Board is to be set up and when it comes into being it will carry on future regulation of wages. District committees to promote output are to be formed. The executives of the Miners' Federation recommended the men to accept the scheme. A ballot was taken in the beginning of November. On Nov. 3 the result of the ballot was reported to the executives of the Miners' Federation. It was found that the number of votes for accepting the proposed terms was 338,045 and that the number against was 346,504. This gave a majority against of 8,459. The rules of the federation, however, provide that a national strike shall not be declared unless two-thirds of those voting decide in favor of such a strike, and similarly that when a ballot is taken during a strike a vote of two-thirds of those taking part in the ballot shall be necessary to continue the strike. As the two-thirds majority was not forthcoming the executives declared the strike at an end. Within a few days thereafter the men were back at work. The government at once canceled the temporary restriction orders on the use of coal, electricity and gas and the railway and tramway services were brought up to full pitch in the week beginning Nov. 7.

A novelty is being introduced in connection with the Bradford municipal tramways in the shape of a double-deck trackless electric car with the top deck inclosed—that is to say, it has a roof cover like many tramcars to protect the top-deck passengers from the weather. The vehicle seats fifty-one passengers. Hitherto such cars have been of the single-deck type, and there was not much encouragement to adopt the two-story vehicles, as permission to fit roof covers has been confined to tramcars.

TRACKLESS TROLLEY FAVORED

The want of a roof cover is one of the great drawbacks to the motor omnibus in London. The Ministry of Transport has, however, allowed it on these Bradford railless electric cars. Over the routes equipped for them there are of course two trolley wires and the cars have double trolleys, positive and negative. They are also adapted for running over overlapping stages of the tramway routes. When using the tramway overhead wire the negative trolley pole is pulled down and for the return circuit an iron shoe is fixed to the front of the car and runs in the groove of the rail. Of course no ground electric contact can be made by the wheels as they are rubber-tired. A considerable body of opinion in this country favors for routes of light traffic the railless electric car rather than the petrol omnibus.

The recent large increase of fares on the London County Council Tramways came none too soon to judge from a return issued for the six months ended Sept. 29 last, when the old fares were in force. The traffic receipts during that period were £2,224,522, while the expenses, including capital charges and half cost of renewals, were £2,594,800, showing a deficit of £370,278. Since the last increase in fares the receipts are showing increases of about 25 per cent over those of the corresponding weeks of 1919. How this will compare with present expenses remains to be seen.

It should be noted that under a recent arrangement with the government the London County Council has been permitted, in view of the exceptional position of the undertaking, to charge during the years 1919-20 and 1920-21 half the cost of renewals against capital, the money to be repayable in twelve years. The proportion of renewals expenditure chargeable to capital account for the year 1919-20 is £142,688 and for the following year £205,000.

ELECTRIFICATION PLAN REVIVED

It is announced that the Northeastern Railway intends next year to promote its scheme, foreshadowed some time ago, for the electrification of the main line from York to Newcastle-on-Tyne and of a line from Northallerton to Stockton-on-Tees. Evidently the recommendations of the government's advisory committee on railway electrification will be followed because it is proposed to use the third-rail system between stations and the overhead system at stations and busy junctions. Electric locomotives will also be used for shunting at important yards. The main line between York and Newcastle is part of the east coast route between London and Scotland over which some of the fastest trains in the country are operated.

There has been some talk here over the fact that the Partington Iron & Steel Company has placed an order valued at £200,000 with the Allgemeine Elektricitäts Gesellschaft, Berlin, for two 1,400-kw. generators and one 3,000-hp. motor for a rolling mill. It appears that the contract went abroad because the Partington company objected to the price adjustment clause now usual in British contracts, which provides for revision of the price in case of any alteration in the cost of materials or wages. The difference in price between the British and the German tenders was not great.

News of the Electric Railways

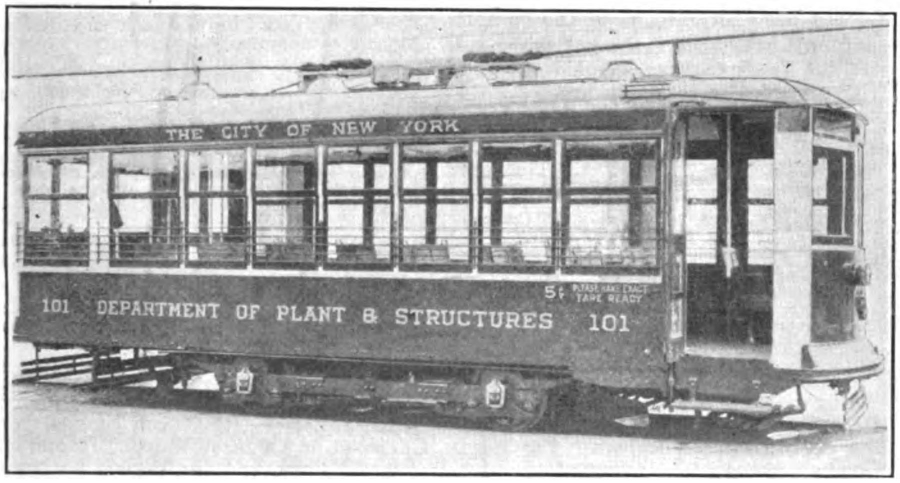
FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Mayor Starts Road

New York Executive Ushers in Municipal Operation of Line on Staten Island

Dec. 1 was a big day on Staten Island. It marked the restoration under city auspices of service on the Midland Railroad, suspended since last January. All was not gladness, however. It is true that a little girl did kiss Mayor Hylan, but then the municipal ferry boat wending its way from Manhattan to the Island and carrying the city celebrities got lost in the fog and delayed the ceremonies.

The line as restored to service runs from Concord to St. George. The Mayor acted as motorman of the first car. The city's chief executive is an old hand at this work. He was once a locomotive engineer on the elevated railroad in Brooklyn. Anyway, those who saw him guide the car over the Staten Island hills agreed that this was a job he handled as if he really knew all about it. Out on the front platform of the car hung a big floral horseshoe, wishing success to the municipal undertaking.


THE CITY OF NEW YORK
101 DEPARTMENT OF PLANT & STRUCTURES 101
5¢ PLEASE HAVE EXACT FARE READY

UP-TO-DATE EQUIPMENT FOR CITY LINE

At the carhouse at Concord the Mayor again was much in evidence. Here he raised the flag of the city over the building to the strains of music by the Street Cleaning Department Band.

But this isn't all. Aside from the formal ceremonies at which the Mayor was kissed there were big doings at St. George, the terminal of the municipal ferry. There the Mayor spoke while a banner fluttered in the fog bearing the inscription "Thanks to Whalen for the Nickel Trolley." The Mayor was introduced as "the most honest, fearless and able executive of the greatest city on earth." He quickly warmed to his favorite subject, "The Traction Trust." The movement of the robber barons of the traction world in New York for an increased fare had its inception on Staten Island, but instead of a fare increase the people now had a municipally-operated line run at a 5-cent fare. Of course, the Mayor was renominated by acclaim by those who listened to him, but he modestly said he had enough.

The lines to be operated are from St. George to Richmond, St. George to Concord, St. George to Port Richmond via Concord, St. George to Port Richmond via Silver Lake, Manor Road, Richmond Terrace, and Clove Road and West New Brighton to Four Corners. A shuttle will operate between Grant City and Midland Beach. The cars to Richmond and Port Richmond will run on a fifteen-minute schedule to meet the ferry boats. The Concord line will have a ten-minute schedule.

Twenty-eight cars were ordered from the J. G. Brill Company. They are the standard-design safety car. The fare will be 5 cents. Special school tickets will be issued to children.

Franchise Forfeit Enjoined

Judge Sater in the United States District Court at Columbus, Ohio, has denied the petition of the city of Martins Ferry, Ohio, for a permanent injunction against the Wheeling (W. Va.) Traction Company. In June last the Martins Ferry City Council passed an ordinance revoking all rights of the company and ordering it to remove rails, wires and poles from the streets. Judge Sater ruled that under Ohio laws a forfeit of franchise does not exist merely by virtue of revoking a grant, but must be fixed judicially.

Syracuse Grant Fails

Council Rejects Service-at-Cost Plan After Months of Delay—Ten-Cent Fare Possible

By a vote of twelve to six the Common Council of the city of Syracuse, N. Y., on Nov. 30 rejected the service-at-cost plan in that city. The New York State Railways, which operates the railway lines in Syracuse, Rochester, Utica and Rome, had placed a proposition in the hands of the Council that the city administration direct service, assuring only that the company might realize a yearly revenue of 6 per cent on the sum of $12,000,000, a valuation placed on the property by Ford, Bacon & Davis, who made an appraisal for the city.

Settlement Pending Nine Months

Nine months ago the proposition was first advanced, and a representative commission was appointed to look into the matter. The New York experts were engaged and made a valuation. The finding of the engineers was considerably lower than the value set by the company on its property. The new figures were accepted by the company, but they did not meet with the approval of the Aldermen, as the many months of constant political wrangling testified.

In consequence of the action just taken by the Council the settlement of the railway question in the city of Syracuse appears to be just as far from a solution now as it was nine months ago. Following the action of the Common Council, B. E. Tilton, vice-president of the railway, gave out a statement to the effect that the company would probably apply at once to the Public Service Commission for a 10-cent fare to make up for the deficit suffered during the many months that earnings have been insufficient to meet operating expenses.

In discussing the action of the Common Council Mr. Tilton stated that the valuation found by Ford, Bacon & Davis was most reasonable, but notwithstanding that the Aldermen still seemed to believe that the 7½-cent fare asked was exorbitant. Mr. Tilton immediately ordered a drastic cut in the service on all lines and eliminated all but a few "owl" cars. This was done in the interest of economy.

Mayor Resents Company's Action

Mayor Harry Farmer was incensed over this action. He stated that a complaint would probably be filed with the Public Service Commission to require the company to give the service deemed necessary to the convenience of the people of the city.

In the city of Utica the New York

State Railways also faces a complex situation. There the company is awaiting the action of the Common Council on an application for an 8-cent fare. The Council has on several occasions ignored the petition, while the Mayor has openly opposed the increase. A number of railway employees in Utica are out of work at the present time, the service is curtailed, and it is intimated that if the city continues to ignore the company's application the service would have to be curtailed still further.

Mayor Urges Railway Settlement

Louisville's Chief Executive Now Convinced That City Must Grant Fare Relief or Submit to Curtailed Service

Plans are being revised for a settlement of the railway problem at Louisville, Ky. In consequence the whole matter will probably be thrown open again soon for public discussion. Foremost in the present movement is Mayor Smith. He appears at last to have been convinced that the city will suffer materially if some forward step is not taken. In a message to the Council he has urged that the matter be considered promptly and disposed of.

THE appeal of the company for relief was made in March, 1919. Several conferences were held. In May the Mayor announced that he would oppose any increase in fares. Subsequently changes were made in the personnel of the company and an executive committee was created to administer the affairs of the railway. This committee consisted of W. S. Speed, John W. Barr, Jr., and William H. Kaye. After considerable study on their part of the affairs of the company and the problems before it they submitted to the Mayor last July an exhaustive report in which the committee asked for an increase in fare from 5 cents to 7 cents and suggested a service-at-cost franchise. In the meantime, however, trial operation at a 5-cent fare for three months under the direction of the committee was carried out in the hope of proving the case of the company to the city. The matter was allowed to drag by the city. It has now been revived by the Mayor on his own initiative.

In a message to the Council on Nov. 24 the Mayor said:

> During the fall of 1918 the Louisville Railway requested the city of Louisville, through me, to grant the company increased carfare. After carefully considering the situation at that time, in April, 1919, I published a statement containing facts and reasons why the company was not then entitled to relief. The company made no effort to deny or refute these facts or reasons. Indeed, subsequent events proved them to be true.
>
> Early in the year 1920 the request for increased fare was renewed. At that time I informed the directors of the Louisville Railway that no request would be considered until the company had reorganized under new executives and with certain new directors. I said at that time that if the company did reorganize as outlined and after a test was able to show that it was still unable to operate without serious loss I would recommend some form of relief. The company was reorganized, new directors were selected and a new president elected.
>
> On July 1, 1920, the company made direct application to the Board of Councilmen to grant relief on the basis of what is known as the service-at-cost plan. That body promptly and properly rejected this ordinance. Since then, I am informed, no new ordinance has been offered by the company.
>
> From figures submitted to me at the present time and carefully analyzed I find the company now is operating at a loss and will continue to do so unless assisted financially. Only two courses are open to the company; the one is to obtain increased revenue from higher fares, the other to reduce its operating costs. To reduce operating costs materially it will be necessary to reduce the service. It is our duty to decide which course must be pursued.
>
> You have so uniformly rendered such splendid service, and you have been so unflinchingly loyal to your duty, I should not have communicated with you at this time except I am convinced the subject is of such importance that I should urge you to take it up promptly and dispose of it.
>
> I ask you, therefore, to consider this problem in the light of public duty and public benefit, and to provide some measure of relief for the Louisville Railway.

J. E. Isgrigg, chairman of the committee of the Council to which the matter has been referred, is of the opinion that any ordinance looking toward relief for the company should originate with the Mayor or in the office of the city attorney. It is expected that he will call a meeting of the committee soon to consider the matter. The next general meeting of the Council will be held on Dec. 7.

Now that the time has arrived when to delay action further can only reflect greatly to the discredit of the city and to the embarassment of the general public, the Louisville papers are inclined to be severe with the Mayor in their editorial comment on his handling of the situation. The *Times* said that the Mayor's word to the Council is a mere alarm clock, buzzing:

> Gentlemen, it is high noon. You were supposed to be at work at 8. It is high noon. Get up or stay abed, but do something.

That paper said further:

> If the proper committees do not originate a program and initiate action, let one or all of the leading members of both bodies resolve themselves into a general committee and do it themselves. They have the ability; they do not take their political profession so seriously as to fear the "organization," and as responsible members of the community they know the perils of having an insolvent street car company in Louisville.
>
> If they or any of them will walk up to the street car question, take it firmly by the hand and lead it to settlement, they will find the community behind them. A few moves by patriotic members of the Council are in order if the duly authorized committees do not do their duty and promptly.

The *Courier-Journal* said:

> The Mayor's message to the General Council on the carfare question at least has the virtue of disclosing, after long delay, some form of action by the chief magistrate of the city. It breaks a silence and officially brings a grave problem before the two legislative boards. Aside from this the message is definite only in its indefiniteness. For the present the issue, involving most complex and profound principles of economics, is left with the individual and aggregated wisdom of twenty-four members of the Lower Board and twelve members of the Upper Board. And the public will now have another opportunity to behold how our city government operates.

City and Railway Discuss Compromise

Prospects Appear Bright for an Agreement Being Arrived at in Detroit Which Will Stop Litigation

Negotiations between the Detroit United Railway and officials of the City of Detroit, Mich., were renewed on Nov. 26 when Elliot G. Stevenson, counsel for the Detroit United Railway; the Mayor, Corporation Counsel Wilcox, Joseph S. Goodwin, general manager of the new municipal lines, and the Street Railway Commission met in the Mayor's office. No statement as to the proposals considered was given out except that the meeting was the first step toward establishing a working agreement between the city and the Detroit United Railway.

IN a statement made by Mayor Couzens, acting as spokesman for all parties concerned in the proposal, it was related that at a meeting attended by Mr. Stevenson and E. J. Burdick of the Detroit United Railway and the Street Railway Commission and the Mayor some months ago a suggestion was made that it was not outside the bounds of possibility that an arrangement might be made whereby the public would be benefited if there were less litigation. With that end in view the meeting on Nov. 26 was arranged. It was suggested that as the directors of the Detroit United Railway were to meet soon a plan for future action might be discussed that probably would meet with the views of the city administration and the directors. Mr. Stevenson left the meeting on Nov. 26 with the understanding that he would confer with the board of directors and meet with the city administration again on Dec. 6.

It is reported that city officials were planning to start action to take over certain non-franchise lines and lines operated on the day-to-day agreements as soon as cars were ready to be operated on the municipal lines that are now nearing completion. In order that the public might not be inconvenienced it is desired that these lines be acquired without long-drawn-out litigation. The company now operates certain lines in the city under day-to-day agreements, the franchises on which the city can terminate at will.

According to a ruling by Federal Judge Arthur J. Tuttle the city cannot acquire these lines with any part of the $15,000,000 bond issue voted last April, but can only cancel the franchises, leaving the company the choice of selling or tearing up its tracks. Resort to the latter course on the part of the city is unbelievable on account of the great inconvenience to which residents of certain sections of the city would be put. The opinion prevails that any proposition leading to the sale of these lines at a reasonable figure would be accepted and presented to the voters for approval.

It is believed that the Detroit United Railway would look with favor upon an agreement whereby the repairing of the day-to-day agreement lines could be avoided. The company is now in a position of having to spend thousands of dollars in repairing lines on streets from which it may be ousted at any time. It is believed that the sale of these lines to the city and an agreement under which the Detroit United Railway could operate over them until the city was in position to connect with them would be considered favorably by the company.

No attempt has yet been made by the municipal railway to cross existing lines of the Detroit United Railway and fear was expressed that another lawsuit would be started by the Detroit United Railway when the attempt to cross the company's lines was made. It is understood that the Detroit United Railway would be willing to permit the municipal lines to cross its tracks provided the city grants certain concessions in return, and it is believed that it would be more satisfactory if an agreement can be reached without appealing to the courts or having the matter referred to the Utilities Commission.

Unless delayed by weather unfavorable to construction work or by the non-arrival of material it is expected to operate the first cars on the municipal lines Feb. 1, over the Charlevoix and St. Jean lines.

"Movies" Refute Injury Claim

A novel use of motion pictures was recently made by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., in defending a personal-injury suit filed against it. The company sought to show through the medium of "movies" that the plaintiff in the case, a woman, was not seriously injured in the accident, on which her $10,000 suit was based. It was testified at the trial that the company employed a motion picture man to make a "fake" verbal contract with the woman, leading her to believe that she was to be a "movie" actress, and thus obtaining pictures which might be used at the trial. Scenes showing the woman alighting from an automobile were among those shown to the jury in the case during the trial. The presentation was made at one of the local theaters. After some deliberation the jury handed down a verdict in favor of the plaintiff of $550. It found her, however, guilty of contributory negligence.

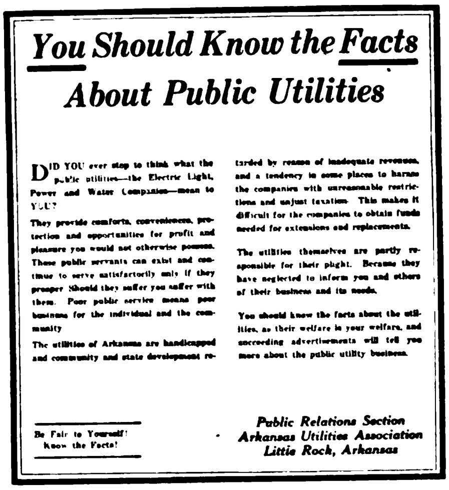
The plaintiff's attorney objected to the use of the film as evidence, claiming that it had been obtained through fraud and that motion picture films could be accelerated to make the plaintiff appear more active than she really was and that parts of the film could be cut out and other devices used. He is reported to have declared that the decision in the case will be appealed to the Wisconsin Supreme Court on the ground that the trial court erred in admitting a motion picture film as evidence.

Another State Bureau

Arkansas Follows Lead of Other States in Establishing Headquarters for Utility Information

Establishment of a public relations section to inform the public about the public utility business in Arkansas was decided upon at a meeting of the executive committee of the Arkansas Utilities Association held at Little Rock, Ark., on Nov. 10.

C. J. Griffith, president of the state association and manager of the Little Rock Railway & Electric Company, will be chairman. A. G. Whidden, until recently managing editor of the Pine Bluff *Daily Graphic*, was elected manager, with S. R. Brough, manager of the Arkansaw Water Company, Little Rock, treasurer. Other members of the committee are: Judge R. M. Foster, Helena; H. C. Couch, Pine Bluff; D. C. Green, Fort Smith; J. S. M. Wharton, Helena; A. S. Long, Little Rock; S. E. Dillon, Hot Springs; J. F. Christy, Jonesboro, and W. J. Thorpe, Little Rock.



You Should Know the Facts About Public Utilities

DID YOU ever stop to think what the public utilities—the Electric Light, Power and Water Companies—mean to YOU?

They provide comforts, conveniences, protection and opportunities for profit and pleasure you would not otherwise possess. These public servants can exist and continue to serve satisfactorily only if they prosper. Should they suffer you suffer with them. Poor public service means poor business for the individual and the community.

The utilities of Arkansas are handicapped and community and state development retarded by reason of inadequate revenues, and a tendency in some places to harass the companies with unreasonable restrictions and unjust taxation. This makes it difficult for the companies to obtain funds needed for extensions and replacements.

The utilities themselves are partly responsible for their plight. Because they have neglected to inform you and others of their business and its needs.

You should know the facts about the utilities, as their welfare is your welfare, and succeeding advertisements will tell you more about the public utility business.

Be Fair to Yourself!
Know the Facts!

Public Relations Section
Arkansas Utilities Association
Little Rock, Arkansas

ONE OF THE FIRST OF THE ARKANSAS ADS

Mr. Griffith issued a statement in which he said:

> It is our plan to publish information to show the people of Arkansas just what the utilities mean to them. The utilities provide not only comfort, convenience and protection, but contribute to the development of states and community resources and create new opportunities for operation of other profitable enterprises. Without electricity, telephone, gas and water services we would not have the industries, the cities, the opportunites for pleasure and profit we enjoy.
>
> The wonderful resources of Arkansas are not being developed as rapidly as they should be because of the impression in some quarters that there is a tendency to discriminate against investors in public service and other large enterprises. It is to show the detrimental effect of this tendency and to serve as a clearing house for information from other states relative to operating methods that this section of the association is established.
>
> The owners and operators of the utilities have come to realize that it is a mistake not to keep the public informed about the utility business. After all, it is the public that suffers or prospers as the utility suffers or prospers.

Open Shop in Shreveport

The citizens of Shreveport, La., have determined that the open-shop principle shall prevail in all local industry. Several months ago it appears that union labor had so completely tied up all lines of industry in the city that it became necessary for the public to declare for the open shop and to form an organization known as the Open Shop Association.

Although the Shreveport Railways, of which H. B. Hearn is president, has a contract with its employees which embodies the closed-shop feature common to most Amalgamated Association contracts, the company became a party to the efforts of the Open Shop Association, because it was convinced that this was a step in the right direction.

Subsequent to the formation of this association, practically all of the business interests of Shreveport, including the banks, agreed to start no new work of any kind except on the open-shop basis. All jobs under way at the time the organization was formed are to be continued to completion.

A climax to this situation in Shreveport came during the week of the recent Atlantic City convention of the American Electric Railway Association. It happened that an important piece of machinery in the plant of a local industrial concern broke down. It was impossible to get this repaired without great delay, except at the shops of the electric railway. The machine was accordingly taken to the railway shops and later the machinist declared they would walk out before they would do the repair work, because the machine came from a non-union shop.

Officers of the open-shop association thereupon wired Mr. Hearn about the situation, as the master mechanic did not feel that he had authority to make the decision. Mr. Hearn was caught on a train en route to the convention and upon being advised of the circumstances, he telegraphed back to have this work done in the railway shops "regardless of consequences." When the master mechanic received this telegram, its contents were disclosed to the shop men, who returned to their work and have had nothing more to say.

Service Resumed in Saginaw

Electric railway service was resumed in Saginaw on Thanksgiving morning on an agreement between the officials of the Saginaw-Bay City Railway and the city in which a new franchise is to be granted the company and the operation of the jitney bus curbed.

Pending the passage of a new franchise the company agrees to charge the old rate of fare; the employees who struck for higher wages will receive their demands, and in return the Council agrees to pass a regulatory jitney ordinance, which will forbid the operation of jitneys on streets where street cars run.

It is proposed to pass the new franchise on a cost plus basis. In return the company will agree to adequate extensions, and improvements to bring the service up to standard.

The Saginaw company, like all other traction companies in Michigan, has been trying to carry an added burden brought on by business depression. With many Saginaw factories closed, or working but part time, the revenue of the company has been considerably reduced.

The City Council has agreed to draft the franchise and have it ready for submission to the voters not later than May 1, 1921.

New Franchise Presented in Richmond

The Virginia Railway & Power Company, Richmond, Va., has submitted to the street committee of the Council of that city a tentative blanket franchise providing for an extension of the present grant of the company for a period of thirty years, at the end of which time the city is to have the right to purchase the property. The provision regarding fares prescribes an initial rate of 6 cents, with school tickets at 2½ cents sold in books of twenty each. A passenger will be permitted to carry free one child under five years of age, but two children under five years of age will be charged at the rate of fare then prevailing. Two cents will be charged for each transfer.

Under the proposed grant the right is reserved to the city to vary the fare from time to time so as to make possible the payment of a return of not less than 8 per cent upon the capital invested by the company. All questions in dispute will be settled by a board of arbitration, composed of a representative of the company, a representative of the city and a third representative chosen by these two. A local public utilities commission of six members will be appointed to adjust complaints about service, schedules and routes. Appeal may be made from the decisions of this commission to the State Corporation Commission. The proposed franchise has been referred to a committee of five, composed of Councilmen Puller, Gunst, Moore, Sullivan and English.

Commissioners Fight Ousting

Action has been begun before the New Jersey Supreme Court to determine the legal status of the members of the old Board of Public Utility Commissioners recently ousted by Governor Edwards on charges of inefficiency in office. The ousted commissioners recently appeared in court in answer to a summons secured by Attorney General McCran. They have been ordered to answer the charge that they are not legally entitled to remain in office and to draw their salaries and will be called upon to make a reply.

The Attorney General, acting in the name of the state, will then reply to the answer of the former board members, and the court will determine where and before whom the case shall be finally settled. The ousted commissioners are represented by Judge William L. Lewis, Josiah Stryker, B. Claude Palmer and L. Edward Hermann. The State Senate has so far refused to ratify the nominations for new members of the board recently made by Governor Edwards.

Toledo Measure Certified

Expected New Service-at-Cost Arrangement There Will Go Into Effect Next February

Arrangements are being made for a meeting during the week commencing Dec. 6 of the board of control under the service-at-cost arrangement approved recently by the people of Toledo, Ohio, at the polls.

MANY MENTIONED FOR COMMISSIONER

Dec. 5 has been set as the limit for the receipt of applications for the position of transportation commissioner. The board will receive written applications from anyone up to this time. Between that date and the time for naming a commissioner the board members will proceed to investigate personally the merits of several of the most acceptable applicants.

Among the men who have been mentioned for the position are Harry McClure, formerly city engineer; George L. McKesson, member of the service-at-cost commission, and identified with the Haughton Elevator Company; Cecil Rood, county surveyor; Arthur Wickenden, engineer with the Defiance Electric Light & Power Company; and John F. Collins, formerly assistant general manager of the railways at Toledo and now with the Michigan United Railways.

W. W. Knight, a member of the board of control, is in California. The first meeting will be held upon his return.

Officials of the Toledo Railways & Light Company, who conferred with Henry L. Doherty and his attorneys relative to the legal separation of the properties, upon which the ordinance is awaiting before it can be put into effect, stated upon their return to Toledo that the full ninety days allowed by the franchise plan would be needed to get ready.

The measure was certified by the city clerk as passed on Nov. 15. This would bring the measure into operation not later than Feb. 15.

COMPANY GOING AHEAD WITH REPAIRS

Attorney Morton Seeley at Toledo and Dewey C. Bailey at New York are making the legal separation and preparing for the operation of the Community Traction Company as created by the ordinance. Meanwhile Attorney Seeley is investigating all the liens against the present properties and adjusting them so that a clear title may be given to the new company when it takes over the lines.

Since the service-at-cost ordinance was ratified by the people of Toledo the company has gone ahead with needed repairs. On Tuesday Federal Judge Killits granted an order in court to spend $28,668 from the Craig fund mostly for repairs made to thirty-six cars. More than $80,000 has been spent out of the fund for the installation of fare boxes.

The Craig fund was set up by the federal court several years ago when a raise in fare was granted to the company. It makes it mandatory for the company to set aside 6 per cent of its revenue each week for betterments to service.

Labor Agreement Reached in Richmond

After a conference extending over four days with a committee of employees representing the locals throughout the system of the Virginia Railway & Power Company, Richmond, Va., an agreement was arrived at which was practically the same as that prevailing last year. The few changes made related to operating details, such as "runs," meal periods, seniority, etc. No change was made in the wage scale nor in the company's "open-shop" policy. Nor was the arbitration clause changed under which all matters may be arbitrated excepting those pertaining to wages or matters affecting operating costs.

The committee, however, was only authorized to negotiate. It took the new agreement back to the locals, and after an interval of about ten days the committee returned stating that it desired some further changes in some of the operating details discussed at the previous meeting. These were readily arranged in a one-day conference. It is understood that the revisions have since been accepted by the Richmond and other locals.

Strike in Clinton

Following the refusal of the City Council of Clinton, Iowa, on Nov. 16 to grant an increase in fare from 5 cents to 6 cents to the Clinton Street Railway employees of the company struck at 1 o'clock on Nov. 17. The company had made an increase in wages contingent upon the granting of an increase in fare. The employees have been working under a contract calling for the payment of 50 to 55 cents an hour, awarded them when the strike a year ago was arbitrated. They recently asked an increase to 70 and 75 cents an hour. The contract expired on Oct. 30, but the men continued at work with the understanding that if the company was granted the increased fare the company in turn would advance wages.

The strike is now reported to have been settled on the basis of a wage of 60 and 65 cents for the men, the company to charge a 6-cent fare, with nine tickets for 50 cents. Pending a permanent agreement as to the rate of fare refund coupons good for 1 cent will be issued for each fare paid.

News Notes

Electrification Rumor Denied.—Rumors that the Chicago, Milwaukee & St. Paul Railway would electrify the Des Moines-Boone and the Madric-Marion branch lines have been denied by Harry Warren, general passenger agent of the company.

Toronto May Run Buses.—The Board of Control of Toronto, Ont., will be asked by the Council to submit a by-law to the voters on Jan. 1 calling for an appropriation of $1,000,000 for the purchase of motor buses by the city for use in passenger service. If the measure is successful at the polls bids for the vehicles will probably be asked early in 1921.

Spokane Men Want More.—Conductors and motormen of the Washington Water Power Company, Spokane, Wash., have petitioned their employers for an eight-hour day and further ask an increase in wages of 14½ cents an hour. W. E. Coman, general manager of the company, declares that "under the present earnings of the railway the expenses cannot be increased."

Request for Eight-Hour Day Denied.—F. E. Connors, vice-president and general manager of the Spokane (Wash.) Traction Company, has notified the employees that the company cannot at this time meet the request of the men for an eight-hour day. It is not expected that the matter will come up again until the expiration of the present working agreement between the company and the men in the spring.

Wage Advance in Muskogee.—Employees of the Muskogee (Okla.) Electric Traction Company will receive a wage increase of 5 cents an hour. The men had been receiving from 25 to 29 cents an hour. Under the new award the scale will run from 38 to 45 cents an hour. Funds for this wage award will come from the higher fare which went into effect in September of this year. Under an agreement with the city half of the increased revenue will be spent on improvements.

Wage Raise for Interurban Employees.—Employees of the Boston & Worcester Street Railway, Boston, Mass., have received a wage increase of 8 cents an hour. The men have been working for 52 cents an hour since July, 1919. In September of this year they demanded 95 cents an hour and a working day of eight hours in ten, instead of nine hours in eleven. The dispute was left to a board of arbitrators, Guy W. Cox, Boston, representing the company and James H. Vahey, Boston, representing the men. The wage increase will probably be retroactive to last September.

Suburban Men on Strike.—Trainmen of the South New Orleans Light & Traction Company operating between Algiers and Marrero, La., are firm in the statement that they will remain on strike unless their demands are met. On Nov. 1, when the men went on strike, it was believed that an amicable solution would be reached in the hope of the commission's passing favorably upon the company's application for increased rates. The men want retroactive pay due for forty days during a former controversy and retroactive pay since Nov. 1. At a recent meeting the men decided to return on the condition that President Burgis would pay the retroactive award pending the granting of 8-cent fares. This he is not willing to do.

Trackless Trolley in Prospect in Richmond.—There are prospects of putting the trackless trolley into service in outlying sections of Richmond when the Common Council takes action on the request of the Virginia Railway & Power Company for a new franchise. This statement is made in *Public Service News*, issued by the company. In this bulletin the company says: "Richmond has for a long time been in need of more transportation service. The company, as well as citizens of the community, has realized this, but the circumstances, financial and otherwise, have made extensions impracticable. When the new franchise is worked out we hope the company may be in a position to try out the trackless trolley, with a view of providing a flexible and dependable service for our residential sections."

Strikers Sentenced for Manslaughter.—Justice James C. Cropsey in the Criminal Branch of the Supreme Court in Brooklyn, on Nov. 29, sentenced to terms of from eight to twenty years in Sing Sing five men who had pleaded guilty to manslaughter in connection with the killing of Ferdinand Friedman during the strike of the employees of the Brooklyn Rapid Transit Company last summer. Edward J. Reilly and Louis Fridiger, who represented the accused men, made a plea for clemency, maintaining that the men were young and that they had served in the war. Justice Cropsey disagreed with the attorneys that the men had meant to injure no one. He said: "You were all guilty of murder. I think every consideration has been shown you when the District Attorney accepted your plea of manslaughter. You had the right to strike, but you did not have the right to interfere with any one who wanted to work."

Temporary Injunction Vacated.—The temporary injunction granted the Detroit (Mich.) United Railway restraining the city from expending tax money in the construction of its street railways has been dismissed by Circuit Judge Harry A. Mandell in one of the two formal decisions made by him recently. This injunction was sought by the Detroit United Railway immediately after the first contract had been awarded for work on the municipal railway on Charlevoix Avenue between Connors Avenue and Alter Road. In the other ruling the judge handed down the decision concurred in by Judges Webster and Dingeman, issuing a mandamus compelling Corporation Counsel Clarence E. Wilcox to approve the form of the ordinance offered by the Detroit United Railway last March in opposition to the ordinance containing the city's plan, which carried on April 5. It is the intention of the Corporation Counsel to appeal the mandamus suit to the Supreme Court. The injunction case is now before the Supreme Court on appeal.

Doherty Men Get Together.—"I can't see anything to disturb us seriously. I think the strength of our organization is due to its ability always to meet situations with courage and confidence." Such was the gist of a talk by Henry L. Doherty before 400 members of his organization who came many miles to attend the annual conference held at the Waldorf-Astoria, New York City, Nov. 22, 23 and 24. There were two sessions daily at which many subjects were discussed. Included in the list were "Employees' Representation Plan," "Publicity," "The Bond Department's Problems and Its Future" and "How We Can Sell More Doherty Securities in Our Towns." There were also sectional meetings of the public utilities, of the oil department and the bond department. These reflected the motto of the organization, which is "We don't always agree, but we do not undertake anything unless we do all agree." This meeting was in line with the practice of the Cities Service Company to call its managers together every year for a general conference. At this time particular stress was put upon questions of public policy and the necessity of rate adjustments to meet present operating costs. A general plan of operations was outlined for the coming year.

Program of Meeting

Equipment Men to Meet

The master mechanics of the electric railways of Ohio, Pennsylvania and West Virginia, who have been organized for the last three years as the Association of Electric Railway Men, will meet in Mansfield, Ohio, at 9 a.m., on Dec. 7, for a round-table discussion of numerous maintenance problems. The meetings of these men have been sponsored by the Westinghouse Electric & Manufacturing Company. They have proved of great value through the interchange of information about common problems. The meeting this year will be held in the offices of the Richland Public Service Company. Railway motor maintenance and electric arc welding will be discussed by J. S. Dean and A. M. Candy of the Westinghouse Company. A general discussion by the members will follow. A list of seventeen questions bearing on equipment maintenance problems has also been prepared as a guide to the discussion.

Financial and Corporate

Discontinuance Considered

Receiver of Buffalo-Depew Line May Abandon Property Unless $80,000 Is Raised

Unless $80,000 is subscribed for the rehabilitation of the Buffalo & Depew Railway Company, Buffalo, N. Y., application will be made by the receiver for permission to discontinue service between Buffalo, Depew and Lancaster and junk the property. A plan of rehabilitation and reorganization has been prepared by C. P. Franchot, attorney for William B. Cutter, receiver for the property.

DEFICIT FOR TWO YEARS

For almost two years the line has been operated by the receiver at a big deficit. The United States government holds receiver's certificates for $45,000 and banks hold receiver's certificates for $13,000. In addition there are several thousand dollars of receiver's notes outstanding in the hands of the public. The government financed the construction of a double-track addition to the company's property between Depew and Lancaster during the war to facilitate the transportation of war workers. The government was paid in receiver's certificates.

The plan of reorganization and rehabilitation outlined by Mr. Franchot calls for the holders of the company's first mortgage bonds to turn in their securities. These would be resold for approximately $80,000. Purchasers would in addition receive a bonus of common stock.

Under this plan there would be sufficient money raised to pay off or compromise all outstanding indebtedness and allow a reserve fund in the treasury for improvements. The new owners would then reorganize the company and the receivership would be terminated.

SEEK HELP FOR INTERNATIONAL

If this plan fails the company plans to carry on negotiations with the International Railway, Buffalo, with the view of having the International acquire the property, which is a 7-mile double-track line between the Buffalo city line and Lancaster.

Municipalization Planned

Plans for the operation of the Guelph (Ont.) Street Railway by the Ontario Hydro Radial Commission are being considered by the municipal authorities. Several conferences have been held between representatives of the city and Sir Adam Beck, representing the commission, and Premier Drury. The commission has promised to take over the management of the property as soon as the municipality desires.

The Guelph Street Railway matter is in the same position as it was before the agreement was signed between the commission and the city for the acquisition of the traction lines by the Hydro, the ratification of which was blocked by Premier Drury. It is proposed to submit a by-law to the ratepayers at the next municipal election to secure authority to raise a sum sufficient to rehabilitate the property and place it in better physical condition.

Premier Drury has advised the city to proceed with the work of improving the line and suggested that a charge be made by the Guelph lines for the privilege of interurban companies operating cars through the city. In this way, Premier Drury says, a substantial revenue could be obtained. It would be necessary, however, to lay heavier rails and improve the overhead system for heavy interurban cars.

Remarkable Progress at Montreal

Operating Deficit for Year Ended June 30 Reduced to $364,700, a Gain of $712,659 Over 1919—Total Deficit Now $1,728,812

The deficit of the Montreal (Que.) Tramways for the twelve months ending June 30, 1920, was $712,659 less than that for the previous year, according to the second annual report of the Montreal Tramways Commission. In its report the commission gives in detail the operations of the system. The deficit of the company was increased during the last year by $364,700. This sum, plus the deficit of $1,364,111 carried over from the previous year, makes a total deficit to date of $1,728,812. The receipts from passengers amounted to $10,578,890. From other items, such as freight, advertising, mail, etc., a sum of $203,580 was realized, making the total railway operating revenue $10,782,470 as compared with $8,645,548 in 1919. This was an increase of $2,136,922, or 24.7 per cent. The total operating expenses increased more than $1,000,000, or 20.5 per cent, over 1919, making a total of $7,840,359. The company was again unable to meet the annual payment of $500,000 to the city for the use of the streets, as provided in its contract with the city.

According to the advance estimates by the commission the company was entitled to expend 24.7 cents a car mile for motor cars and 17.4 cents for trailers at a traffic density not exceeding 8.4. The actual density for the year was 8.386. Therefore the commission decided that the company, having complied with the conditions laid down in regard to mileage and density, was entitled to receive the allowance as granted. This allowance amounted to $5,749,116. If the company had not expended more than this amount it had the right to claim its operating profit, which is ⅛ of 1 per cent of the average total of the capital value during the year. For 1920 the latter sum was fixed at $37,285,347.

Excess of expenses over credits must be taken from the gross receipts to the point where they equal the operating profit. Where the excess is greater than the operating profit, as was the case in 1920, the company must submit a detailed statement in justification of the excess. Failure to justify the excess of expenses over credits results in the company itself having to pay the difference, but if the commission finds the justification sufficient it may authorize the company to take from the gross receipts the sums necessary to liquidate every approved item making up the excess, allowing the company its operating profit, less any part of the excess not deemed to be necessary.

For 1920 the excess of expenditure

INCOME STATEMENT — MONTREAL TRAMWAYS COMPANY

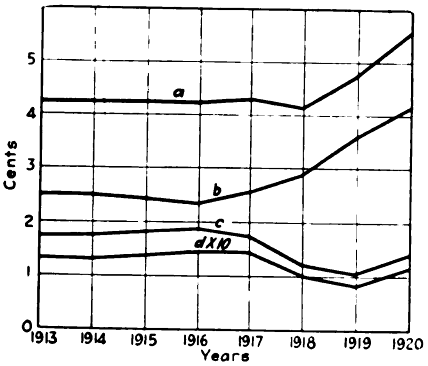
Year ended June 30	1920	1919	Percentage Change
Revenue from transportation	$10,578,890	$8,483,137	+24.7
Revenue from other railway operations	203,580	162,411	+25.3
Total railway operating revenue	$10,782,470	$8,645,548	+24.7
Maintenance of way and structures	609,766	516,160	+18.1
Maintenance of equipment	982,261	802,458	+22.4
Miscellaneous renewals	598,530	362,856	+65.0
Power	1,208,206	1,172,376	+ 3.1
Conducting transportation	3,056,348	2,423,936	+26.1
General miscellaneous	1,338,641	1,182,874	+13.2
Operating profit	46,607	45,928	+ 1.5
Total railway operating expense	$7,840,359	$6,506,588	+20.5
Net operating revenue	$2,942,111	$2,138,960	+37.6
Taxes assignable to railway operations	246,717	208,680	+18.2
Gross income	$2,695,394	$1,930,280	+39.6
Deductions from gross income:			
Interest 6% on capital value	2,177,178	2,189,200	— 0.6
Interest 7% on additions	69,827	16,205	+331.0
Interest 6% on working capital	23,833	34,347	—30.6
Financing expense	181,431	181,431	......
City of Montreal rental	500,000	500,000	......
Contingent reserve fund	107,825	86,456	+24.7
Total deductions from gross income	$3,060,094	$3,007,639	+ 1.7
Net income	*$364,700	*$1,077,359	+66.2

* Deficit.

STATISTICAL INFORMATION—MONTREAL TRAMWAYS COMPANY

Year ended June 30	1920	1919	Percentage Change
Total length of track	264.60	262.25	+ 0.9
Length of track in operation	246.03	243.68	+ 1.0
Car-miles	22,888,670	23,155,516	— 1.2
Revenue passengers	191,941,835	183,350,923	+ 4.7
Transfer passengers	63,744,151	65,711,288	— 3.0
Total number of passengers	255,685,986	249,062,211	+ 2.7
Gross receipts per mile of track inspection	$43,826	$35,478	+23.5
Gross receipts per revenue passenger (cents)	5.62	4.72	+19.1
Operating expenses and taxes per revenue passenger (cents)	4.21	3.64	+15.7
Percentage — operating cost and taxes to gross receipts	54.68	57.72	— 3.04
Percentage — maintenance and renewals to gross receipts	20.32	19.44	+ 0.88
Percentage — total operating cost to gross receipts	75.00	77.16	— 2.16
Statistics per car-mile:			
Operating revenue (cents)	47.11	37.40	+26.0
Operating expenses (cents)	34.20	28.10	+21.7
Number of revenue passengers	8.38	7.92	5.8
Car-miles per revenue passenger	0.119	0.126	— 5.6

for motive power was $122,712. The commission's estimate for this item was $1,085,494, based upon a probable saving due to the installation of a new substation which would permit the substitution of hydro-electric power for steam-generated power. This substation was not completed during the year and consequently the cause of the excess was apparent. The company also paid over and above allowances, $38,430 for taxes, $16,593 for snow removals, and $22,517 for insurance, all of which were unavoidable. The total excesses, amounting to $100,796, were therefore approved, and the company was entitled to its operating profit of $46,607.



a—Gross receipts per revenue passenger.
b—Operating expenses and maintenance per revenue passenger.
Net receipts for payment of fixed charges and dividends:
c—Per revenue passenger.
d—Per car-mile (scale 10: 1).

At the end of the first year's operation under the present contract the gross receipts were sufficient only for the operating expenses and taxes, the cost of maintenance and renewals and a part of the interest on the capital invested. For the second year, ended June 30, 1920, the results were better, and there was sufficient to pay operating expenses and taxes, maintenance and renewals, all the interest on capital invested, original and additional, and also $120,212 for financing expenses out of $432,784, which should be provided. Therefore the commission believes that next year the company will be able to commence to make payments to the city. The contract provides that the company pay $500,000 a year for the use of the streets. The total amount owing the city on this account is now $1,192,694.

The company has deposited $100,000 both years as required by the contract as a fund against which action could be taken for failure to carry out the provisions of the contract.

Receivership Suit Carried to U. S. Supreme Court

An appeal has been taken to the United States Supreme Court from the decision of the Federal Court of Appeals in St. Louis in the receivership suits against the United Railways, St. Louis, Mo. The original receivership suit was filed by John W. Seaman in the United States District Court. In addition to asking for a receiver for the company it sought to recover large sums from the directors. While this suit was pending a second receivership suit was filed by Samuel Adler. In the Adler suit the United Railways admitted its insolvency.

District Judge Dyer held that the Seaman suit should take precedence over the Adler suit. Mr. Adler appealed to the Circuit Court of Appeals. That body reversed Judge Dyer. It held that Mr. Adler was entitled to have a receiver appointed. Mr. Seaman has now taken an appeal from the decision of the Circuit Court of Appeals to the Supreme Court.

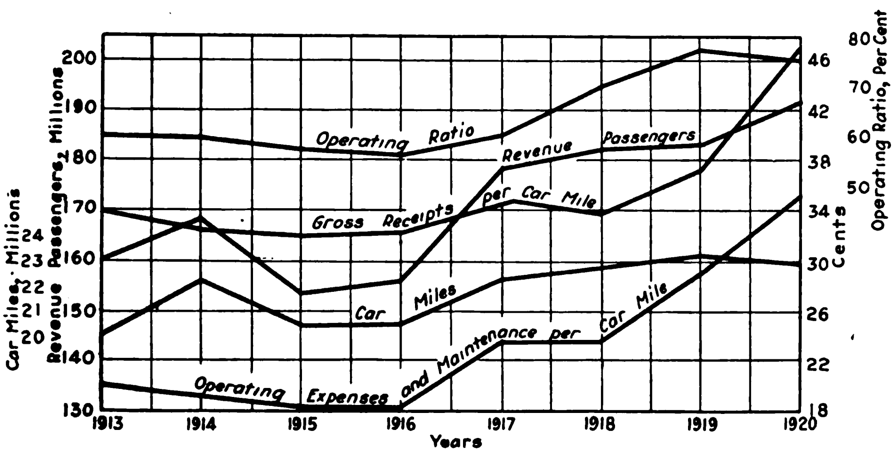


CHART SHOWING PROGRESS MADE BY MONTREAL TRAMWAYS FROM BEFORE WAR TO THE PRESENT

Duluth Earnings Shrink

Figures to show that the Duluth (Minn.) Street Railway has increased operating costs and a decreased income this year in comparison with 1917 were submitted to the City Council on Nov. 26 by Herbert Warren, vice-president and general manager of the company. Mr. Warren agreed to meet with the City Council and discuss the question of bettering the service. The table submitted by Mr. Warren follows:

October:	1920	1917
Gross revenue	$157,078	$140,986
Operating expenses	134,076	93,988
Net revenue	$23,001	$46,997
Interest, sinking fund, taxes	25,387	30,489
Net income	*$2,385	$16,508
Year to Date:	1920	1917
Gross revenue	$1,620,745	$1,338,087
Operating expenses	1,310,727	849,881
Net revenue	$310,018	$488,206
Interest, sinking fund, taxes	260,182	252,481
Net income	$49,835	$235,724

* Deficit.

Financial News Notes

Seeks to Sell Another Shore Line Section.—Robert W. Perkins, the receiver of the Shore Line Electric Railway, Norwich, Conn., has filed a petition in the Superior Court asking that he be allowed to sell that portion of the Shore Line lying in Westerly, extending from Pleasant Street to the Pawcatuck River at White Rock. This portion of the railway is said to be one of the few sections that has in the past been operated on a paying basis.

Receiver Asked for Barre Road.—The Westinghouse Electric & Manufacturing Company applied on Nov. 26 for the appointment of a receiver for the Barre & Montpelier Traction & Power Company, Barre, Vt. An injunction was also served to stop a sheriff's sale of railroad property to satisfy a judgment of $5,500 secured against the road by Robert Stewart. The action was declared to be designed to prevent the depletion of the assets of the railway.

Manchester Company to Offer Stock.—The stockholders of the Manchester Traction, Light & Power Company, Manchester, N. H., have voted to increase the capital stock of the corporation from the present amount of $3,864,000 to $4,250,000. The new stock will be offered proportionately to the present stockholders at $100 per share.

Equipment Trust Plan Approved.—The Board of Public Utility Commissioners of New Jersey has approved an equipment trust agreement between the Public Service Railway, Newark, N. J., and the Philadelphia Trust Company, as trustee, and the Standard Steel Car Company. Under the agreement the Public Service Railway will issue $1,300,000 of equipment certificates at par. The certificates will bear interest at the rate of 8 per cent.

Rochester Valuation Under Way.—J. C. Brackenridge, representing the city, B. C. Campion, representing the railway, and E. G. Connette, neutral member, are busily engaged upon the task of appraising the Rochester lines of the New York State Railways. The field work is expected to require four or five weeks for its completion. Session of the full board will then be held to fix the final determination. The appraisal will probably not be ready to be made public until early in 1921.

Fort Wayne Traffic Increasing.—Pressure of traffic in Fort Wayne, Ind., has resulted in the re-establishment of the old belt line service in that city which was discontinued in 1914. The old tracks, which had been disused for so many years, have been replaced by new tracks and a four-minute schedule will be in force over the line during the rush hours. Traffic in Fort Wayne has been increasing rapidly during the past few weeks with the advent of cold and disagreeable weather.

Bus to Replace Railway.—The City of Greenville, Tex., has purchased the railway system of the Greenville Power & Traction Company, which has been in receivership. The road has not been in operation for some time. The city paid $15,000 for the property, which includes about 7 miles of single track, trolley wire, carhouse and other equipment with the exception of seven cars. The city will junk the line and sell it and with the proceeds will establish a municipally owned motor bus transportation system.

Agreement Appears Likely.—The postponement for a week of the appointed hearing in the proceedings for the confirmation of sale of stock of the American Railways, Philadelphia, Pa., held as collateral by the National Properties Company, is taken to be an indication that the minority bondholders' committee and the majority bondholders' committee have come to an understanding which may result in the withdrawal of the petition in bankruptcy recently applied for, on the basis of the appointment of a receiver for this company.

Segregation Planned.—Plans for the segregation of the lines in the Ohio Electric Railway system have been announced by J. H. McClure, vice-president of the company. A meeting of the stockholders will be held at Philadelphia on Dec. 11, at which time the division of the present system into its two tributary lines—the Indiana, Columbus & Eastern and the Ohio Electric Company—will be passed upon. The former road operates between Lima, Dayton, Springfield, Columbus and Zanesville, while the latter operates from Lima northward into Toledo.

Upward Turn Seen in Utility Securities.—H. M. Byllesby, who recently returned to Chicago after a visit to the Southwest on the annual inspection train of the Texas Oil Company, says that the consensus of opinion on the part of the gentlemen on the special train, who represented, without exception, large financial interests and operations, was that the utility securities were due for a substantial rise; that they had weathered the recent storm as well as, if not better than, any other class of securities; that the situation was at present far better understood by the public and the law makers; and they all predicted a greatly improved and very satisfactory condition, now appearing in all utility investments.

Receiver Wells Reports for September.—The September report of Rolla Wells, receiver for the United Railways, St. Louis, Mo., filed in the United States District Court in St. Louis, shows that on Aug. 1 the cash on hand was $2,920,172 and that on Sept. 30 the cash on hand was $661,256. The difference in amounts was explained by the fact that in September the sum of $2,285,000 was used to redeem receiver's certificates which fell due on Sept. 2 and for which money had been set aside from the August receipts. The largest items in the receipts for September were $724,544 conductors' remittances and $968,817 from the sale of tokens. The redemption of receiver's certificates was the largest disbursement item. In September the company paid $29,420 in back wages and $829,993 accrued wages.

Outlook More Hopeful.—The protective committee representing the holders of $260,000 of 4½ per cent twenty-year bonds of the Brockton & Plymouth Street Railway, Brockton, Mass., due on Dec 1, 1920, announced recently that there was no way by which the bonds could be paid at maturity. The members did say, however, that from their constant study of the situation they believed that the outlook for a reasonable settlement in the near future was hopeful. The committee, believing that the interests of the bondholders would be best protected by continuing the receivership, has approved such continuation. Interest on the bonds has remained unpaid since Dec. 1, 1918. The protective committee consists of Francis E. Frothingham, Arthur Perry and Alfred A. Montgomery. The road has been operated since Dec. 9, 1919, by Hollis T. Gleason as receiver.

Stockholders Approve Abandonment.—The stockholders of the Providence & Danielson Railway, Providence, R.I., on Nov. 22 authorized the directors to dispose of the company's property. In short, the security holders confirmed the action of the directors and officers in discounting the operation of the road and approved the action of the latter authorizing the abandonment and sale of certain portions of the road.

Announcement was made on Nov. 27 by D. F. Sherman, president of the company, of the sale of the rails, poles and wires and all other equipment of the road, from North Scituate to East Killingly, Conn., some 20 miles of railway, to M. C. Fairchild & Company, Inc., New York, and Swift & McNutt, Boston, who will tear up the rails and junk the system. At the present time the road is not in operation, but the branch of the system from Providence to North Scituate has been reserved by the company with the hope that some arrangement may result from the negotiations now under way looking to the resumption of this line.

Sea View and Pier Roads to Be Sold.—The Sea View Railroad, Providence, R. I., will be sold for scrap. This decision was reached at a joint meeting held recently of the various committees appointed by the towns of South Kingstown, North Kingstown and Narragansett. Nathaniel T. Bacon, the present owner of the property, declared at the meeting that this was the only course open in view of the fact that the report made by the various committees showed the towns to be unwilling to bond themselves for the purpose of financing operation of the lines. Mr. Bacon stated he was willing to let the towns have the road at its scrap value, but that if it was the sentiment of the towns that it would be inadvisable to take the line over there was no further need for argument. He declared that the scrap value of the two roads, the Sea View and the Narragansett Pier Railroads, was $220,000. He added that this sum included the real estate owned by the company. According to Mr. Bacon, the road will be sold to M. C. Fairchild & Company, Inc., New York.

Protective Committee for Interurban Holders.—A protective committee has been formed to represent the holders of the first mortgage 5 per cent bonds of the Columbus, Newark & Zanesville Electric Railway, Springfield, Ohio, due 1924. Livingston E. Jones, president of the Saving Fund Society, Germantown, Pa., is chairman, and William A. Law, president of the First National Bank, Philadelphia, and A. A. Montgomery, treasurer of the Portland Savings Bank, are the other members of the committee. The circular of the committee states that "the interest due on Nov. 1 last on the Columbus, Buckeye Lake & Newark Traction Company first mortgage 5 per cent bonds of 1921 was not paid, and a protective committee has been formed in the interest of holders of that issue. This default makes it obligatory, in order better to safeguard their interests, that all owners of the Columbus, Newark & Zanesville Electric Railway first mortgage 5 per cent bonds, due 1924, unite and deposit their bonds with the Girard Trust Company, Philadelphia."

Traffic and Transportation

Traffic Changes Suggested

Expert Thinks Memphis Equipment Adequate, but Recommends Expenditure for New Construction

Ross W. Harris, Madison, Wis., consulting engineer, has submitted to the Railroad & Public Utilities Commission of Tennessee his report on the traffic survey of electric railway conditions in Memphis, Tenn. The survey was made under order of the State body by Mr. Harris himself for the joint account of the Memphis Street Railway and the city of Memphis. Six months was required to complete the job.

The state commission has since handed down an order approving the recommendations set out in the report and ordering the Memphis Street Railway to proceed to put the recommendations into effect. About $140,000 worth of property will be abandoned and approximately $75,000 of new construction will be required.

MR. HARRIS IN CHARGE

At the joint request of the city and the company the state commission has issued an order appointing Mr. Harris as its representative in Memphis to supervise the operations of the Memphis Street Railway. In this work it is expected Mr. Harris will put into effect the scheme of line standards used with good effect by him in other cities. This calls for following out a system of determining equitable daily line standards for each route in such manner as will connect operation equitably with the rate of fare, rate of cost of service, integrity of securities, volume of business, etc.

The full report is now being printed and bound for distribution. The principal recommendations contained in it, however, have been outlined by Mr. Harris for the benefit of the public.

If the recommendations made by Mr. Harris are followed, Main Street will be relieved of street railway congestion, with more cars on Third Street than are now on Main Street; with a greater transfer point at Third and Union, and with more cars passing every hour of the day than now pass Main Street and Madison Avenue.

According to the plan advocated by Mr. Harris, the principal railway loop will be Third Street to Jefferson Avenue to Main Street to Union Avenue. Front Street will be practically abandoned by the street cars. The congestion on Main Street will be relieved by having as much traffic on Third Street through Jefferson to Union.

In order to gain some idea of the situation, it is only necessary to state that cars are now operated on Main Street at the rate of 120 per hour, on one track in one direction, and occasionally the rate is as high as 152 an hour.

Mr. Harris believes that the Memphis Street Railway has a sufficient number of cars and that its equipment is adequate to take care of the traffic with the rerouting and distribution which he proposes. He says that the receivers have done remarkably well in maintaining the present standard of service under the system that is now in vogue.

Asks Ten Cents in Trenton

The Trenton & Mercer County Traction Corporation, Trenton, N. J., has filed a petition with the State Board of Public Utility Commissioners asking an increase of fares from 7 to 10 cents in Trenton and on all its suburban zones. The railway proposes to relinquish the 1-cent transfer charge. The petition will come before the board at a hearing on Dec. 15. The company has announced that unless relief is granted it will face insolvency. The New Jersey State League of Municipalities will be called upon by Mayor Donnelly of Trenton, who is chairman of the executive committee of the league, to oppose the fare increase.

Mayor Donnelly has announced that he will move for the inauguration of a motor bus service for Trenton and vicinity, paralleling the traction company's lines, to be operated under municipal franchises. The Mayor says that the proposed bus system would be different from the ordinary jitney service and that double-deck buses of large size would be placed in operation.

The Trenton & Mercer County Traction Corporation declares that 10-cent fares are absolutely necessary to maintain its property and its service at the present standard; that it has not paid any dividends whatever and no rentals in more than three years, and that the cost of operation has increased during the past year to such an extent that deficits have continued to grow. The company says that there is no possibility of a reduction of rates of wages at present paid motormen, conductors, operators, powerhouse employees and electrical workers, and that the cost of all materials has been advanced. The railway's petition says:

> We are not alone in this situation. It is nation-wide. Traction companies in forty-nine cities are charging a base rate of 10 cents, and many other applications for 10-cent fares are pending. No company can operate for less than cost.

The present 7-cent fare and 1-cent transfer rate was put into effect on Jan. 4 last. The revenue for the present year will amount to approximately $1,387,733. The total operating expenses and taxes for 1920 will amount to $1,239,987. The deficit for the year will be more than $440,262.

Cleveland Results Good

Early Returns Indicate Fare Increase and Industrial Depression Have Not Affected Company Adversely

Patrons of the Cleveland (Ohio) Railway on Nov. 14, began paying a 6-cent fare with 1 cent extra for a transfer. They met this increased rate as predicted in the ELECTRIC RAILWAY JOURNAL of Nov. 13, without a murmur.

While the new rate of fare makes Clevelanders for the first time in the city's history pay more than a nickel for a car ride, it has taken ten years for street car fare in Cleveland to double, as in November, 1910, the rate of fare was 3 cents cash with a 1-cent charge for transfer.

NO DECLINE IN TRAFFIC

No figures to indicate how the recent raise has affected the receipts of the company are as yet available, but at the offices of the Cleveland Railway it was said that there was a very marked increase in revenue and that no falling off in the number of riders had been noticed. In fact, Cleveland, unlike other large industrial cities, has so far been free from any reflection in its railway receipts from the recent industrial depression.

It is a curious fact that residents of two of Cleveland's populous suburbs, Lakewood and Cleveland Heights, can ride to and from their places of residence more cheaply than car-riders within the city limits proper. This is due to the fact that Lakewood and Cleveland Heights both have franchises that call for a straight 5-cent fare. This situation again demonstrates the unfairness of incorporating in a long term franchise a fixed maximum rate of fare.

SUBURBAN FARE UNCHANGED

The Cleveland City Administration, City Street Railway Commissioner Sanders and the newspapers are now engaged in a campaign urging Lakewood and Cleveland Heights car riders voluntarily to pay the increased rate demanded of the city riders. Some of the officials of the two suburbs have indicated their willingness to change the franchises so as to permit the increased rate for Lakewood and Cleveland Heights riders.

In this connection the Cleveland *Plain Dealer*, in commenting editorially on the recent report of the American Electric Railway Association showing the upward trend of electric railway rates, said:

> Its own report indicates an increasing tendency on the part of American cities to treat railway companies fairly while preserving the interest of the car rider. The course of fares in the future as in the past will be determined mainly by the cost of operation.

Since the agitation was started for an increase in fares in the suburbs, the Cleveland City Council has passed a resolution asking Lakewood and Cleveland Heights to raise their fare from 5 cents to 6 cents to conform with the new rates of fare in Cleveland.

Bus Issue Unsettled

The Connecticut Company Continues Operation in Waterbury Pending Action by Aldermen

The federal trustees of the Connecticut Company, New Haven, Conn., at their meeting in New Haven on Nov. 27 reported that the revenue of the company had increased materially since the 10-cent fare went into effect. The receipts were nearly sufficient to meet expenses, it was announced. The trustees, however, are not at all satisfied with the action of cities throughout the State with regard to jitney regulation.

The trustees are said to be dissatisfied with the situations in Waterbury and New Haven. It was believed by the trustees that the ordinances restricting jitneys in New Haven and Waterbury did not meet the requirements as laid down by the trustees for assurance of uninterrupted railway service.

Although the Board of Aldermen of Waterbury on Nov. 26 failed to pass an amendment to the jitney ordinance barring jitneys from Bank Street in that city, it was said that the trustees had not taken any definite action relative to that situation. The ten-day period agreed upon by the representatives of the company and the city of Waterbury at the hearing before the Public Utilities Commission in Hartford last week was to expire on Dec. 3. Chairman R. T. Higgins of the Public Utilities Commission recently stated that he hoped the results would warrant the continuance of railway service in Waterbury.

WATERBURY LINES LOSE

Lucius S. Storrs on Dec. 1 addressed a letter to Mayor W. S. Sandland of Waterbury, in which he said in part:

> For the period of seven days to and including Monday, Nov. 29, the average daily revenue on the Waterbury Division has been $4,347, which you will note is a marked falling off from the revenue of the first few days, which was $4,613 per day.
>
> This is accounted for by the decline in revenues upon these lines on which competitive jitney operation is possible under the recent ordinance, mainly East Main Street, the revenues on which average but $894 per day for the period, the average for the first four days having been $991. The number of jitney buses operating on that route have increased from one on Tuesday, the 23d, to eleven on Monday, the 29th.

R. B. Stoeckel, State Motor Vehicle Commissioner, in his biennial report issued Nov. 29 stated that legislation by the state rather than by municipal ordinances should be obtained to effect regulation of public jitney traffic throughout Connecticut. The report states that the number of public service motor vehicles registered by the department declined from 3,025 in 1919 to 628 in 1920. With regard to the regulation of public motor vehicle transportation in the state as affecting the trolleys, Commissioner Stoeckel says:

> The various emergencies created between competing transportation systems and more particuarly between the public service vehicles and the trolleys have created a situation which seems to call for additional State legislation. If it is proper that the public service motor vehicle be regulated beyond the point to which the regulation now extends, then that regulation should be made by state law rather than by city ordinance.
>
> That is, if the operation of the public service motor vehicle is to be determined as to routes, stopping places, continuous service and other like details, as is the case with other carriers of the public, then such legislation should be statewide.
>
> In making such legislation, if it is determined that such is necessary, great care must be taken that the functions of this department relating to the determination of the fitness of an operator and as to the safety appliances and general equipment of the vehicle be not interfered with in any way. This department has the necessary machinery to examine into qualifications of drivers and into safety appliances of vehicles.
>
> As regards the latter point, the department needs a law giving it discretion as to what it will pass as a safety factor in connection with the public service motor vehicle. There are, at the writing of this report, many public service motor vehicles on the highways which are topheavy because a light chassis has been loaded with too heavy a top. Whatever else is done in connection with the public service motor vehicles the functions of this department must include the ones referred to to safeguard the public, and the department must cause the necessary legislation to make them absolutely effective.

Plea for Special Rates for School Children

A campaign to have the Cleveland (Ohio) Railway establish a special fare for school children at 3 cents a ride or forty tickets for $1 is being waged by the Cleveland *Press*. As proposed, the plan would restrict the 3-cent or 40-ticket-for-a-dollar rate to the school children riding on school days between the hours of 7: 15 a.m. and 4: 30 p.m. The campaign was started immediately after the fare in Cleveland was boosted to 6 cents with a 1-cent charge for transfer.

John J. Stanley, president of the Cleveland Railway, has so far refused to give an opinion on the proposal, but City Street Railway Commissioner Sanders is objecting to it on the ground that it is directly contrary to the spirit of the Tayler service-at-cost franchise, which provides that all riders shall be treated equally in the matter of fare and none shall be discriminated against for any reason.

Mr. Stanley has, however, indicated that he is not inclined favorably toward the plan on the ground that if the general industrial depression should hit Cleveland, there is no certainty that a 6-cent fare will suffice to meet the cost of operation. Increased tax levies approved by the people at the election in November will boost the Cleveland Railway's taxes $150,000 a year, company officials say.

Public and parochial school officials, members of women's organizations, and some other civic bodies have approved the low fare for school children. The City Council is now considering the plan.

Fare Reduction Sought

The town of Winthrop, Mass., has petitioned the Massachusetts Department of Public Utilities asking for a reduction of fare on the narrow gage electric line of Boston, Revere Beach & Lynn Railroad. At present the fare is 10 cents. A similar petition for a reduction in fare has been presented by residents of Revere.

Cincinnati Fares Up

Ticket Rate Advances Half Cent—City Asks Injunction, Alleging Faulty Allocation in Certain Accounts

The Cincinnati (Ohio) Traction Company on Dec. 1 raised its cash fare from 8 cents to 9 cents. Two tickets are sold for 17 cents, or six for 51 cents, making the ticket rate 8½ cents.

If the contentions of the City of Cincinnati as set forth in a suit filed by Solicitor Saul Zielonka in Hamilton County Court of Common Pleas are sustained, the end of the increases in fare in Cincinnati is in sight and a downward revision of these fares will result. Acting under the instructions of the City Council with respect to a report made by Street Railway Director W. C. Culkins, that the Cincinnati Car Company and the Ohio Traction Company owe the Cincinnati Traction Company thousands of dollars for rent, light and electric power supplied, City Solicitor Zielonka filed the suit, which demands an accounting from the Ohio Traction Company for light and power provided and for rentals for buildings from Jan. 1, 1917.

In the petition the court is asked to determine the amount due to the Cincinnati Traction Company and to compel its payment, and, if the sum is sufficient to create a fund which meets the provisions of the new ordinance under which the traction company is operating, an injunction to prevent further increases of fares is demanded, as well as an order to decrease the rate of fare charged.

MR. SCHOEPF'S EXPLANATION

W. Kesley Schoepf, president of the railway, has replied to the charge made by Mr. Culkins. Mr. Schoepf contends that the total sum to be accounted for by his company is $20,000 instead of $350,000. Mr. Schoepf is in full accord with the views of the director that any agreement between the Cincinnati Traction Company and the Ohio Traction Company, or between it and the Cincinnati Car Company that would be inequitable to the Cincinnati Traction Company is contrary to the spirit of the revision franchise. He says that the $20,000 in question is the amount payable by the Cincinnati Car Company to the traction company for light, heat and power.

He also states that he believes that the maximum rate of fare will be reached on March 1, when a straight 9 cents may be necessary. He expressed the belief that if granted the full requirements for the budget of the year of 1921 the fare will not go above 9 cents, unless some extraordinary condition looms up. Mr. Schoepf also says that he does not believe that this maximum will continue for long.

In answering Mr. Culkins' charge that the Traction Building is lighted by power which belongs to the car riders, the company says that a full accounting for current used in the building since the operation under the service-at-cost franchise would be $800.

City Grants Relief

Eight-Cent Fare Allowed in Grand Rapids — Attempt to Force Referendum on Fares

An 8-cent cash fare with seven tickets for 50 cents will take effect in Grand Rapids, Mich., on Dec. 16. The new rates have been authorized by the City Commission to afford financial relief to the Grand Rapids Railway. The fare is now 7 cents.

The railway recently applied to the city authorities for a 10-cent fare. The commission, although admitting the justice of the railway's petition, refused to allow the 10-cent rate because of the stand taken by the Trades and Labor Council, the body representing the organized labor of the city. The council threatened to force a referendum on the fare increase unless the 10-cent fare were granted by the commission.

UNION ASKS REFERENDUM

Organized labor stood out for the higher fare to back up a demand of the railway's employees for an advance in wages. The carmen were promised a wage increase from 60 cents to 62 cents an hour, provided the fare was raised to 10 cents. Petitions for the proposed referendum have not yet been circulated. A small group of citizens has endeavored to stir up feeling against the rate increase by an "I walk—Do you?" campaign, but with little success.

In September the Grand Rapids Railway did the largest month's business in its history. Nevertheless, on a basis of a 7-cent cash fare, with sixteen tickets for $1, it lost about $1,500. This was the best financial showing made by the company in a year. In October the financial report of the company was the poorest in its history, showing an actual operating loss of $23,000, due to an increase in wages of from 52 to 60 cents an hour, and also to the dropping off in patronage resulting from the business depression which set in at Grand Rapids about Oct. 1. With winter coming on the company found itself facing a monthly loss of more than $25,000, and the commission was quick to respond to its request for aid.

ESTIMATED TICKET RATIO 60 PER CENT

Under the present rate of fare—7 cents cash and sixteen tickets for $1—statistics compiled by the company show that a little less than 40 per cent of the company's passengers use tickets. It is estimated that under the new fare 60 per cent of the car riders will use tickets and 40 per cent will pay the cash fare. Patronage based on the October business, at the increased rate, should net the company in the neighborhood of $25,000.

Financial statements for the first ten months of the present year indicate an actual loss for the company during 1920 of $150,000. The loss for the first ten months totals $125,000.

A wage agreement of the company with its men expired Sept. 1, and the company offered 60 cents an hour, as against a demand for 68 cents on the part of the men. The working contract provides for arbitration, but the company and its employees could not agree on the third arbitrator. With wages decreasing locally almost weekly the men signed an agreement on Nov. 1 for 60 cents an hour, effective until May 1, with the further understanding that they should receive 62 cents an hour in the event the City Commission at any time before May 1 granted a 10-cent fare.

SPEED WORK ON FRANCHISE

The present franchise of the Grand Rapids Railway will expire on April 4, 1921. The company will be forced to operate under a working agreement with the city from that time until the new franchise can be submitted to the voters, which cannot be before Aug. 1, and may not be before April, 1922.

Members of the special committee of the City Commission having in charge railway affairs last week blocked an attempt which was being made to make the franchise a political football, when they instructed the engineers at work making an appraisal of the company's property to complete their task at the earliest possible moment. Those in charge of drafting the new franchise were also instructed to complete their work at once. The appraisal is being made on the basis of three costs. The first is a historical cost, the second the value on the average price for the last five years and the third on present-day values. The inventory work is now completed, and the valuations should be in the hands of the company and the city about Feb. 1. Provisions for service-at-cost will be contained in the new franchise.

May Put Absolute Ban on Parking

The local-transportation committee of the City Council of Chicago, Ill., has unanimously recommended that all parking in the downtown business district of Chicago be prohibited between 7 a.m. and 6:30 p.m. The final decision in the matter rests with the Council, but Chairman Schwartz, who advocated the measure, believes that its adoption is assured.

Traffic experts told the committee that enforcement of the ordinance would save Chicagoans from $20,000,000 to $25,000,000 annually in time saved and accidents prevented. If the ordinance becomes law it will be the duty of the police to see that all vehicles, whether horse-drawn or automotive, stop only to load or unload passengers, baggage or merchandise in the no-parking area between the hours stated. The anti-parking district as defined by the proposed ordinance is bounded on the south by Harrison Street, on the north by Kinzie Street, on the east by Michigan Avenue, and on the west by Clinton Street. The measure was opposed before the committee only by the representatives of the local automobile clubs.

Another Increase Needed

Dallas Railway Unable to Earn Authorized Return Under Six-Cent Fare —Fewer Riders Carried

The Dallas (Texas) Railway has found that the 6-cent fare granted it last July is inadequate to enable the company to earn the authorized 7 per cent on the agreed valuation of its property under the terms of its franchise. Richard Meriwether, vice-president and general manager of the railway, recently pointed out the reasons why the 6-cent fare had proved insufficient. Mr. Meriwether expressed the belief that an 8-cent cash fare with two tickets for 15 cents would prove adequate and would enable the company to maintain service and at the same time to earn its authorized return.

The decreased revenue of the company under the 6-cent fare, according to Mr. Meriwether, is due to three factors:

1. Material reduction in the number of passengers carried, which decreased the gross earnings of the company.
2. The very material increase in the cost of power, due to the higher cost of fuel. Power costs for September were approximately 3½ cent per kw.-hr., as compared with 1.4 cents per kw.-hr., when the power company purchased oil at 90 cents a barrel. The company is now paying $3.50 a barrel for fuel oil.
3. Increased wages to car operators. An increase in pay was granted immediately before the 6-cent fare went into effect.

FARE SITUATION DISCUSSED

Mr. Meriwether goes into detail in explaining that money spent for extensions and improvements in the Dallas Railway's system does not come from the gross earnings of the company, but is obtained by the sale of securities, and in no way affects the earnings of the company, except that the added value of the property gives a larger amount on which to calculate the authorized return of 7 per cent.

Discussing the unprofitableness of the 6-cent fare and the reasons therefor Mr. Meriwether said:

> We could not foresee that passenger traffic would greatly fall off when we asked for the 6-cent fare, nor at that time could we have shown that a higher fare than 6 cents would be needed. In our application we called attention to the fact that traffic probably would decrease immediately following the increased fare, but we had every reason to believe that it would return to normal after the first month. It has failed to do so.
>
> For the last three years the number of passengers has steadily increased, the monthly average carried in 1918 being 2,829,000, which increased to 3,927,247 in 1919, and to 4,523,050 for the first six months of 1920. Instead of continuing the steady increase as was anticipated the average number of passengers carried during July, August and September, the first three months of operation under the 6-cent fare, was but 4,275,602.
>
> Taking the first six months of 1920 the number of passengers carried, month by month, was: January, 4,316,027; February, 4,088,823; March, 4,641,792; April, 4,604,369; May, 4,880,451; June, 4,606,839. Immediately following the 6-cent fare the traffic decreased to 4,287,275 in July, 4,277,702 in August, and 4,261,827 in September, showing a steady decrease.
>
> Whether the decrease in traffic is due to the higher fare or to other causes I cannot say, but it is a fact, nevertheless, that the revenue has failed to increase as we had anticipated it would.

Jitney Dying Hard

Seattle "Parasites" Carry Their Case Against City to the State Supreme Court

W. R. Crawford, attorney for the jitney interests at Seattle, Wash., has made an offer to the city to dismiss the litigation against the city now pending in the courts, if the city will approve the proposed route schedule for the jitney buses outlined by the jitney commission just before election. The city utilities committee, to which the offer was made, however, has turned a deaf ear, and "indefinitely postponed" the measure.

At the election the city voters declared against the jitneys. Previous to the election the jitney owners objected to the schedule of routes proposed, but since the election their attitude has changed, inasmuch as the city voted against allowing them full rights to operate as they chose.

The right of the city to regulate the jitneys was upheld by the court refusing a permanent injunction against the enforcement of the city's jitney ordinance, but the victory was a hollow one, as the temporary restraining order remains in effect until the case is disposed of in the State Supreme Court.

Before the case was heard on its merits, the city made an effort to have the temporary restraining order dissolved, but this motion was denied. Had the temporary order been dissolved and the case then gone to trial on its merits, the city would not be in a position to enforce its regulation of the jitneys.

Three federal judges passed on the validity of every phase of the city's proposed ordinance regulating the jitneys before the application for a restraining order was filed in the Superior Court. They held that the city had every right under the law to carry out its regulation of the jitneys.

The whole litigation means that probably several months will elapse before the city will be in a position to proceed with its regulation of the jitneys as proposed in the ordinance.

"No-Accident" Week in Fort Wayne

R. N. Hemming, superintendent of transportation of the Indiana Service Corporation, Fort Wayne, Ind., was in active charge of the "No-Accident" week staged in Fort Wayne by the local Safety Council during the week of Nov. 29. Mr. Hemming is the chairman of the council. The week was advertised by means of posters placed in all the street cars, in downtown buildings and in all the industrial plants and by means of newspaper stories and advertisements. During the week the Boy Scouts distributed small cards and window shield stickers to the public to help along the movement. In speaking of the campaign Mr. Hemming said:

> The number of accidents in Fort Wayne and Allen County during the past year is appalling, compared with fatalities due to carelessness in other cities. In Allen County there were eighty-two fatal accidents during the period from Oct. 1, 1919, to Oct. 1, 1920, and that figure represents nearly one-thousandth of the total of 88,000 fatalities due to carelessness in all the United States. We hope by means of this campaign to prove to the public the hazards of carelessness and we also hope to induce a greater degree of safety on the part of the general public.

Transportation News Notes

Three Cents a Mile on Interurban.—The Auburn & Syracuse Electric Railroad, Auburn, N. Y., recently raised the fare on its interurban lines from a basis of 2.75 cents to one of 3 cents a mile. The company also raised the price of commutation and other reduced fare tickets.

City Sanctions Fare Increase.—The City Council of Charles City, Iowa, has approved an application of the Charles City Western Railway for permission to increase its cash fare within the city limits from 5 cents to 10 cents. The company proposes to sell fourteen tickets for $1.

Ten Cents on Maine Road.—The Portsmouth, Dover & York Street Railway, Portsmouth, N. H., on Nov. 1 raised the fare on its lines in Maine from 7 cents to 10 cents. The increase was made under authority of the Maine Public Utilities Commission. Tickets are sold at the rate of 6 cents each.

Grants Temporary Increase.—A tentative increase in fares from 7 to 8 cents has been allowed the North Alabama Traction Company, Albany, by the Alabama Public Service Commission. The higher rate will be in effect until a formal hearing is held in December, when the case will be finally decided.

"Safeties" in Kenosha.—The Wisconsin Gas & Electric Company introduced Birney one-man safety cars on its lines in Kenosha, Wis., on Nov. 15. It is planned to have the "safeties" furnish the base service, while the old type cars are to be used during rush hours to furnish supplementary service. Reports in the Kenosha newspapers indicate that the new cars have already won public favor.

Higher Newspaper Rates Asked.—Following increases in freight and passenger rates, the Philadelphia (Pa.) Rapid Transit Company has filed a new tariff with the State Public Service Commission increasing newspaper-carrying rates from 12 to 18 cents a hundred pounds, effective Dec. 19. The increase on newspapers completes the general advance that the company has effected in the last four months.

Asks More on Suburban Line.—A petition for an increase in fare from 8 to 10 cents on the Black Bridge-Venice division of the East St. Louis & Suburban Railway, East St. Louis, Ill., has been filed with the Illinois Public Utilities Commission. Service on this division was curtailed for about four months but was resumed recently. During the time it was suspended persons going to and from Venice paid from 20 to 25 cents for jitney rides.

Six Cents in El Paso.—The City Council at El Paso, Tex., has approved the application of the El Paso Electric Company for a 6-cent fare on its city lines. The Council first held a public meeting to obtain the views of the public on the proposal, and at this meeting practically no opposition to the fare increase was voiced. The company represented that it could not maintain the present service on the 5-cent fare, and that unless fares were increased, the service would have to be curtailed.

Conductor Freed of Murder Charge.—J. C. Knight, who on Oct. 12 shot and killed James M. Means, assistant superintendent of transportation of the Georgia Railway & Power Company, Atlanta, Ga., has been acquitted of a charge of murder by a jury in the Criminal Court at Atlanta. The shooting occurred while Mr. Means was reprimanding Knight, a conductor, who had admitted being short in his accounts. Knight based his defence on the claim that the slaying was accidental.

Bus Regulation Urged.—The Chamber of Commerce of Providence, R. I., has forwarded to the City Council a copy of the report of its committee on jitney regulations, made after a study of the local bus situation. The committee finds that the jitney service as at present operated is "extremely dangerous," and believes that the public should be safeguarded by the passage of a new ordinance. The report recommends the requirement of a bond for every person operating a jitney, limitation of operation to persons over twenty-one years of age who have passed an examination, and the establishment of routes and schedules.

More State Rates Raised.—The Interstate Commerce Commission on Nov. 26 rendered a decision in which it directed railroads operating in the State of Illinois to raise intrastate passenger fares 20 per cent. The commission on Dec. 1 ordered a 20 per cent increase in intra-state passenger fares in Wisconsin. The commission reaffirmed its recent action ordering intrastate passenger fares fixed by the New York Public Service Commission for the Second District should be increased to conform to the interstate rates. It asserted that its construction of the recent transportation act is not a violation of state rights. Fourteen railroads operating in Illinois on Nov. 29 obtained an injunction in the federal court restraining Attorney General Brundage and municipal and county officials in Chicago from enforcing state tariff restrictions. Justice Cropsey of the New York Supreme Court on Nov. 27 issued injunctions restraining the Long Island Railroad and other carriers from placing in effect the higher fares authorized by the Interstate Commerce authorized by the I. C. C.

Personal Mention

William H. Taylor Resigns

Fritz J. Frank, vice-president of the Iron Age Publishing Company, has been elected president of that company, following the resignation of William H. Taylor, who has been president and general manager for more than ten years.

Mr. Taylor has resigned because of ill health. He became connected with the *Iron Age* as general manager, after a group of publishers had acquired the ownership from David Williams. Mr. Taylor had been connected previously with various trade and engineering publications over a period of fifteen years, having for a time been vice-president of the McGraw Publishing Company, and, later, president of the Taylor Publishing Company of Chicago.

Fritz J. Frank, who succeeds Mr. Taylor, has been with the Iron Age Publishing Company since 1910, after an active association with other trade publications, among them *Colliery Engineer* and the *Mining and Scientific Press*. He has a wide acquaintance in the iron and steel and machinery trades, is experienced in business journalism, and is thoroughly committed to the traditions and standards of *Iron Age*.

Changes on the Chicago "L"

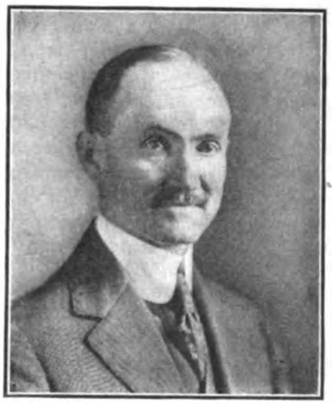
E. C. Noe, for many years general manager of the Chicago (Ill.) Elevated Railways, has been promoted to the office of vice-president of the several companies comprised in the system. The duties of the general manager will be assumed by Britton I. Budd, president. Active responsibility for operation of the roads will be assigned to B. J. Fallon, assistant general manager.

John Bauer, Consultant

John Bauer has established himself in New York as a consultant on finance, accounting and tax matters. From July, 1917, to December, 1920, he was chief of the division of accounts of the Public Service Commission for the First District of New York. Following his resignation from the Public Service Commission Mr. Bauer acted as expert adviser on transit matters in the office of the Corporation Counsel of New York City. Mr. Bauer received his technial training in economics and finance at Yale University. In 1908 he went to Cornell, where he served as instructor and then assistant professor in economics, lecturing on general economics, corporation finance and accounting. In 1914 he obtained a leave of absence from Cornell and joined the Public Service Commission for the First District temporarily, working more particularly on a revision of the uniform system of accounts. He also did a variety of analytical work in connection with rate cases, capitalization cases, rapid transit contracts, etc. He subsequently took charge of the newly created department of accounting, corporation finance and public utilities at Princeton University. Mr. Bauer is the author of numerous articles on finance, economics and accounting matters, some of which were contributed by him to the ELECTRIC RAILWAY JOURNAL.

Mr. Perry, President

Through an oversight in the composing room incident to the preparation of the issue of Nov. 20 for the press, the wrong portrait was published in connection with the biography of James A. Perry, the new president of the National Association of Railway and Utilities Commissioners. The correct portrait of Mr. Perry is published this week.


J. A. PERRY

Mr. Perry is a stanch advocate of vesting rate-making authority in the state commissions. He will probably play a prominent part in the campaign to be waged by the state regulatory bodies to preserve their powers from curtailment at the hands of the Interstate Commerce Commission. It is reported that the association may intervene in the legal actions now pending to test the right of the federal commission to fix intrastate rates.

Obituary

P. L. Utley, secretary, general manager and purchasing agent of the Escanaba (Mich.) Traction Company, died recently.

J. J. Regan, of the railway department of the General Electric Company, Schenectady, N. Y., died on Nov. 11. Mr. Regan was born in Schenectady in 1876. He received his education at the schools in that city and entered the employ of the General Electric Company at the age of eighteen years. For a number of years he was connected with the railway department of that company, and had a large acquaintance with men identified with railway interests.

B. Leighton Beale, secretary of the Boston (Mass.) Transit Department, died on Nov. 24. Mr. Beale became secretary of the Boston Transit Commission when it was organized in 1894. He served continuously in that capacity until it went out of existence in 1918. When, under the "constitution" act, it became the Boston Transit Department he remained its secretary, and was such at the time of his death. Mr. Beale was a newspaper man by profession. He was connected with a number of Boston dailies at one time or another, occupying positions all the way from reporter to city editor. He gave up journalism several years ago.

D. Levering Jones died of paralysis at his home in Philadelphia recently. Mr. Jones was a dominant figure in electric railway circles in Indiana from 1895 to 1910. He was president of the old Ft. Wayne & Wabash Valley Traction Company and chairman of the board of directors of the Ft. Wayne & Northern Indiana Traction Company until the company went into receivers' hands some years ago. At various times he was interested in the Indianapolis Street Railway, the city lines of Lafayette, the Indiana Union Traction Company, the Ohio Electric Railway, the Ft. Wayne & Wabash Valley lines and the Ft. Wayne & Northern Indiana Traction Company, now the Indiana Service Corporation.

Edgar Peckham, prominent as a manufacturer of trucks for electric railways during the early history of the industry in this country, died in London, of heart failure, on Sept. 22. For a number of years Mr. Peckham had been living in London, part of this time being engaged in the manufacture of trucks. Mr. Peckham was a native of Oneida County, N. Y., and while engaged in the truck business in this country, had his factory at Kingston, N. Y. He was one of the earliest to advocate the use of independent trucks as opposed to the former horse car running gear with the motor suspended from the car frame. The principal feature of the Peckham truck, as built for single-truck cars, was what was called the cantilever extension frame or the use of an extended spring base supported by a cantilever truss from underneath. The purpose of this construction was to reduce the oscillation of the car and at the same time to provide a better support for the end of the car, while retaining a short wheel base. Mr. Peckham moved from this country to England in 1904. He was eighty years of age.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Buying of Heater Repair Parts Not Large

Manufacturers Are in Good Shape to Meet the Demand—Back Orders for Heaters Catching Up

Following a good buying season for electric car heaters, manufacturers report that the buying of repair parts thus far, while fair, has not been up to the standard of other seasons. Apparently electric traction companies are not making repairs to heaters except where absolutely necessary, the inference being that tightness of money is to blame. Furthermore, on the buying of material for repair work there is a tendency to postpone ordering as long as possible, a circumstance which causes embarrassment to the heater manufacturer who must anticipate his needs for repair parts well in advance. On the other hand, late rush orders for completed heaters did not develop this year along in October or November.

Supply conditions of heater parts on the whole are favorable. The steel situation has eased up to such an extent that surplus stocks of the metal parts, such as screws, clips, sheets, etc., are in good shape. Resistance wire is also said to be in good shape. Shipments of porcelain, on the other hand, leave much to be desired, but by advance ordering manufacturers have accumulated a stock sufficient to care for customers' needs.

Up to this time manufacturers have been very busy turning out back orders for complete heaters, but just now production is beginning to catch up with unfilled orders.

Emergency Coal Order Vacated by I. C. C.

Preferential Transportation of Coal for Utilities and Priorities on Open-Top Cars Withdrawn

With the vacating by the Interstate Commerce Commission on Nov. 24 of service order No. 21 all preferential transportation of coal for utilities has been stopped. This order, which had been on the books since Oct. 8, superseded the general preferential order for utility coal and applied only to emergency cases. In setting the order aside the commission stated that "the emergency which caused the commission on the eighth day of October, A. D. 1920, to make and enter its service order No. 21 has in general been measurably relieved."

A few days later the I. C. C. cancelled order No. 20, the last of the open-top car coal transportation priority orders.

The Interstate Commerce Commission rescinded the priority order against the advice of many coal specialists. It is believed necessary to continue maximum production during December to insure against scant supplies later with attendant price increases.

The commission very evidently is of the opinion, however, that most of the open-top cars will continue in the coal trade despite the withdrawal of the order owing to the limited amounts of building and road materials which are shipped at this season of the year. In some quarters it is feared that the lack of open-top equipment during recent months has led to an accumulation of stocks of materials best handled in that type of car and that immediate advantage will be taken of the lifting of the order to make these shipments. It is pointed out, however, that should other commodities absorb an undue proportion of the open-top cars the commission would reinstate the order on short notice.

Steel Price Cut Expected to Stimulate Buying

Action of Certain Independent Mills in Lowering Prices to Meet Those of Steel Corporation Likely to Relieve Steel Situation

Following the announcement on Nov. 26 by the Jones & Laughlin Steel Company that its prices on bars, plates and structural shapes had been revised downward to meet the prices quoted by the United States Steel Corporation, which prices were those suggested at the conference of steel interests with the Industrial Board in March, 1919, there has been in the steel trade a general feeling of satisfaction. It is felt that this action on the part of this independent steel company will exert a stabilizing influence on the steel market, and that a readjustment in the trade will follow.

Some action was necessary to overcome the low level of steel buying and to avoid complete suspension of work in many plants. At the time of this writing, however, there has been little noticeable revival of buying, but it is expected that few days will go by before this condition is overcome and buying is resumed. While not all independent producers have met the full drop in prices announced by the one producer above, many mills have shown a recession to figures close to the bottom prices quoted.

The independent mills as a whole are working much below capacity, in some cases down to 60 per cent. It is probable that these mills will now receive some orders which had previously been given to the corporation but on which shipments were some distance off. This feature of prompt shipment on the part of the independent companies is likely to cause cancellation orders on the leading steel producer.

Certain independent prices on plates are quoted now at 2.65 cents, on structural shapes 2.45 cents and on bars 2.35 cents, Pittsburgh, while wire nails have dropped to $3.25 per keg. At the same time other of the independents have quotations much higher than these. Reductions in sheets have just been announced from some independents; blue annealed has gone to 4.05 cents base, black to 4.85 cents and galvanized to 6.20 cents. However, other interests are still quoting 5.50 cents for the black and 7 cents for galvanized.

Better Deliveries Help Railway Purchasing Agents

In meeting immediate needs, railway purchasing agents note general improvement in deliveries by both manufacturers and jobbers. Hand-to-mouth buying is practised throughout the traction industry, but the better shipments now available are tending to establish a fairly healthy cash business, especially in small supplies. A substantial volume of service must be maintained regardless of the present shrinkage in general business, and from the buyer's standpoint conditions are improving right along. The demand for supplies continues far above levels common to some less stable industries whose buying has fallen to a bare fraction of their normal.

For a long time the electrical supply jobber was overwhelmed with orders from industrial plants and central stations. Little attention was paid by some of these houses to the problems of electric railway material supply, probably because of its comparatively small volume and because of the precarious financial status of many traction companies. Now that the jobbers' sales forces are combing the field for orders, the purchasing agent who seeks service need not go far to find it. In the opinion of well-informed purchasing agents, the time is ripe for establishing new and better relations with the sales representatives of both manufacturer and jobber. Even small orders are treated with a new respect and current needs may be helpfully met by such orders in view of future price uncertainties, it is believed. The railway purchasing agent is not inclined to stock up extensively on supplies with the prospect of price recessions which many buyers still believe exists, and it is felt to be a wise policy to buy carefully and to take advantage of improving deliveries in cutting down idle investment in spare parts. A little cooperative sales effort on the part of the jobber, it is believed, especially in supplying material from stock for roads in the same general territory, would help in liquidating accumulated supplies and reduce the outlay needed by the companies to maintain the volume of service now necessary. Nor are the electric roads canceling orders as are some other buyers. These are the opinions of a leading purchaser of electric railway supplies and are suggestive of a better outlook.

Trolley Cord Quotations Lower in Soft Cotton Market

Recent declines in the raw cotton market—spot cotton being quoted in New York at 16.65 cents at this writing —have been reflected in lowering prices for trolley cord and bell cord. Within the past month reductions in the different grades of cord have amounted to approximately 25 per cent and new figures are being quoted almost weekly. According to the grade desired, trolley and bell cord can be purchased at prices ranging from approximately 75 cents to 95 cents a pound.

Buying in the trolley field is quiet and the building field is not providing anything like normal demand for either the weatherproof or plain braided cord. Stocks, consequently, are in good condition both in manufacturers' hands and in jobbers' hands and no difficulty is found in filling orders.

Low Cotton Affects Car Curtain Manufacturers

Present Light Demand Reflects Tendency to Await Drop in Prices—Production and Deliveries Improve

Sales of car curtains the past year have been good, but for some time past demand has been falling off as consumers are taking the attitude of waiting for lower prices. The buying of curtain material and parts for winter repair purposes, however, is said to have been as good as in other seasons. Steam road demand especially has been large in that respect.

Earlier this year the large buying of curtain material from other industries than railway, such as the automobile, for instance, was so heavy that it curtailed somewhat the supply of curtains. Trouble in obtaining metal fittings for curtains was also experienced. These conditions have now changed as curtain cancellations from automobile manufacturers were received in considerable volume and the metal situation has eased up. Combined with greater labor efficiency and a very plentiful supply of cotton, these factors have tended to improve deliveries of car curtains, and back orders which were numerous three or four months ago are now catching up.

At present deliveries can be made on curtains in about four weeks, according to representative manufacturers, with a variation at each extreme depending upon the class of material desired. There seems to be a decided tendency at present for electric railways to make their curtains serve a longer period than usual without making repairs.

Following their rate increases some time ago the buying of steam railroads for a time increased substantially. There is still considerable business in sight both from steam and electric lines, which will probably not be placed until the market reaches a firm basis. Even curtain manufacturers are buying on a hand-to-mouth basis owing to the situation in the cotton market. Some slumping of prices on the finished product is reported recently and at present, it is stated, the price tendency seems still to be downward.

New Woods Sought for Ties

The Pennsylvania Railroad, owing to unprecedented cost of railroad ties, it is announced, has decided to investigate the adaptability of the hard woods of Central and South America for this purpose. Normally the Pennsylvania system uses from 5,000,000 to 6,000,000 ties annually. The average net cost has risen fully 100 per cent since the beginning of the war. Furthermore, white oak, which the company considers the most desirable wood for ties, is becoming scarcer. Therefore the company has inquiries under way to determine the comparative cheapness and longevity of southern hard woods for railroad ties.

Rail Bonds and Contactor Parts Lower

With electrolytic copper being sold at a figure below that reached at any time since the opening of the war, it has brought down with it prices of certain of its products made for the most part of that metal. Copper has been sold in small amounts by dealers for spot delivery as low as 13.5 and 13.75 cents delivered, but little is available at that figure. Producers are holding

NEW YORK METAL MARKET PRICES

	Nov. 3, 1920	Dec. 1, 1920
Copper ingots, cents per lb	15.00	14.00
Copper wire base, cents per lb	17.50 to 18.00	17.00
Lead, cents per lb	7.25	5.50
Nickel, cents per lb	43.00	43.00
Zinc, cents per lb	7.40	6.00
Tin, cents per lb	39.50	33.25
Aluminum, 98 to 99 per cent, cents per lb	33.10	32.90

OLD METAL PRICES—NEW YORK

	Nov. 3, 1920	Dec. 1, 1920
Heavy copper, cents per lb	12.00 to 13.00	10.50 to 11.00
Light copper, cents per lb	10.00 to 10.50	8.50 to 9.00
Heavy brass, cents per lb	6.50 to 7.00	6.50 to 7.00
Zinc, cents per lb	4.00 to 4.50	3.25 to 3.50
Yellow brass, cents per lb	5.00 to 5.50	4.50 to 5.00
Lead, heavy, cents per lb	5.25 to 5.50	4.00 to 4.50
Steel car axles, Chicago, pet net ton	31.00 to 32.00	20.00 to 21.00
Old car wheels, Chicago, per gross ton	33.00 to 34.00	32.00 to 33.00
Steel rails (scrap) Chicago, per gross ton	22.50 to 23.50	19.00 to 20.00
Steel rails (rerolling), Chicago, gross ton	30.00 to 31.00	20.00 to 21.00
Machine shop turnings, Chicago, net ton	8.00 to 8.50	7.50 to 8.00

ELECTRIC RAILWAY MATERIAL PRICES

	Nov. 3, 1920	Dec. 1, 1920
Rubber-covered wire base, New York, cents per lb	23.00	23.00
Weatherproof wire (100 lb. lots), cents per lb	23.00	22.00
Standard Bessemer Steel Rails, per gross ton	45.00 to 63.00	45.00 to 55.00
Standard open hearth rails, per gross ton	47.00 to 65.00	47.00 to 57.00
T-rail, high (Shanghai), per gross ton, f.o.b. mill	73.00	73.00
Rails, girder (grooved), per gross ton, f.o.b. mill	88.00	88.00
Wire nails, Pittsburgh, cents per lb	3.25 to 4.50	3.25 to 4.25
Railroad spikes, drive, Pittsburgh base, cents per lb	4.25 to 5.25	3.25 to 4.25
Tie plates (flat type), cents per lb	4.00 to 5.00	3.00 to 3.75
Tie plates (brace type), cents per lb	4.00 to 5.00	3.00 to 3.75
Tie rods, Pittsburgh base, cents per lb	6.50 to 7.00	6.00 to 6.50
Fish plates, cents per lb	4.00 to 5.00	3.25 to 4.25
Angle bars, cents per lb	4.00 to 5.00	3.25 to 4.25
Rail bolts and nuts, Pittsburgh base, cents per lb	6.00 to 7.00	6.00 to 7.00
Steel bars, Pittsburgh, cents per lb	2.35 to 3.25	2.35 to 3.00
Sheet iron, black (24 gage), Pittsburgh, cents per lb	4.20 to 6.85	4.20 to 5.35
Sheet iron, galvanized (24 gage), Pittsburgh, cents per lb	5.25 to 8.05	5.25 to 6.55
Galvanized barbed wire, Pittsburgh, cents per lb	4.45	4.10 to 4.85
Galvanized wire, ordinary, Pittsburgh, cents per lb	3.95 to 4.70	3.95 to 4.45
Car window glass (single strength), first three brackets, A quality, New York, discount*	77%	77%
Car window glass (single strength), first three brackets, B quality, New York, discount	77%	77%
Car window glass (double strength, all sizes, A quality), New York, discount	79%	79%
Waste, wool (according to grade), cents per lb	15 to 21	15 to 21
Waste cotton (100 lb. bale), cents per lb	15 to 17½	15 to 17½
Asphalt, hot (150 tons minimum), per ton delivered	40.00	40.00
Asphalt, cold (150 tons minimum, pkgs. weighed in), per ton	42.50	36.00
Asphalt, filler, per ton	40.00	36.00
Cement, New York, per bbl	5.10	4.90
Linseed oil (raw, 5 bbl. lots), New York, per gal	1.05 to 1.07	.85
Linseed oil (boiled, 5 bbl. lots), New York, per gal	1.07 to 1.09	.87
White lead (100 lb. keg), New York, cents per lb	15½	14.25
Turpentine (bbl. lots), New York, per gal	1.17	.95

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* These prices are f.o.b. works, with boxing charges extra.

to 14 cents as a minimum figure, with some of them not in the market at that price.

This has reflected on rail bonds, which are being quoted at another 5 points off, bringing the discount to 25 per cent as of Dec. 1, with the buying very quiet. Copper wire, net, at the mills is at 17 cents. At the same time from at least one source contactor fingers and segments are being quoted at about a 5 per cent lower figure since the last week in November.

Rolling Stock

The Los Angeles (Cal.) Railway, following the successful operation of forty-five safety cars on two of its lines, has received a recommendation from the Board of Public Utilities of that city to install fifty more Birney cars.

Consolidated Railway Company, Springfield, Ill., has installed the first of seventeen one-man cars and the others are expected soon. Officials stated that the use of the new cars will result in no reduction of the working force, but will reduce the present twelve-minute schedule to ten and nine minutes.

Track and Roadway

Los Angeles (Cal.) Railway.—The Hollywood Board of Trade has petitioned the Board of Public Utilities requesting the extension of the Vermont Avenue line from First Street to Griffith Park.

South Covington, Cincinnati & Newport Street Railway, South Covington, Ky.—The South Covington, Cincinnati & Newport Street Railway has been granted an extension of six months instead of a year for the use of Cincinnati streets north of Third Street because the Dixie Terminal will not be completed before that time.

Union Traction Company of Indiana, Anderson, Ind.—In order to eliminate two sharp curves and also the slow movement of interurban cars in Main Street through Summitville, Ind., the Union Traction Company is moving more than 4,000 ft. of its track one block west of Main Street. A compromise was effected with persons who at first refused an offer of the railway for a small tract of land, where curves in the line will be removed.

Pittsburg County Railway, McAlester, Okla.—The Pittsburg County Railway announces that it will extend the interurban line eastward to Fort Smith, Ark., in the near future. Preliminary surveys have already been made and financial arrangements are now being negotiated. The distance is approximately 80 miles. It is estimated that the line will cost about $2,500,000.

Minneapolis (Minn.) Street Railway.—An ordinance has been drafted on authority of the street railway committee directing the Minneapolis Street Railway to build its proposed East Twenty-fifth Street line in accordance with the plan originally suggested.

Duluth-Superior Traction Company, Duluth, Minn.—The Wisconsin Railway Commission has dismissed the petitions for a new railway on East Second Street from McBane to Hennepin Avenues and also a double-track from Wyoming Avenue to New York Avenue in Superior, Wis. The petition for the erection of these two lines is part of the recent demand made for the construction of new lines which also included a line on Twenty-first Street and extensions on the Tower Avenue line. These two lines were ordered constructed by the commission in the month of April, 1920. At this time the petitions for the Itasca line and the Billings Park line were considered.

Holyoke (Mass.) Street Railway.—The Holyoke Street Railway will very shortly begin the work of laying new ties and rails in Hitchcock Street. This improvement plan was brought about by the repeated complaints of residents of Hitchcock Street against the way in which the ground shakes and vibrates when trolleys pass.

Trade Notes

The J. G. Brill Company, Philadelphia, Pa., has arranged for the sale of equipment trust notes totaling $152,000 and $144,000 respectively.

The Walstrum Armature Works, Birmingham, Ala., have filed notice of increase in capital stock from $10,000 to $25,000.

W. McK. White, Western representative of the Columbia Machine Works & Malleable Iron Company, has moved his office from 6712 Cornell Avenue to 343 South Dearborn Street, Chicago.

The Kalamazoo Railway Supply Company, Kalamazoo, Mich., manufacturer of railway supplies, has filed notice of an increase in capital stock from $300,000 to $600,000.

The Bates Expanded Steel Truss Company, Chicago, Ill., has placed a contract for a one-story addition, 100 x 135 ft., to its plant on Forsythe Avenue, East Chicago, Ind.

The American Insulator Company, New Freedom, Pa., has acquired a site at Norfolk, Conn., on which it proposes to erect a two-story building. The proposed plant will give employment to about 500 people.

The Southern Car Wheel Company, Railway Exchange Building, St. Louis, Mo., contemplates the erection of a new plant on Marcus Avenue, fronting on the Terminal Railroad. The estimated cost will be more than $250,000.

The Worthington Pump & Machinery Corporation has completed plans for remodeling a building at North Bridget and East Dwight Streets, Holyoke, Mass., in connection with its local plant there. The cost is estimated to exceed $25,000.

Heywood Brothers & Wakefield Company, Wakefield, Mass., announces the appointment of Edward Buker as representative of its car-seat department, with offices and exhibits at 1415 Michigan Avenue, Chicago, Ill. Mr. Buker will handle sales of car seats and woven rattan car-seat webbing, as well as snow-sweeper rattan, in that territory.

Swedish Merchant Wants Cars.—An importer and commission merchant in Sweden desires to be placed in communication with manufacturers of narrow-gage electric motor cars for two or three passengers. Information may be had from the Bureau of Foreign and Domestic Commerce at Washington, D. C., by referring to No. 34067.

The Erie Electrical Equipment Company is seeking a location in Johnstown, Pa., to erect a foundry and factory for the manufacture of electrical and mechanical products, fittings to support high-tension and low-tension cables, busbars, insulator supports, switchboard panel fittings, etc. The company has opened an office at 620 Elder Street, Johnstown. F. S. Proudfort is chief engineer.

The Black & Decker Manufacturing Company, Towson Heights, Md., has recently increased its capitalization by $2,000,000. Of this amount $368,500 was subscribed by the employees. Since closing the books on the above issue so many more requests for subscriptions have been received that the company has decided to open up immediately another block of $150,000 for the benefit of the employees of the organization.

New Advertising Literature

Condensers.—The Elliott Company, Jeannette, Pa., has issued bulletin "C," covering its Elliott-Ehrhart condensers.

Elevators and Conveyors.—The Dodge Sales & Engineering Company, Mishawaka, Ind., has published a 160-page catalog describing the Dodge standardized elevators and conveyors.

Copper-Clad Steel.—"Putting the Strength of Steel Into Your Wires" is the title of a two-page leaflet issued by the Copper-Clad Steel Company, Rankin, Pa. (Braddock, Pa., post office).

Ballbearings.—"Langhaar Self-Adjusting Ballbearings" is the title of a thirty-two-page booklet issued by the Langhaar Ballbearing Company, Aurora, Ind., describing the "L-S-A" self-adjusting ballbearings.

Headlights.—"Mine Locomotive Headlights" is the subject of bulletin 7-A-C-1, which describes the new mine locomotive headlights for 23-watt to 94-watt lamps recently placed upon the market by the Westinghouse Electric & Manufacturing Company, George Cutter Works, South Bend, Ind.

Jacks.—The Duff Manufacturing Company, Pittsburgh, Pa., is distributing catalog No. 104, a 148-page book illustrating and describing the complete line of Duff lighting jacks.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. B. ANDERSON, Assistant News Editor

Volume 56 New York, Saturday, December 11, 1920 *Number* 24

C. E. R. A. Hears How to Sell Service

ANOTHER very much worth while meeting of the Central Electric Railway Association is a matter of history. Even without the addresses of two prominent men on the program, who were unable to be present, the meeting at Indianapolis seems to have been adjudged a decided success. Particular interest was manifested in the appeal made by W. L. Goodwin for sales co-operation within the industry and sales managers to sell electric railway service to the public. What seemed to "hit home" was Mr. Goodwin's statement that it is utterly impossible for an executive who is absorbed in all of the technical problems of producing service to be at the same time a successful salesman of his product, transportation.

There has been quite a good deal of talk in the industry the last two years about using merchandising principles in selling electric railway service, but much of this has been of a rather intangible character. It was something that should be done, but how it was to be accomplished was the part largely untold by the speaker and not understood by his auditors. Mr. Goodwin's ideas were more definite, and this fact, together with his demonstration of a sales talk, probably accounts for the unusual interest he aroused. It is apparent that he has a rare gift of salesmanship himself, and, having in mind the great work he has done in promoting co-operation among the several branches of the electrical industry, we hope that he may promptly be induced to apply further his genius along these lines to the electric railway field. He should be heard from again.

Does Courtesy by Railway Employees Pay?

A CHICAGO Surface Lines conductor recently found that it did—at least to the extent of $50 which he was awarded by a daily newspaper in a politeness contest. The experience of the newspaper reporter with this conductor was nothing unusual, but it revealed how an employee may make a favorable impression by the exercise of proper judgment in stretching one of the company's rules. In this instance the conductor accepted a transfer at a non-transfer point, but explained courteously what the passenger should have done and allowed him to ride a short distance to his destination. The company was possibly out one fare by the transaction, but it had gained much more through the courtesy of an employee.

This conductor's policy as explained in an interview quoted by the newspaper is as follows: "I try to treat them right. So many people get confused on this transfer business—there are so many different rules and regulations. But I size the man up. If he looks honest and his intentions seem good I usually give him the benefit of the doubt. Sometimes I have to throw the dead beats off—I can usually tell them from the others."

Nearly every book of rules for trainmen has a sentence reading, in substance, "Use proper judgment in all cases." One difficulty in the selection of employees is to choose those capable of exercising proper judgment. Where the company loses an occasional fare through the stretching of a rule it should gain a hundred-fold through the friends made by courtesy. No company wants to be defrauded by unprincipled passengers, but if the trainmen report all cases of lenient construction of the fare rules by them there is little danger that such an attitude by the company will be abused.

Keeping the Public Fully Advised on Labor Matters

IF A company is sure that its position in a labor controversy is absolutely on the square and thoroughly fair to public, employees and company, it seems to us that the plan adopted by the Virginia Railway & Power Company during its recent labor negotiations can well be taken as a noteworthy example of how to keep the public correctly advised. In Richmond and the other cities served by this company the full text of each proposal made to the men and the corresponding reply from the men were simultaneously published in each of the daily newspapers, the space used being paid for. In other words, all negotiations were made public as they proceeded, and there could thus arise no opportunity for a distortion of the company's intentions or the reasons for its position. It seems to be very generally agreed that a strike wins or fails as it has or does not have public sympathy. This being the case, why should not the companies see to it that the public, the jury, has all the facts all the time in the exact form in which they transpire. The public is the party most seriously inconvenienced by a strike and the one that must stand the bill if wages are increased. Hence, there is every reason why this party should be informed on every move, and the Richmond plan seems to be a good way of doing this.

An Axiom for Public Relations

A GREAT DEAL is said from time to time about how to "get on" with the public and how to get the message across to the public. For some reason or other, it appears the public doesn't understand all that we wish it to understand. People seem to be awful fools because propositions which appear to be so simple are not comprehended at once.

How much of this is our own fault? We heard a slogan the other day, stated by Judge Reed of the Kansas Court of Industrial Relations, which appealed to us as pointing out the reason why much of this has not "got across" and at the same time how we may accomplish what we wish. This slogan is:

"Treat the other fellow according to *his* understanding of your business and not according to *your* understanding of it."

Is the C. E. R. A. Slowing Down?

AT ITS recent meeting the C. E. R. A. adopted half-heartedly an amendment to the by-laws which provide for two meetings a year instead of three. One will be the annual meeting in January and the other the summer meeting, a boat trip usually, which is largely social in character. Without reference to the custom of, or what may be desirable for, any other association, we are inclined to think the Central Association is making a mistake by further reducing the number of meetings. The principal reasons that were assumed to be behind the proposed change, although no one present had any particular enthusiasm for the amendment, were that fewer meetings might be better attended and that the expense to the companies of sending their men would be less.

The members of this association are all within easy reach of any meeting place in the territory, so that the items of expense and time lost in getting to and from a meeting are of small consequence, an entirely different situation than that which surrounds meetings of the American Association. And as to this expense, one prominent railway member, who like a number of others was not present at the session when the matter was discussed and was very much disappointed when he heard of the action taken, expressed our feeling in a few words when he said: "The money spent in sending men to these conventions is the cheapest money we blow in." Any man who does not bring back information worth many times his expense account is one whose mind is not on his job. Even if there were no formal meeting and no program, the getting together with other railway men who are working on solutions to common problems is sure to be productive of an exchange of experience that is invaluable.

As to better attendance at fewer meetings, we are not at all "sold" on this idea and feel that arguments of as much weight could be made in support of a contention that one or two more meetings would improve attendance. As a matter of fact, the C. E. R. A. meetings were much better attended in the days when there were four a year than now. The reason that there has been less apparent interest the last year is perhaps very largely because of the pressure of many matters at home. And now with only two meetings a year, if an operating man is prevented from attending one of them, he then has only one opportunity a year for this personal contact with his friends in the business. With three meetings, should he be unable to attend one, there would still be two other opportunities to derive the great advantages of the association meetings.

A suggestion was made again at the Indianapolis meeting that opportunity be provided for the equipment, track and electrical men, respectively, to gather in separate meetings at which problems pertinent to their particular work could be freely discussed. We think this is a good idea, and particularly so if there are to be but two main meetings a year. There are many detail technical problems to which these groups can profitably direct their attention, and it seems reasonable to expect that more can be accomplished when all present in a meeting are interested in the subject under consideration. Such group meetings should not interfere, however, with attendance of these men at the general meetings of the association, for it is there that the departmental men learn much of the problems of the companies as a whole and are thereby better fitted to do their part of the whole business of manufacturing transportation, or any subsidiary company-wide project.

One plan of handling these group meetings in the Central Association would be to have the mornings during a two or three day session given over exclusively to the general sessions, leaving the afternoons open for the several group sessions. This end can be accomplished without going to the formality of creating separate subsidiary associations for these respective groups, along the line of the A. E. R. A. organization. It seems to us that the object sought can be accomplished if the executive committee of the Central Association would simply authorize meetings, in the nature of committees of the whole, of these groups of men, appointing a chairman for each group. These chairmen could then appoint sub-committees to take up any special problems, and any matters requiring association approval could be brought up by the chairman in the general session, after approval of definite recommendation by the committee of the whole. Such an organization scheme would be simple, would increase the organization machinery of the association almost not at all, would lead to a greater interchange of detail operating experience, would result in greater accomplishment along engineering lines and, we believe, would meet the end sought by the operating men and manufacturers.

Reach Out to Suburbanite with City Service

IT WAS to be expected that so thought-provoking a paper as that of Henry M. Brinckerhoff's on "Urban and Suburban Passenger Transportation" (see ELECTRIC RAILWAY JOURNAL for Nov. 27) would produce some interesting reactions. Not the least of these is that contained in the contributions from the steam railroad men, who were united in the opinion that their commuter business was being conducted for less than cost. For this reason they expressed their desire to have this business taken over by the rapid transit lines, leaving to the trunk lines more room in their terminals to accommodate their more profitable long-distance passengers. Indeed, one railroad operator went so far as to say that the average cost in the way of fixed charges, etc., per passenger for the use of the New York terminal of his company was so large that in many cases it exceeded the receipts from the commuter for his entire transportation.

This is not a new complaint on the part of the trunk line operator, who, as long as we can remember, has bewailed his commuter travel as unprofitable, largely on account of this terminal charge. Nevertheless, he continues to force the commuter to use the same expensive terminal as the long-distance passenger, although its marble passageways, spacious waiting rooms and beautiful frescoed ceilings are not only not necessary for the commuter but actually he would prefer to be without them. The reason for this is that when a railroad station is built the architect usually contrives to increase the distance which the commuter has to walk between the train platform and the street, although the chief thought of this passenger is how to get most quickly between the train platform and the street. Hence, a system of bookkeeping which charges any considerable proportion of the fixed charges of these marble palaces to the commuter business is erroneous. If trunk line managements doing a commuter business would take a leaf from the experience of the electric roads they would find that there are many better ways of providing for the commuter than to put him on a par as regards terminal facilities with the long-distance passenger.

One of these ways of caring for the commuter is to provide a simple terminal designed primarily to accomplish (1) speedy switching of trains, and (2) saving of time to the passenger in passing through the terminal. The Brooklyn Bridge terminal of the Brooklyn elevated railways is an early though good example of such a structure. It is used now somewhat less than formerly, owing to the construction of new rapid transit routes between New York and Brooklyn, but a few years ago about 100,000 elevated railway passengers a day passed through this station each way. This compares with about 55,000 daily one-way passengers at the Grand Central Station for both the New York Central and New Haven and Hartford roads, and of about 74,000 for all of the city terminals of the Long Island Railroad. Examples of other compact terminal stations without excessive investment may be found at several points on the Boston Elevated Railway, at Hoboken on the Public Service Railway and elsewhere.

Another solution for the problem of the delivery in the city of incoming passengers is to have a distributed rather than a concentrated terminal. This is now followed for all of the Brooklyn traffic that enters Manhattan over the Manhattan and Williamsburg bridges by the Center Street loop, from which passengers can leave the cars at any one of a number of points. Another example of a distributing terminal is the elevated loop in Chicago, used for both interurban and city traffic. Indeed, this plan of a distributing rather than a concentrated terminal was proposed for New York a decade ago when it was suggested that the Lexington Avenue Subway, then under contemplation, should be built large enough to admit standard railroad coaches from without the city limits. While such a plan was not to be recommended on account of the added expense for excavation, it suggests the third way of caring for suburban traffic, to which we have already referred.

This is to extend the service of the rapid transit line out onto the trunk line tracks, thus doing away altogether with any terminal for the commuter. This plan is followed largely in London; in fact, it was followed there even before the electrification of the underground railways. Since the change to electricity of the Metropolitan and District Railways and the construction of the tube lines the practice has been greatly extended. With the further electrification of the trunk lines extending from London a still greater expansion of this practice may be expected.

The construction of a terminal in the Hackensack Meadows for the steam suburban traffic now being taken into Jersey City, Hoboken and Weehawken, as suggested by Mr. Parsons of the Erie, with rapid transit service in from that point, would be in line with the development mentioned above. The service supplied to commuters on the Pennsylvania Railroad by the Hudson & Manhattan Railroad from Manhattan Transfer is another example.

Europe Will Now Push Electrification, Profiting by Our Experience

MANY persons who look forward eagerly to the convenience and facility of electrification of our steam railroads ask why there is so much more interest abroad in the matter than here. A moment's reflection would show them that conditions on the two sides of the Atlantic are not analogous, that the dominating forces acting to make electrification a reality in the two places are quite different. And they are not the same, either, in all European countries. Different as conditions may be, however, here and there, many valuable lessons will be furnished us by the next few years of electrification progress abroad. And as present practice there shows the effects of the past few years' developments here, so we may expect a reciprocal effect upon our own practice a few years hereafter. It therefore behooves us to watch carefully every electrification move made abroad, to analyze the reasons for the economic pressure forcing it and to study the technical principles applied in working out its problems. Americans are not particularly familiar with the situation abroad; they lost interest in it on account of the slump caused by the war. It is now time to gather up the loose ends of information in order that we may intelligently keep our hold of the situation.

Before the war there was much talk in European countries regarding electrification, and not a few far-reaching plans were made. The governments which owned or directly controlled railroad lines were particularly active. They foresaw what actually came to pass during the war, a condition in which the existence of the countries depended upon the facile movement of trains. Fortunately, they were able to muster their fuel resources to meet the emergency, but it was at frightful cost. The resolve was then firmly made to secure comparative independence of coal for transportation as soon as possible and to stretch the meager supplies of fuel to the limit by the exercise of the best obtainable technical skill. This resolve is now being carried out, at least as far as planning is concerned. Government commissions are actively at work; as soon as the money stringency loosens a bit there will be some real action.

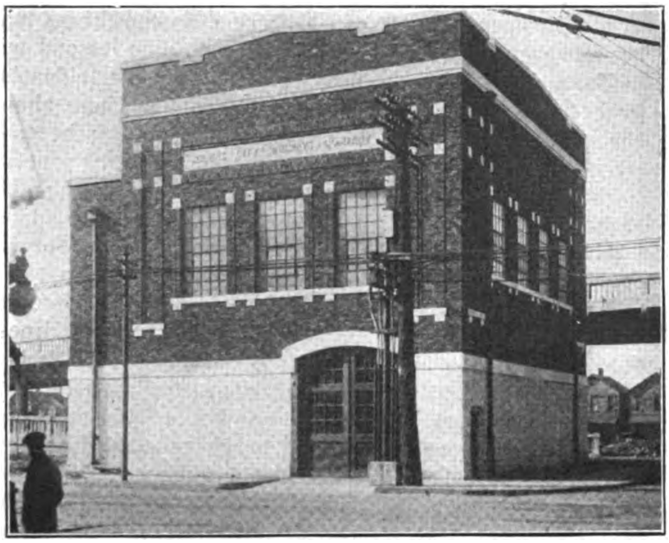
This whole subject was recently presented in a convincing way by Sir Philip Dawson before a group of engineers at Liége, Belgium. His address was abstracted in last week's issue. It shows quite clearly why and how the transportation and power problems of every country are individual. Sir Philip occupies a vantage point for observation of this situation.

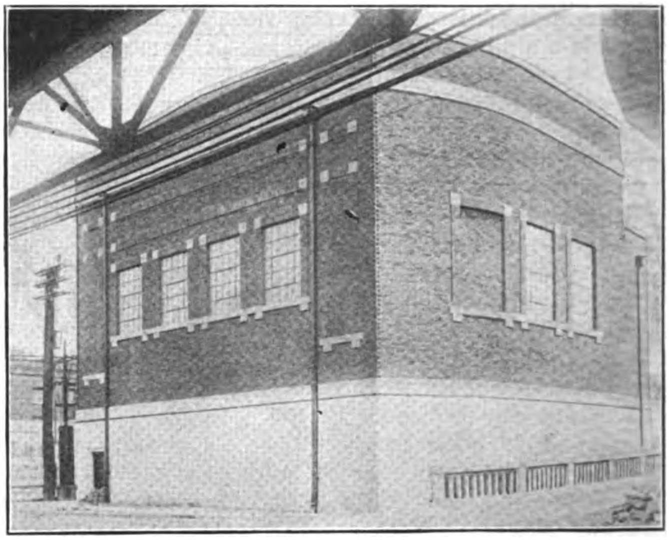
Now as to reasons why our neighbors across the water are more stirred up about electrification today than we. Here are some of the salient ones: Enormous cost of fuel, which in some cases must come from outside the country; presence in many countries of water powers, proportionately large with respect to transportation and industrial needs, and to the area over which distribution has to be made; general and vital interest in programs of economy and reconstruction following the waste and devastation of war; need for increasing track capacity by means involving the least capital expenditure. Although the handicaps of expensive capital, disadvantageous exchange rates, shortage of supplies and multitudinous demands upon money, men and materials render the carrying out of an electrification program a Herculean task, this task will be accomplished if we are to judge by what has already taken place since November, 1918.

Electrical Layout in New Substation

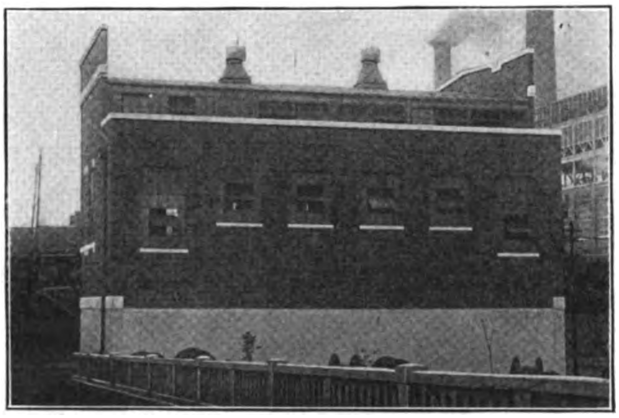
Kansas City Railways Has Incorporated Several Unusual Features of Building Design and Equipment in Recently Completed Station—But One Oil Switch Used for Each Pair of Incoming and Outgoing High-Tension Lines

By S. H. GRAUTEN
Electrical Engineer Kansas City (Mo.) Railways





A NEW substation recently placed in operation by the Kansas City Railways is of particular interest because of the peculiar building design, forced by topographical conditions, and the unique layout of the high-tension circuits, resulting not only in the saving of equipment but in improving operating conditions at other substations subsidiary to this one.



FIGS. 1, 2 AND 3—FRONT, REAR AND SIDE VIEWS OF NEW SUBSTATION OF KANSAS CITY RAILWAYS

In general this new substation was built to supplant the old Kaw River power house and it thus forms a switching center for the entire west side of the city, feeding two other more remote substations and a heavy interurban line. It is also a tie-in point with the Kansas City Power & Light Company's system. Because of the importance of the station as a high-tension switching center it was deemed advisable to build it as a manually operated station, despite the fact that the company now has four automatic substations in operation. However, provisions were made for the installation of automatic devices at a later date, when the separation of the railway and lighting systems will have been completed, thus simplifying the operation of the station.

The new substation is located in the west bottoms industrial district at an intersection of the elevated line and two surface lines. The station is known as the James and Central substation, from the adjacent streets. The location of the station in the bottoms had a very important bearing upon the design of the building. This district was inundated in 1903 and by previous floods, and even though flood preventive measures have been taken along the Kaw River since that time this past history had to be given serious consideration. Consequently the level of the main operating floor was placed at an elevation slightly above the 1903 high-water level and the station laid out so that no equipment which could be damaged by water would be installed below this line.

This high elevation of the main floor gave considerable basement space, part of which was utilized for the oil-insulated transformers, so installed that the bushings are above the high water line, and part by having the machine entrance at the sidewalk level. An opening was left in the main floor over this machine entrance, forming an entrance well which permits the trucking of heavy parts directly into the building under the craneway. This entrance well also provides a convenient station for tower truck or emergency wagon, a desirable arrangement from an operating standpoint.

Some complication was encountered in providing suitable foundations for the building, inasmuch as the soil in the bottoms is principally of quicksand, with rock only at great depth. The building was therefore set on a reinforced concrete mat ranging in thickness from 16 in to 42 in. The entire structure up to the first floor level, including machine foundations, was built of solid concrete. Above the floor line the building is of brown matt brick with native Missouri Carthage stone for base course, sills, name panel, cornices and coping. The effect is dignified and in keeping with the purpose of the building as well as its surroundings.

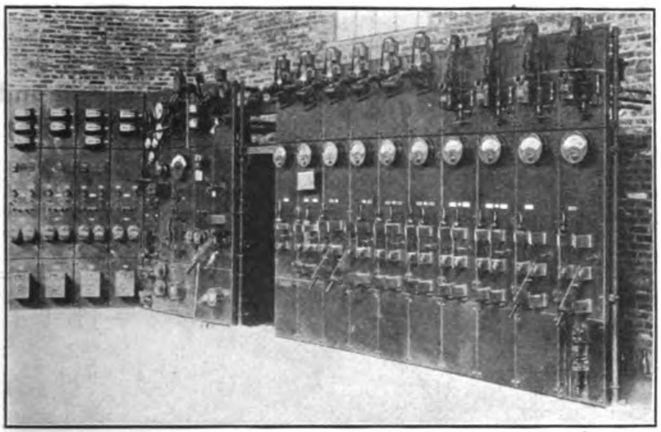


FIG. 4—A CLOSE-UP OF THE SWITCHBOARD, SHOWING THE FOUR HIGH-TENSION PANELS SET ON AN ANGLE TO THE REMAINDER OF THE BOARD

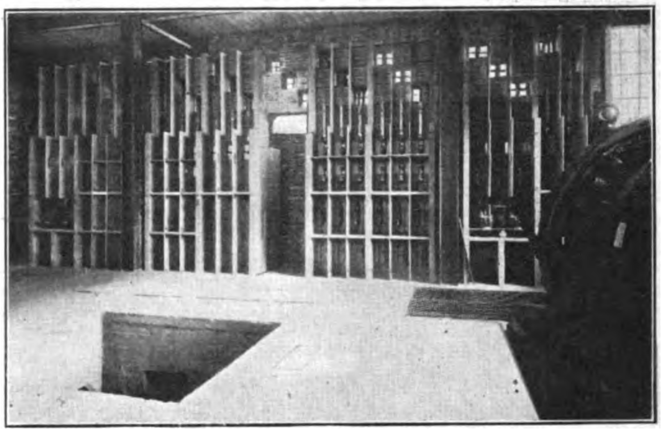


FIG. 5—FRONT OF HIGH-TENSION BUS STRUCTURE, THIS VIEW BEING TAKEN BEFORE INSTALLATION OF THE THREE-COMPARTMENT-WIDE DOORS

The substation was laid out to accommodate three machines of any size up to 3,000 kw., the initial installation consisting of one 2,000-kw. rotary converter. The floor plan and general location of equipment are shown in an accompanying drawing.

ARRANGEMENT OF ELECTRICAL EQUIPMENT

One of the most interesting features of the station is the arrangement of the high-tension lines and their connection to the station bus in a manner which reduces the number of oil switches required to one-half that usually employed for such installations of incoming and outgoing high-tension lines. Four incoming and four outgoing lines are grouped in pairs and considered a unit, each pair being in effect a through line with a tap-off to the bus of this substation. This arrangement requires but one oil switch for two lines, which is obviously a saving of one oil switch together with the accompanying bus structure and corresponding floor space. Each incoming line is provided with reverse power relays and current transformers. Each outgoing line is provided with induction type overload relays and current transformers. The combination has the advantage that it permits operation of any line as a radial line direct from the generating station to the remote substation, independent of the bus at this substation. Economy of cable capacity dictated that the several lines be ordinarily operated in parallel on this

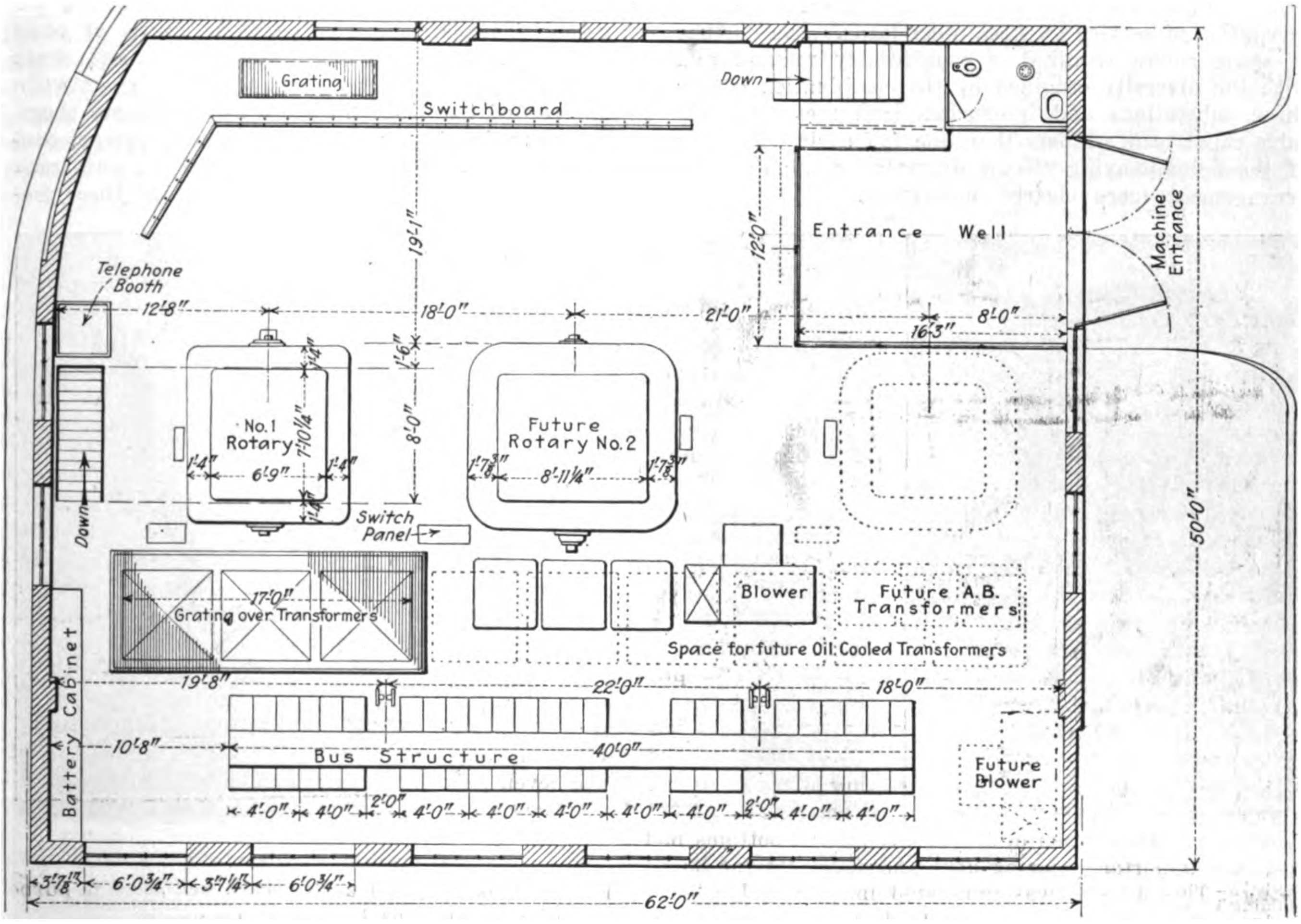

Grating
Switchboard
Down
Entrance Well
Machine Entrance
Telephone Booth
12'8"
18'0"
21'0"
8'0"
16'3"
12'0"
19'1"
1'6"
8'0"
No. 1 Rotary
7'10¼"
6'9"
1'4"
1'4"
1'4"
1'4"
Future Rotary No. 2
8'11¼"
1'7⅜"
1'7⅜"
Switch Panel
Down
17'0"
Grating over Transformers
Blower
Future A.B. Transformers
Space for future Oil Cooled Transformers
Battery Cabinet
19'8"
22'0"
18'0"
10'8"
Bus Structure
40'0"
4'0"
4'0"
2'0"
4'0"
4'0"
4'0"
4'0"
4'0"
2'0"
4'0"
4'0"
Future Blower
50'0"
3'7⅞"
6'0¾"
3'7¼"
6'0¾"
62'0"

FIG. 6—FLOOR PLAN AND LAYOUT OF EQUIPMENT IN NEW KANSAS CITY SUBSTATION

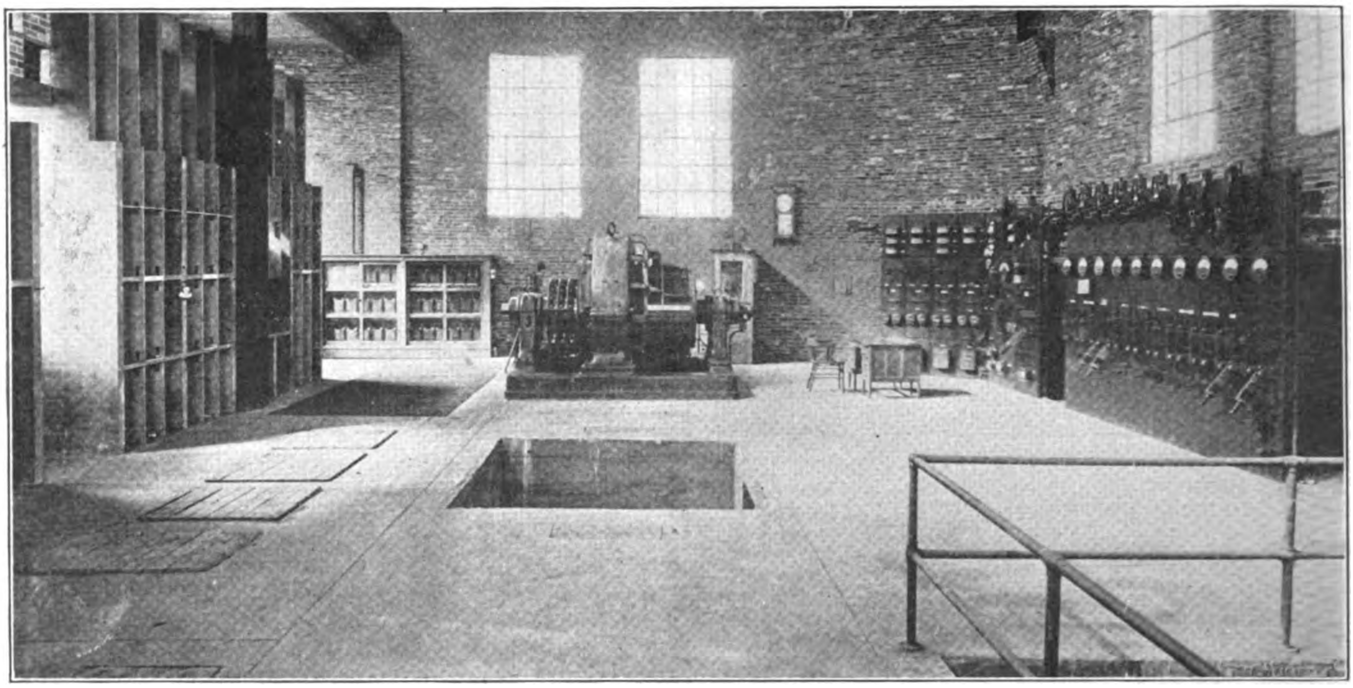
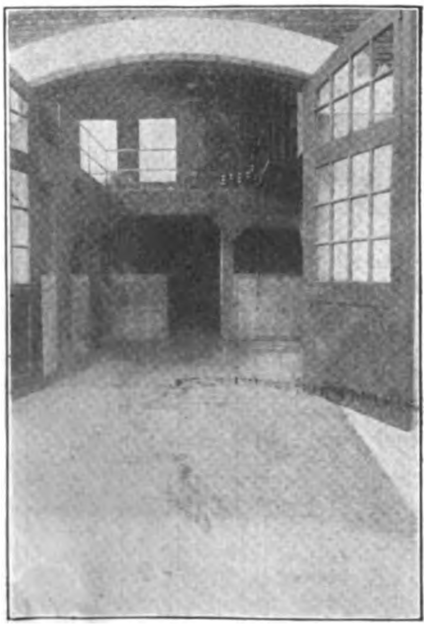
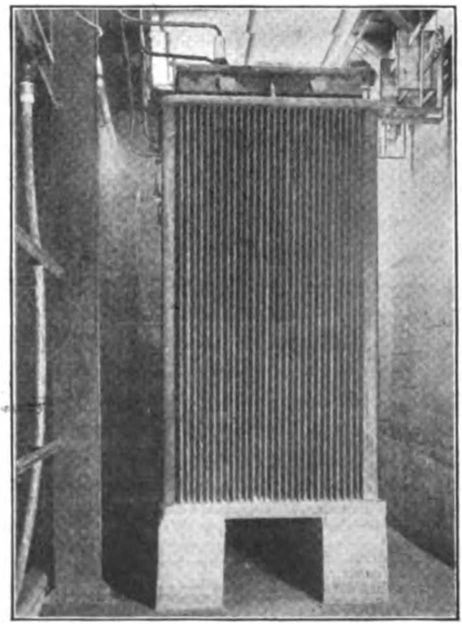


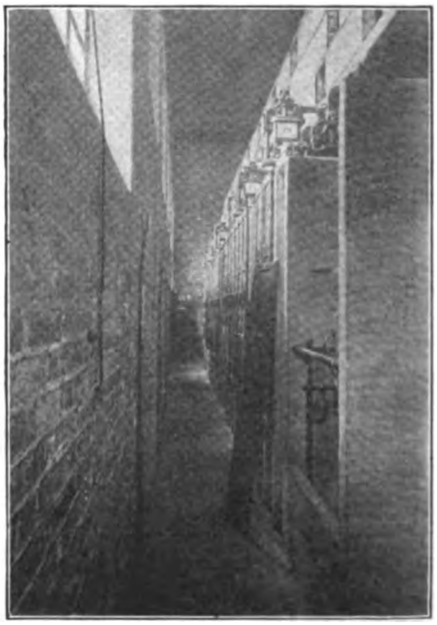
FIG. 7—THE GENERAL LOCATION OF SWITCHBOARD, CONVERTERS, STORAGE BATTERY AND HIGH-TENSION BUS AND SWITCH STRUCTURES CAN BE SEEN IN THIS PICTURE

substation bus, with the outlying substations feeding from this point in tandem fashion. The arrangement of relays is such that when operating in this manner, should there be trouble in this substation, the line oil switches to the bus would open, thus cutting off this station but leaving the cables connected direct to the more remote substations and probably avoiding an interruption of service to these other loads. The number of spare cables required is considerably reduced and with the diversity obtained by the combination of the three substations and interurban load the saving in cable capacity is not less than one full cable. A study of the accompanying circuit diagrams will make this arrangement more clearly understood.

The high-tension bus structure and the oil switches and disconnects are located on the main floor, which places them in a convenient place for operating. There are three sections of the bus, one of which is for future use. Each bus section provides for one rotary converter, two incoming 6,600-volt lines, two outgoing 6,600-volt lines, one electrolytic lightning arrester and one set of potential transformers. The structure is of composite construction, the oil switch valves and main barriers being of concrete, while the barriers between phases are of transite. The bus compartments themselves are made of gray pressed brick with precast concrete horizontal slabs. The transite doors are unframed and are arranged so that one door covers all three dis-







VIEWS SHOWING DETAIL CONSTRUCTION IN KANSAS CITY SUBSTATION

Fig. 8—The machine entrance and well at the front end of the building.

Fig. 9—The single-phase oil-insulated transformers are located in the basement, with the bushings placed well above the high-water line.

Fig. 10—Rear of the high-tension bus structure.

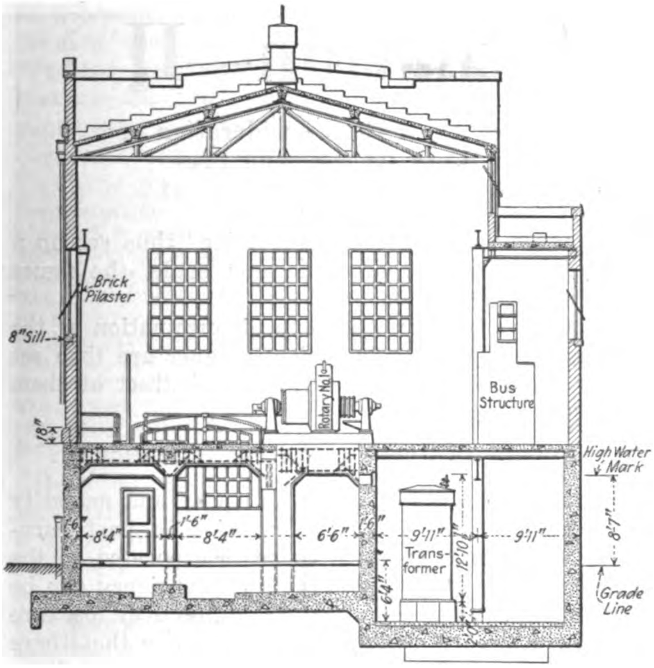

Brick Pilaster
8" Sill
1'8"
Rotary No.1
Bus Structure
High Water Mark
8'-7"
Grade Line
1'-6"
8'-4"
1'-6"
8'-4"
6'-6"
1'-6"
9'-11"
9'-11"
Trans-former
12'-10"
6'-4"

FIG. 11—A LATERAL CROSS-SECTION THROUGH NEW KANSAS CITY SUBSTATION

connects of a given set, so that the removal of the proper door uncovers the three switches which the operator is to handle without exposing other live parts.

The oil switches used are the General Electric Form K-52, 400-amp., 1,500-volt, solenoid-operated remote control. They are operated by a fifty-six-cell Exide storage battery mounted in a cabinet having sliding glass doors. The inside of the cabinet is protected from the acid fumes with acid-proof paint and the cabinet itself is ventilated by a duct through the wall of the building.

The initial converter installation is of standard Westinghouse design. The transformers are single phase, oil-insulated, self-cooled type, and are located in a large room in the basement, over which there is a grating in the main floor.

SWITCHBOARD CONSTRUCTION AND ARRANGEMENT

The switchboard is made up of seventeen three-section panels of marine black slate, manufactured, with the exception of the panels for No. 1 converter, by the General Electric Company. The line of the high-tension panels is placed at an angle of about 60 deg. to the line of the other panels, since this position helps in distinguishing these panels and also makes the instruments more easily read from the middle of the main switchboard. Each high-tension panel provides for an incoming and outgoing line, a reverse power relay being mounted on the bottom section of the board and the overload relay on the lower part of the middle section.

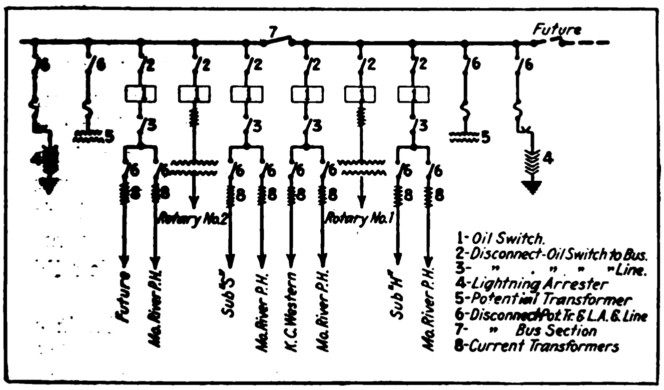

7
Future
6
6
2
2
2
2
2
2
6
6
3
3
3
3
5
5
4
4
6
6
6
6
6
6
6
6
8
8
8
8
8
8
8
8
Rotary No.2
Rotary No.1
Future
Ma. River P.H.
Sub "S"
Ma. River P.H.
K.C. Western
Ma. River P.H.
Sub "H"
Ma. River P.H.
1-Oil Switch.
2-Disconnect-Oil Switch to Bus.
3- " " " " Line.
4-Lightning Arrester
5-Potential Transformer
6-Disconnect Pot. Tr. & L.A. & Line
7- " Bus Section
8-Current Transformers

FIG. 12—A SINGLE LINE DIAGRAM OF HIGH-TENSION CONNECTIONS, SHOWING MANNER OF PAIRING INCOMING AND OUTGOING HIGH-TENSION LINES

One ammeter is provided for each incoming line and one for each outgoing line, three plug jacks being provided so that the ammeter can be cut in on any phase, and also for convenient calibration of meters and relays. One voltmeter is provided for each bus section.

A battery panel is provided for the oil switch battery and control of the motor generator set for charging the battery. The feeder panels are each arranged for two feeders of 1,000 amp. capacity each.

MAIN BUS IS IN TWO SECTIONS

There are two main buses, which may be connected together by a tie panel. For convenience of operation, the connection of feeders to these two buses has been so arranged that all feeders to the west are on one bus and all extending to the east are on the other, this arrangement being of considerable value during emergency operation. An auxiliary bus and panel is also provided so that any feeder may be thrown on the auxiliary bus while repairs or inspection are being made on the circuit breaker. On each positive bus section there are two tie feeders and two independent feeders. The independent feeders are equipped with automatic reclosing circuit breakers. The tie feeders, which connect through a section of another substation, are equipped with the usual automatic circuit breakers. The use of the reclosing circuit breakers permits the station to be without an attendant during the off-peak hours, when the number of cars in operation permits a reduction in the rotary converter capacity on the line. All feeders are taken out of the substation underground, either to a pole serving the surface lines or an elevated column for the elevated lines.

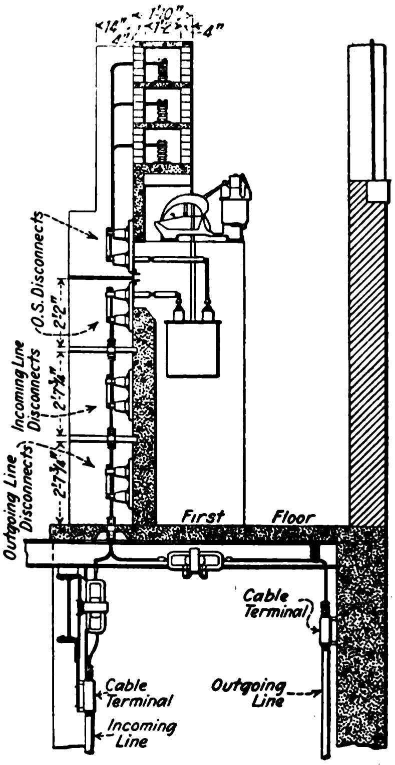

1'-0"
14"
4"
1'-2"
4"
O.S. Disconnects
2'-2"
Incoming Line Disconnects
2'-7¾"
Outgoing Line Disconnects
2'-7¾"
First Floor
Cable Terminal
Cable Terminal
Outgoing Line
Incoming Line

FIG. 13—CROSS-SECTION OF HIGH-TENSION BUS STRUCTURE, SHOWING ARRANGEMENT AND CONNECTION OF OIL SWITCHES AND DISCONNECTS

From the standpoint of negative returns, the substation is very fortunately located, for the number of surface and elevated lines radiating from this point provide an excellent return circuit. These tracks, together with the guard rails on the elevated structure, which are bonded, make a total of twenty-eight bonded rails, averaging 90 lb., radiating from the location of this substation.

Norfolk's Traction Situation—II

Determination of Value Made by a Judicial Decision Based Upon the Consideration of Several Indices of Value Such as Reproduction Cost at Both Present and Pre-War Prices, Historical Investment and Past Deficiency in Earnings

THE valuation of the railway property is an interesting part of the Taylor-Cooke report on the Norfolk traction situation, a review of which was started in last week's issue. Franchise recommendations formed the subject of the first installment; a third part will give the operating analysis and recommendations for rerouting and other service improvements.

Fixation of value for rate-making purposes as one of the guides toward an equitable result with respect to the over-all program was predicated on doing practical justice to the riding public, local property owners and to investors in the property as well as in the securities of the railway company. Valuation is admitted to be a matter of judgment, which in the Norfolk case was guided largely by four partial or incomplete measures provided by historical costs, estimated deficiencies in past earnings and by reproduction costs at 1914 and 1920 prices.

Stone & Webster had previously been employed by the Virginia Railway & Power Company to make a valuation of the property and had reported figures for reproduction costs at 1914 price levels and at 1920 price levels and had also reported on the historical investment. The figures thus reported were checked and accepted with modifications in the Taylor & Cooke report. The following table shows the original Stone & Webster figures and the modifications made:

SUMMARY OF REPRODUCTION COSTS AT 1914 AND AT 1920 PRICES

	Stone & Webster Inventory and Appraisal		Taylor & Cooke Modification	
	1920	1914	1920	1914
Land	$1,149,549	$919,639	$730,049	$584,039
Construction and equipment	9,116,732	4,651,500	9,116,732	4,651,500
Organization prior to construction	853,849	439,968	582,017	317,515
Working capital	223,269	97,960	223,269	97,960
Total	11,343,399	6,109,067	10,652,067	5,65,1014
Portion of power plant chargeable to railway on basis of 16 per cent use	472,000	259,604	472,000	259,604
Grand total (*A*)	11,815,399	6,368,671	11,124,067	5,910,618
Estimated omission (Note *A*) inventory being incomplete	....	....	175,000	100,000

(*A*) Excludes portion of transmission line between Norfolk and Richmond.

The historical investment as developed by Stone & Webster was accepted without modification by Taylor & Cooke. In the determination of the final value to be recommended as a consideration for the base rate the following factors were then set up in a table:

ESSENTIAL FACTORS IN RATE BASE DETERMINATION

		Taylor & Cooke	Stone & Webster
1.	Cost to reproduce at 1920 prices	$11,124,067	$11,815,399
2.	Cost to reproduce at 1914 prices	5,910,618	6,368,671
3.	Historical investment excluding going concern and the increment of land value	7,077,400 (accepted)	7,077,400
4.	Past deficiency in earnings below an 8 per cent return (*a*) excess power earnings not deducted	9,016,000	....
	(*b*) Excess power earnings deducted	5,118,000	....
5.	Minimum going concern value in case of company rendering good service is considered by Mr. Taylor to be	15 per cent of item 3	
6.	Present going concern value considered to be	250,000	....
7.	Three-year construction program recommended	1,269,395	....
8.	Portion of Item 7 required 1920-1921	854,713	....
	Note:—Portion on order or under contract	551,831	....
9.	Deferred maintenance	830,572	....
10.	True deficit, year to April 30, 1920, after allowing adequate reserves for renewals, not including amortization of item 9	157,839	....

With these various "indices of value" thus set up a judicial determination of value was made, the figure arrived at being $8,750,000.*

The arguments in support of a determination of the value for rate purposes in such a manner are then set forth in detail in the report and an abstract of them is here given.

HISTORICAL INVESTMENTS AND EARNINGS

Great emphasis is laid upon the equity and necessity of recognizing unavoidable deficiencies in past earnings as an element of value to be incorporated in the rate base where the existence of such deficiency can be established. This is regarded as a practical measure operating to assure capital in public service that there will be no denial of the right to earn in excess of the usual 8 per cent as and when profitable years occur following the lean period of development in which the property either produces unreasonably low returns or none at all. The considerations of equity which justify recognition of this principle are clearly set forth in the report.

Major causes responsible for past deficiencies in earning power of the Norfolk property were specified as follows:

1. Construction of unnecessary and competitive lines by earlier independent companies under franchises unwisely granted by the city and the necessary inheritance of operating and of fixed charges thereon by the present company and public.
2. Unjustifiable neglect of the company's property and inefficiency of its management during the early years of its operation.
3. Burdensome franchise conditions imposing heavy annual charges upon the company for purposes which are in no sense connected with the function of the street railway.

To such extent that losses of return on the historical investment have been the fault of the companies then or now on the premises they cannot be admitted as part of the legitimate historical cost of the property or considered as an element of value in determining the rate base.

To the extent that such losses have been due to compliance with franchise provisions imposed by the city and to the unavoidable inheritance of fixed and operating charges originating in the construction of unnecessary and competitive transit lines they must be regarded as investment and considered as a legitimate element of value.

While the report attaches major importance to total historical investment plus suitable additions for intangibles as a principal index of the rate base value, the development of historical figures necessarily based on the incomplete records of fifty-one underlying companies, requiring in many cases the subdividing of property and income accounts as between the railway and power business of such companies, did not produce figures representative of investment and deficiency in earning power of sufficient accuracy and reliability as to provide an acceptable and defensible rate base.

Under the heading "Cost to Reproduce as a Basis of Value" the report analyzes the strong and weak points of this theoretical measure and develops its limitation as a practical guide toward an equitable result. The dangers and fallacies lurking in the advocacy of "Present Day Reproduction Costs" as value for rate making are fully presented from the standpoint of public service companies. The following quotations and comments embody the argument on this topic:

---

*This value was questioned by the company before the Norfolk Public Utilities Commission and the $11,000,000 figure argued for, as reported in the JOURNAL for Oct. 2, page 688.

> Even if it be admitted that theoretically the present day "reproduction costs" may reflect, from the standpoint of abstract economic equity, a fair present value for present rate making, it should, of course, be considered only as in the nature of an index and not as the actual numerical basis for computing the "return" to which the capital value of the property is entitled. To do so would evidently be to disregard the apparent fact that we are now on or near the peak of "values" as expressed in dollars and cents and that this peak is not likely to be of sustained duration to the extent that it would be either equitable, wise or economically sound to elevate service rates to a peak equivalent to this unstable "value" peak.

In other words, the interest of public utilities is to establish the "return" to which they are entitled upon a stable and defensible foundation, and not to have it based upon unstable peak conditions, the recession of which to lower levels would immediately lay the service company's rates open to attack. While it is stated that the "return" under present day conditions should be greater than in pre-war times in order to recognize specified economic factors bearing upon supply of and demand for capital, it is not believed sound policy to fix the return on a maximum peak basis, particularly as, in order to support the contention, resort must be had to an argument that cuts both ways. On this point the report says:

> It may also be pointed out here that if reproduction costs were to be adhered to in determining the numerical rate base, then in future valuations and adjustments of service rates, which might be made in a period of low reproduction cost of a property built in a high cost period, the result would be an unwarranted reduction of rates and confiscation of property investment equivalent to such reduction. Conversely, if patrons of a property built in low cost periods were charged rates based on abnormally high and presumably non-permanent reproduction costs, such as at present existing, such rates could not be otherwise than excessive and beyond the reasonable worth of the service sold.

The inherent inability of cost figures developed under the reproduction theory to represent and interpret "value" in the broad sense which must be considered if valuations are to be used as a measure of the reasonableness of rates is summed up as follows:

> One of the important factors to be regarded in establishing such a value centers about the ability of the property to give the service to which the community is entitled. Determination of costs upon the "reproduction" theory must necessarily be based upon the property as it exists, at the same time realizing that if the service facilities were to be reproduced today the property providing them would be of substantially different character than that which is actually in use.

Following development of factors centering about the value question, as outlined in the foregoing, a conclusion is reached that:

> Consideration of such factors further emphasizes the truth that reproduction cost figures are of weight only for judicial and judicious use as a guide toward fixation of value of a proper and fair order of magnitude.

BOND DISCOUNT TO BE AMORTIZED

The company is conceded the right to amortize bond discount out of earnings as part of the cost of operation in order to provide for refinancing security issues upon maturity. If earnings are insufficient to provide for discount reserves the amount of shortage which a company would have to pay out of its treasury upon maturity of the bonds is considered as part of the cost of developing the business and should be included in the rate base until it can be amortized and withdrawn from permanent capitalization.

Going concern value is "essentially the difference between the 'cost value' of inert property and the value of that property enlivened to service through application of human energies." It is recognized to be present in the Norfolk railways to a much less extent than in others which have maintained service of a character which begets maximum patronage with corresponding profits. In the absence of special conditions entitling it to more it is considered that 15 per cent of the established rate base represents a minimum allowance for going concern value for a property furnishing good service. While in view of local service conditions in Norfolk only nominal allowance is made for this item it is recommended that it be included in the company rate base in full amount following required improvement in service.

"SERVICE" DEPRECIATION ALONE CONSIDERED

The point of view taken with respect to depreciation as a factor in rate making is an interesting chapter of the "value" section of this report. It states in the preamble:

> For the practical purpose with which we are herein concerned, physical property in public service may be considered as subject to two broad classes of so-called depreciation:
>
> 1. That theoretical depreciation which sets in and accumulates between the condition now of a physical item and the condition at which its practical serviceability begins to become impaired, and is replaced as a matter of maintenance.
>
> 2. That real deterioration in service value which begins to occur at the limit of good service life, accumulating rapidly thereafter through stages of poor service and bad service life to a point where the physical item ceases to function as an element of property useful in the public service.

Theoretical depreciation is discarded as an academic factor and in view of the truth that the theoretical computations on which it must be based can be put to no practical use. The doctrine tending to support it as an element of weight is believed to be faulty on economic reasoning, but aside from that question the theory itself, it is stated, cannot be correctly incorporated in its numberless refinements in any practical system of accounting yet devised. As to its effect on the broad question of "value" the report says:

> Any real conception of the sweep of economic tides and of the forces making for obsolescence which underlie the "value" question shows clearly that these transcend in effect and importance all such petty correction factors as would result from an attempt to work out practically such a theory of depreciation to a logical conclusion.
>
> As such depreciation is a theoretical liability which never matures so long as the property continues to function, a street railway company should not be required, from the public viewpoint, to accumulate out of earnings and maintain a fund equivalent to it which burdens the company with an additional needless expense to no useful purpose.

Deterioration below good service condition as a kind of depreciation, being a matter of vital concern to both public and company, was made the subject of extensive field surveys to determine the practical physical things which have to be done in Norfolk to provide the basis for satisfactory and efficient service. The rehabilitation program thus developed shows, by street locations, necessary repairs and resurfacing of track, necessary relocations of track and portions which require complete rebuilding, together with the cost of this work and of necessary rehabilitation of passenger cars. Total cost of restoration to be effected through the specified program aggregates $830,572.

GOING CONCERN VALUE PRESENT ONLY AS JUSTIFIED

While it is stated as a basic proposition that fares should be made sufficient to establish adequate reserves to provide for renewal of property not taken care of by current maintenance it is, on the other hand, considered that in the Norfolk case it would be unjust in principle to concentrate the above cost of correcting deferred maintenance on the present riding public through a fare increase for that purpose. Referring further to this subject the report says:

> It is also necessary to give great weight to the cause of deterioration, *i.e.*, whether it has been allowed to accumulate as a result of unjustifiable inefficiency of management and as a result of diverting earnings to pay unjustified dividends at the expense of proper upkeep of property, or whether past earnings have been insufficient to permit of adequate current maintenance and setting aside of proper renewal reserves to take up the invisible accumulation of physical wear and obsolescence when these have matured at the limit of good service life. It is also essential to consider the effect of inescapable physical conditions inherently affecting operation of the property, in their tendency to shorten the life thereof and to exact heavy expenditures for its proper upkeep. Such conditions exist in the Norfolk situation in the character of the subsoil and drainage underlying track foundations. These are such as to prevent the maintenance of good track surfacing except at the cost of constant abnormal expenditures for this purpose.
>
> Earnings have been insufficient to provide for the abnormal amounts which company should have spent on such work, resulting in poor surface of track and bad joints characteristic of the past, and of today, in the streets of Norfolk and on county lines.

For the above and other reasons set forth deterioration below good service condition as measured by cost of restoration was not considered as a deduction in arriving at the rate base value. The position was taken that cost of restoration simply represented an element of value now absent from the property but which must be promptly incorporated and maintained therein out of company resources amplified and strengthened through means specified in the comprehensive program, and not out of proceeds from a fare increment designed for that special purpose.

AMOUNT OF VALUE ESTABLISHED

After consideration of all factors conceived to bear upon value for rate making of the property and going business organization producing street railway service covered by the report the rate base was established at $8,750,000 as of Jan. 1, 1920. Upon this the company should be entitled to earn a return of 8 per cent, and upon subsequent investment it should be entitled to a return at a rate commensurate with interest cost of new capital plus a just profit thereon. The above valuation is at a rate of approximately $89,000 per mile of equivalent single track operated and is about midway between reproduction costs at 1914 and 1920 prices, and about $1,700,000 in excess of estimated total historical investments in physical property. Provision is made, presumably as an expedient to get practical results, that when the company completes the new construction and rehabilitation program and is rendering the service so provided for it shall be entitled to add 15 per cent to its rate base for minimum going concern value, instead of the nominal amount of $250,000 which was temporarily allowed.

Snow Costs Money

Snowfighting Is a Serious Problem for Most Electric Railways, but a Well-Organized Force with the Proper Equipment Will Solve It

WHEN snow is not removed from city streets and main trunk highways the public pays the bill. New York's vehicular paralysis during twelve days of February, 1920, meant an economic business loss of $60,000,000. Figuring conservatively, the nation's business loss due to the snow invasion of last winter was at least $500,000,000, states the *Commercial Vehicle*, New York. a motor truck fleet owners' magazine.

The seriousness of the snow removal problem is perhaps greater this year than ever before. What are we going to do about it? The first requisite is a public realization of the problem, and that snow can be removed and money saved by removing it. True, snow is one of Nature's greatest problems which man must solve. But its solution is not an impossibility if we first admit that snow is a problem and then attack that problem in a businesslike way.

Snow removal is essentially an emergency work. The snow battle consists of three main phases, the attack, the battle and the clean-up. The campaign must be worked out months in advance. Plans cannot be made the day the storm arrives. Then it will be too late. More snow battles have been lost on account of a delay in the attack due to a lack of a prearranged plan than for any other cause with the exception of inadequate apparatus with which to make the fight. There must be a plan worked out months in advance.

Additional labor and private vehicles and other equipment must be employed during the emergency. Labor must be paid at a rate in excess of the average in order for the city to compete with industries.

Owners of trucks suitable for snow removal work must be paid in excess of the rate which can be obtained from ordinary industries in order that contracts can be made for such equipment in advance and such contracts kept. Heretofore such contracts have been broken because the vehicle owner could make twice as much money hauling for private interests after a storm as he could in helping to remove the snow.

It also seems necessary that the vehicle drivers should be paid a bonus over and above their wages as paid by the vehicle owners in order that they can be called and actually put into service immediately the snow has reached a certain depth, be it 4 o'clock in the afternoon or 4 o'clock in the morning. Greater progress can be made in removing or plowing the snow in two hours after it has started falling than can be made in ten hours after it has become packed by vehicular traffic.

Machines instead of manual labor should be employed to the greatest possible extent. The hand shoveler should be eliminated wherever practicable. Motorized plows, mechanical loaders, steam shovels and other forms of contractors' equipment usually idle during the winter months should be employed to greatest possible extent.

In a report received from the American Embassy in Argentina by the Bureau of Foreign and Domestic Commerce of the United States, the statement is made that the Argentine Minister of Public Works is investigating the possibilities of electrifying the Central Norte Argentino Railway from Cordoba to Cruz del Eje, a distance of 93 miles.

Selling and Safety Occupy C. E. R. A.

W. L. Goodwin Arouses Great Interest by Address on the Need for Sales Managers and Co-operation—Bernard J. Mullaney Urges Policy of Publicity — Safety Is Discussed — Association Votes to Have but Two Meetings a Year, Though Discussion Points to Desire for Separate Group Meetings of Equipment, Track and Electrical Men

DECLARING that the electric railway companies are the only big organizations in the world in the business of selling a product that do not have sales managers, W. L. Goodwin aroused the one hundred members attending the Indianapolis meeting of the Central Electric Railway Association on Dec. 2 and 3 to a new conception of the idea of applying merchandising principles to the business of selling transportation. His address on co-operation within the industry and how to sell its product to the public proved to be the outstanding feature of a program interesting and instructive throughout. Addresses were also made by B. J. Mullaney, on publicity, and by Charles B. Scott and Edward C. Spring on safety work.

The only business matter of importance passed upon by the association was the adoption of a by-law amendment whereby there will be two meetings a year instead of three. These two are to be held on the fourth Thursday and succeeding days of January and July, the January gathering to be the annual meeting. An important executive committee matter was the election of L. E. Earlywine, assistant secretary, to succeed A. L. Neereamer, deceased, as secretary of the C. E. R. A. and of the subsidiary accountants' association, as well as chairman of the subsidiary traffic association.

Mr. Goodwin, General Electric Company, though thoroughly well known in the electrical field as the genius behind the great co-operative movement between the central stations, electrical manufacturers, jobbers, dealers and contractors which started on the Pacific Coast and is spreading over the whole country, came to the meeting of the electric railway men almost an unknown, save to the program chairman, Harry Reid, president Interstate Public Service Company, Louisville, Ky., who is active in the power field as well as the railway. Judging by the discussion that followed the session at which Mr. Goodwin talked, the thanks of the association are certainly due Mr. Reid for bringing this speaker's ideas and personality into the railway field.

SALES CO-OPERATION IS NEEDED

Getting into his subject, scheduled on the program as "Co-operation," Mr. Goodwin said that the test of business men over a long period of years is whether they are a success or a failure. If they are not making a profit in their business, he declared they are failures. He said there had been a tendency in the electric railway field to assume that all the wrong was on the side of the public, whereas in the light of the above test, the large number of electric railway properties in the hands of receivers might point out that there were some things wrong within the industry.

Co-operation within the industry itself, as the groundwork necessary for placing the industry in a position to sell its produce to the public successfully, was urged by the speaker. But co-operation cannot be successful unless the individuals co-operating are successes, he said, otherwise the effort results in a group of co-operating failures. No matter what a product may be, how good or how useful, it has no value unless there can be agreement on the fundamentals of the product. He though that the notable lack of agreement in the electric railway industry was the principal reason that the street railway companies are so misunderstood by the public. The public does not understand this mysterious thing called "service" and does not appreciate that it is receiving what is actually good service or poor service, because a yardstick for measuring the quality of service has never been found. And somehow electric railway men have never been able to give the story of their service to the public in a way understandable by it.

He compared this inability of the layman to understand that what he was getting might really be good service, though condemned, to the contract for power which the average central station requires a man to sign. The contract has printed matter on both sides of the form containing a lot of technical terms and conditions about load factor, kilowatts load, volts and amperes, about which he knows nothing. But since the company is the only one in the community from which he can buy power, he blandly signs the contract and permits what he considers a "meter cheater" to be installed on his premises to record what his bill shall be, and he has no measure that he can use to check the meter. The speaker said that the difficulty is that the men in these utility businesses are technical people, all absorbed in the engineering problems, and they deal with so many things mysterious to the public that it looks upon them with suspicion. It is as though they talked a different language. There is no way to explain street car service, and we can't say to the public, as a prominent railway man of another day is reported to have done after a period of ceaseless criticism, "If you don't like our service why the h—— don't you walk?"

This suspicion of the general public about things electrical, including the street railway, Mr. Goodwin said, has been intensified by the fact that the utility men have for years been at discord with one another and have been trying to sell their own product by discrediting that of the other fellow. As practical business men in the business to make money, we must agree in the family on how our product shall be sold, he argued. The reason people are unwilling to pay a fair price for our product is because we are poor salesmen—we have not learned how to sell transportation. The first thing to do is to get the house in order, agree on a common story and then go out and tell it. And in going out to get the people to help solve our problems, we cannot expect much success unless we help them solve theirs. By this, the speaker meant that not only should the railway officials be members of the Kiwanis, Rotary and other civic clubs, but they should be leading spirits in those clubs and in every other civic movement and any general cause of the public.

Mr. Goodwin said that the electric railway companies hold the singular position of being the only business in the world that does not have a sales manager. He thought this was why there were so many companies in receiverships. In this connection he pointed out that the railway officials have been completely occupied with the problem of getting the cars over the lines, and there has been no one whose duty it was to sell the service. He said the companies have got to have sales managers whose sole duty it is to go out and sell rides and make the people like them and pay a lot more for them. Publicity, he said, is only one of ten thousand ways of selling the commodity, though it is an exceedingly important method. Of all the methods, the spoken word is the best, for it starts the mind going and the printed word keeps it going.

Mr. Goodwin said that a man who has a commodity to sell and does not talk about it is lacking in faith in it. One cannot sell anything unless he believes in it, and he cannot believe in it unless he "has got the goods."

Continuing his argument, Mr. Goodwin said that no man in the electric railway business can be an operating man, an engineer, a mechanic, a financial man, and in addition be a sales manager. This simply is an impossibility. The mental attitude of mind of the man who sells and the man who manages are entirely different. He insisted that one cannot compromise principles, and that sales work and management are two different principles and cannot be compromised. A sales manager must be an enthusiast, he must know all of the good points about the thing he is trying to sell, and while knowing any possible flaws, he must be skillful in keeping the customers' mind on the good things so that they won't think of the possible defects, and he must go out and talk his product from morning until night. On the other hand, the executive must be a cool, calm man who will direct operations and watch results.

Henry Ford and John Wanamaker were referred to by the speaker as the greatest of all business men in the country, yet each has included in his organization the best sales manager that he can secure. A man may be ever so good an operating railway man and yet as a salesman be nothing. Mr. Goodwin expressed a very earnest desire to see a sales manager brought into the organization of the electric railways.

He then told the audience how he had talked about the utility business to some four hundred business men of South Bend, Ind., a few days before, gathered under the auspices of the Rotary Club. In repeating part of the speech he had made, he demonstrated how the problems of the utilities can be told to the public and how the public can be sold on the utility by one who is free from all the operating responsibility and has the salesman's instinct. He concluded by saying that if every one would do his bit in thus selling the industry, the effort would ultimately create a psychological state of mind that would enable the electric railways to win.

MR. MULLANEY TALKS ON PUBLICITY

An address on publicity by Bernard J. Mullaney, public relations manager People's Gas, Light & Coke Company, and director Illinois Committee on Public Utility Information, was presented to the association at the beginning of the afternoon session on Dec. 2, and was followed by Mr. Goodwin's talk. Harry Reid presided at this session.

At the outset of his address Mr. Mullaney declared that he did not particularly like the term "publicity," the title of his address on the program, but he said that up to this time no better word has been invented to describe the idea which he meant to convey. He then outlined ways and means of educating the public, but the best channel of all, in his opinion, was the newspaper. The utility manager is seldom a good judge of what the newspapers want. He sees only one side of the case and is apt to see that so earnestly that his judgment of the other side is obscured. It is practically essential to get the assistance of men who are used to looking at the public side and who have had training and experience in writing for the public, and facts, not arguments, should be the foundation of all publicity efforts in behalf of the public utility industry. From them will come the kind of public opinion that is wanted—an informed and well-grounded and stable public opinion.

The place to start giving educational publicity matter used, established and made effective is in the home town newspaper, and the person to get it started is the local utility manager. The way for him to start in the home paper is by using the columns of that paper to advertise his business. Many managers of public utilities think they have nothing to advertise unless they happen to have gas or electric appliances to sell, that the use of their transportation or other utility service comes automatically and that the public must use it or do without. This is an error, because advertising in the columns of the home town paper cultivates goodwill on the part of the public. The newspapers also want news, and if the company is doing anything or if the officers as individuals are doing anything that will be news to the community, the newspaper publisher should be told about it. The manager should also be an active factor in the community life of the town where he operates.

In conclusion, the speaker told about the work of the Illinois Committee on Public Utility Information, after which had been patterned eight or ten similar enterprises in neighboring states. The Illinois committee has been at work for about a year and a half and sends out regularly informational material ready for use in the newspapers, prepares speakers' bulletins and is prepared to furnish other information about utilities on request. The State University has asked for and receives 300 copies of everything the committee prints. Results are effected in a multitude of ways, and those obtained in Illinois can be duplicated whenever or wherever an effort is made. The Illinois plan may not be the only one or the best one that can be found, but it is a plan which works and it is the only plan that is producing observable results anywhere in the country. These results, the speaker thought, would be cumulative and ultimately the public utility industry should be made as safe and immune from unfair political attack as the churches and public schools.

BUSINESS SESSION ON THURSDAY MORNING

At the opening session on the morning of Dec. 2, President Robert I. Todd and both vice-presidents of the association were absent because of engagements with local authorities or the state commissions, from which they could not be excused. C. N. Wilcoxon, president Chicago, Lake Shore & South Bend Railway, and a former president of the association, was therefore invited to preside. The chairman explained that the principal speaker on the program for the morning, James P. Barnes, president Louisville Railway, had been unable to be present on account of important fare hearings.

H. H. Buckman, master mechanic Interstate Public Service Company, Scottsburg, Ind., made a progress report as chairman of the standardization committee of the C. E. R. A. At the time of the Ottawa Beach meeting last June he had been forced to report his inability to get the members of the committee together, and by motion of the association the president had been instructed to impress upon the members of the committee the importance of this work and their duty to take active part. Mr. Buckman reported that following this meeting President Todd discharged all members of the committee and then later reappointed the same men. The effect was helpful, Mr. Buckman said, but he had yet been unable to get a full attendance of the members. He pointed out that one of the first things the committee was endeavoring to do was to make available in proper form for use by manufacturers the standards of the association already adopted. He said that when C. E. R. A. standards were now specified to the manufacturers, the latter were unable to find out what these standards were because the records were incomplete and no drawings available. This applied to wheels in particular. Consequently, in order to use the standards, it was necessary for each company to make up its own drawings, which was an expensive process.

C. E. R. A. STANDARD WHEELS HAVE GOOD RECORD

In reference to the value of the C. E. R. A. standard for wheel contour, he said that records had been taken to show that wheels purchased with the A. E. R. A. standard contour had given 47,000 miles of service, and upon the first turning, at which time the wheels were brought to the C. E. R. A. standard contour, they had given 54,000 miles service before the second turning was necessary, showing the relative efficiency of the two contours. He pointed out that the association had adopted standards for axles, wheels, brake shoes, trolley wheels, end connections, couplers and several other things, and that the records should be made available so that these standards could be freely used if good, and if not, the committee should be so instructed. These old records of the company must also form the basis for any new work the committee may undertake, and the chairman felt that not much could be done until this matter had been cleared up, except perhaps for work on the controlling dimensions of cars used in interchange service.

R. N. Hemming spoke of the great need of a standard stop sign for use in cities and the advantages that would be derived therefrom. He told of the very exhaustive study made of this subject some ten years ago, which had been presented to the association and no action taken.

Mr. Buckman then asked the association to give an expression as to whether the committee should work on a design of sign to be used on the span wire on trolley pole, a special sign set in the sidewalk, paving mark or what. Chairman Wilcoxon suggested that the committee submit different designs, pointing out the merits and deficiencies of each, and let the association vote upon the committee recommendations.

Mr. Hemming also called attention to the imperative need for a nationalization of the design of railway crossing warning signs. He said that special attention should also be given to the location of the numerous advertising signs, some of which are combined with a warning sign, for it has been demonstrated that these were sometimes the cause of considerable confusion to the motorist.

REDUCTION OF MEETINGS DISCUSSED

The proposed amendment providing for two meetings a year instead of three, which had been presented at the Ottawa Beach meeting and held over in accord with the constitution for action at this meeting, was then brought up for action. In order to get the matter before the association in proper order for discussion, L. G. Parker, Cleveland Frog & Switch Company, who said he did not know what the idea of making the change was, moved that the amendment be adopted. It was duly seconded and the matter was then discussed by S. D. Hutchins, Chairman Wilcoxon, G. T. Seely, Myles B. Lambert, W. S. Rodger, S. W. Greenland, John Collins, S. W. Crawford and E. F. Schneider, practically all of whom were called upon by the chairman in an effort to bring out the consensus of opinion. Some of these men inclined to three meetings a year and some to the proposed amendment for two meetings, but no one seemed to have any strong conviction either way. When the question was called, the amendment was carried.

The association then took action electing R. R. Cunningham, James C. Jamison, Nelson E. Baxter, Albert L. Wescott, William Visel, G. E. Bell, W. B. Finchert, C. W. Rhodes, J. E. Slimp, William Anderson and A. M. Hartzog as supply members of the association.

In the course of the discussion on the proposed amendment regarding the number of meetings, the suggestion was made by Mr. Lambert, Westinghouse Electric & Manufacturing Company, that it might be desirable to have an independent meeting, either at the time of one of the main meetings or at a separate time, for the equipment men, another for the engineers of maintenance of way, and another for the electrical men. This gave rise to considerable discussion later on, after it had been decided that there should be but two meetings. In this connection, reference was made to the great success of the recent Iowa Electric Railway Association meeting, at which only operating men were in attendance, and to the semi-annual meetings of the equipment men alone of Pennsylvania, Ohio and West Virginia, under a loose organization called the Association of Electric Railway Men. W. G. Brooks gave a brief account of the manner of conducting the Iowa meeting and the highly successful results. This meeting was reported in the issues of this paper for Sept. 25 and Nov. 20, 1920, pages 585 and 1046.

The idea of group meetings wherein men of common interests would get close together in informal round-table discussions to talk over common problems without the restraint which some feel in the presence of the general managers was also discussed by Mr. Parker, C. Dorticos and J. E. Cockran, Lima, Ohio. It developed that there was a strong feeling among some of the members that such meetings were highly desirable for the Central Electric Railway Association. However, no action was taken, though Chairman Wilcoxon remarked that if such meetings were really desired it was up to the electrical and equipment men to make definite proposals of what they wanted.

FREIGHT HANDLING, MARKET PROSPECTS AND MEN

In the absence of the speaker of the meeting, Mr. Barnes, the session was thrown open to the discussion of any subject that any one might have on his mind and M. B. Lambert was called upon. He spoke of the opportunity the railways now have to take an active part in the solution of the transportation problem of the country. He pointed out how exceedingly slow the movement of freight by the steam roads had been. In view of this situation and the fact that inadequate transportation is charged with from 15 to 30 per cent of the cost of living, he pointed out that the time seems particularly propitious for the interurban railways to expand their facilities and relieve the situation by handling more freight and thereby derive more profit from operation.

He felt that the public has come to understand the reason why increases in fares have been necessary and that the crowd psychology is now more favorable than ever to the electric railways. He thought that this also was a reason why the electric railways should take steps to handle more freight, and that if they did not the shippers were going to be more inclined to favor the motor-truck people, who are expanding their facilities at a tremendous rate. In other words, if the electric lines will give the service which they can there will be no disposition to go to the motor truck for shipping facilities. He also expressed the thought that if electric railways show an indifferent attitude toward the needs of shippers for more service there will be a reaction against the electric lines.

Turning to the subject of market conditions, Mr. Lambert said that he was continually asked whether prices for electrical equipment were going to come down. Speaking for his own company, he said that it did not know what the course of prices might be, but as far as could be seen now the only reduction in prices expected is that to come from the greater efficiency of labor.

However, Mr. Lambert said, a company in need of equipment now, but holding off six months for lower prices, should consider this question: Supposing prices would be 10 per cent lower in six months, would this saving offset the loss of revenue which the new equipment would earn in the meantime if the order for it was placed now?

Mr. Lambert directed his further comments to the subject of training men for responsible positions. He said he was constantly asked to suggest some one to fill a vacancy, and as he looked about the country he could not but be impressed with the absence of men being trained and made ready for the day when the men now in charge would be gone. In reference to master mechanics in particular he wondered who there would be to succeed some of the men who now stand out so prominently, for there was no one in their organization "coming along" to fill these possible vacancies. He urged department heads and officials to give this question serious thought.

J. E. Cockran pointed out a very significant situation in connection with the adoption by the electric railways of the Bureau of Standards safety code, which covers the specifications for electrical construction. He said that nine out of ten of the electrical men in the electric railway field do not know the specifications laid down by the Bureau of Standards and that the only reason that steps had not been taken by the bureau to enforce these was the intervention of the war. He said that loss of life, damage to property and delay to traffic were resulting from improper construction and lack of care in adhering strictly to the provisions of the safety code. He urged upon the members of the association that they inform themselves and take steps to bring about the observance of the code voluntarily, rather than to wait until steps are taken to enforce it.

SAFETY DISCUSSED AT FRIDAY'S SESSION

President Todd was able to be present and preside at the final session Friday morning. Charles B. Scott made an address on "Safety," of which an abstract appears elsewhere in this issue. Martin J. Insull, it was learned, who was to have made an address at this session, was prevented from coming by sickness. It had also been planned that George F. Fonda, general supervisor of employment, compensation and welfare, Bethlehem Steel Company, would address the association on Friday on the safety-first movement. An unexpected turn of events made it impossible for him to attend.

Edward C. Spring, general superintendent Lehigh Valley Transit Company, Allentown, Pa., and first president of the Central Electric Railway Association, then addressed the association briefly on the safety drive which his company had put on in a safety week campaign extending throughout the valley served by the property. This drive was described at length in the ELECTRIC RAILWAY JOURNAL for July 10, 1920, page 78, and a number of pictures of the campaign appeared on page 420 of the Aug. 28, 1920, issue. A point of particular interest made by Mr. Spring at the Indianapolis meeting was that the railways are forced by their financial condition to confine their activities almost wholly to those things which cost no money. They cannot go into the safety movement as they ought to and as they would like to, and consequently the time has come for them to place their dependence in what they can induce other industries and the people generally to do in safety-first work, the electric railways acting only as one constituent of all industry.

This was what was done in the splendid Lehigh Valley drive, which is said to have been the most successful and of the greatest magnitude of any safety campaign yet attempted. The significant thing here is that while the campaign cost about $12,000, the electric railway company, with all its subsidiary utilities throughout the valley, had to expend only $300. It should be said, however, that Mr. Spring was the guiding spirit behind the movement, although he made it a point to keep the railway company in the background by appointing a general manager and so organizing the movement as to give the National Safety Council all of the credit and, incidentally, a large share of the responsibility. Mr. Spring urged all the electric railway companies to give active support to the local safety council in their community, and if there was not such an organization at present to take steps to bring about one. The greatest good can be accomplished by getting the people of all lines of activity to talking about safety, rather than to have only the railway employees talking about it.

Mr. Hemming then spoke briefly on the recent statewide safety drive in Indiana, which had been got up on such short notice that there had not been time to make the no-accident week a very comprehensive campaign. However, the way had been blazed for a real drive next year and it was therefore felt that the effort had been well worth while. Mr. Hemming reiterated a thought which Mr. Spring had made, that the people are eager to co-operate in reporting any safety-first activities.

Safety matters were also briefly discussed by J. E. Cockran, James Harmon, New Albany, Ind.; H. A. Nicholl, Anderson, Ind., and Harry Reid.

E. M. Walker Talks on Safety Cars

In Address Before New England Street Railway Club He Gives a Review of Their Service in Terre Haute—Discussion Brings Out Points of New England Practice —Paper on Track Maintenance Also Presented

TWO enthusiastic sessions of the New England Street Railway Club were held upon the subjects of "Track Maintenance" and "Safety Car Operation" at the American House, Boston, Mass., on December 2. At an afternoon meeting Frank B. Walker, chief engineer maintenance-of-way Eastern Massachusetts Street Railway, gave a lantern-slide talk describing recent construction and maintenance work on the lines of that system. Extracts from Mr. Walker's paper and the discussion which followed will be published in a later issue.

After the usual dinner E. M. Walker, general manager Terre Haute Traction & Light Company, Terre Haute, Ind., read a paper on his experience with safety cars vs. the jitney bus.

WHY THE SAFETY CARS WERE INSTALLED

The paper by E. M. Walker in the evening was devoted largely to an account of how the safety car happened to be introduced into Terre Haute and how competition between the railways and jitneys was affected by this change.

According to Mr. Walker the earnings of the Terre Haute city lines had grown steadily through successive years until 1913, after which, yielding to the competition of the jitney, they declined for the next five years. The percentages of decline, based on the 1913 figures, for these years were 2 per cent, 22 per cent, 15 per cent, 13 per cent, and 14 per cent. During the year of greatest decline in earnings a trial was made of the effect of reducing the street railway service, but this only served to increase the popularity of the jitney bus. An attempt was then made to introduce one-man operation on the line of lightest traffic and a few old cars were remodeled for that purpose, but this move was promptly met by the passage of an ordinance requiring two men to a car. An effort was then made to have the jitneys restricted as to routes and schedules and licensed and bonded as to their accident liabilities. This met with no success, and the number of jitney buses continued to increase. Indeed, the drivers formed a union and affiliated with the Central Labor Union, although most of the drivers were owners of their own cars; in other words, were proprietors or capitalists as distinguished from workers. This distinction was not thought of, however, and the effect of the organization was to insure strong support from the friends of organized labor.

A petition was then presented to the Public Service Commission of the State asking that body to assume regulatory control over the jitney bus as a common carrier, but the commission refused to take jurisdiction. At that time commission regulation in Indiana was in its early days and the jitney business was a new business. By 1918 there were 200 jitneys in operation. To use a figurative expression, the streets had grown too small for them, and it was evident that something would have to be done to restrict their use in the downtown streets. At length the City Council on its own initiative passed a restrictive ordinance which was so unpopular that the jitney drivers went on strike for two weeks and the ordinance had most of its teeth pulled when it was repassed.

By that time the railway company had lost hope of any assistance from without and decided to approach the matter solely on a competitive basis. It proposed to the Council that it would purchase thirty new Birney safety cars if the two-man ordinance of an earlier date was repealed, and this was done on Dec. 1, 1918. Results from the first were very encouraging, and the company quickly found that it needed more cars, so it kept on buying them until now the city has 100 per cent safety car operation and a total of sixty-eight cars. The number of cars operated has been increased 55 per cent, the car-miles 60 per cent, the gross revenues over 65 per cent, and the earnings per car-mile over 10 per cent. In the meantime the jitneys dropped in number from 200 in 1918 to the present number of twenty-three. Of this number only seven are operating in competition with the street railway lines and they only during the hours of heavy travel. The sixteen others operate on a non-competitive line. All of these jitneys carry taxi signs and are generally on the lookout for that sort of work.

The speaker did not claim that this experience could be repeated anywhere or everywhere. He said it took a little patience, a little courage and a whole lot of faith, but the results justified the mixture. Doubtless also the high costs of gasoline, oil, tires and general repairs had their share in discouraging jitney competition, but this does not detract from the efficacy of the safety car as a successful competitor.

In his opinion restrictive or repressive measures will not be permanently effective in overcoming jitney competition. Regulations putting the jitney buses on the same operating basis as the street cars can be made much more effective, as, for example, the requirement of a payment of a fixed tax on a measured mileage basis for repair and maintenance of street pavements, the requirement of adherence to fixed schedules and routes, the operation of a fixed number of hours per day every day, and lastly the giving of transfers from line to line. These measures, if resorted to, would make more nearly equal the basis of operation and there would be little room for doubt as to the final outcome.

At the close of his address Mr. Walker explained, in answer to questions, that there had been no increase from the 5-cent fare during the period described in his talk, that the men, who were not unionized, took kindly to the car and that the total number of employees was now really larger than in the two-man period, owing to the increase in traffic and shorter extra lists.

DISCUSSION ON MR. WALKER'S PAPER

Walter Jackson, New York, being called upon by the chairman, declared that one-man operation has reached the stage where it is no longer a debatable subject. Any man who does not believe that a company can save money by running a car by one man instead of two and can create traffic by running two cars instead of one is hopeless at this time. The one-man car, of course, is not suitable for all situations. Where there are great tidal waves of traffic big cars and even trains are necessary, but there is room for some one-man car service in every city. Where it is possible to eliminate the awkward collection of odd cash fares or where people can pay their fares before they come on the car, as in prepayment areas, the field of the safety car is widened. It is even possible in large cities where the prepayment area idea has been worked out extensively to use very large one-man cars because the operator of the car has little else to do but to run it, the passengers having paid their fare before they got on. It is an anomaly to have a conductor on that car at all, because there would be nothing for him to do. The speaker also called attention to the fact that Terre Haute had had an enormous increase in the number of private automobiles during the period considered by Mr. Walker and coincidentally with the increase in safety cars there had been a corresponding decrease in the number of jitneys. The private automobile, instead of injuring the street railway, has increased the street car riding habit in Terre Haute. A man who owns a car is the very man who will take a street car for three or four blocks because he is used to stepping into a vehicle and being carried a trifling distance.

H. F. Fritch, assistant general manager Eastern Massachusetts Street Railway, Boston, said that that company was also headed fast toward 100 per cent one-man operation. The company now has about 200 Birney cars, 200 double-truck cars fitted for one-man operation, and about 250 double-truck two-man cars in daily service. One hundred of these cars will be converted to one-man operation. In addition 50 more Birney cars are being put in service as rapidly as possible. The Birney cars are being used in the main on the short lines where there is one fare or at most two fare collections. The double truck cars in general are being used on the longer lines. These cars seat from forty to forty-four passengers. They are fairly modern cars with either hand or pneumatic appliances for operating the doors. The only change made in them for the collection of fares was to change the location of the box stanchion so that it would be more in front of the operator, and to put in an arrangement so that in case of emergency the rear door could be opened by the man in front. The operation of these double-track cars by one man has been approved by the Public Service Commission with the proviso that before May 1, 1921, they should be equipped with certain safety devices. At present, therefore, the company is making very rapid progress toward 100 per cent operation of safety cars. The ideas of the company as to the possibilities of one-man car operation have changed since it started to put this style of car on the road. The company began with the car on city lines, but it has now been extended to all sorts of lines, city and suburban and interurban. The cars have been successful on all. One of the hardest problems was the question of the collection of multiple fares. The company has zones of practically 2 miles in length. In city service the collection problem usually can be solved according to the condition of each particular line. At present the company has very few lines which it does not anticipate can be made one-man car routes.

George E. Haggas, chief engineer Cumberland County Power & Light Company, explained that that company had twenty-seven one-man cars, of which twenty-three are of the Birney safety type and four are remodeled two-man cars, equipped with safety devices. Where these cars were introduced on lines formerly operated by two-man cars the service was increased, in some cases it was doubled. On the whole the operation of the cars has been quite successful. During the severe snowstorms of last winter the company was able to operate safety cars as easily as two-man cars.

Frank I. Hardy, manager Salem division Eastern Massachusetts Street Railway, pointed out that in certain country sections on that system there had been no increase in population during the past twenty years and that a safety could not only handle all the traffic but would be the only means of preventing the abandonment of lines. The use of one-man cars had been followed also by a decrease in the peak load demand at the power stations. The speaker cited a case of a line 9.15 miles in length with four fare zones. During the summer months there is heavy riding on this line, yet there has been no trouble in operating small safety cars and collecting four fares on this line. The distance, 9.15 miles, most of which is in some settlement or village, is covered in fifty-seven minutes.

B. C. Richmond, general manager Berkshire Street Railway, Pittsfield, Mass., said that he had had for about a month fifteen safety cars in operation and was substituting that type of car for the double-truck car as rapidly as possible. Some of these cars ran on routes where there were more than two zones. The double-truck car was still being used on the long interurban lines and to some extent in rush-hour service. The company and public are well pleased with the safety cars.

Carl H. Beck, Safety Car Devices Company, spoke of an address which he had made before the club two years ago on the subject of safety cars. Now all the testimony in regard to the operation of these cars is favorable, and members were speaking of the operation by one man of double-truck cars.

Charles H. Johnson, superintendent of railways Bangor (Maine) Railway & Electric Company, said that that company had operated sixteen safety cars for the past two years. They are equipped with scrapers. During last winter they gave better service than the heavy cars. The company would not think of changing back to the old cars.

E. M. Walker, the speaker of the evening, then, at the request of one of the members of the club, explained how the purchase of the cars in Terre Haute was financed. The first thirty cars cost about $165,000 or $170,000 and were bought on a car trust equipment plan through bankers in Indianapolis. When the next twenty-five cars were purchased the bankers asked that 25 per cent of the money should be raised in Terre Haute. This was done. The next order, for ten more cars, was in March of this year and all the money required was borrowed for five years at 6½ per cent from Terre Haute bankers. In this case the company furnished 10 per cent of the money, and as there have been three increases in the prices of the cars since they were bought the equity is even greater than that per cent.

Commenting then on the paper presented during the afternoon by Frank B. Walker, E. M. Walker said that while there is not very much cold weather in Terre Haute the company had fifty-five rail breaks last winter, and of these only four occurred on the 55 per cent of trackage over which safety cars are used exclusively.

He also said, in reply to a question on accidents at Terre Haute, that while the total number of accidents reported for the safety cars has been slightly more than with the two-man cars, the cost per thousand car-miles has been just half of what it was with two-man cars. Personal injuries, which are the hardest to settle, have practically disappeared because of safety car operation.

Safety Cars in Eastern Massachusetts

Frank B. Walker, chief engineer maintenance-of-way Eastern Massachusetts Street Railway, said that he had not taken up one-man cars in his talk during the afternoon because he knew they would be considered in the evening. He explained that when these cars were being considered the company was uncertain as to how much work would be needed on the track because the cars had a very long wheel base, whereas the track had many curves of as low radius as 50 ft., 40 ft., and even 35 ft., with some low joints and special work in the condition in which it would naturally be on an old railroad. Actually it was found that the safety cars were very easy on the track and the repairs required light. In some track formerly discontinued but now being rehabilitated for one-man car operation the company is putting in ties 5 ft. apart.

A rising vote of thinks was then extended to "the team of Walker and Walker" for the addresses of the day. The meeting then adjourned.

Engineers Discuss Burning of River Coal and Culm

River Beds of Pennsylvania Anthracite Region Contain Vast Store of Valuable Fuel Once Considered Practically Worthless

ON DEC. 3 the Engineers' Club of Philadelphia held a meeting devoted to a discussion on utilizing fuel formerly considered as waste. Interest centered in "river coal," of which there is a vast supply in the beds of the rivers which flow through the Pennsylvania anthracite region. The recent development of apparatus for pulverizing and burning river coal, culm and other "waste" fuels lends special interest to this subject at this time.

The first speaker at the meeting was Dr. George Ashley, State Geologist of Pennsylvania, who explained that the vast supply of coal now available in the river beds was washed there by the discharge from the mine washeries. The coal is carried long distances in the rivers, especially during high-water periods. In many cases the tributaries of the main rivers have become practically filled with this coal. Much of the river coal is of the grades known as "rice" and "barley," although a large part of it is merely dust. For some years this coal has been reclaimed on a small scale, but only during four or five years has the reclamation reached large proportions. In 1919 a total of 2,000,000 tons was reclaimed.

One of the largest sources of the coal is the bed of the Susquehanna River near Harrisburg, where 750,000 tons is recovered annually. In fact, practically all of the coal used in Harrisburg for industrial power and utility power purposes is pumped from the river bed.

The preferred method of recovering the coal is to pump it from the bottom of the river by means of a steam-driven centrifugal pump mounted on a flat-bottom boat. The pump discharges onto a screen which rejects sand and very fine coal, delivering the larger sizes to a barge. In the river tributaries the method is to build small dams, behind which the coal is pumped. Clamshell buckets and steam shovels are utilized to gather up the coal.

Dr. Ashley's opinion was that at the present rate of mining there is enough river coal now in sight to last for from four to ten years. The supply will be added to as the dumps of the mines are worked over. J. P. Edwards followed Dr. Ashley, differing from him in estimating the available tonnage of river coal. From Mr. Edwards' experience, he estimated that coal is being deposited at the rate of 8,000,000 tons per year and he told of one of his reclamation stations where the deposits are 10 ft. deep. A crane which he installed on a river bank to operate a 1¼-yd. clamshell bucket with a 25-ft. digging radius has in three years removed 140,000 tons of coal from the comparatively limited area which it commands.

River Coal Is of High Grade

Mr. Edwards felt that the supply of river coal has only begun to be utilized. It is of good grade and can be secured at less than one-half the cost of bituminous coal. Tests show a heat content as high as 14,000 B.t.u., although in general it will run around 11,000 to 12,250 B.t.u. with an ash content of 13 per cent. Mr. Edwards' arguments were confirmed by D. R. Delamater, who emphasized the necessity of equipping boilers to burn smaller sizes of coal than at present and even coal dust. He said that he had seen river coal burned with only 10 per cent waste in ash.

Taking up the subject of pulverizing anthracite coal, R. M. Vail said that success in burning anthracite would be found in taking advantage of its brittleness and avoiding its abrasiveness. Touching the burning of powdered anthracite, J. R. Wyllie told of obtaining more than 400 per cent rating from boilers with this fuel and operating them for days at 300 per cent rating. He had been able to obtain very high percentage of CO_2, but thought that excessive CO_2 is hard on the furnace. He said that in burning powdered anthracite 90 per cent of the coal should go through a 200-mesh screen.

W. W. Pettibone gave experience of the Bethlehem Steel Company, Lebanon, Pa., in burning pulverized coal. This company has four 520-hp. boilers in operation, burning pulverized bituminous coal. The pulverizer used satisfactorily on bituminous coal was soon worn out with anthracite, but Mr. Pettibone believed that pulverized anthracite can be burned successfully. He had obtained boiler efficiencies averaging more than 80 per cent in regular service, with coal ranging from 11,000 to 13,000 B.t.u. At times efficiencies from 82 to 87 per cent were secured.

At the meeting there was discussion on the use of briquettes, and J. H. Kennedy outlined the requirements of a successful briquette. This, he said, must be waterproof, hard but not brittle, and able to "stand up" in the fire while burning. He told of some briquettes that are being manufactured from 92 per cent culm and 8 per cent binder, the latter containing twelve parts water, two parts asphaltum and one part starch. Such briquettes can be sold at $8 per ton f.o.b. factory. This fuel requires less draft than common grades of coal.

Technical Features of the Motor Bus[*]

Fuel Economy, Standardized Equipment and Bus Types Are Discussed by an Experienced Motor Bus Engineer

FUEL economy in motor bus transporation is a fundamental problem and also a business barometer, in the opinion of George A. Green, general manager of the Fifth Avenue Coach Company. The newly installed research department of this company has completed experiments which indicate a net gain of 18 per cent in the yearly fuel bill, which in round figures represents a saving of $90,000 annually. The changes necessary to obtain this economy are comparatively inexpensive and may be tabulated as follows:

1. The adoption of thermostatic hot-air control.
2. The adoption of a system permitting more complete control of idling speeds.
3. The employment of automatic instead of fixed spark advance.
4. The elimination of gasoline tank evaporation losses by the use of a proper valve.
5. The introduction of a little exhaust gas into the inlet manifold.
6. The modification of the exhaust pipe and silencer layout with the object of reducing back pressure.

Mr. Green states that 18 per cent is a very conservative estimate of the saving that can be obtained by the above methods. A greater saving is obtained by attention to fuel economy than can be obtained with any other item in connection with maintenance. The two factors in such economy are the machines and the operators; the machines should operate at maximum economy and the employees should have the idea of high gasoline averages instilled in them. The greater problem is encountered in dealing with the employees.

DIFFERENTIATE BETWEEN JITNEYS AND ORGANIZED COMPANY

In dealing with jitneys Mr. Green points out that there are marked differences between a jitney company and the Fifth Avenue Coach Company, which caters to a lasting business and gives service at all times. There is more to the operation of a motor bus company than the purchase of stock vehicles and the operation of these vehicles only when traffic is heavy. Such a procedure can only result in failure and in causing a setback to a promising industry. In general the Fifth Avenue Coach Company loses money on 30 per cent of the mileage. In wet and cold weather the seating capacity is cut in half, and it frequently happens that an entire day's operation results in a monetary loss.

Mr. Green states that the motor bus industry is in its infancy, with almost unbounded possibilities for improvement, which is not true of other forms of surface transportation. In connection with transportation he points out such features as the large amount of time and money required to secure a competent operating personnel, the large and expensive supervisory force, the complexity of schedule making and its direct effect on income, the volume of motor bus traffic on streets that are already congested, and the difficulties of winter operation. He lays stress on the fact that unified control, a highly trained technical organization and a 10-cent fare are fixed and necessary factors.

PNEUMATIC TIRES EXPERIMENTAL

The pneumatic tire has been tried out as an experiment by the Fifth Avenue Coach Company on the double-deck buses and Mr. Green states that many of its disadvantages result from its large diameter. Among the disadvantages of the pneumatic tire from the motor bus standpoint are:

1. The center of gravity is made higher, with resultant greater possibility for overturning.
2. The increased height makes more possibility of injury to passengers on the upper deck because of striking overhead obstacles.
3. There is very great difficulty in obtaining a low level loading or unloading platform.
4. The weight of the pneumatic tire equipment is greater than for solid tire equipment of the same carrying capacity.
5. The inside seating capacity is decreased because of the large size of the wheel pockets.

The pneumatic tire is much more comfortable for the rider, but no great increase in speed can be obtained because of street congestion and traffic rules, especially on Fifth Avenue. The pneumatic tire permits of fuel economy and lower maintenance costs, but for the Fifth Avenue Coach Company these economies would not offset other increased costs introduced by the use of pneumatic tires. Mr. Green states that there is, however, a very fruitful field for the pneumatic tire in connection with the single-deck bus and suggests two improvements in the design of pneumatic tire equipment:

1. Over-all diameters should be nearly equal to those of solid tires on the same carrying capacity basis.
2. Demountable wheels and not rims should be used.

From the standpoint of the motor bus 8, 9 and 10-inch tires are out of the question. The small diameter pneumatic tire on demountable rims will reduce the unsprung weight which is a vital factor, and Mr. Green suggests the use of aluminum hubs to obtain still less weight. The present weight per passenger of the double-deck bus is 200 lb., which includes all equipment on the bus, even to oil, water and fuel. Each bus makes an approximate yearly mileage of 30,000.

In concluding his discussion Mr. Green states that more attention should be paid by the Society of Automotive Engineers to the human side of organizations, as the experience of his company indicates that bad design or material does not mean failure so much as a bad organization. Where co-operation and team work are lacking all the engineering skill of the best men in the industry will not make for success, where success means a condition which permits of satisfied workers and at the same time a fair return on capital.

H. M. Crane in his discussion of the paper by Mr. Green points out that the truck today is a side line in that it is not a thing that makes money for a business, but an accessory where the matter of economy in operation is not serious. He states that a very successful truck might lack almost every good engineering point except the important feature that it transported its load over the road. The fact that a 10-cent fare is fixed for the transportation business is the stimulus that should and does bring out improvements in motor bus design and operation.

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[*] An abstract of a paper on motor bus transportation delivered at the summer meeting of the Society of Automotive Engineers by George A. Green, general manager and engineer of the Fifth Avenue Coach Company of New York, was published in the July 24, 1920, issue of the ELECTRIC RAILWAY JOURNAL. The discussion of the paper published in the November issue of the *Journal* of the Society of Automotive Engineers brings out some added points of interest which are abstracted for the benefit of the readers of the ELECTRIC RAILWAY JOURNAL.

Echoes of the P. C. A. A. Convention

Pacific Claim Agents' Association Held Annual Meeting at San Diego—Abstracts of Several Papers Are Given This Week

THE annual meeting of the Pacific Claim Agents' Association was held at San Diego on Sept. 22 to 24. Abstracts of the following papers which were read at the meeting are given below: "The Carelessness and Negligence of a Driver Cannot Be Imputed to His Passenger or Guest," by Arthur L. Levinsky, claim agent Stockton Electric Railroad; "The Best Method of Obtaining Statements of Accident Witnesses Whose Names Are Not Secured by the Trainmen," by J. H. Handlon, claim agent United Railroads of San Francisco; "Should Accident Prevention Standards Be Adopted?" by H. G. Winsor, claim agent Puget Sound Electric Railway, Tacoma, and "The Claims Man and the Public," by B. F. Boynton, claim agent Portland Railway, Light & Power Company.

As a result of the election and of the holding over of officers and executive committee members whose terms did not expire, the list of these governing groups for 1920-1921 now stands as follows: President, Charles A. Blackburn, Butte Electric Railway, Butte, Mont.; first vice-president, John S. Mills, San Francisco-Oakland Terminal Railways, Oakland, Cal.; second vice-president, Frank D. Oakley, Tacoma Railway & Power Company, Tacoma, Wash.; third vice-president, S. A. Bishop, Pacific Electric Railway, Los Angeles, Cal.; secretary and treasurer, B. F. Boynton, Portland Railway, Light & Power Company, Portland, Ore.; executive committee, J. H. Handlon, chairman, San Francisco, Cal.; Thomas G. Aston, Spokane, Wash.; C. M. McRoberts, Los Angeles, Cal.; A. M. Lee, Seattle, Wash.; H. G. Winsor, Tacoma, Wash.; J. W. Grace, Sacramento, Cal.; W. H. Moore, San Diego, Cal.

SITUATION REGARDING CONTRIBUTORY NEGLIGENCE ON PART OF VEHICLE PASSENGER NOT SATISFACTORY

The question as to whether the carelessness and negligence of a driver can be imputed to his passengers or guests was discussed by A. L. Levinsky, claim agent Stockton (Cal.) Electric Railroad. He said that courts of different states have adopted the rule that the carelessness or negligence of a passenger or guest cannot be imputed to the driver of whatever vehicle the passenger or guest may be in. Hence, large sums of money are annually paid by transportation companies in settling damage claims and this will continue unless steps are taken to obtain relief. The mushroom growth of the jitney and auto-stage service has placed additional burdens on railway companies, which are compelled to pay damages to passengers carried by their competitors on account of injuries occasioned through the carelessness of the drivers of these vehicles.

Mr. Levinsky said that he could not understand the theory upon which the court holds that negligence cannot be imputed to a passenger or guest. To show the attitude of the court toward the matter, he cited a number of decisions. In one Utah case the court granted a non-suit as to the owner and driver of a vehicle but returned judgment in favor of the passenger, because the latter had neither the right nor the power to substitute his judgment for that of the owner as to the operation of his vehicle. The fact that the conveyance was a private one was construed not to affect the question. In a California case involving a collision between an automobile and an electric railway car a passenger for hire was held not to be negligent because the chauffeur was not employed by her and she did not undertake to direct the manner in which the automobile should be operated. It was not denied that a passenger in a vehicle operated by another is bound to exercise ordinary care for his own safety, but in this case, the passenger being a stranger in the city (San Diego), it was held that she was not negligent in failing to call the attention of the chauffeur to the fact that the road crossed a railway track and that there might be danger from an approaching car.

Mr. Levinsky said that in Pennsylvania there is a different rule, a decision cited holding that in a certain case a guest riding with the driver was precluded from recovering for injury received in a collision at a railroad crossing because, being familiar with the necessity for caution at this crossing, he did not warn the driver of his duty to "Stop, look and listen" when the latter failed to do this. In a New York case also it was held that the mere fact that a guest had no control over the horse which was drawing a vehicle did not relieve him of the responsibility of looking and listening for himself and doing all that a careful and prudent man should do under similar circumstances.

Mr. Levinsky quoted at considerable length from a case of Ellis vs. Central California Traction Company, in which he had represented the defendant, because here he had explained clearly his understanding of this whole situation. He pointed out the hardships which are imposed upon a transportation company by inability to impute negligence to a passenger, even though he may be logically responsible to a degree. The District Court of Appeal in and for the Third Appellate District of the State of California ruled that "here as in these cases the plaintiff was a passenger in the vehicle which was struck by a railroad train. He was not the driver of the machine, nor the owner, and had no authority or control over the driver. Assuming the driver to have been guilty of negligence, there is no evidence that the plaintiff participated in or was a party to such negligence. There is no evidence that he volunteered advice to the driver as to the course he should follow after the moving freight train hove in sight of the driver and the passengers. In fact, there is no evidence that he did or said anything which contributed in any measure or in any way to any negligence of which the driver might have been guilty."

Mr. Levinsky's contention was thus not sustained by the court. He said, however, that in accordance with the decisions which he had cited it would seem that if the driver be so negligent that he cannot recover, it is but a fiction of the law to say that the passenger has no control over and cannot direct the driver, and by reason thereof notwithstanding the negligence of the driver the injured passenger or guest can recover. The corporation does not know who the owner of the vehicle is, and were it not for the rule which is now being opposed it would really make no difference whether the owner was driving the car or stage or not; but by virtue of the rule electric railways are placed at the great disadvantage complained of.

Mr. Levinsky closed by suggesting that the members of the association take the matter up with their respective law departments, looking toward the formulation of an amendment to the statute covering the matter. He recognized the difficulty of drafting a law that would be constitutional, would not be too sweeping in character, and would accomplish the purpose of the electric railways in decreasing the number of claims that seem to them unwarranted.

GETTING THE NAMES OF POSSIBLE WITNESSES

Mr. Handlon said that when the topic concerning the best method of obtaining statements of witnesses to accidents when their names are not secured by trainmen was assigned to him he thought that it might be beneficial to enlarge it to cover original methods used in obtaining additional witnesses' names. Therefore, he included some comments as to the importance of locating and interviewing persons who were not eyewitnesses of an accident but who have knowledge of the conditions existing at the time of the accident and of developments immediately thereafter.

Others than passengers are often the best witnesses, especially as to such accidents as collisions with vehicles and pedestrians. A person on the street has a better general view of collisions than a passenger. He can more accurately determine such things as speed of vehicles, their direction, the exact location of the accident, the point of contact, the distance that vehicles traveled after a collision, etc. In the event of pedestrians being struck, fellow pedestrians are more likely to give an accurate detailed description of the occurrence than passengers, and their testimony is very convincing. Trainmen, therefore, should be urged to secure the names of street witnesses immediately after the occurrence of an accident.

Another point made by Mr. Handlon was that claims department representatives should visit the scene of an accident to obtain the names of additional witnesses. If this cannot be done the same day it should be done at about the same hour the following day, because drivers of vehicles, newspaper carriers, mail carriers and others who might have witnessed the accident are likely to be found in the vicinity at about the same time the following day. Again, a house-to-house canvass may produce results, as it is not unusual to locate witnesses on streets parallel to that on which an accident has occurred, especially where the rear of a building faces the scene of the accident.

The testimony of persons who may not have seen an accident is often valuable, especially in verifying other testimony. Police reports and hospital records should also be carefully scrutinized to secure names of witnesses, and in the most important cases advertisements can be inserted in the newspapers. The names of persons riding on cars at points other than that at which an accident occurred should be secured. Passengers who did not witness an accident can give valuable testimony as to speed of car, ringing of warning gong, exact location of an accident, etc.

Mr. Handlon said that considerable trouble is experienced in locating witnesses where the address given is either incorrect or illegible. Hence trainmen should be instructed carefully to examine the witness' signature and address in the presence of the witness. They should also be requested to obtain the local addresses of out-of-town witnesses. He had found certain instructions to investigators to be helpful when addresses seem incorrect: Examine city and telephone directories, see whether street has been renumbered, try transposing house numerals, examine address under microscope, etc.

Finally, Mr. Handlon said that witnesses will usually make a statement if their sense of fairness is appealed to. As to the signing of statements which witnesses have made and approved, in case the witness refuses to do this sometimes he will tear off and retain a corner of the sheet on which the statement is made as a means of identification.

BIG PROGRAM FOR SAFETY STANDARDIZATION

Mr. Winsor began his paper with an affirmative answer to the question: "Should accident prevention standards be adopted?" He outlined his paper as divisible into three parts relating respectively to: (1) Some of the conditions which appear to make such action imperative; (2) the efforts that have already been made, together with the results secured, and (3) suggestions regarding methods which could be employed in working out suitable standards.

Under the first head he gave numerous statistics to prove the seriousness of the accident situation in this country today. He said that there must be many descendants of the famous King of Israel named Jehu, who was blamed for fast driving. Once the reputation of this king was reflected in the remark of the watchman on the tower of the city of Jezreel who saw a company of warriors approaching the city and who said, "I see a company and the driving is like unto the driving of Jehu, the son of Nimshi, for he driveth furiously."

As to the progress made in accident prevention, Mr. Winsor traced the history of the National Safety Council and told of some of its accomplishments. He said that fatalities resulting from industrial accidents had been reduced from 35,000 in 1918 to 25,000 in 1919.

Again, the state governments have passed laws which tend toward the standardization of safe practices. In Washington, for example, the State Safety Board has adopted the following provisions as standard: (1) A safe place to work, to be termed "safe place" standards; (2) the making of machinery, apparatus and appliances safe to work with, to be termed "safety device" standards; (3) the education and training of employer and workmen to avoid danger and to appreciate the advantage of compliance with the principles of the safe-place and the safety-device provisions of the safety act, to be termed the "educational" standard. Since the passage of this law the state board has issued two safety codes covering respectively general safety standards and educational safety standards.

Mr. Winsor referred with appreciation to the action of the American Electric Railway Claims Association, at its 1920 Atlantic City convention, in ordering the reprinting of a paper read by C. M. Talbert at the 1919 National Safety Congress, a paper which described the St. Louis plan of public safety.

As to the production of safety standards, he quoted Charles E. Oakes of the United States Bureau of Standards, as follows: "A truly national standard can be secured only through an agency which can co-operate with all interests and can co-ordinate their thoughts and efforts. The nationalization of safety methods and practices should be brought about by co-operative means and the body charged with this work should have no legal status whatever in the enforcement of its standards. They should stand on merit alone. This is distinctly a public service. That it is a monumental task cannot be doubted, but assurance must be given that it will be promoted without danger of lapses in activities. It will be realized that the initial preparation of a set of standards is only a beginning of the work. It must be developed and revised from time to time and its application and practice followed up by an agency which can make interpretation whenever necessary."

While Mr. Winsor expressed appreciation of the work on safety standards which is being done through the United States Bureau of Standards, in co-operation with representatives of the National Safety Council and the American Engineering Standards Committee, he thought that this movement is principally devoted to standardizing the various codes which apply to industrial safety. He felt that the federal government should take steps to provide adequate safety laws, calling to its aid any agencies required and seeking the co-operation of organizations and individuals best equipped to assist in the work. Failing of this, he suggested that the scope of the work now being undertaken by the National Safety Council and others to establish safety councils be enlarged, and a general conference called; this in addition to representatives from national associations interested, to include such other representation as progress in the work demands. This conference, he thought, should meet annually and its purpose should be to create and develop suitable standards which can be adopted and enforced locally.

Mr. Winsor's final suggestions were that the Pacific association go on record as favorable to immediate and continued action which will establish suitable and practicable accident prevention standards, both industrial and public; that the National Safety Council be requested to use its best efforts toward that end, and that the association pledge to such an undertaking unqualified support.

CLAIMS MAN MUST BE A GOOD MIXER

In speaking of the relation of the representative of the claims department and the public, Mr. Boynton specified that the claims man must be both firm and reasonable. The type of people who are constantly trying to "put something over" on the electric railway must be taught that fraudulent claims will be contested from start to finish; but if a meritorious claim is presented it must be settled equitably, not only because this is right but because such action will improve the standing of the claims man and his employer in the community. It is important that a claims representative of a utility company affiliate himself with civic organizations and take an active part in their proceedings, thus making friends for himself and company.

The claims man, said Mr. Boynton, is naturally interested in the prevention of accidents, and he can, through continued effort, show the public that he is employed not only to save his company's money in the settlement of claims but to help to standardize safety methods that will result in saving of life, limb and property. The claims man must not confine himself to the prevention of accidents on the railway property, but must be broad enough to work along all safety lines.

Referring to the results of the safety efforts made in Portland, Mr. Boynton said that the educational work done in the schools has proved very effective and the public testified to the fact that this work was beneficial to the community as a whole. In Portland, also, the railway co-operated in fire prevention work, as a logical development of the safety effort. A fire prevention committee was organized, which in three years reduced the fire loss from $7.50 to $1 per capita.

Accident Prevention*

Safety Should Be Made Fundamental Part of Operation — Requires Carefully Planned Though Not Necessarily Expensive Organization

BY CHARLES B. SCOTT

General Manager Bureau of Safety, Chicago

IT SEEMS remarkable that any electric railway company should be skeptical, indifferent or inactive with reference to accident prevention. The safety work done by many industries, and particularly by the steam roads, has proved conclusively that a material reduction in accidents is possible and that the burden of accident costs can be made less. Why are not the electric railways as a whole awakened to the importance of the subject? Perhaps it is because of the error in which many companies have fallen of adopting plans which were not thorough. If the manager of any property believes that he can bring about safe operation of his property and co-operation from the public by any inexpensive and spectacular plan of publicity only he is doomed to disappointment. It is also a mistake to believe that the work of accident prevention can be delegated to some particular individual within the organization and that thereafter it need have no further thought by those in a supervisory capacity.

A great majority of those electric railway accidents for which the employees of the company are responsible are due to a laxity in enforcement of rules. There is an inclination upon the part of electric railway employees to supplant certain rules with habitual customs, and for this reason a frequent and careful check-up of dispatching systems, obedience to rules governing the trainmen and rules adopted by the mechanical departments is absolutely necessary. Until this has been done other usual efforts, such as enlisting the co-operation of the public, are of very little avail.

The successful road with respect to accident prevention is the road that makes safety fundamentally a definite, businesslike part of its operation and one that involves the attention of the executives, the supervisory force and the employees and public generally. Such a proper intermingling of safety with operation requires a carefully planned though not necessarily an expensive organization whose chief function must be an everlasting drive. Sporadic efforts are really harmful to the cause of safety, causing the employees and the public to lose faith in the efficacy of the safety movement.

The problem which usually discourages the management of a company from making any definite, systematic and sincere effort toward lowering accident costs by preventing the accidents is the supposed indifference of the public. This is another problem that is not so difficult of solution as is imagined, and the public utility interests should be the leaders in the safety movement in their respective localities. The necessary expense would be small in comparison with the cost of the preventable accidents caused by public negligence. I know of no better way in which to begin this work than to bring the subject to the attention of the public schools, and in such an effort the utilities will find a prompt and hearty spirit of co-operation from school officials, school teachers and school children.

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*Abstract of address presented at meeting of the Central Electric Railway Association, Indianapolis, Ind., Dec. 3, 1920.

Your present big problem in accident prevention is the automobile, but here again careful organizational plans are necessary and the support of the executive is most helpful. On one of the principal electric roads entering Chicago, a road passing through a thickly populated district and along and across a trunk highway with extraordinarily heavy vehicular traffic, automobile accidents have been reduced 60 per cent, or $50,000, a year in three years, with a 30 per cent increase of traffic. This saving is being maintained, but not without a continuous functioning of its safety organization and the continued interest of its chief executive.

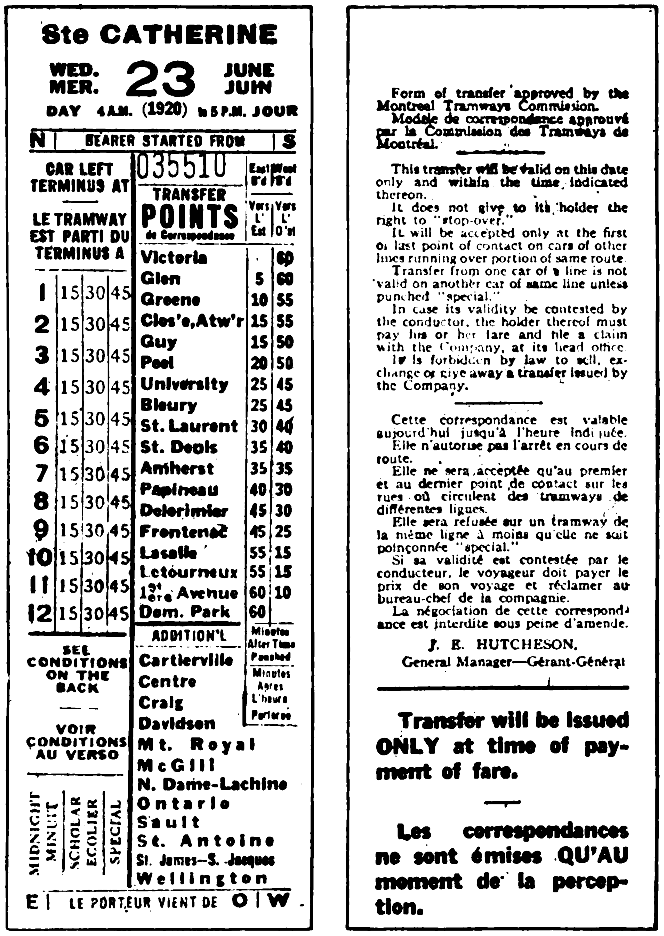
New Montreal Transfer

The Time of Leaving Terminus Is Punched and the Color Change Is at 5 p.m. Instead of at Noon

ON AUG. 1 the Montreal Tramways Company put into use on all of its lines a form of transfer which had been on two months' trial on the Ste. Catherine Street line. This transfer contains a number of novel features, as will be seen from the accompanying reproduction.

One of these features is that the time punched is not the time at which the car reaches the transfer point, as on most transfers, but is the time at which the car left its terminus. Then, the time during which the transfer is valid is shown by the time punched plus the number of minutes printed on the front of the transfer opposite the name of each intersecting route. The principal advantage of this plan is that the time of departure and direction can be punched at each terminus, when the conductors have ample time to punch enough transfers for the half trip. On the trip, the conductor has to punch only the transfer point desired, so that the number of punches required during the trip is only one. If a passenger has to transfer twice, there is provision for it at the bottom of the transfer which contains under the words "additional" the names of all routes which do not directly connect with the line from which the transfer is issued.

The second distinguishing feature of the transfer is that different colors are used for day and night transfers rather than for a.m. and p.m. transfers. Thus, in Montreal a white transfer is good from 4 a.m. to 5 p.m., and a blue transfer from 4 p.m. to 4 a.m. This time also is indicated at the top of the transfer, the night transfer being similar to the day transfer shown except as to this line and as to color. An overlap of sixty minutes is allowed between 4 and 5 p.m., for the reason that conductors stop issuing white day transfers at 4 p.m. and sixty minutes is sufficient to permit passengers to make the full half trip on any of the lines in Montreal. The change is made at the close of the afternoon rather than in the middle of the day, because 5 p.m. marks the beginning of the rush hours, and it is less convenient for conductors during the rush hours to examine transfers for the time punched. Under the plan described they know at a glance by the color if the transfer is good.



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3	15	30	45
4	15	30	45
5	15	30	45
6	15	30	45
7	15	30	45
8	15	30	45
9	15	30	45
10	15	30	45
11	15	30	45
12	15	30	45

TRANSFER POINTS de Correspondance	East B'd Vers L'Est	West B'd Vers L'O'st
Victoria	.	60
Glen	5	60
Greene	10	55
Clos'e,Atw'r	15	55
Guy	15	50
Peel	20	50
University	25	45
Bleury	25	45
St. Laurent	30	40
St. Denis	35	40
Amherst	35	35
Papineau	40	30
Delorimier	45	30
Frontenac	45	25
Lasalle	55	15
Letourneux	55	15
1st 1ère Avenue	60	10
Dom. Park	60	

SEE CONDITIONS ON THE BACK

VOIR CONDITIONS AU VERSO

ADDITION'L

Minutes After Time Punched

Minutes Après L'heure Perforée

Cartierville
Centre
Craig
Davidson
Mt. Royal
McGill
N. Dame-Lachine
Ontario
Sault
St. Antoine
St. James—S. Jacques
Wellington

MIDNIGHT MINUIT | SCHOLAR ECOLIER | SPECIAL

E | LE PORTEUR VIENT DE O | W

Form of transfer approved by the Montreal Tramways Commission.

Modèle de correspondance approuvé par la Commission des Tramways de Montréal.

This transfer will be valid on this date only and within the time indicated thereon.

It does not give to its holder the right to "stop-over."

It will be accepted only at the first or last point of contact on cars of other lines running over portion of same route.

Transfer from one car of a line is not valid on another car of same line unless punched "special."

In case its validity be contested by the conductor, the holder thereof must pay his or her fare and file a claim with the Company, at its head office.

It is forbidden by law to sell, exchange or give away a transfer issued by the Company.

Cette correspondance est valable aujourd'hui jusqu'à l'heure indiquée.

Elle n'autorise pas l'arrêt en cours de route.

Elle ne sera acceptée qu'au premier et au dernier point de contact sur les rues où circulent des tramways de différentes lignes.

Elle sera refusée sur un tramway de la même ligne à moins qu'elle ne soit poinçonnée "special."

Si sa validité est contestée par le conducteur, le voyageur doit payer le prix de son voyage et réclamer au bureau-chef de la compagnie.

La négociation de cette correspondance est interdite sous peine d'amende.

J. E. HUTCHESON,
General Manager—Gérant-Général

Transfer will be issued ONLY at time of payment of fare.

Les correspondances ne sont émises QU'AU moment de la perception.

FRONT AND BACK OF MONTREAL TRANSFER, WHICH REQUIRES ONLY ONE PUNCH EN ROUTE

Provision has been made on the transfer for emergency use under the heading "special," which is used only in emergency. Thus, if a car is diverted from its route for a trip on account of blockade, fire or to make a special trip for some hurry-up traffic, the conductor is required to make two punch marks at the head of the transfer, which indicate that the car is off its route. If a conductor on the road accidentally runs out of transfers and has to obtain some of another line, the same procedure is followed.

There are also places to punch "after midnight" and "child," the latter being especially needed as school children travel at reduced fares and they number about 60,000 each day.

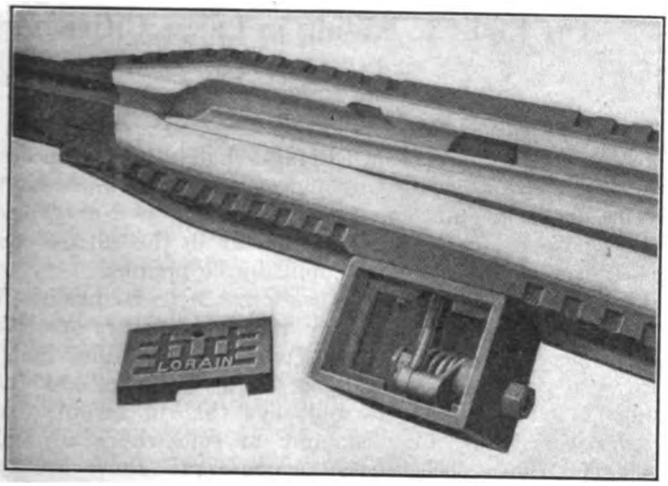
Another interesting feature of the transfer is that it is printed in both French and English, although in size it does not differ from most transfers in other cities, being 5¾ in. long and 2 in. wide.

In the transportation of freight, various plans have been set forth for the use of containers which can be loaded by the shipper and carried to their destination by means of one vehicle or another. One such system is that of the River & Rail Transportation Company of St. Louis, Mo., which uses a container of such size that five can be loaded on a specially designed flat car. These containers are suitable for transportation by truck, or they can be unloaded on the flat car through suitable openings on top or side.

Preventing Splitting of Switches

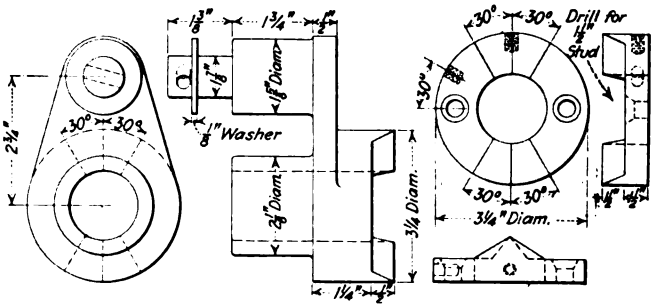
New Track Switch Automatic Locking Device Designed to Prevent Changing to Opposite or Neutral Position While Car Is Passing

THE splitting of switches by street cars may be overcome, it is claimed, by the use of an automatic locking device, attached to the switch tongue, which has been invented by A. Taurman, superintendent of equipment Birmingham (Ala.) Railway, Light & Power Company, and placed on the market by the Lorain Steel Company. The device, in general, comprises a two-way cam which works against a coil spring in a manner that holds the switch tongue firmly in either running position. A bell crank is mechanically connected to the switch tongue, so that a movement of the switch point in either direction is accompanied by a rotation of the crank. The outer face of this crank is made with a double 30-deg. cam, machined and case-hardened, which works against the face of a corresponding cam fastened to the end of the steel containing box and supported by the crank stud. The rotation of the crank causes the cam to act. As the switch point moves to a central position the crank is shifted along its axis by action of the cam, compressing a heavy coil spring. The switch point thus resists being moved away from either running position. As the switch point is forced over beyond the central position the spring and cam act together to snap the switch point to the opposite running position. It is thus seen that the switch point is firmly held, virtually locked, in either running position, and that it cannot fly over to the opposite or to a neutral position while a car is passing over it. The position of the switch point can be changed only upon application of a substantial lateral force.



A NEW TRACK SWITCH LOCKING DEVICE

The amount of pressure exerted by the spring upon the cam is adjustable. Sufficient travel is provided on the cam to take up for wear in the mechanism and to hold the switch tongue firm and steady in either position. The cam faces are protected from grit and dirt by a shield mounted on the top of the cam block and extending out over the crank boss. All wearing parts of the mechanism are made of machined steel and hardened. The whole device is mounted in a standard Lorain Steel Company track box, which is securely bolted to the switch casting.



DETAIL DRAWING OF CRANK AND BOTTOM CAM, WHICH FORM THE MAIN PARTS OF THE LOCKING DEVICE

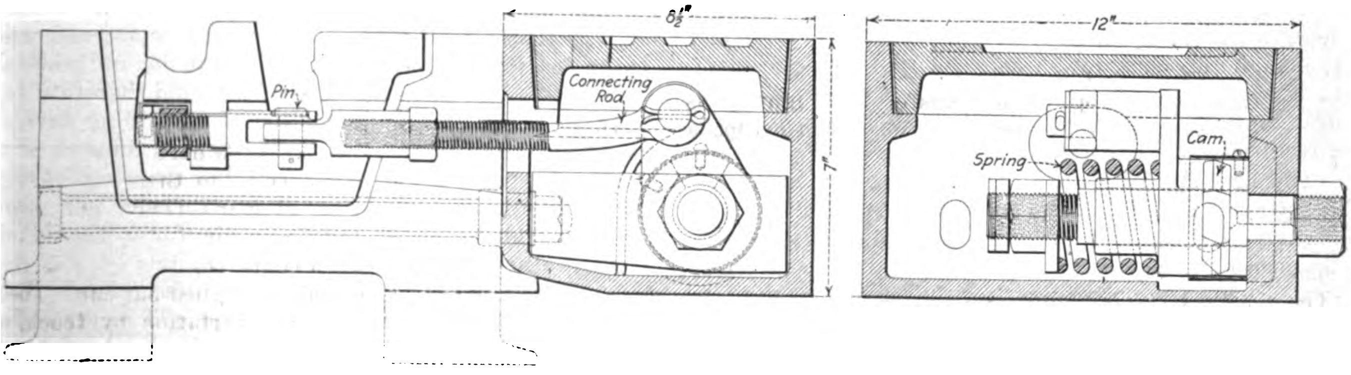
This Taurman track switch locking box is in use by the local companies in Richmond, Norfolk and Hampton, Va.; Cincinnati, Ohio; Covington, Ky., and Birmingham, Ala.

Twentieth Century Freight Haulage

AT A RECENT meeting of the Society of Terminal Engineers held in New York City Col. J. C. Bonner presented a paper under the title of "Twentieth Century Freight Haulage." The paper was principally a presentation of the rail wagon which was described in ELECTRIC RAILWAY JOURNAL Oct. 12, 1918, page 658.

The rail wagon was likened by Colonel Bonner to the English and French 3½ to 10-ton goods lorries. It is designed so that it can be drawn by a team of horses, or rest astride an auto chassis; again, two or three of these vans may be vestibuled snugly, end to end, astride a chassis trolley car or a similar freight car.

By the use of these containers or rail wagons it is claimed that much of the expense of terminal loading and unloading would be obviated. Another advantage is that this is a practicable means for utilizing electric railway trackage at idle or off-peak hours. Colonel Bonner estimates a saving of 50 per cent of the present cost and time of transportation where freight rehandling in transit is required.



TWO CROSS-SECTIONAL VIEWS OF TRACK SWITCH LOCKING DEVICE

Association News

Emblem Cuts Ready

SECRETARY BURRITT has sent a notice to manufacturer members of the association, calling attention to availability of the cuts recommended by the 1919-1920 committee on company membership for use on members' printed matter.

EMBLEM FOR USE ON MEMBERS' PRINTED MATTER

The cuts are available in the sizes shown in the accompanying illustrations. To illustrate the use of the emblem in a practical way it has been incorporated in the layout of the "Contents" page, the one facing the inside front cover, in this issue of the JOURNAL.

Recommendations on Mail Pay

A MEETING of the committee on mail pay of the American Electric Railway Association was held in New York on Dec. 9. Those in attendance were L. H. Palmer, chairman; Charles L. Henry, W. S. Rodger, G. K. Jeffries.

As a result of the meeting the committee will make two recommendations to the executive committee. One is that the association should ask the commission for permission to reargue the case on the failure of the commission to award the increase of pay for the transportation of mails from the date of the passage of the act in 1918.

The other recommendation of the committee was that the electric railways urge the commission to make a readjustment and increase in mail pay rates on June 6, 1921, the date upon which the next mail pay period begins.

Connecticut Company Section Elects Officers

AT THE monthly and annual meeting of Company Section No. 7, held at New Haven on Dec. 2, F. P. Harlan, manager New Haven division, was elected president, while V. S. Curtis, secretary and general traffic agent of the company, was re-elected vice-president. C. K. Savery, secretary, and George H. Crosson, treasurer, were re-elected, and J. M. Hamilton was re-elected director for three years.

The first speaker was L. S. Storrs, president of the company, who gave a frank talk concerning company matters, past, present and future, including reference to the jitney situation and to the company's financial condition. He gave an opportunity for the asking of questions and the meeting developed into an informal one. J. K. Punderford, vice-president and general manager, was the next speaker. He congratulated the men on the work done in keeping the lines open during the winter of 1919-1920, which he stated had been the most severe in his railway career of twenty-eight years.

In addition to the speaking there were several good musical numbers. The meeting was preceded by the usual dinner.

Coming Committee Meetings

Meetings of the executive committee of the Committee of One Hundred and the publicity committee of the American Association are scheduled for Dec. 15 in New York.

Letter to the Editors

The Limit to Riding in Large Cities

84 PINE STREET
NEW YORK, Dec. 1, 1920.

To the Editors:

The paper by H. M. Brinckerhoff at the recent A. S. C. E. section meeting and the resulting discussion raise the important questions "How big is New York City going to grow?" and "How far in the future can further transportation economically be planned?"

Regarding the first question, Mr. Brinckerhoff goes no further than to say that this future growth must have some limits. Mr. Turner, on the other hand, estimates the urban traffic of New York in 1945 at 5,000,000,000 passengers and says that in seventy-five years the traffic may amount to somewhere around 9,000,000,000. The writer proposes to show briefly what the traffic figures predicted by Mr. Turner really mean.

It is well known by students of urban transportation that the Mattersdorff rule, that traffic will increase in the ratio of the square of the population increase, can be confidently applied within certain limits only, and where the number of "rides per capita" approaches 400, the rate of traffic increase will approximate the rate of population increase. This statement can be proved by the following consideration:

The average American family in large cities consists of five members, three of whom are, as a rule, engaged in useful occupation. Of these three, two may be assumed to ride and one to walk to and from his place of employment. In very large cities, where ample and rapid transportation is available, the proportion of walkers is reduced. The 1916 canvass in Chicago showed about 25 per cent walkers. No actual data are available for the habits of New York workers, but the writer believes that the proportion of walkers is not and will not be less than 20 per cent. The number of habitual rides per annum for a family of five would therefore be, making the customary assumption of 330 riding days,

$$330 \times 2 \times 0.8 \times 3 = 1{,}584 \text{ rides per annum.}$$

Four rides per week for the two other members of the family, a liberal assumption, gives 416 rides per year. A yearly total of 2,000 rides results for a family of five—in other words, 400 rides per capita.

Of course, in a large city the daily influx of suburban residents and the transient population will increase the total number of rides and consequently the number of rides per capita of resident population. Based on present Greater New York statistics (as far as they are available) this increase amounts to about 10 per cent, so that a figure of 450 rides per capita of resident population is probably the maximum which can ever be expected. On this basis, Mr. Turner's traffic prediction of 9,000,000,000 passengers means that he expects a population of 20,000,000 within the boundaries of corporate New York seventy-five years hence, and a population of more than 11,000,000 in 1945.

In the writer's opinion it is altogether unwarranted to assume that Greater New York ever will reach a population of 20,000,000 people. It seems certain that the housing and feeding of, and the supplying of such utilities as paving, sewerage, water, light and power to, this tremendous hypothetical aggregation of humanity cannot be accomplished without increasing the living cost (through taxes, distributing expenses and middlemen's profits) far beyond the figure which the people would be willing to pay for the comforts and attractions offered by the metropolis. There is no doubt that the increase of the cost of living will be one of the principal agencies which will stop the further growth and eventually cause a decrease of the city's population. The result of the last census is indicative in this respect. It not only shows a decreasing rate of population increase, but actually a decreasing numerical increase, suggesting the thought that the saturation point of Greater New York cannot be very far in the future.

Another element which should receive careful consideration in this connection is the fact that the Atlantic Ocean is evidently beginning to lose its overwhelming importance as the highway of international commerce. Broadminded manufacturers, business men and well-informed bankers seem to be of the opinion that Europe, as a consequence of the war, has fallen into another period of decadence and they turn their eyes toward the Far East as the future market of American products. The unprecedented increase of the population of certain Western cities, especially that of Los Angeles and San Francisco, should not be overlooked.

Finally, the writer believes that should the next decade indicate a growth of the city toward the figures predicted, or implied, by Mr. Turner, the safety of the residents would require action to stop this growth by economic pressure. There would be no way to prevent, for instance, famine, due to accidental breakdown of transportation facilities, should the city grow to 20,000,000 people living on an area of less than 300 square miles. At the present time already continued bad weather is almost catastrophic to the welfare of New Yorkers. Imagine now the plight of four times as many people dependent on food, every ounce of which must be imported, should floods or snow or ice demolish or damage all or even only some of the avenues of incoming supplies. Furthermore, from a strategic point of view, it would be almost criminal to permit the aggregation of perhaps 12 or 13 per cent of the country's population and possibly 50 per cent of the nation's wealth in a location exposed to enemy attack. The writer cannot conceive of the possibility of supplying the necessities of life to a New York of 20,000,000 people under conditions which may arise should the country be forced to carry on a defensive warfare.

All of the foregoing arguments, in the writer's opinion, point toward the necessity of applying extreme conservatism in predicting the future growth of New York City. He believes that a damper should be placed upon the fantastic figures appearing in papers dealing with the city's transportation problem, at least when this problem is seriously considered by a scientific body. The conditions are such that predictions made beyond a very few, say five or six, years have little, if any, value.

Regarding the second question: "How far in the future can transportation in New York be economically planned?" It follows from what has been said that it would be unwise, at the present time, to consider any radical extension of the city's rapid transit lines. The efforts of the competent authorities should rather be turned toward righting the mistakes made in the planning and in the make-up of the present facilities.

Mr. Turner states that the present rapid transit mileage has an estimated capacity of 3,000,000,000 passengers. It is fair to assume that when this capacity is reached, the surface lines and buses will still carry one-third of the city passengers—in other words, the total number of passengers will be about 4,500,000,000. Based on the limiting number of rides per capita as determined above, the population necessary to produce this figure is 10,000,000, which is probably very near, and possibly above, the magnitude that the city will ever reach. It appears, therefore, that all that should be done is to make such changes in both the layout and the operating methods of the present lines as would enable the use of the present trackage to the best advantage.

For this purpose the actual movement of the passengers should be accurately determined. It seems unbelievable, but nevertheless a fact, that no dependable traffic check has ever been made in New York City. The Public Service Commission in analyzing the traffic characteristics of the rapid transit lines bases its figures on the flimsy information furnished by station ticket sales, while there are practically no data by which such important factors as the length of haul or the density of traffic on different sections of the several routes could be determined for the surface lines. It is no wonder that the "dual system" operated at present appears to be already saturated, as it was planned without the knowledge of fundamental conditions. This mistake should be avoided in the future and no further planning done unless reliable data are made available through a thorough traffic count and other studies fundamentally pertinent to the traffic problem.

After the passenger movement throughout the city is so determined it should be comparatively easy to make physical plans for necessary changes in the present layout and equipment and possibly for some unavoidable extensions of the lines of both rapid transit and surface systems.

At the same time, the legal and financial questions included in the unification of all transit lines should be carefully studied and a plan devised by which a new period in the history of the city's transportation could start, based on the principle of: "One transit system and one fare for Greater New York." E. E. HALMOS.

The Bureau of Standards has recently issued a circular letter describing the properties found from tests made on proprietary light aluminum alloys. The conclusions reached are that the claims for superiority of these light alloys over standard alloys are not fulfilled. Many of the compositions tested were not new because their properties had been recorded many years ago during systematic investigation. The available standard alloys have well-defined properties superior to those of all present competitors.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Construction Progressing

Municipal Road at Detroit Suspends Evacuating Work for Winter—Continues Overhead Construction

In order that traffic can be resumed on streets which have been closed because of construction work on the municipal railway lines at Detroit, Mich., excavation work on the streets along which new lines are being built has been suspended by the city for the winter.

STEEL TIE CONSTRUCTION ON THE ST. JEAN LINE SOUTH FROM WARREN AVENUE, OCT. 22

The work of the municipal railway is being done by the city of Detroit, Department of Street Railways, James Couzens, Mayor, under a Board of Street Railway Commissioners consisting of Ralph B. Wilkinson, chairman; William B. Mayo and G. Ogden Ellis. The general manager of the system is Joseph S. Goodwin. Other officers are: William C. Markham, construction engineer; A. C. Colby, superintendent of equipment; W. D. Edgecomb, engineer of maintenance and way; H. M. Gould, electrical engineer; I. N. Merritt, accountant; H. P. Hevenor, consulting engineer; C. J. Conway, superintendent of tracks; E. M. Booth, superintendent overhead lines, and H. B. Stowe, chief draftsman.

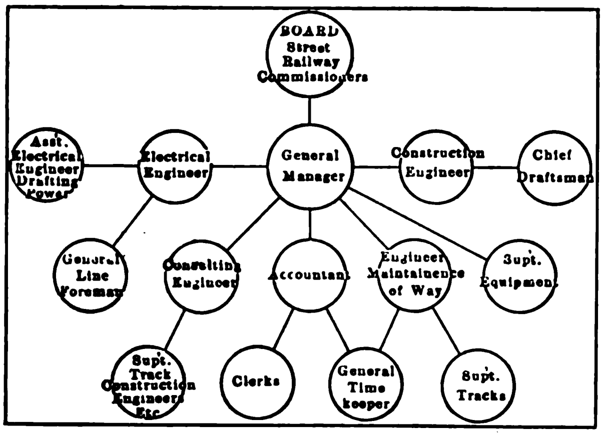
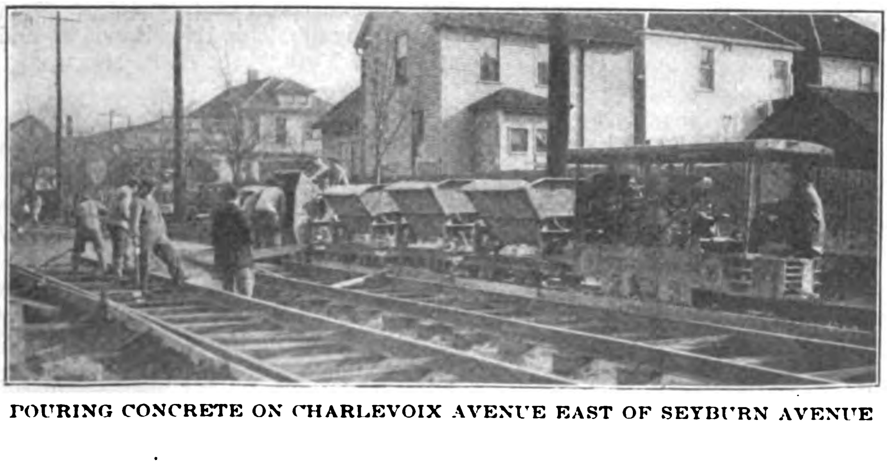


CHART OF ORGANIZATION OF DETROIT MUNICIPAL RAILWAY

According to the report of the general manager for the week ended Nov. 27, 49,053 linear feet of concrete base has been completed—all of which is for double track except the 3,610 ft. of single track road bed on Harper Avenue. Double track in place to gage amounted to 39,490 linear feet. The 3,610 feet of single track on Harper Avenue has also been placed to gage.

Of the total amount of track laid, 23,429 linear feet of double track and 2,610 feet of single track has been finished and paved in.

Twenty-five cars have been ordered and are being built according to the specifications furnished by the municipal street railway officials. Arrangements have already been made with the Detroit Edison Company to furnish energy.



POURING CONCRETE ON CHARLEVOIX AVENUE EAST OF SEYBURN AVENUE

Work is progessing on the overhead line, all the equipment and material having been purchased except the trolley wire. Bids are to be opened soon by the city purchasing department for 30 miles of cold drawn copper wire. Poles are set on the Shoemaker section of the St. Jean line.

Semi-Annual Safety Banquet

Successful Gathering of Union Traction Company Employees at Anderson on Dec. 3

The 100 members of the safety organization of the Union Traction Company of Indiana gathered for their regular semi-annual safety banquet in Anderson on the evening of Dec. 3. H. A. Nichol, general manager of the company and general chairman of the safety organization, acted as toastmaster, as is the custom. Dinner was prepared by C. S. Keever, superintendent of transportation. After dinner there were songs and other entertainment and speeches on safety. A local orchestra, a soloist and a reader from the company's own organization livened the interest in the meeting. The reader was Mr. Patton, who was introduced as a life-long personal friend of James Whitcomb Riley. His reading of two of Riley's best poems brought him an ovation. Other members of the company organization who addressed the meeting were H. A. Nichol, J. A. Van Osdol, general attorney; Arthur W. Brady, president; James Hesler, chairman of the shop safety committee, and R. E. Luellen, safety engineer.

For the first time at these banquets outside guests were placed on the program. The principal speaker was Edward C. Spring, general superintendent of the Lehigh Valley Transit Company, Allentown, Pa., whose highly successful and extensive safety work with his own company enabled him to make a very interesting and inspiring talk. The other outside guest on the program was H. L. Brown, Western editor of the ELECTRIC RAILWAY JOURNAL.

The spirit of enthusiasm for the safety work of the company displayed at this banquet was noteworthy. These banquets have become an institution with the Union Traction Company and new members elected to the safety organization each year look forward with great interest to this event. The dinner, the speeches about safety and the entertainment produce enthusiasm for the work that may explain in a measure the reason for the winning of the Brady safety award by the Union Traction Company on two occasions, and for the apparent continuing success of the safety work of this company.

Railway Wins Tilt With City

Davenport Officials Blocked in Attempt to Prevent Service Curtailment—Court Enjoins City's "Strong-Arm" Methods

In the face of unabated opposition on the part of the city authorities of Davenport, Iowa, the Tri-City Railway has instituted a program of financial retrenchment as a means of putting its Davenport lines on a partially paying basis. Service has been curtailed by the cutting off of one line, the shortening of others and the stopping of "owl" cars at midnight. The company has secured from Judge A. P. Barker an injunction restraining the present administration of Davenport from employing "strong-arm" methods to force the railway to abide by the provisions of its franchise. The court action has brought about a cessation of open hostilities between the city and the railway pending an appraisal of the company's property.

THE battle between the city and the railway was precipitated when the company, which has operated at a loss for many months, discontinued service on the Fourth Street line and cut off the "owl" cars at midnight. This action occurred Dec. 1. The City Council had previously turned down the company's plea for an experimental operation of one-man cars as a means of reducing cost of operation and giving better service.

COMPANY FACING BANKRUPTCY

The railway did not take the action in cutting service until a conference was held with the city officials to bring out the fact that the company was facing bankruptcy. The company asked for relief through the elimination of non-paying lines. This conference secured no unbending on the part of the City Fathers, who stated that they would enforce the old franchise to the letter.

The fare in Davenport is now 9 cents, with free transfers, as fixed by a court injunction several weeks ago. The rate was raised to 9 cents from 7 cents, a fare also made through injunction. The franchise rate is 5 cents. The party now in control of the city government won its offices at last spring's election largely on the promise that if elected it would reduce the fare to the old 5-cent base specified by the existing franchise.

It is improbable that the audit and appraisal of the traction lines for which the city is paying $25,000 will be in the hands of the authorities before Jan. 1.

Following the cut in service City Attorney U. A. Screechfield, representing the majority members in the City Council, immediately filed warrants for the arrest of President B. J. Denman, Vice-President J. G. Huntoon, Assistant General Manager T. C. Roderick and ten trainmen.

A PLAY TO THE GALLERIES

The warrants were served by the city police with all of the demonstration which might accompany the seizing of noted criminals. With bells jangling the patrol wagon was driven to the general offices of the traction company, the officials were taken into custody by policemen and the patrol was then driven through the downtown streets before the traction officials were taken to the station house.

Arriving at the police station the officials were taken before the police magistrate, who imposed a fine of $100 each on five counts. Two trainmen were fined $25 each. Appeal bonds for the three officials were fixed at $1,000 each and were posted after notice of appeal to the District Court was filed.

Messrs. Huntoon and Roderick were arrested twice and the arrests threatened to become a daily occurrence until Judge Barker of the United States District Court intervened by signing a temporary injunction restraining the city authorities from a continued attempt to enforce the old franchise requirements through the medium of the strong arm of the law. The traction company then shortened the Bridge line loop by several blocks, cutting out much dead territory, and put into effect the full retrenchment program previously announced.

Judge C. M. Waterman, dean of the Davenport bar, severely criticised the action of the city authorities in making the arrests, saying that the use of the patrol wagon was "calculated to humiliate and disgrace" the officials of the traction lines. The latter bore the action with good grace. As a means of preventing the curtailment of service the city's course proved a dismal failure.

Local newspapers also roundly scored the city's tactics in their editorial columns.

Monorail Seeks Rights in Michigan

Requests have been made by the Michigan Elevated Railway for permission from the State Public Utilities Commission to do business in Michigan. The company proposes to construct an experimental monorail elevated electric line in or near Detroit. Under the plan outlined by the incorporators, the general public would be solicited to pay the cost of an experimental line, to be constructed on Woodward Avenue between Detroit and Royal Oak or on some street designated by the City Council. This would ultimately become a part of an elevated system running from the center of the city to the northern suburbs.

Pedestals supporting the monorail would be placed from 40 to 60 ft. apart and based where the present curb line runs. Coaches would run on a single I-beam rail on top of the pedestals, 14 ft. above the curb. Another I-beam would be held above the coach and guide wheels on the top of the coach would be closely fitted into this rail to assure stability and keep the coach from tipping to one side. The number of cars included in a train could be varied to meet the demands of traffic. The cars would be of modern fireproof construction. They would weigh approximately 80,000 lb. each. The trucks would be made to follow the rails by means of guide wheels which make it impossible for a car to leave the rail. The brakes would be made to operate directly on the lower rail, relieving friction from the driving wheels. A composition rim made practical because of the width of the rail on which the drive wheels run would permit the cars to operate almost noiselessly.

New Depots and Yards Planned for Hollywood

Final steps toward the establishment of a new freight station and yards for the Hollywood district of Los Angeles have been announced by the Pacific Electric Railway. The company has completed arrangements to file with the California State Railroad Commission applications for the vacation of its present station facilities at Hollywood and Cahuenga Boulevards, while a new freight station, with adequate trackage to serve same, will be erected and constructed at a relocated site in the Hollywood district known as Santa Monica Boulevard and Highland Avenue.

It is planned to have the new station facilities ready for service shortly after the first of the year, and construction work will be undertaken as soon as the approval of the railroad commission has been received. The new site provides a greatly enlarged area over the present facilities, and the acquisition of additional ground will permit the company to provide a layout that will meet the needs of the community.

The tract of ground is just beyond the city limits of Los Angeles and in a district in which a number of important industries have recently located. For the location of the depot and trackage to be constructed a portion of the tract needed requires a 285-ft. frontage on Santa Monica Boulevard and extending to a depth of 340 ft. The estimated cost of the removal of the old layout and construction of new depot and trackage is $20,000, exclusive of the cost of acquiring the new site.

Vacating of the present freight depot site will serve to make the property available for a further building up of the business section of Hollywood, which has rapidly developed around the old station during the past eight years. It was because of this rapid growth of business that the company saw fit to seek an enlarged site that would permit of development as a freight depot without encroaching upon the natural development of the business center of the town.

State Commission Reports

Connecticut Body Says Electric Railways Are in Bad Way Financially —Appraisal Being Completed

The State Public Utilities Commission of Connecticut, in its ninth annual report, issued on Dec. 5 at Hartford, declared that the electric railways of the State were in a bad way financially and that they had not been kept up to the standard of previous years. The commission says:

> During the present calendar year the commission will have made a physical valuation of most of the electric railways of Connecticut. We did not have the money nor the employees to make a minute appraisal such as would have been made at an expense of approximately $100,000 by an expert appraisal company, but we believe the result obtained by the commission's valuation will be equally satisfactory and reliable and in the final analysis check up closely with a detailed scientific appraisal.

CONNECTICUT COMPANY EARNED $11,043,804

The following statistics were given out concerning the twelve electric railways operated in the State for the fiscal year just closed:

The total balance on Dec. 31, 1919, was $1,299,889, a decrease of $844,595. The aggregate assets in 1919 were $107,879,988, a slight increase over the previous year. An increase of $875,-667 in operating revenue was more than offset by an increase of $1,047,433 in operating expenses, the net revenue being decreased $171,766. The net revenue from the transportation of passengers totaled $948,775.

Figures for the Connecticut Company show that, up to the time that the zone system went into effect on Nov. 2, 1919, the road carried 143,934,704 passengers at an average fare of a little less than 5 cents, because of free transfers. Between Nov. 2 and Dec. 31, 1919, 22,632,171 passengers were carried at an average fare of about 7 cents.

The total operating revenue of the Connecticut Company for the year ended Dec. 31, 1919, was $11,043,804, of which $10,908,328 was from transportation, while $135,476 was revenue from other railway operations. The increase over revenue of the previous year was $1,108,054. Railway operating expenses amounted to $9,210,376, an increase of $1,059,942 over the previous year. The net revenue from railway operations was, therefore, $1,833,428, an increase in net operating revenue of $48,111. Taxes amounted to $619,657, making the net operating income $1,213,770 and with non-operating income the gross income was $1,446,601.

$53,046,568 IN PERMANENT INVESTMENT

The Connecticut Company had a liability to the Connecticut Railway & Lighting Company on Dec. 31, 1919, amounting to $625,287. Its floating indebtedness, represented by demand and short term notes, is $3,130,313, of which amount $3,071,038 was due the New York, New Haven & Hartford Railroad and $59,305 to the Wason Manufacturing Company.

An amount in excess of $400,000 was expended by the Connecticut Company last year on its plant, according to the report. Of this sum, $162,242 was for road and equipment and $241,479 for improvements, additions and betterments.

The total permanent investment of the company is $53,046,568.

Buffalo Railway Demurs

Says Wage Increase Should Not Be Retroactive and Must Be Contingent Upon Fare Advance

Efforts are being made to break the deadlock existing in the wage controversy between the International Railway, Buffalo, N. Y., and its union employees. The latest hitch in the arbitration proceedings came at a meeting of the board in New York City. At that time the company demanded that the arbitration proceed only upon the condition that any further wage increase shall be made effective only from the date that a further increase in fare is allowed. This stipulation was added in order to make the payment of such increased wage possible.

James A. Vahey, general counsel for the Amalgamated Association, who represents the platform men on the board, objected to proceeding under this stipulation and the meeting was adjourned. Since then sessions have been held in Buffalo at the call of Charlton Ogburn, New York, the third member of the board.

MR. JOYCE STATES COMPANY'S ATTITUDE

In a letter to Mr. Ogburn written by C. J. Joyce, counsel for the Mitten interests and representative of the International Railway on the board, Mr. Joyce declares that he sees no good purpose to be accomplished by a meeting of the arbitrators until "we are sufficiently agreed to permit us to proceed with the actual work of arbitrating the question submitted."

Mr. Joyce reviews the disruption of negotiations which followed his presentation of Herbert G. Tulley's letter as president of the railway setting forth the company's insistence upon a fare increase as preliminary to wage increases.

The board was told by Mr. Joyce at its session in Buffalo that Buffalo cannot fairly be expected to pay increased wages at Niagara Falls, Lockport or on the interurban lines and that consequently if a general increase in wages were ordered by the arbitration board, the actual payment of these wages in each of the four separate divisions must await the collection of a fare in each separate location sufficient to meet the increased wages ordered.

Seattle Investigation Continued

The grand jury at Seattle, Wash., reported to have been investigating the city's purchase of the Stone & Webster traction lines for $15,000,000, has been recessed until Jan. 17, when, if Mayor Hugh M. Caldwell is prepared to continue the inquiry, it will resume its investigations. No indictments were returned with the grand jury's report, nor was there any indication in the statement in regard to progress made.

The grand jury report says that in view of public dissatisfaction with the purchase of the lines, the jury "considered it its duty to tender to the Mayor of the city of Seattle its services and powers, so that he would have the benefit of its inquisitorial functions in the discovery of any facts that he desired to obtain."

The report sets forth that Mayor Caldwell requested the grand jury to adjourn its sessions until January, 1921, when, he has said, he expects to have ready for report to the Council the results of the investigation of the railway purchase which he is conducting in accordance with the resolution of the City Council.

Two Railway Employees Win Courtesy Prizes

The Chicago *Tribune* is carrying on a courtesy contest by sending out a reporter in search every day of the most courteous and polite person he can find, this person being awarded a $50 prize as the result. A Chicago Surface Lines conductor and a switch tender have been the recipients on two different days of the $50 prize.

Conductor John Lynch won the prize because he honored a transfer which was not good according to a strict interpretation of the company rules, but chose to accommodate the passenger and win a friend for the company rather than to refuse the passenger the privilege for the few blocks he intended to ride. Later, in explaining his attitude, the conductor said that he always hoped to be polite, though with the crowded condition of cars it was a hard job. "But I try to treat them right, you know," he said. "So many people get confused on this transfer business —there are so many different rules and regulations, but I size the man up. If he looks honest and his intentions seem good I usually give him the benefit of the doubt. Sometimes I have to throw the dead beats off—I can usually tell them from the others."

The switch tender who won the $50 prize was Thomas Heffernan, whose position of employment is in the Loop District at the corner of Dearborn and Randolph Streets. In this case the reporter noticed that this man was constantly being asked for directions about the city. The reporter approached him and asked, "Where am I?" The switchman answered him and asked him where he wanted to go. The reporter answered, "The railroad station." In return he was asked "Which one?" The reporter didn't know, and the switchman finally dragged out of him that he wanted to go to Milwaukee, and then explained in detail how to get to the proper station. To make his questioning more unbearable the reporter asked for a piece of paper on which to write down the directions. The switchman's temper was not ruffled, however, and he won the prize.

New Attitude Suggested

Commission's Letter to Governor Tells of Effect of Rising Costs on Electric Carriers

The interurban and street railways have suffered more, perhaps, than any other class of utilities from the conditions brought about by steadily rising costs during the last few years, says the California Railroad Commission in its report to Governor William D. Stephens for the year ended June 30, 1920. With fares fixed at 5 cents, by custom and by franchise, the shrinking value of the dollar threatened disastrous consequences for practically all street railways. The report says:

> And yet it is apparent that, in spite of the more severe competition of motor vehicles, the time is by no means here when our cities and rural territories can dispense with electric railway facilities. The automobile stage, the jitney and the privately-owned automobile are not a substitute for the city railway or the electric interurban railway. In the few places in the United States where this belief was prevalent, the consequences have shown its fallacy.

The commission says it has not hesitated to extend to the electric railway systems of the State such relief, by increase of fares or by establishment of the zone system, or by ordering radical operating economies, as would insure a continuation of reasonably good service. Continuing it says:

> The commission has also taken opportunity to call attention to its belief that the relationship between street railway and the communities they serve should be radically changed and that a modification of obsolete franchise requirements would distinctly be in the interest of the public. No sound reason exists any longer, for instance, why the street car user should bear the total burden of the cost of paving a portion of the most expensive city streets, when in adjoining city streets, which do not have the advantage of street railway service, this same burden is borne entirely by the adjoining property owners. The change from unsatisfactory and obsolete term franchises to better indeterminate franchises is now being effected in several communities and is being given careful consideration in others. The commission, under the public utilities act, is called upon to take part in the creation of better franchise conditions and several proceedings of this nature are now pending.

Trustees Seek to Spend $4,421,000

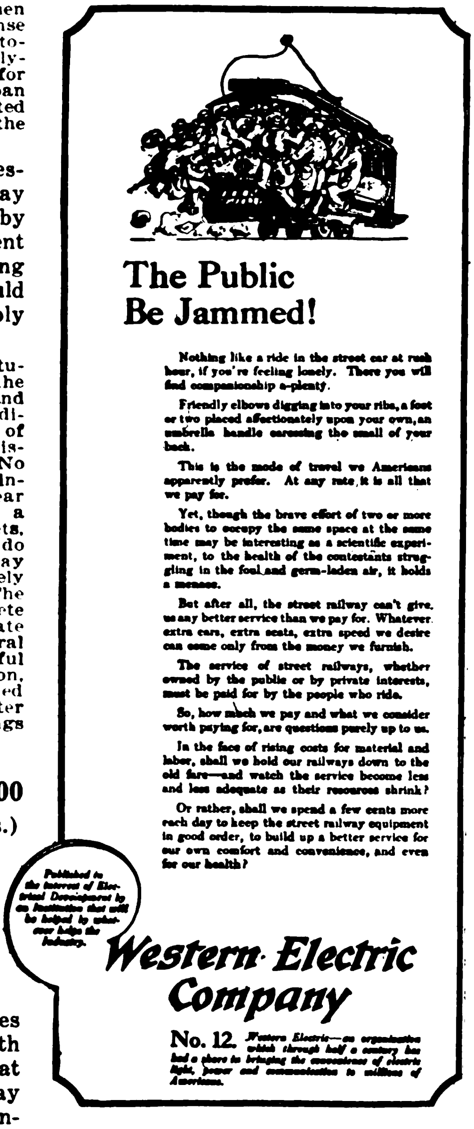
The trustees of the Boston (Mass.) Elevated Railway have asked the Legislature for authority to spend $4,421,000 for the erection of new repair shops, the building of a new powerhouse, the establishment of storage yards and the general improvement of the service.

The recommendations of the trustees are embodied in a petition filed with the Secretary of State, which says that "proper operation of a street-railway calls for sufficient cars to carry passengers in reasonable comfort, and for shop facilities to keep those cars in repair." Continuing, the trustees declare that some of the present facilities of the Elevated are wasteful and inefficient, and must be improved in order to eliminate delays which may result in inconvenience to thousands of passengers at a time.

They ask for authority to spend $3,000,000 for new repair shops at the Everett terminal, $1,421,000 for increasing the power facilities, and an unestimated amount for a storage yard at Forest Hills. They also reiterate the request made in their first annual report a year ago that the State be empowered to buy bonds to be issued for service improvements.

Railway Problem Advertised in National Medium

The Western Electric Company, in the interest of electrical development and achievement, published the accompanying advertisement in a recent issue of the *Literary Digest*. The occasional rider and even the regular rider on an electric railway is transported from one place to another in sublime ignorance of just what that one trip has cost the owner of the property. As the Western Electric Company indicates, the problem for the public to decide is whether in the face of rising costs it shall hold the railways down to the old fare and watch the service become less and less adequate or whether riders will spend a few cents more each day to keep equipment in good order so that service may be bettered for their comfort.



The Public Be Jammed!

Nothing like a ride in the street car at rush hour, if you're feeling lonely. There you will find companionship a-plenty.

Friendly elbows digging into your ribs, a foot or two placed affectionately upon your own, an umbrella handle caressing the small of your back.

This is the mode of travel we Americans apparently prefer. At any rate, it is all that we pay for.

Yet, though the brave effort of two or more bodies to occupy the same space at the same time may be interesting as a scientific experiment, to the health of the contestants struggling in the foul and germ-laden air, it holds a menace.

But after all, the street railway can't give us any better service than we pay for. Whatever extra cars, extra seats, extra speed we desire can come only from the money we furnish.

The service of street railways, whether owned by the public or by private interests, must be paid for by the people who ride.

So, how much we pay and what we consider worth paying for, are questions purely up to us.

In the face of rising costs for material and labor, shall we hold our railways down to the old fare—and watch the service become less and less adequate as their resources shrink?

Or rather, shall we spend a few cents more each day to keep the street railway equipment in good order, to build up a better service for our own comfort and convenience, and even for our health?

Published in the Interest of Electrical Development by an Institution that will be helped by whatever helps the Industry.

Western Electric Company

No. 12. *Western Electric—an organization which through half a century has had a share in bringing the convenience of electric light, power and communication to millions of Americans.*

A MAGAZINE AD IN THE INTEREST OF FAIR PLAY

Sectional Body Suggested

Commissioners of Intermountain States May Arrange to Consider Problems Common to All of Them

Members of the Public Utilties Commissions of Utah, Nevada, Montana and Idaho have concluded a conference at the State Capitol in Salt Lake with a general discussion of problems common to all. The matter of express rates, which was one of the reasons for the calling of the conference, was left to the individual commissions to decide, in the light of what had been brought out by the discussions at the conference.

The commissioners found, however, that the exchange of ideas and general discussions at the present conference had been so helpful and beneficial that the proposition of forming a sort of intermountain association of utilities commissioners was very much in favor. It was pointed out that problems common to all the intermountain country might be discussed at meetings of such an organization, and it was indicated that some sort of a sectional meeting might be held with a view to uniform presentation of views to the National Association of Railroad & Utilities Commissioners.

In the absence of other members of the visiting commissions no action could be taken. It was left with Judge Joshua Greenwood, president of the Utah Commission, to correspond with other commissions to ascertain if some sort of an association of the kind suggested would be agreeable to all.

The visiting commissioners and the Utah commissioners were guests of the Mountain States Telephone & Telegraph Company at luncheon at its cafeteria. After lunch the officials were taken through the plant and the details of traffic and operation were explained. Later some of the visitors inspected the plant of the Utah Copper Company at Bingham.

Financing Interurban Found Difficult

Difficulties are being met in arranging for the financing of the Wichita Falls-Dallas Interurban line. There is talk to the effect that the project may not be carried through at this time. The Dallas (Tex.) Railways is committed to build the road in substitution for two lines each at least 30 miles in length as provided in the franchise granted to that company in 1917.

Under the contract entered into last spring Dallas and Wichita Falls raised $1,500,000 of the $7,500,000 needed to build the line. George Bishop, Cleveland, Ohio, agreed to dispose of the $5,000,000 of first mortgage bonds of the company. The first agreement called for the disposal of these bonds by Oct. 15, but this was later extended to Nov. 25. Another extension will be granted.

J. F. Strickland, president of the Dallas Railways, is of the opinion that the line can be built with less than the estimated $7,500,000, as materials used in railway construction and the cost of labor are on the decline. Mr. Strickland says he believes the line can be financed on $4,000,000 of first mortgage bonds and expresses a willingness to go ahead on that basis.

Mr. Bishop reported that he had disposed of $3,500,000 of the $5,000,000 first mortgage bonds by Oct. 1. It is believed that another $500,000 at least can be placed.

The committee had until Dec. 1 to notify the city of Dallas of success or failure of efforts to dispose of the securities and complete details for financing the project.

Kansas Industrial Court and Commission Functions to Be Separated

Governor Allen will ask the Kansas Legislature to separate the Industrial Court from the Public Utilities Commission. The plan suggested is to unite all the labor boards and industrial commissions of the state under the supervision of the Industrial Court and to restore the Public Utilities Commission for the administration of questions affecting the public utilities.

The Public Utilities Commission never has been able to keep up with its work even without the added duties of the Industrial Court. The commission is far behind now in its work as a public utilities commission, and because of that much important work of the body functioning as an industrial commission has suffered neglect during the past year. The court has been able to demonstrate the principle involved in the law and to show that such a court is entirely feasible, but it has only had time to establish the work of the Industrial Commission.

Paving a Burden in San Diego

The fate of the San Diego (Cal.) Electric Railway is in the hands of the people themselves, whose co-operation and support are prerequisites for the maintenance of service in that city. This is the point of view of William Clayton, vice-president and managing director of the company, who discussed the solution of San Diego's transportation problem on Nov. 15 before representatives of various business and civic bodies. He said that the automobile was in a great measure responsible for the poor financial showing of the company. The possibility of the company spending $1,000,000 on paving requirements was absolutely out of the question. Mr. Clayton further stated that paving obligations should be excluded from charter statutes by an act of the Legislature and that the Railroad Commission of California, with its comprehensive knowledge of public utilities, should review the paving question and other franchise burdens which the company must bear. He thought that abutting property owners and the city should bear the paving charges. In the final analysis the question was one for the people to decide. Without the support of the people San Diego was likely to find itself without electric railway service.

News Notes

Seven-Cent Raise for Fitchburg Men.—The Fitchburg & Leominster Street Railway, Fitchburg, Mass., has increased the wages of its employees to a maximum of 64 cents an hour. The new scale represents an increase of 7 cents an hour over the former rate.

Ottawa Will Vote on Railway Purchase.—The City Council of Ottawa, Ont., has decided to apply to the Provincial Government for power to borrow the necessary money to purchase the Ottawa Electric Railway should the ratepayers approve of its purchase by plebiscite in January. The price will be fixed by arbitration.

Fourteen Years a Commissioner.—The terms of Commissioners Loveland of San Francisco and Edgerton of Los Angeles of the Railroad Commission of California expire on Dec. 31, 1920. Commissioner Loveland has been holding office for fourteen years, and next to Commissioner Mills of the Minnesota Commission, has had the largest service in that respect of any man in the country. Commissioner Edgerton has held office for eight years.

Toronto to Submit Motor Bus By-Law to Citizens.—A by-law to authorize the expenditure of a maximum of $500,000 on motor buses as an auxiliary to the electric railway system of the Toronto Railway when taken over next year by the city of Toronto has received favorable consideration at a private meeting of the Toronto Board of Control, the Civic Transportation and the Harbor Commission. The matter will be sent on to the City Council.

Railway Loses Realignment Suit.—The Belt Line Railway Corporation, New York, N. Y., has lost its fight against an order to relay its rails on West Fifty-ninth Street by a decision handed down by the Court of Appeals. The court reversed the order of the First Appellate Division, which had reversed an order of the New York Special Term in granting a peremptory writ of mandamus to compel the corporation at its own expense to conform its surface rails upon West Fifty-ninth Street between Fifth and Eighth Avenues with the level of the street when repaved. The order of the Special Term was affirmed.

Further Retrenchment Planned.—H. A. Orr, resident manager of the local branch of the Southern Public Utilities Company at Anderson, S. C., has returned from Charlotte, where he went to attend a meeting of the managers of this company. Mr. Orr is quoted as stating that the consensus of opinion at the meeting in Charlotte was to the effect that further economies must be effected or a raise in rates be asked. He also states that while he thinks the company is economizing wherever possible, he hopes through judicious advertising of the service to bring about an increase in revenue, sufficient to make it unnecessary to seek an advance in fares from 7 cents to 8 cents.

Receiver Greets Pensioners.—An informal reception was held recently in the general office of the United Railways, St. Louis, when fifteen distinguished pensioners were greeted by Receiver Wells and Manager Perkins. The occasion was the last visit of these sturdy employees to the general office. Prominent among these pioneers was a man who had served under Receiver Wells' father, and another who had started to work for the old Union Line in 1869.

Crosstown Line Must Wait.—A rapid transit cross-town line in Brooklyn, N. Y., is not nearly so urgent as subway extensions in Staten Island, Manhattan and Flushing. This is the opinion of John H. Delaney, Transit Construction Commissioner, in answer to an inquiry about the Queensboro Plaza cross-town line, a recently revived improvement. The commissioner stated that the city has still to spend about $50,000,000 on the completion of the dual system, and no new additional routes should be considered before the present construction problems are completed.

Subway Plan Revived.—A plan for short subways for downtown streets in Detroit, Mich., has been revived by Councilman Nagel and preparatory to resubmitting a plan for short dips, similar to the plan he proposed last year, Mr. Nagel has put through the Council a resolution asking the Corporation Counsel to give an opinion as to whether or not the city has the power to assess the cost of such a system against abutting property owners in proportion to the benefits. Subways in all street car streets in the section bounded by Cass Avenue, Randolph Street and Adams Avenue and the Detroit River at a cost of approximately $12,000,000 are advocated by Councilman Nagel.

A General Clean-Up in Muskogee.—With the motto of "nothing to conceal, everything to disclose," W. M. Cutlip, now general manager Muskogee Electric Traction Company, has gone through the rank and file, and all employees guilty of "knocking down" fares have been "spurlos versenkt." It was shown at the November meeting of the Chamber of Commerce that the dismissal of the dishonest men increased the company's revenue $100 a day. One of Mr. Cutlip's first accomplishments was a wage advance of 5 cents an hour. With the increased receipts to which the manager looks forward improved and extended service will be granted the patrons of the Muskogee Electric Traction Company.

Financial and Corporate

$32,000,000 Power Deal

Electric Railway Lines Included in Purchase of MacKenzie Holdings by Ontario Commission

After two years of negotiations, Sir Adam Beck, chairman of the Ontario Hydro-Electric Power Commission, on Dec. 4 concluded an agreement with representatives of Sir William MacKenzie to purchase the entire electrical interests of the various companies promoted, controlled or influenced by him in the Toronto and Niagara district for $32,734,000. Sir Adam acted on behalf of the city of Toronto and the other Ontario municipalities comprising the hydro-electric power union.

RAILWAYS INCLUDED IN PURCHASE

The properties purchased are the Toronto Power Company, the Toronto & York Radial Railway and the Schomberg & Aurora Railway lines. These three properties include the systems of the Toronto Power Company, the Toronto & Niagara Power Company, the Electrical Development Company and the Toronto Electric Light Company

The purchase will be financed as follows: $6,971,295 of 6 per cent twenty-year bonds of the city of Toronto; $2,375,000 twenty-year 6 per cent bonds of the Hydro-Electric Power Commission; $613,528 twenty-year 5 per cent bonds of the Hydro Commission, and the assumption by the commission of $4,355,000 of underlying bonds of the Toronto Power Company, $13,558,917 bonds or debenture stock of the Toronto Power Company, $4,103,200 5 per cent mortgage bonds of the Electrical Development Company, $840,000 three-year 6 per cent notes of the Toronto Electric Light Company, and $13,100 outstanding stock of the Electrical Development Company

Thus there will be delivered to the former owners $9,958,823 of bonds and the new owners will assume responsibility for $22,775,177 of obligations of the companies taken over. The consummation of this large deal was practically necessary if the undertaking of the proposed hydro-radial railways was to be continued. The taking over of the Toronto Street Railway by the city of Toronto at the expiration of the franchise next September involves the question of securing an adequate power supply for its operation.

COMPLETING POWER SCHEME

Although assurances had been given from time to time that the Chippewa canal scheme of the Hydro Commission would be far enough advanced to supply the necessary power for the operation of the street railway next September, there were grave doubts that this could be accomplished. In addition it was essential that the franchises owned by the Toronto & York Radial Railway be extinguished if the proposed hydro-radial scheme was to be a success. Some of these were granted in perpetuity and so long as they existed there would always be difficulty.

By the acquisition of the foregoing power plants the total capacity of the plants owned, acquired and under construction by the Hydro-Electric Power Commission will be more than 1,000,000 hp. and the total investment by the end of 1922 will be between $160,000,000 and $170,000,000, by the Province of Ontario and the municipalities.

Cincinnati Going Behind on Eight Cents

The report of the Cincinnati (Ohio) Traction Company to W. C. Culkins, Street Railway Director, for the month of October shows a deficit larger than that for the month of September. The total increase in operating expenses over last year is 31.04 per cent. This increased cost is accounted for in the figures compiled by the auditor of the street railway director. The cost of power for October of this year was $131,329. Last October the cost of power was $78,779, an increase of 66.71 per cent. October a year ago there were 10,403,207 revenue passengers. This October there was a falling off of passengers to 18,059,657. The total cost of service this year was $897,447, as compared with $706,582 for October, 1919, an increase of 27.01 per cent. The deficit for October, 1919, was $25,678. The deficit for October, 1920, was $92,515.80, an increase of 127.7 per cent. The fare last year was 7 cents. This year it was 8 cents. The details are given in the accompanying table.

STATEMENT OF EARNINGS OF CINCINNATI TRACTION COMPANY

October	1920	1919	Per Cent Increase
Passenger revenue	$791,932	$721,032	
Other revenue and income	12,999	11,228	
Total	$804,931	$732,260	9.9
Operating expenses	73,628	47,220	55.9
Equipment	71,144	45,695	55.6
Power	131,329	78,779	66.7
Conducting transportation	277,993	244,600	13.6
Traffic	848	756	12.1
General and miscellaneous	43,636	36,916	31.8
Total	$598,580	$453,969	31.8
Taxes and rentals of viaducts	$67,705	$448,694	39.0
Rental of leased lines	104,030	104,030	....
Interest on equipment: Notes B 1; Interest and sinking fund, reducible debts	17,971	28,695	78.9
Interest on equipment: Notes G 1 2; interest on sinking fund notes and debentures	44,126	6,007	
Return on capital	35,043	35,043	....
Taxes, franchise	29,991	29,483	....
Total cost of service	$897,447	$706,582	27.0
Total revenue and income	804,931	732,260	9.9
Deficit	$92,515	$25,678	127.7
Fare	8 cents	7 cents	
Revenue passengers	10,059,657	10,403,207	
Car-miles	1,740,547	1,884,780	

Stockholders Organize

Local Holders of Stock of Kansas City Railways See No Need for Foreclosure Now

Holders of preferred stock of the Kansas City (Mo.) Railways resident in Kansas City held a meeting on Nov. 26, at the Hotel Baltimore, pursuant to informal suggestions. John I. Glover, elected chairman of this meeting, was asked to appoint a committee to take such steps as seemed necessary with reference to the present situation of the company. The committee, appointed since the meeting, consists of James E. Gibson, chairman; C. D. Parker, Robert M. Goodlet, Henry Florsheim and Edward J. Corrigan. Mr. Gibson was former general manager of the railway.

The immediate cause of the action by local stockholders is said to have been reports that first mortgage bondholders anticipated foreclosure. Such report seemed premature and doubt was expressed at any result of this nature.

It is made clear that there is no belligerent motive in the formation of a stockholders' committee.

There were about twenty-five holders of preferred stock at the meeting. Two or three large local stockholders not present had previously indicated their desire to co-operate.

Frank Hagerman has announced that he represents J. O. Armour, the largest stockholder and an unsecured creditor. He has so far taken no active part, as Mr. Armour's representative, in the court proceedings.

After the meeting on Nov. 26 there was casual conversation among stockholders, touching upon a possible means of regulating jitney service in Kansas City. A leading business man suggested that perhaps service might be suspended for a few days, in which period the inability of jitneys to maintain regular and continuous operation would be demonstrated. Legislation long desired might then be secured. The conversation was not a feature of the meeting.

Change Proposed in Reorganization Plan

Cash Needed to Pay Off Existing Loans of International Company at Buffalo and Make Good the Operating Deficit

Holders of the collateral trust 4 per cent gold bonds of the International Traction Company, Buffalo, N. Y., have received copies of a new plan for the reorganization of the corporation. The old plan was abandoned a month ago after an omission had been found in the notice to depositing bondholders. The protective committee of which Elliott C. McDougal, president of the Marine Trust Company, Buffalo, is chairman feels that in view of improved operating conditions it is warranted in recommending a plan which will permit the free distribution of a substantial amount of the railway company stock to those depositors who are not able or willing to contribute any part of the funds required.

IT IS pointed out that the "inherited hostile attitude of the public toward the corporation has been changed to one of favorable comment" and that in view of these facts the committee has reached the conclusion that the financial position of the railway company would be reasonably safe if enough cash were provided to pay off existing loans and make good the operating deficit, and if an amount of bonds sufficient to provide for necessary renewal and construction expenditures were set aside in the hands of the trustees.

"Some provision for new capital is essential at this time because of the inhibition contained in the supplemental indenture to the railway refunding and improvement 5 per cent mortgage which as a condition precedent to the issuance of additional bonds requires that the net earnings for a period of twelve consecutive months shall have equaled 7½ per cent of the total funded debt of the company," the notice to bondholders says. It adds that the present annual gross earnings of the company are approximately $11,000,000, but the net earnings for 1920 will not exceed the present fixed charges.

PLAN SUMMARIZED

The underwriters of the new plan now recommended have agreed to purchase at certain prices voting trust certificates for 94,487 shares of railway stock, par value, $9,448,700, and $2,000,000 in principal amount of railway 5 per cent bonds, less the amounts which the depositors elect to purchase in accordance with the offers made to them. There will be no underwriting commission on the bonds; the underwriting commission is 5 per cent upon the full purchase price for the voting trust certificates. The underwriting is conditioned upon the establishment of a voting trust for five years.

The plan of readjustment recommended by the committee is substantially as follows:

> The committee proposes to transfer and deliver to voting trustees all the stock of the International Railway, consisting of 167,075 shares, with power to vote the same for a term of five years, receiving in exchange therefor voting trust certificates issued under an appropriate voting trust agreement.
>
> It is proposed to distribute among the depositors pro rata and free of charge voting trust certificates for 72,588 shares of railway stock, representing four shares for each $1,000 traction bond deposited under the protective agreement. Depositors will be offered for each $1,000 traction bond deposited under the protective agreement the opportunity to purchase voting trust certificates for five shares of railway stock and $100 in principal amount of railway 5 per cent bonds, the price to be $100 plus accrued interest.
>
> Depositors also will be offered the opportunity to purchase the remainder of the voting trust certificates at the price of $10 per share and the remainder of the $2,000,000 in principal amount of railway 5 per cent bonds which have been underwritten at the price of 50 per cent of the principal plus accrued interest.
>
> The committee will allow depositors a reasonable time for making elections to purchase the voting trust certificates and bonds. The purchase price will be payable at the time of making the election to purchase and the voting trust certificates and bonds will be delivered as soon as practicable after payment of the purchase price.
>
> In addition the committee proposes to sell to the underwriters at the prices above stated the portions of the voting trust certificates for 94,487 shares of railway stock, and of the $2,000,000 in principal amount of railway 5 per cent bonds, which the depositors do not elect to purchase in accordance with the offers made to them under this reorganization plan.
>
> The committee proposes to transfer and deliver to the voting trustees $1,944,000 in principal amount of the railway 5 per cent bonds and $640,500 in principal amount of underlying 6 per cent bonds to be held in trust but with full power in the voting trustees to sell or otherwise use the bonds or any part of them and the proceeds thereof for the benefit of the railway company or the holders of the voting trust certificates for railway stock, as the voting trustees in their discretion may from time to time deem to be necessary or desirable, provided, however, that the interest payable on the bonds while held by the voting trustees is to be returned to the railway company. After disposing of the voting trust certificates and the bonds as provided in the reorganization plans and after paying and discharging its obligations and expenses, including the compensation of its members, the committee proposes to pay over to the railway company all cash and other property remaining in its hands.

Under this plan the protective committee says it will be able to pay its obligations and expenses and to make good the operating deficit of the railway, the voting trustees will be in a position to use the bonds set aside in their hands to meet future cash requirements of the railway and the depositor of each $1,000 traction bond will have an opportunity, by the payment of $100, to secure a par or principal amount of securities equal to the principal of his original investment, as follows: $400 railway stock distributed free; $500 railway stock and $100 railway 5 per cent bonds for $100 cash payment.

Chairman McDougal tells depositing bondholders that no promise can be made at this time of a return on the stock. The estimated gross earnings this year are $11,175,000; operating expenses and taxes, $9,525,000, and fixed charges $1,650,000.

If objections are not filed the committee expects to adopt the amendment and give notice to the depositors and thereafter proceed to carry out the plan as expeditiously as possible.

Members of the committee in addition to Chairman McDougal are Jacob Gould Schurman, Thomas DeWitt Cuyler, R. Walter Leigh and Thomas E. Mitten. A. F. Halsted, 62 Cedar Street, New York, is secretary of the committee. The Guaranty Trust Company, New York, is the depository.

P. R. T. Increase Disappointing

Mr. Mitten Appears to Be Vindicated by First Month's Result Under Commission Ruling

Thomas E. Mitten, president of the Philadelphia (Pa.) Rapid Transit Company, has reported to the Public Service Commission the results of the increase in fare in Philadelphia which became effective on Nov. 1. He has also taken up with the commission the need for the continuance of skip-stops.

Mr. Mitten says that the actual result of the new schedule closely approaches the flat rate of 5 cents per passenger asked previously by the company. He adds it is too early to say what effect the new fare has on short riding, but that it is evident the operating economies possible under the tariff formerly proposed are not obtainable under the plan which the commission ordered the company to adopt.

With regard to skip-stops Mr. Mitten intimates that he does not favor doing away with them entirely. He declares that skip-stops are the means of saving about $1,000,000 a year in operating costs. He wrote to the commission in effect that the economy of $1,000,000 worked by the skip-stop, if now dissipated, will decrease by $20,000,000 the amount of city subway and elevated investments upon which 5 per cent per annum can be paid by the operating company.

The sum of $429,742 of added passenger earnings was collected during the month on account of the increase in the rate of fare to 7 cents, with 4 tickets for 25 cents. This is shown in the following summary:

Passenger earnings same period last year	$3,019,977
Average increase ten months to Oct 31, 6.85 per cent	206,868
Estimate of earnings Nov., 1920, at former 5-cent fare	3,226,845
Increase attributable to higher fare, 14.23 per cent	429,742
Actual passenger earnings for Nov., 1920	$3,056,587

It is estimated that $2,562,736 of added passenger earnings would at this rate be collected for the period of six months from Nov. 1, 1920, to April 30, 1921. In regard to the valuation Mr. Mitten said:

> The valuation of the property of the Philadelphia Rapid Transit Company is progressing and when finally determined will be the basis of the fair return thereafter payable to the owners of the property. After this is done skip-stop and other economies will no longer be of financial advantage to the company, but will directly advantage the community served. The skip-stop economy of $1,000,000, if now dissipated, will decrease by $20,000,000 the amount of city subway and elevated investment upon which 5 per cent per annum can be paid by the operating company.

$32,083,389 Is St. Paul City Railway Value

This Figure Is Reported by Drum & Company, Valuation Experts, as the 1920 Reproduction Value Including Superseded Property

A. L. Drum & Company, consulting engineers, Chicago, reporting to Horace Lowry, president of the Twin City Rapid Transit Company, have found the value of the total property of the St. Paul (Minn.) City Railway to be $32,083,389 on the basis of cost to reproduce new as of Jan. 1, 1920, inventory and unit prices. A second figure submitted, based on the cost to reproduce new as of Jan. 1, 1916, using the inventory of Jan. 1, 1920, and average unit prices of labor, material, apparatus and equipment which prevailed during the five years from 1911 to 1915 inclusive, or the ten years from 1906 to 1915, inclusive, is $21,368,781. In either case the figures represent the minimum amount of capital that would have been required actually to reproduce the physical property as of Jan. 1, 1920, plus the capital invested in development.

THIS latter item is of particular interest. In discussing it, the report of the engineers goes on to state that in preparing the report and appraisal it became apparent that a large amount of capital had been invested in the development of the property during the early years which was superseded prior to the expiration of its useful life, owing to the development in the art of transportation, or to meet the demands of the public in bringing the property to its present state of efficiency.

A thorough investigation was made of such items of superseded property and those items were included only where it was apparent from records that such property was superseded or abandoned after a short period of operation, or that the net earnings of the company had not been sufficient to amortize the capital invested in superseded property.

The estimated cost of this property superseded by constant improvement, radical changes and unforeseen developments covers the replacement and supersession of such serviceable property as horse and cable lines superseded by electric traction, initial electric cars and power stations superseded by modern cars and modern power stations, and serviceable track removed and replaced on account of new paving ordered by the city.

In St. Paul the horse-car period began in 1872 and continued until 1890 and 1891, when all horse-car lines were replaced by initial electric traction lines. The horse-car system consisted of 49.02 miles of single track, twenty-three buildings and 118 horse cars.

The cable period began in 1887 and continued until 1893, when it was superseded by initial electric traction lines. The cable system consisted of 14.785 miles of cable railway, two power station developments and 104 cars.

The initial development of electric traction commenced in 1889 and the early experimental stages continued until about 1904. During this period the company made an extensive power station development at the Hill Street station, including the substations and electrical distribution lines connected therewith. At the same time, the report declares, all of the single-truck cars were replaced by modern double-truck cars, and 30.176 miles of track was removed and replaced before the expiration of its useful life on account of new paving ordered by the city.

STATEMENT OF VALUATION OF ST. PAUL CITY RAILWAY, EXCLUSIVE OF SOUTH ST. PAUL LINE OUTSIDE OF CITY LIMITS

Item	Cost to Reproduce New 1916	Cost to Reproduce New 1920	Per Cent Increase 1920 over 1916
Track	$3,333,977	$6,150,078	84.47
Bridges and subways	111,116	136,704	23.03
Tunnels	304,518	495,025	62.56
Paving	1,807,559	2,667,472	47.57
Electrical distribution system	1,330,895	2,132,022	60.19
Rolling stock	2,662,979	5,856,542	119.92
Substation equipment	408,331	625,280	53.13
Shop machinery and shop tools	497,188	848,822	70.73
Buildings	1,052,640	1,656,282	57.35
Furniture, fixtures and office equipment	61,863	88,032	42.30
Stores, floating tools and miscellaneous equipment	790,440	831,423	5.18
Miscellaneous items not included in inventory	127,105	127,105	00
Total exclusive of land	$12,488,611	$21,614,787	73.07
Administration, organization and legal expense	519,350	654,495	26.02
Taxes during construction	279,428	399,402	42.94
Interest during construction	1,509,312	2,494,348	65.26
Working capital	300,000	440,000	46.67
Total	$2,608,090	$3,988,245	52.92
Grand total, exclusive of land	$15,096,701	$25,603,032	69.59
Land	1,087,014	1,087,014	00
Grand total, including land	$16,183,715	$26,690,045	64.92

VALUE OF SUPERSEDED PROPERTY

The figures included in the valuation for the value of such superseded property was itemized as follows: For horse-car lines, $1,384,778; for cable lines, $1,564,808; for initial electrical development, $1,242,677, and for track reconstruction destroyed and replaced owing to new paving laid by the city, $648,275; making a total of $4,840,538. This item, termed in the engineer's report as the "capital invested in the development of the property," takes the place, presumably, of an entry for "going concern value," for no item of value under this head is included.

The principal property of the St. Paul City Railways as of Jan. 1, 1920, is shown to consist of 168.37 miles of single track; 367 passenger cars; 38 miscellaneous service cars; four substations containing conversion apparatus having an aggregate rated capacity of 20,400 kw., all primary power being furnished by the Minneapolis Street Railway from its main station located in Minneapolis; car houses, office, shops, and miscellaneous buildings.

A comparison of the cost of reproduction new on the bases employed in the work is contained in the accompanying table, in which the various main elements of the property are itemized. To the value as shown in this table, which cover the property within the city limits of St. Paul only, should be added the sum of $344,528 and $552,805 for 1916 and 1920, respectively, to obtain the total property value figures quoted in the first paragraph, these amounts covering the value of the property outside the St. Paul city limits. The main item of this property outside the city limits consists of 8.29 miles of single track, with overhead trolley, feeder wires, etc.

In commenting on the condition of the property, the report states that it "has been carefully and properly maintained and is in an efficient operating condition, capable of supplying all the present demands of reasonable service to the public in the territory, and therefore the cost to reproduce new represents the actual value of the physical property, as a similar property could not be reproduced at a less amount."

The report includes figures to show the depreciated present value, defining the deductions as representing the amount of existing depreciation due to wear or mechanical deterioration ascertained by field inspection and measurement. The cost to reproduce new less depreciation as thus defined, for the total property and comparable with the total value figures given in the first paragraph, are estimated to be $20,479,437 as of Jan. 1, 1916, and $30,547,539 as of Jan. 1, 1920.

Shore Line Near New Haven to Be Restored

Louis I. Levinson of the U. S. Wrecking Company, who some time ago purchased a part of the Shore Line Electric Railway, is proceeding with plans looking toward the preservation of the line as an operating unit for the benefit of residents of the territory affected by the discontinuance of service. His purpose, as reported now, is to form a company with a capitalization of $600,000 of bonds and an equal amount of stock and to issue ten shares of stock as a bonus with each $1,000 of bonds subscribed. The bonds would be secured by a first mortgage on the property. They would bear interest at 7 per cent. The trustee of the issue will be the Merchants' National Bank, New Haven.

Mr. Levinson, it is reported, paid $570,000 for the road, but it is said will receive only $540,000 for his interest, the difference between that amount and the total sum realized from the sale of the $600,000 of bonds being used to provide working capital. Mr. Levinson has already made a profit by selling the rails from the Stony Creek branch and those east of Saybrook. He will turn over to the new owners all the equipment, including power houses, substations, etc. It is said that pledges of subscriptions have already been made sufficient to insure the success of the new plan.

I. R. T.'s October Deficit Higher Than in 1919

For the month of October, 1920, the Interborough Rapid Transit Company, New York, N. Y., shows a deficit in its net corporate income of $407,792 against a deficit of $218,762 for the corresponding month of 1919. For the past three months now the Interborough has been consistently decreasing its deficit, having lost about $600,000 in August and $500,000 in September. For the four months ended Oct. 31, 1920, the net income is a deficit of $2,119,927 against a deficit of $1,742,969 for the same period of last year. In October, 1920, the number of revenue passengers carried increased more than 9,000,000 over the same month in 1919 and for the four months ended October, 1920, the passengers carried increased about 37,000,000, or 13.3 per cent, over the similar period of 1919. The operating ratio for the month was 67.44 per cent, while for the four months it was 67.97 per cent.

SUMMARY OF EARNINGS OF INTERBOROUGH RAPID TRANSIT COMPANY

Month Ended Oct. 31:	1920	1919	Percentage Change Over 1919
Gross operating revenue	$4,733,162	$4,280,838	10.6
Operating expenses	3,191,896	2,668,307	19.6
Net operating revenue	$1,541,266	$1,612,530	— 4.4
Total taxes	220,088	216,401	1.7
Income from operation	$1,321,178	$1,396,129	— 5.4
Non-operating income	49,766	40,130	24.0
Gross income	1,370,964	1,436,259	— 4.5
Interest, rentals, etc., including Manhattan guarantee	1,778,757	1,655,022	7.5
Net corporate income (exclusive of accruals under the provisions of Contract No. 3 and related certificates which under these agreements with the City are payable from future earnings)	*$407,792	*$218,762	—86.8
Operating ratio (per cent)	67.44	62.33	5.11
Passengers carried (revenue)	88,354,850	79,307,822	11.4

Four Months Ended Oct. 31, 1920:	1920	1919	Percentage Change Over 1919
Gross operating revenue	$17,175,735	$15,245,108	12.7
Operating expenses	11,673,984	9,699,512	20.3
Net operating revenue	$5,501,751	$5,545,595	— 0.8
Total taxes	873,219	857,010	1.9
Income from operation	$4,628,531	$4,688,585	— 1.3
Non-operating income	207,929	175,076	18.8
Gross income	$4,836,461	$4,863,661	— 0.6
Interest, rentals, etc., including Manhattan guarantee	6,956,388	6,606,631	5.3
Net corporate income (exclusive of accruals under the provisions of Contract No. 3 and related certificates which under these agreements with the City are payable from future earnings)	*$2,119,927	*$1,742,969	—21.8
Operating ratio (per cent)	67.97	63.62	4.35
Passengers carried (revenue)	319,606,420	282,186,716	13.3

* Deficit.

Financial News Notes

Abandonment at San Diego Approved.—The California Railroad Commission has issued a ruling permitting the San Diego Electric Railway to discontinue the line that extends from First and Washington Streets to Fifth and Spruce Streets. The company showed that the entire system was operated at a loss of $54,420 from January to September, 1920. The company was granted permission to tear up the tracks on the abandoned line.

Issue of Funds for Improvements Approved.—The department of Public Utilities of Massachusetts has approved of use by the Eastern Massachusetts Street Railway, Boston, Mass., of proceeds of the sale of $2,000,000 of serial bonds for additions to the property, amounting to $574,375. The improvements include fifty one-man cars at cost of $337,500 and purchase of equity in machinery of the Quincy Point Company's power house at a cost of $115,000.

Railway Acquires Power Company.—George Kidd, general manager of the British Columbia Electric Railway, announced at Vancouver, B. C., on Dec. 3 that all arrangements had been completed for the formal taking over of the Western Canada Power Company in New York on Dec. 23 by an issue of debentures guaranteed by the railway amounting to between $7,000,000 and $8,000,000. The present directors of the power company will resign and be replaced by administrative officers of the British Columbia Electric Railway.

New Jersey Valuation Nearing Completion.—Ford, Bacon & Davis, New York, N. Y., who are appraising the property of the Public Service Railway in New Jersey, expect to have the work completed inside of six months, according to the report of the special valuation commission, consisting of State Treasurer William T. Read and State Comptroller Newton A. K. Bugbee. The appraisers are gathering data on which to place a valuation for use by the Board of Public Utility Commissioners in making permanent rates to be charged by the railway throughout the State. The State appropriated $100,000 under the provisions of an act which has been summarized previously in the ELECTRIC RAILWAY JOURNAL.

Special Master at Kansas City.—John Kennish, who served four years on the Public Service Commission of Missouri, and was reappointed three months ago, has been made master in chancery in Kansas City (Mo.) Railways receivership matters. Judge Kennish, immediately upon the appointment on Nov. 29, resigned from the State Commission, and on Dec. 1 qualified as master. Judge Kimbrough Stone of the federal court, under whom the receivership is being conducted, had intimated that he might appoint a master to relieve him of the burden of hearing evidence in case controversies should become voluminous. Judge Kennish has maintained his prvate law office in Kansas Cty for several years. The master notified parties at interest to appear on Dec. 9, to arrange for a hearing, particularly regarding petitions that the properties be sold.

Receiver Named for Cincinnati-Dayton Line.—George P. Sohngen, president of the Hamilton Dime Savings Bank, Hamilton, Ohio, has been appointed receiver of the Cincinnati & Dayton Traction Company by Judge Clarence Murphy. The original action was started by the Citizens' Savings Bank & Trust Company, Cleveland, Ohio. Argument was heard last July. In September the court rendered a decision on some of the points in dispute, but held in obeyance the naming of a receiver. Meanwhile Judge Murphy has been considering other questions establishing the rights of holders under various liens. On these matters he has ruled as follows: The property purchased for private right-of-way between Cincinnati and Dayton is covered by mortgages on the original right of way; the second track on Central Avenue, Court Street and North B Street, Hamilton, comes under the mortgages; the mortgagees can have personal judgment against the Cincinnati, Dayton & Toledo Traction Company; the transmission lines are a part of the power house and are not covered by the mortgages.

Traffic and Transportation

Eight Cents Enough

Special Masters Recommend Increased Fare for Des Moines City Railway—Want Service Improved

John A. Guiher, Paul Beer and E. D. Perry, special masters in chancery appointed by Federal Judge Martin J. Wade to investigate the condition of the Des Moines (Iowa) City Railway, have filed a report suggesting that fares be advanced to 8 cents for adults and to 4 cents or seven tickets for a quarter for school children. They also recommend that in the event the 8-cent fare is granted that a 40 per cent increase in service for eighteen hours daily be put into effect by the railway. A 6-cent fare is now charged.

In their report the masters say:

> From our examination we find and believe that an 8-cent fare for adults and a 4-cent fare, or eight tickets for a quarter, for school children and high school pupils will be required to furnish the necessary revenue to pay the operating expenses, fixed charges, interest and taxes with a 40 per cent increase over the present service, and we recommend the establishment of fares with increase in service in accordance with said finding.
>
> Our estimate shows a surplus of $61,460, which in our judgment is none too wide a margin for meeting emergencies.

SERVICE IMPROVEMENT URGED

In presenting their report the masters also drew certain conclusions which resulted from their investigation. These findings are as follows:

> The standard of service now given is fully 30 per cent below that furnished in 1914.
>
> A reduction in service has been necessary because the receipts of the company would not cover the cost of operating on the old schedule.
>
> The cost of labor has increased from 107 to 149 per cent over what it was in 1916 and the cost of fuel has increased 146 per cent. As these are the principal items in the cost of operating the system they are the principal factors in determining the costs.

The masters state further that the company should have greater support from the people of Des Moines because it is a public utility dependent entirely upon and responsible to the public, and that the management of the railway both under its own officers and under the receivers has been efficient.

The masters arrived at the surplus of $6,460 accruing from the fares they suggest by computing the number of passengers who have ridden the cars while the system has been operating under direction of the court and also for several years previous to that time. They estimate that 35,429,335 adult passengers will produce a revenue of $2,834,346 and that the 4-cent fare for children will give an additional revenue of $50,863. Allowing for $14,276 derived from children's tickets sold seven for 25 cents this would make a total revenue of $2,834,486, from which must come all the costs of operation without any provision for profits.

Attorneys for the company contended that the costs of operation had increased from 100 to 150 per cent in the past few years while the revenues of the company had increased approximately 40 per cent. The company further introduced evidence to show that it could not increase service without a material increase in fares and that it had already used both additional capital and absorbed surplus in meeting operating expenses.

CITY ASKS NICKEL RATE

H. W. Byers, attorney for the city, centered his fight against a further increase upon the premise that by reducing service the company had decreased its revenues and that if a material increase in service were brought about that it would provide sufficient revenues. Mr. Byers contended that a 5-cent fare would produce ample revenue if service were furnished in accordance with traffic needs. He denied the company's claims that there had been an increase in operating costs sufficient to warrant an 8-cent fare and further claimed that the franchise contract which provided for a 5-cent fare for a period of twenty-five years was still valid.

It is expected that Judge Wade will make a ruling on the masters' recommendations at once. In the meantime the City Council has authorized the appointment of a board of auditors to go over the books of the company to check the appraisal recently made.

Commission Invites Public's Suggestions

The Public Utilities Commission of Idaho has just issued an order requiring every public utility operating in the state of Idaho to post in each of its main and branch offices, waiting rooms, sales or show rooms, etc., in a place "most likely to meet the notice of its patrons or the public," notices, to be furnished by the commission, upon request, reading as follows:

> NOTICE TO THE PUBLIC
>
> The Public Utilities Commission has jurisdiction over:
>
> 1. Boat
> 2. Electric Power
> 3. Express
> 4. Gas
> 5. Railroad
> 6. Sleeping Car
> 7. Street Railroad
> 8. Telegraph
> 9. Telephone
> 10. Water
> 11. Warehouse
> 12. Wharf
>
> RATES—SERVICE—REGULATIONS
>
> (except those of cities and villages, and mutual companies).
>
> If you have any question, complaint or suggestion as to any rate or fare charged, or as to the kind or adequacy of any service furnished, or as to the scope or effect of any regulation or rule, please inform the commission.
>
> We can help you only when we know your needs.
>
> Address, phone or call on
> PUBLIC UTILITIES COMMISSION.
> Boise, Idaho.

Fare Increase Waived

Minneapolis Street Railway Voluntarily Defers Charging 7 Cents—Ninety-two More Cars in Service

There will be no increase in fare in the immediate future on the electric railway lines of Minneapolis, Minn. The Minneapolis Street Railway, a subsidiary of the Twin City Rapid Transit Company, will continue to operate for the present at least at a 6-cent fare. This is in spite of the fact that the company has been authorized by the municipal authorities to charge a 7-cent cash fare with four tickets for a quarter, beginning Dec. 15.

RAILWAY ACTS VOLUNTARILY

The management's action in waiving the fare increase was entirely voluntary. It resulted from the fact that the company has not yet been able to place in service the full number of cars called for by the terms of the agreement with the city for a higher fare. In a letter to the City Council, Horace Lowry, president of the company, declares that the fare will not be raised "until such time as increased service and resulting increased expenses justify us in so doing." Meanwhile Mr. Lowry proposes to retain the skip-stop in the interest of both the public and the railway.

In his letter to the Council Mr. Lowry points out that on Aug. 16 last, when the 6-cent fare took effect, the company operated a maximum of 417 cars on its Minneapolis lines. On Nov. 26, during the same hours, it operated 509 cars, an increase of ninety-two. Mr. Lowry's letter follows in part.

> Pursuant to the terms of an ordinance of the city of Minneapolis, duly adopted by your honorable body on the sixth day of August, 1920, this company was authorized to increase its street car fare to a 7-cent cash fare with four tickets for 25 cents. Under this ordinance, on the sixteenth day of August, 1920, this company put into effect a 6-cent fare, fully expecting to increase the fare on Dec. 15 to the 7-cent cash fare with four rides for 25 cents, as provided in the ordinance.
>
> MORE CARS IN SERVICE
>
> Because of the fact that we have as yet been physically unable to put in service the full number of cars finally contemplated by the ordinance, we are of the opinion that we should not ask the car riders of this city to pay the 7-cent cash fare on Dec. 15, and we now advise your honorable body that, if agreeable to your wishes and without surrendering any of our rights under said ordiance, we will not further increase the fare until such time as increased service and resulting increased expenses justify us in so doing.
>
> For your information we beg to state that on the sixteenth day of August, 1920, during the rush hours, we operated 417 cars in this city, and on the twenty-sixth day of November, during the same hours, we operated 509 cars, an increase of 92 cars.
>
> WILL RETAIN SKIP STOP
>
> We wish to take this opportunity of advising you that the continuance of the skip stop is of great assistance, as it enables the company to render much better service to the traveling public with the number of cars operated than if it was discontinued. The car riding public of this city is vitally interested in service and fare, and the skip stop has a very important bearing on both.

The fare ordinance was passed by the City Council on Aug. 9 to enable the company to meet the demand of its employees for higher wages. They had threatened to strike on Aug. 14.

Dime Fare Asked in Jersey

Public Service Railway Loses $1,200,000 in Year Under 7-Cent Rate—System Faces Disintegration Unless Relief is Granted

The Public Service Railway of New Jersey on Dec. 7 filed with the State Board of Public Utility Commissioners a notice of its intention to charge a 10-cent flat fare with free transfers, beginning Jan. 1 next. The board immediately suspended the new rate pending determination by the courts of the board's legal status. The application for a 10-cent fare came exactly one year after the abandonment of the zone fare system, and the introduction of a 7-cent rate with 1 cent for a transfer. Thomas N. McCarter, president of the railway, in a letter to the board, stated that the 7-cent fare had failed. It has provided no depreciation fund whatsoever, and in addition has resulted in an operating deficit of $400,000, making a total deficit for the year of approximately $1,200,000. The total operating deficit of the railway for the past three years now amounts to $3,600,000.

MR. McCARTER notified the board that "nothing will save the property except a 10-cent fare." He stated that the system must either be saved for the use of the people of the state promptly, or it will disintegrate, if, in fact, it continues to operate." He declared that the Public Service Corporation, the owners of the railway's stock, cannot make further advances.

Mr. McCarter declared that when the zone system was abandoned it was thought that the 7-cent fare would keep the company going, although without return upon its capital stock, until such time as the valuation of the property of the company, then in process of being made by the utility board, should bo completed, which it was thought would be within a few months. Since the passage by the Legislature of the act providing for a valuation of the company's properties by independent engineers the board has suspended further hearings in the valuation inquiry which it was conducting. The valuation by the engineers is now nearing completion.

INCOME STATEMENT—PUBLIC SERVICE RAILWAY

Account for Years 1917, 1918 and 1919 and Year 1920 with November and December Estimated, and Estimate for 1921 on 10-Cent Fare Basis

	1917 Actual	1918 Actual	1919 Actual	1920 Two Months Estimated	1921 Estimated 10c. Basis
Revenue from transportation	$17,970,893	$19,154,097	$22,384,870	$26,006,909	$30,427,162
Revenue from other railway operations	460,262	506,633	536,519	592,042	592,000
Total railway operating revenues	$18,431,155	$19,660,730	$22,921,389	$26,598,952	$31,019,162
Railway operating revenue deductions	12,551,340	14,857,379	18,590,941	22,080,449	24,876,976
Railway operating income	$5,879,814	$4,803,350	$4,330,448	$4,518,502	$6,142,186
Auxiliary operations—Income	11,517	9,408	6,655	7,626	6,000
Total operating income	$5,891,331	$4,812,759	$4,337,103	$4,526,129	$6,148,186
Non-operating income	217,687	184,254	186,559	205,731	184,734
Gross income	$6,109,019	$4,997,014	$4,523,663	$4,731,861	$6,332,920
Total income deductions	4,972,063	5,001,836	5,145,832	5,165,369	5,237,731
Net income	$1,136,956	*$4,822	*$622,168	*$433,508	$1,095,189

* Deficits.

After declaring that the company faces a total operating deficit of $1,200,000 for the present year, Mr. McCarter continued:

> This deficit has come about by further increased costs of labor and materials over and above the amount estimated a year ago.
>
> These increased costs are represented by the amount of the deficit, which would have been very much greater had it not been for the receipt by the company of a larger increased revenue than was estimated a year ago.
>
> This deficit of $1,200,000 for the year comes on top of similiar deficits for the previous two years, which have resulted in a total deficit in operating and depreciation amounts of approximately $3,600,000 for the past three years.
>
> This is a situation that cannot continue any longer. This property must either be saved for the use of the people of the state promptly, or it will disintegrate, if, in fact, it continues to operate. The Public Service Corporation, the owner of its stock, and its financial backers, cannot and will not increase its burdens by further advances.
>
> DIME FARE ONLY REMEDY
>
> A very careful study of the remedy for the situation has been made and it is perfectly plain that while the present condition of operating cost and unregulated and unfair competition exists, nothing will save the property except a 10-cent fare. This lesson has already been learned in many cities of the country. * * *
>
> But whatever the facts may be in other places, the necessity here is perfectly plain. The best estimate that we can make of what the rate will do for the next fiscal year is, that it will enable the company to pay its present operating expenses, its fixed charges, set apart a proper amount for current depreciation, make up its operating deficit, and one-third of its past deficit in the depreciation allowed by the board, so that after three years the depreciation loss of the last three years will have been recouped.
>
> The railway company has also been obliged, during the last three years, to provide additional moneys for absolutely necessary capital expenditures, thus adding to the plight in which it finds itself. It can, however, borrow no more and no further capital expenditures can be made until the situation is relieved, whatever their necessity.

Steadily increasing jitney competition is largely responsible for the railway's present plight. Several months ago the railway instituted court action against many bus operators and a number of municipalities alleged to be unlawfully competing with it. It is reported that a bill will be introduced at the coming legislative session to place the buses under state control.

Meanwhile the situation has been complicated by the action of Governor Edwards in removing from office the members of the Board of Public Utility Commissioners. Governor Edwards has named a new board, but as yet his appointees have not been confirmed by the State Senate. Attorney-General McCran has begun quo warranto proceedings to determine the present status of the "ousted" commissioners, who contend that the Governor has no power to remove them. Pending a ruling by the Supreme Court the old board declines to act.

Lines on Warrant Basis

Seattle City Council Refuses to Grant Municipal Railway an Immediate Increase in Fare

Efforts to make effective immediately an increase of rates on the Seattle (Wash.) Municipal Railway proved unsuccessful for the second time when the City Council at a special session on Dec. 3 refused to pass in emergency form the Thomson ordinance establishing a token fare of 8⅓ cents with the privilege of transfers. With three Councilmen standing firmly against the proposed advance in rates, the bill lacked the seven votes which were required for its passage as emergency legislation.

Councilmen were unable to predict at the conclusion of the meeting on Dec. 3 the procedure that will be followed. After its rejection in committee of the whole, the bill was referred back to the Council with the recommendation that it be sent back to the city utilities committee, from which it had been taken for consideration in committee of the whole. The consensus of opinion at present seems to be that for a time at least no further effort will be made to adopt the ordinance in emergency form.

CITY TREASURER TAKES ACTION

Adding another complication to the situation, E. L. Terry, City Treasurer, announced immediately after the Council session that the city railway fund would be placed on a warrant basis on Dec. 10. He had previously notified the Council that the fund would go on the warrant basis on Dec. 24 because of the heavy overdraft. Upon learning that the fare increase bill had been rejected, Mr. Terry revised his plan and advanced the date two weeks.

Reluctance on the part of the supporters of the bill to enact the ordinance without an emergency clause attached is due to the fact that in that form the provisions of the bill would not become effective until thirty days after approval of the measure by the Mayor. During that time, it is claimed, speculators would attempt to corner the available supply of metal tokens at the present rate of 6¼ cents.

Another reason for the hesitation in passing the ordinance in the usual form is understood to be fear that the measure might be forced to submission as a referendum measure An emergency ordinance is not subject to referendum, but an ordinance in the regular thirty-day form must be submitted to the people for approval or rejection upon petition of a certain number of qualified voters equal to 10 per cent of the vote cast for Mayor at the preceding municipal election.

If a referendum should be invoked, enforcement of the ordinance would be held up until the question is settled at the polls either at the election next March or a special election at an earlier date. Certain city officials doubt as to whether the measure would carry if submitted to popular vote.

Stage Lines Increase Fares

Increased fares on three Southern California stage lines were announced by the State Railroad Commission on Nov. 17. This was in response to recent blanket applications of the Pickwick Stages, Inc., operating between Los Angeles, San Diego and Imperial Valley; United Stages, Inc., running between Los Angeles and Santa Barbara, and also to San Diego and Imperial Valley, and the White Star Auto Stages, operating between San Diego and El Centro. This subject was reviewed in the ELECTRIC RAILWAY JOURNAL for July 31, page 248, and Sept. 25, page 622.

While the commission's report indicated an average increase in fares of approximately 15 per cent, the management of the affiliated auto stage lines stated that the order of the commission would serve to give in certain cases a maximum increase of only 10 per cent and in other cases an even lower rate than now applying.

The most important feature of the order appears to be the fact that for the first time auto bus stage fares in Southern California are now standardized and inequalities previously existing between different communities are removed. The three companies affected operate a total of more than 600 miles of auto stage lines.

Franchise Restrictions Overruled

The Public Service Commission for the Second District of New York has issued a ruling to the effect that it is empowered to regulate fares on the Troy lines of the United Traction Company, Albany. The company is now seeking a 10-cent fare on all its lines, the present fare being 7 cents. The city of Troy has contended that in view of franchise provisions limiting the rate of fare on the Troy lines to 5 cents the commission has no power to raise the rate. On two occasions the city waived its franchise rights on the ground that the situation necessitated a temporary increase. As a result of this action the company raised its fares from 5 to 6 cents and later from 6 to 7 cents.

When a 10-cent fare was sought the Common Council refused to waive the franchise restrictions, instructing the corporation counsel to oppose the railway's petition. The commission has sustained an objection of the city of Rensselaer to the power of the commission to increase rates in that city.

Seven-Cent Fare Asked in Birmingham

Combined Railway and Light Properties Have Earned Slightly Less Than Bond Interest and Sinking Funds

Claiming that the railway department yielded a return of only 1.9 per cent upon its book value and of only 3.3 per cent upon its taxable value, the Birmingham Railway, Light & Power Company, Birmingham, Ala., filed a petition for the right to increase its fares from 6 cents to 7 cents before the Alabama Public Service Commission on Dec. 1. Judge William I. Grubb of the United States Court, now holding court in New York, granted permission to Receiver Lee C. Bradley to ask a 7-cent fare of the Public Service Commission, in a formal order issued at New York on Nov. 29.

IN his application made to Judge Grubb for permission to file his petition with the Alabama Public Service Commission Receiver Bradley has made a detailed report on certain phases of the company's finances and operating expenses. He declares that the combined properties have earned slightly less than bond interest and sinking funds during the receivership. The railway department, he states, is chiefly responsible for the deficit.

CASH DEFICIT OF $1,435,101

The condition of the receiver's estate on Nov. 1 showed a cash deficit of $1,435,101. This does not include $179,203 advanced by the city for the new track and paving on Tuscaloosa Avenue; or about $210,000 advanced by Sloss-Sheffield Steel & Iron Company for the construction of the new by-products gas main; or $49,518 advanced by electric consumers for extension to be repaid from future earnings. They are, however, all obligations of the receiver.

The only obligations resting upon the estate of either company which have been actually paid by the receiver, with the exception of $67,029 of preferred operating accounts incurred shortly prior to receivership and wages and salaries of employees then accrued, have been the interest and sinking funds on the mortgage bonds. The combined properties have earned slightly less than bond interest and sinking funds during the receivership.

The railway department is chiefly responsible for the deficit as shown on the receiver's cash statement. Up to Sept. 4, 1919, this department operated with a 5-cent fare. On that date a 6-cent fare became effective.

BIG ADVANCE IN WAGES

On Sept. 1, 1919, a very large increase in the wage scale of trainmen and shopmen became effective by virtue of a contract between the receiver and the Amalgamated Association. The term of this contract is three years and the wage scale is uniform throughout the term. The increase in wages to trainmen and shopmen was immediately followed by a corresponding increase in the wages of practically all other employees. These increases, in the opinion of the receiver, must remain in effect for a considerable time. They more than absorbed the increased revenue resulting from the 6-cent fare.

For the period of one year, beginning Nov. 1, 1919, and ending Oct. 31, 1920, the operation of the railway department resulted as follows:

Gross revenue		$3,012,263
Operating expenses	$2,279,106	
Taxes and license (50 per cent of total)	184,247	
Renewal and replacement reserve (50 per cent of total)	230,157	
*Tidewater rental	75,000	
*Tidewater operating deficit for the period	7,555	2,776,066
Net operating income		$236,196

*Interest on the Tidewater bond is in its practical effect a rental, and it is so treated in the operating statement shown.

Only 50 per cent of the total taxes, license and renewal and replacement reserve is allocated to the railway department, although both the book value and the state tax assessment show a somewhat higher percentage of the entire property in the public service invested in the railway department.

NET OPERATING INCOME $807,465

The net operating income of the entire property for the year was $807,465, which is an annual return at the rate of 7 per cent on a total value of only $11,535,200. The book value of the entire property of the company is $24,090,421. The total net operating income for the year yielded a return on the total book value of only 3.3 per cent. Assuming the railway to represent one-half of the total investment, the net operating income from the railway department yielded a return of only 1.9 per cent on its book value and of only 3.3 per cent on its taxable value.

The only relief in the way of rates which the receiver has realized has been the increase of 1 cent in the railway fare, producing an increase in total gross revenue of approximately 7½ per cent, but material improvements have been made in the service and in the physical condition of the property.

These are all facts recited by Mr. Bradley, the receiver, in his appeal to the court. This appeal Mr. Bradley concluded as follows:

> Immediate relief by increase of income is imperative. It is obvious that this relief should come through the railway department. It is not, however, the purpose of the receiver at this time to present the question of a permanent valuation or fair return thereon.
>
> Your receiver is advised that the Alabama Public Service Commission is now clothed with plenary power to fix rates and fares.
>
> Wherefore, your receiver prays that he may be authorized to apply to the Alabama Public Service Commission for a railway fare of 7 cents, applicable to each of the fare zones, with such modifications and exceptions as may be deemed necessary, and that the receiver shall put into effect such increased fares as the Alabama Public Service Commission may order.

The matter was taken up promptly with the City Commission by Mr. Bradley and J. S. Pevear, general manager. Following the announcement of Judge Grubb's order and the formal application to the Alabama Public Service Commission conferences were held by the City Commission. It is probable that within a few days resolutions will be adopted by the City Commission declining to agree to any raise in present rates and holding that a 6-cent car fare is adequate. It is contended by members of the City Commission that prices are coming down and that as prices of materials and labor drop still further a 6-cent fare will yield an adequate return. Just what effect the present petition will have upon the reorganization plan upon which the City Commission and officials of the company have been at work has not been stated by either side since the issuance of the court order.

Service Record in Fort Wayne

Sixty-one new cars have been placed in service on the city lines of Fort Wayne, Ind., during the past three years, according to a recent statement of Robert M. Feustel, president of the Indiana Service Corporation, formerly the Fort Wayne & Northern Indiana Traction Company. Ten of the cars are of the light-weight double-truck variety and fifty-one are of the one-man safety type. The total cost of this equipment was $380,000.

Mr. Feustel called attention to the fact that while many companies were cutting expenditures the Fort Wayne system increased the total number of cars in service by fifteen. In 1917 the railway operated thirty-four cars on the base schedule and forty-six in rush hours. Eighteen of the near-side cars were used, the remainder being side bench, closed cars. The one-man car was in its earliest stages of development at that time and more equipment was urgently needed in Fort Wayne. Ten modern light-weight double-truck cars were therefore purchased by the company at that time for $7,500 each.

More cars were needed, and men were becoming scarce. The first order for sixteen one-man safety cars was at a price of $5,100 each. A year later thirty-five such cars were purchased for $6,400 each. In the spring of this year the railway asked for bids on twenty-five additional cars, and the price had jumped to $9,400 each. This was $1,900 a car more than was paid for double-truck cars in 1917. Because of insufficient revenues the company was unable to purchase this additional equipment.

Mr. Feustel, in summing up the situation, referred to the railway's inability to purchase additional equipment at this time. He outlined the company's plans as follows:

> We could not stand the $9,400 price and consequently the use of the old cars for industrial trippers and of every new car, both double-truck and one-man, and rebuilt near-side cars in regular service, is our plan for this winter. That is why we know that the service will be right.

Losing $2,000 a Day

New York State Railways Asks Commission for 10-Cent Fare in Syracuse—Service Cut

Unable to secure financial relief from the city authorities of Syracuse, N. Y., the New York State Railways has appealed to the Public Service Commission for the Second District for authority to charge a fare of at least 10 cents on Syracuse lines. This action follows the rejection by the Syracuse Common Council of a proposition for a service-at-cost franchise. The flexible-fare plan was turned down by the Council on Nov. 30, as announced in the issue of Dec. 4, page 1162. The present fare in Syracuse is 6 cents.

CITY PROTESTS SERVICE CUT

Corporation Counsel E. H. Lewis has filed with the commission a complaint against the curtailment of service by the railway. Immediately following the rejection of the service-at-cost plant B. E. Tilton, vice-president of the railway, announced a drastic cut in service and the elimination of all but a few "owl" cars. The city's complaint alleges that the company has put into operation a schedule which reduces car service 21 per cent.

In its petition the company states that the maximum rates now charged on its Syracuse lines are insufficient to yield a reasonable return and are unjustly and unreasonably low. It refers to the appointment of a commission by Mayor Farmer for the purpose of investigating and reporting upon the local railway situation. This commission made a unanimous report to the Mayor on Sept. 17, but the Common Council has refused to accept the recommendations.

The company further states that an arbitration board on July 1 granted its employees an increase in wages of 33⅓ per cent, retroactive to May 1. It is alleged that since the award was made the company "is losing upward of $2,000 per day in an effort to furnish adequate service at the present rate of fare." It is contended that if the present rate of fare and present wage scale were applicable throughout the year 1920 the operating loss alone to the railway would be $112,134, this being without any allowance whatever for return upon the value of the property, surplus or contingencies.

DIFFER ON VALUATION

During the past few years several independent valuations of the Syracuse lines have been made. The report of McClellan & Campion, employed by the company, shows the following value of the property used in the public service in the Syracuse district on June 30, 1920: Based on present-day prices, $21,012,201; based on average prices, 1915 to 1919, $16,663,300; based on pre-war prices, $12,006,134. The report of Ford, Bacon & Davis, employed by the city, shows the fair value on June 30 last to be $12,415,000. For the year ended Dec. 30, 1919, the company received a return of only $1,694,681, and for the first eight months of 1920 of $608,833, although the full wage increase was not included in the costs of operation for that period.

Taken in conjunction with the increase in wages a 10-cent fare is expected to yield a fair return on a valuation of $12,732,655.

Milwaukee Prepares for Increased Service

Deliveries of the 100 new cars which the Wisconsin Railroad Commission on Oct. 30, 1919, ordered the Milwaukee Electric Railway & Light Company to place in service by Nov. 1, 1920, will probably be started next February, according to a letter to the commission from John I. Beggs, president of the company. Mr. Beggs declared that the charges recently made by Commissioner John S. Allen of the Wisconsin Commission that the Milwaukee Electric Railway & Light Company had "flagrantly disobeyed" the commission's order for new cars were unjustified. He points out that labor troubles and other causes beyond the control of the company had seriously retarded the delivery of the cars. The cars are to be double-truck, light-weight cars designed for either one-man or two-man operation.

The Milwaukee Electric Railway & Light Company, according to Mr. Beggs, will be in a much better condition than ever before to take care of the coming holiday travel. It is now operating 587 cars, and expects to have twenty-four more, largely from Racine and Kenosha, where safety car operation was recently instituted. In addition there have been added 648 more seats—the equivalent of sixteen cars—by remodeling equipment in use. For the first time in several years also the company is able to operate with a full force of men. It will have at congested corners a large number of front-end collectors to facilitate the loading and movement of cars, especially in rush hours.

Utah Interurban Asks Increase

An application for increased passenger fares has been filed with the Public Utilities Commission of Utah by the Salt Lake & Utah Railroad, an electric interurban road running between Salt Lake City and Payson, Utah. It is claimed by the company that for an electric railroad to charge lower rates than a steam railroad on passenger traffic between the same points is in violation of the state public utilities act. The company asserts in its petition that, while the rates it asks would not equal those now charged by the Denver & Rio Grande and the Salt Lake Route, the increases sought would minimize the discrepancy.

The company is asking for a one-way rate of 3.60 cents a mile; for a round trip rate of 3.42 cents; for commutation tickets at the rate of 2.64 cents; for school tickets at the rate of 1.70 cents; for 1,000-mile mileage books at the rate of 2.70 cents, and for 500-mile mileage books at the rate of 3 cents.

In petitioning for the increased rates the company asserts that in spite of some increases already permitted by the commission, the railway finds itself with insufficient revenue; that the increases asked would still give a return to the company less than it claims is a fair return, but would afford substantial relief; that the one-way fares have never been increased by the commission, and that its passenger traffic is not bearing a fair proportion of the cost of the service to the public.

After the Auto Driver

National Safety Council Hopes to Teach Motor Vehicle Operators the Need of Exercising Caution

The 8,000 industrial organizations, trade associations and governmental agencies comprising the National Safety Council have just undertaken the biggest job attempted by the council during the eight years of its existence—to teach the fundamentals of safe driving and motor vehicle maintenance to every motor truck and passenger car driver employed in industry, whether or not his employer is a member of the council. The purpose of the undertaking is threefold:

1. To reduce so far as possible the number of fatalities resulting from automobile accidents, these now approximate 15,000 a year. One person is killed by an automobile every thirty-five minutes.
2. To save for industry and the public at large the millions of dollars lost each year through property damage resulting from automobile accidents. This loss amounts to $500,000 a year in a city of about 500,000 population.
3. To save for industry some of the many millions of dollars now paid out annually for compensation, medical attention, lost time and damage for personal injuries resulting from automobile accidents.

The National Safety Council through its forty local councils has for several years carried on a campaign against jay walking and other forms of carelessness on the part of pedestrians. But it has discovered in this campaign that while the pedestrian is responsible for a large percentage of accidents, at least an equal percentage of automobile accidents is due to ignorance of the safe methods of motor car driving or maintenance on the part of the drivers of commercial vehicles.

The council, with the aid of automobile manufacturers, automobile driving instructors, automobile traffic managers, repair men and the representatives of practically every industry interested in any phase of the automobile accident problem, conducted a nine months' study of the causes of accidents and means of eradicating those causes. This study has just been completed and the findings published by the council in the form of a set of twelve safety bulletins and lessons for automobile drivers.

Transportation News Notes

Grants Higher Newspaper Rates.—The Ohio Public Utilities Commission has granted the Ohio Electric Railway, Springfield, and the Dayton & Troy Electric Railway, Dayton, an increase of ¼ cent a pound on newspapers carried by them. The old rate was ½ cent a pound. Application was made to the commission for permission to increase the rate to 1 cent, but this was refused in favor of a rate of ¾ cent a pound.

Dairy Rates Stand.—Three interurban companies operating in Indiana, the Terre Haute, Indianapolis & Eastern, the Indianapolis & Cincinnati and the Union Traction, were recently authorized by the State Public Service Commission to continue indefinitely their existing rates on milk, cream and dairy products. Without the commission's order, the rates would have been reduced to the old levels on Dec. 31.

Interurban Fares Advanced.—The Public Service Commission for the Second District of New York has granted the Empire State Railroad, Syracuse, N. Y., permission to charge 3 cents a mile for cash fares on its line between Syracuse and Oswego. Commutation rates are advanced to a basis of 1⅝ cents a mile. The fare has been 2.77 cents for cash and ticket fares and 1½ cents for commutation fares. The new rates took effect on Dec. 1.

"Safety Week" for Capital.—Washington, D. C., is to have a city-wide safety campaign, to be initiated with a "safety week." The suggestion for the undertaking came from the Washington Railway & Electric Company. The movement now embraces practically every activity in the city, but the two traction systems, the Washington Railway & Electric and the Capital Traction, are leading the campaign. The street cars are to carry both inside and outside slogans calling attention to the need for care on the part of all persons using the streets.

Kansas City Fare Extended.—The Missouri Public Service Commission has granted the receivers of the Kansas City Railways six months from Nov. 20 in which to charge the present rates of 8 cents for a single trip fare. Although the company before it passed into the hands of the receivers had an application pending asking for an increase in existing rates, supposed to be for a 10-cent fare, the receivers did not ask to have this application considered, but only to have the present rates continued until they had had ample time in which to familiarize themselves with the finances of the company.

Fares Raised, Strike Ends.—To meet the demands of its employees for an increase in wages the Clinton (Iowa) Street Railway on Nov. 23 raised its cash fare from 5 cents to 6 cents. The men had gone on strike to force the company to increase their wages to 75 cents an hour. The management agreed to pay the men 60 and 65 cents an hour. The new fare rate provides for the sale of nine tickets for 50 cents. Passengers will receive a refund slip with each cash fare, pending permanent settlement of the fare situation. The city authorities recently refused to allow the company to raise its cash fare to 7 cents.

Bus Company Organized.—A certificate of incorporation was filed recently with the Maryland Tax Commissioner organizing and incorporating the Shore Transit Company, with main office at Salisbury. The incorporators are A. M. Jackson, Mark J. Cooper and B. J. Jackson, all of Salisbury. The authorized capital is placed at $75,000 to be issued in common stock at $100 per share. It is understood the bulk of the stock will be subscribed by business interests of Baltimore. The purpose of the Shore Transit Company is to operate a fleet of passenger buses between Elkton and Salisbury, connecting with the lines at Easton and Chestertown and the ferries at Rock Hall and Clairborne.

Congestion Greater in Dallas.—The City Plan Commission of Dallas, Texas, has proposed that interurban cars entering Dallas be so routed into and out of the terminal on Jackson Street that they may be taken off of Commerce and Main Streets This proposition is advanced as one of the best solutions of the traffic problem, as it is maintained that the presence of interurban cars on Main and Commerce Streets is one of the chief causes of congestion. The project involves not only the re-routing of interurban cars, but the relocating of the interurban terminal. The new interurban station in Dallas, while one of the finest in the South, is rapidly becoming inadequate to accommodate the traffic, and the need for a larger station will soon become imperative, in the opinion of the commission.

Rubber Slump Reflected in Akron Fares.—During the month of November, 1920, the average number of revenue passengers carried daily on the city lines of the Northern Ohio Traction & Light Company in Akron, Ohio, was 115,847, as compared to 141,984 in November, 1919. On a 5-cent fare basis this loss of 26,137 daily passengers represents a daily money loss of $1,306, or at the rate of $477,000 a year. This condition reflects directly the great slump in the rubber-tire business, the difficulty of which may be appreciated by the knowledge that the price of raw rubber dropped with extreme rapidity from $3.50 a pound to 26c. a pound. On top of this enormous shrinkage in stock inventory the tremendous orders from automobile manufacturers virtually have been cut off. The tire manufacturers were thus caught at both ends.

Personal Mention

W. L. Goodwin Speaks

Successful Organizer of Electrical Industry Outlines His Co-operative Plan at C. E. R. A. Meeting

A feature of the meeting of the Central Electric Railway Association at Indianapolis on Dec. 2 was an address on "Co-operation," by William L. Goodwin of the General Electric Company. Mr. Goodwin has achieved a national reputation in the central stations and electric supply fields for the work which he has accomplished in crystallizing public opinion in behalf of constructive measures. This was the first occasion upon which Mr. Goodwin had addressed an audience of electric railway men. He urged his hearers to forget petty grievances and to adopt a spirit of conciliation toward the public, and stressed the importance of good-will in the rendering of efficient service.

The "Goodwin plan," as outlined at the Indianapolis meeting, consists of a campaign of education, conducted principally through the medium of newspaper publicity and other channels to co-ordinate the various interests in the industry, and to bring them together in harmonious action. It aims to "inspire every man in the electrical industry, whatever his rank, job or title, with an appreciation of the responsibility now before us, and the responsibility upon every electrical man to help 'put across' this great job of the electrification of households, shops, factories, and transportation systems, thereby increasing, as is possible in no other way, production, for human efficiency and comfort."

THE GOODWIN PLAN IN OUTLINE

Mr. Goodwin has been eminently successful in working out his idea in his own business and in the electrical industry as a whole. His plan is based on the premises that:

Each individual owes a responsibility to the organization representing his branch of the industry.

The organization owes a similar responsibility to its members.

Each organization representing each branch of the industry owes a responsibility to all other organizations in the industry, to the end that all problems may be discussed, having in view the interest of all, thereby providing a basic plan for more adequately and effectively serving the American public.

Mr. Goodwin is a native of San Francisco. In 1901 he became the representative in that city of the Western Electric Company. Four years later he resigned to organize a jobbing business for himself. He subsequently organized the Pacific States Electric Company, with offices in the principal cities of the Coast states. He kept hammering away at his co-operative idea, contributing greatly to the development of the electrical business of the Coast. Other work which he did in California at this period in the way of organizing included an organization in 1900 of the fruit growers of the state, and in 1915 of the motion picture industry. In 1916 he was invited to go East to explain his ideas on co-operation to the rest of the industry.

C. E. Brown Steps Up

General Manager of the San Francisco, Napa & Calistoga Railway Appointed Vice-President Also

C. E. Brown, general manager of the San Francisco, Napa & Calistoga Railway, Napa, Cal., has been promoted to be vice-president of that system. Mr. Brown will continue to serve as general manager. The railway operates city and interurban lines connecting San Francisco with Valejo, Napa and other towns.

C. E. BROWN

Mr. Brown took charge of this property in November, 1915. Under his supervision the road has been managed economically and to the satisfaction of the owners. Its facilities have been developed by the building of several extensions which have secured for it a freight traffic of considerable proportions. It has extended its lines to connect with those of the Government operating in the Mare Island Navy Yard, and is now handling all freight to and from the yard. An interchange freight yard, with a capacity of seventy-five cars, has been built jointly with the Southern Pacific Company.

Mr. Brown was born in New York City, Sept. 4, 1882. He was educated in the public schools of New York and Ohio, later attending the Fayette Normal University of Ohio and the Central College of Indiana. From the latter institution he received the degree of Bachelor of Science. His first employment was with the Baltimore & Ohio Railroad in the car department. He remained with that company for three years as repairer, piece-work inspector, inspector and foreman. In 1905 he went with the Chicago, Rock Island & Pacific Railroad, working on air brake equipment and installing the Loree system of accounts on the Colorado Division. In 1908 he joined the Atchison, Topeka & Santa Fé, Albuquerque Division, where he was employed as bonus timekeeper and bonus inspector. He also assisted in installing the bonus system of pay on that division of the Santa Fé system.

In the latter part of 1909 Mr. Brown entered the electric railway field with the Chicago & Milwaukee Electric Railroad (now the North Shore) in the shops and stores department. He was later transferred to the general office. A. W. McLimont, now vice-president of the Winnipeg Electric Railway, was then in charge of this property. When Mr. McLimont left to take the position of vice-president and general manager of the Michigan United Railways late in 1910, Mr. Brown was selected by him as his assistant and remained at Jackson, Mich., as assistant general manager for about three years. He then went with Mr. McLimont to Atlanta, Ga., where he had charge of purchases for the Tallulah Falls hydro-electric development of the Georgia Railway & Power Company.

L. C. Gilman Leaves Electric Railway Field

L. C. Gilman, president of the Oregon Electric Railway and the United Railways, Portland, Ore., has been elected vice-president of the Great Northern Railway, with headquarters in Seattle, Wash. Mr. Gilman was born at Levant, Mo., on Jan. 28, 1857. He was educated at the Maine Central Institute at Pittsfield, Me., from which he was graduated in June, 1879, and at the law school of Columbia University. He entered railway service in October, 1903, as Western counsel of the Great Northern Railway, with headquarters in Seattle.

In February, 1909, he was made assistant to the president of the Great Northern, with headquarters at St. Paul, Minn., where he served until June 1, 1914. He was then elected president of the Spokane, Portland & Seattle Railway and its subsidiary lines, including the Oregon Electric Railway and the United Railways. In June, 1918, Mr. Gilman was appointed director of the Puget Sound district, comprising the states of Oregon and Washington, by the United States Railroad Administration. He served in this position throughout the period of federal control. On Nov. 1 last Mr. Gilman resigned as president of the Spokane, Portland & Seattle and its subsidiaries to enter upon his new duties as vice-president of the Great Northern and removed to Seattle.

A. C. Bounsall has been appointed safety agent of the Anderson Division of the Union Traction Company of Indiana, Anderson, Ind. Mr. Bounsall is storekeeper of the division.

Foster Ash has been appointed freight agent of the Monongahela Valley Traction Company, Fairmont, W. Va. Mr. Ash succeeds O. J. Flowers, who has been promoted to general inspector of the company. Mr. Ash was formerly assistant freight agent.

J. B. Shaedel, who for several years has been connected with the Union Traction Company of Indiana, Anderson, Ind., has resigned. Mr. Shaedel has accepted a position as superintendent of the municipal light and power station of Columbia City, Ind., and has entered upon his new duties.

Manuel V. Domenech has been made general manager of the Porto Rico Railway, Light & Power Company, San Juan, Porto Rico. In a previous statement concerning Mr. Domenech's election his name was incorrectly spelled. Mr. Domenech succeeds E. M. Sewell, resigned.

M. E. Graston, freight claim agent of the Union Traction Company of Indiana, Anderson, Ind., has been granted a leave of absence and is spending the winter in Florida. During Mr. Graston's absence W. G. Cooper is acting as freight claim agent of the company.

John Kenish, who for several years has been connected with the Missouri Public Service Commission, has been appointed a special master in chancery to handle matters involving the receivership of the Kansas City Railways. Mr. Kenish, immediately after his appointment, resigned from the commission and on Dec. 1 qualified for his new duties.

D. J. McGrath, who recently resigned as assistant to the president of the Mobile Light & Railroad Company, Mobile, Ala., is now engaged in special editorial work for the ELECTRIC RAILWAY JOURNAL in connection with the preparation of the annual statistical issue. Prior to the war he was engaged as special assistant to M. C. Brush, then president of the Boston Elevated Railway. Upon his return to civil life in the spring of 1919 he was made assistant to the president of the Mobile Light & Railroad Company.

Frederick D. Gordon has been appointed general manager of the Cumberland County Power & Light Company, Portland, Me. Mr. Gordon succeeds A. H. Ford, who resigned more than a year ago. Since the resignation of Mr. Ford the company has been without a general manager, the heads of the several departments having supervision of the work. Mr. Gordon was formerly general manager of the Androscoggin Electric Company, Lewiston, Me. He resigned his position at Lewiston last August to accept a position with the Portland company, after being connected with the Androscoggin system for a number of years as general manager.

C. Thorburn Promoted

Succeeds I. L. Ward as General Purchasing Agent of the Pacific Electric Railway—C. C. Fenimore Advanced

C. Thorburn has succeeded I. L. Ward as general purchasing agent of the Pacific Electric Railway, Los Angeles, Cal., Mr. Ward having resigned to become general manager of the Steel Mill & Foundry Supply Company, with headquarters in Los Angeles. C. C. Fenimore has been appointed Mr. Thorburn's successor as general storekeeper of the railway.

Mr. Thorburn began his training in the Southern Pacific shops at Ogden, Utah, in May, 1902, as a car cleaner. He remained with the Southern Pacific at Ogden in various positions, first in the shops, then in the engineering department, and, still later, in the stores department. In August, 1905, he became storekeeper of the Oregon Short Lines, at Sparks, Nev. Here he remained until June, 1907, when he went to Los Angeles and became a member of the stores department force of the Southern Pacific. He was subsequently promoted to stores accountant.

C. C. FENIMORE

In May, 1909, he joined the Pacific Electric as an accountant in the auditor's office. In December of the same year he was appointed general storekeeper of the railway. He served during the war as a member of the Engineers Corps, Railway Operating Troops in France. In July, 1919, upon his discharge from military service, he returned to the Pacific Electric as general storekeeper.

Mr. Fenimore was born in Economy, Ind., on May 4, 1884. He was graduated from the Economy High School in 1901. Five years later he entered railroad work as a boilermaker's helper for the Southern Pacific Company in Sparks, Nev. He was subsequently transferred to the stores department, where he served successively as counter boy, shipping clerk, price clerk and chief clerk to the division storekeeper. In 1909 Mr. Fenimore went to Los Angeles, where he accepted a position with the Pacific Electric as price clerk in the general storekeeper's office. With the transfer of accounting of that department to the auditor's office he became an accountant in that division. Here he successively held the positions of chief clerk in charge of store and mechanical accounts, and head clerk of disbursement in charge of store, mechanical, roadway and disbursement accounts.

Mr. Fenimore was transferred to the purchasing department in December, 1917, as chief clerk to the general purchasing agent. He has since held this position, with the exception of a period from September, 1918, to July, 1919, when during the absence of Mr. Thorburn he served as acting general storekeeper.

Obituary

Owen M. Dean, at one time president of the Carondelet Railway, St. Louis, Mo., one of the fourteen companies absorbed when the present United Railways was organized, died on Dec. 4. Mr. Dean was eighty-two years of age. He came to America when a boy.

Ward Baldwin of Cincinnati, Ohio, who built the line of the South Covington & Cincinnati Street Railway, Covington, Ky., died recently in Cincinnati. Mr. Baldwin designed all the mechanical and electrical equipment that will be used in the new subway entering Cincinnati. In 1915 he completed the valuation of the Cincinnati Traction Company's property. He was a director of the Engineering Club of Cincinnati and a member of the American Society of Civil Engineers, and had formerly been professor of civil engineering at the University of Cincinnati, where he was largely instrumental in founding the Department of Engineering.

George S. Rice, a civil engineer and at one time chief engineer of the New York Rapid Transit Commission, died on Dec. 7 at his home in Montclair at the age of seventy-one years. Mr. Rice became identified with rapid transit construction in 1887 as chief engineer of the Boston Transit Commission, and later, in 1904, he was chief engineer of the New York commission. Mr. Rice spent several years prior to 1900 making studies for the subway project in New York City, and he not only served under the commission but remained in his position of chief engineer under the Rapid Transit Board. During the construction of the dual system, now operated by the Interborough Rapid Transit Company, Mr. Rice was in charge of the tunnel division and sections of the work in Brooklyn. When the so-called new Croton Aqueduct was placed under construction Mr. Rice became deputy chief engineer of that enterprise and remained on aqueduct construction until 1892. Since that time he had been identified with subway construction in New York.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Railway Buying Is Good

New England Reports Show Good Fall Orders—Prompt Deliveries Aid to Maintain Trade

Although there is nothing spectacular about the present buying of electric railway supplies it is going on steadily in a volume that is encouraging to more than one manufacturer. A New England representative of a number of leading specialties informed an ELECTRIC RAILWAY JOURNAL man this week that notwithstanding the ups and downs of general business, buying of supplies has continued well into the fall, the earlier months of which compare favorably with the purchasing of the first part of the year. The promptness with which orders are being filled is a valuable aid to trade. Thus, an order for 10,000 special malleable-iron castings placed a month ago was filled within thirty days, and improved shipping conditions are helping to reduce the ultimate cost of getting supplies to the consuming traction companies.

The relative steadiness of the demand for equipment, especially in connection with safety car parts, is most encouraging. Railway purchasing agents are buying conservatively, but they are seldom out of the market, and manufacturers prepared to give personal attention to service problems are sure to reap the reward of their efforts. It seems a truism to point out that as long as street car service continues supplies must be bought, but in the face of present general business conditions a recognition of these rather elementary points is worth while. This representative of manufacturers pointed out that on some products orders for two months' factory output are in hand, and actually the demand for some special supplies in the line of trolley fittings is so active that very little new business is being solicited at the moment. Through the field of railway equipment as a whole buying is cautious, but the stability of traction service as a public utility is proving week by week a factor tending toward confidence.

Insulating Materials Weak

Consumers' Supply Low, but Demand Is Lacking as Prices Decline—Deliveries from Stock

Current weakness in the market for insulation of all sorts apparently is felt by one manufacturer as much as another. Consumer demand is of the lightest hand-to-mouth variety, even repair shops now having ceased to buy. Electric railways, in spite of the imminence of winter bringing necessary repairs to equipment, are not as yet providing for their needs in such lines as tapes, varnished cloth, etc.

Foreign buying is as badly off as domestic demand, present exchange rates being largely held responsible. Reports are received that foreign competition is now starting to make itself felt. Samples of insulation material that are said to compare favorably with the product of home manufacturers have been received in this country with a view toward introducing them in the American market.

The general attitude of consumers at present is to await lower prices. Even some manufacturers are holding off buying raw material in view of the uncertain condition of the market. Stocks of finished insulation with large consumers are said to be low, however, and hence producers feel optimistic regarding a return to normal business before spring. At the factories inventories, though in ample shape to care for customers' current needs, are not very large, as the policy of manufacturers has been to avoid stocking high-priced material on a declining market.

Deliveries are about all that can be desired. Virtually all standard material can be shipped from stock, though how long this condition would obtain with a good volume of orders is a question. Prices have slumped considerably following the falling off in demand and lower raw material costs. Varnish gums, shellac, linseed oil etc., have eased off in price, consequently insulating paints and varnishes are lower. Spot cotton at this writing is quoted at 16¾ cents and the low levels of these materials have been reflected in a drop of from 15 to 20 per cent on varnished cambric and silk, and about 20 per cent on armature twines within the last month. Tapes, though not reduced by all manufacturers, are lower, and friction and rubber tape have dropped materially. On the other hand, paper insulating material has undergone no change, as the market for paper is still undersupplied.

Steel Rail Orders Taxing 1921 Output

Some Mills Already Booked to Capacity as Heavy Orders Are Placed —Traction Companies Advised Not to Delay Buying— One Independent Fixes Price at $57

Buying of steel rails is proceeding strongly and from present indications the rail mills of the country will be booked to capacity throughout next year. In fact, the mills of some companies are already completely booked up and will accept no further orders. Many of the independents still have considerable rolling capacity in reserve, however.

Consumers are anticipating their needs earlier than usual this year as it is stated that steam roads have either covered or are covering their 1921 requirements now. A press dispatch this week states that five lines alone have placed or are about to place orders totaling nearly 400,000 tons. Foreign buying is lacking, but this circumstance, which is largely due to financial conditions abroad and prevailing exchange rates, causes little or no concern. In fact, some of the leading rail interests are not encouraging foreign orders, because it is said that domestic needs will absorb the entire supply.

According to an article in the Dec. 2 issue of *Iron Age* the railroads of the country will need to buy about 4,500,000 tons of rails for each of the next five years to place them in normal operating condition. The estimated total production of rails in this country can only reach an annual total of about 3,500,000 tons of rails, however, leaving a shortage of a million tons of rails each year.

Orders for girder rails are being received in considerable volume, but not to the same extent as for standard T-rails. Suburban traction companies which use the latter class of rail on their roadbed are showing considerable interest in the market at present, especially in view of the strong competitive buying from steam roads. But on the whole electric traction companies seem to be inclined to hold off placing their 1921 requirements as large tonnages from that quarter are known to be still unplaced. Girder rail producers predict that they will be busy all through next year and are advising customers to cover their spring needs right now instead of waiting until January or February.

Unless this advice is heeded, it is pointed out, many lines will probably be left in the lurch on their spring construction programs. This especially applies to the smaller street car lines, as it is the policy of mills not to roll under 500 tons of girder rails, but to hold small orders until a sufficient tonnage accumulates. On the standard sections 1,000 tons would probably be considered too small an amount to roll. So far as can be learned, however, mills are not raising the tonnage limit for which they will roll an order. Nor are rail jobbers endeavoring to stock up with rails on the chance of obtaining a premium later on for quick delivery. On the contrary, rail dealers report a very quiet market at present.

Prices are still largely undetermined, but this does not seem to affect buying adversely as the price in most cases is left open. The market on girder rails for 250 tons or over is 3¼ cents per pound, or about $72 to $73 per gross ton. A leading independent interest has fixed its 1921 prices for standard T-rails at $57 per gross ton covering the first quarter, but other independents have not yet announced their schedule. The United States Steel Corporation has also not as yet announced its 1921 prices, which are expected to be made public this month.

Still Lower Quotations in Trolley and Bell Cord

Since last week's quotations on cotton trolley cord and bell cord were announced further changes have been made which brought the price still lower. This material may now be bought for as low as 66 cents a pound and from there on up to 85 cents, depending upon grade and manufacturer. Conditions of supply and demand have undergone no change.

Slight Recessions Found in Cotton Waste Market

Buying of cotton waste for traction purposes is only of a hand-to-mouth nature, and the same condition applies to the steam railroad field. Demand in general from all sources is extremely light, and under the conditions existing in the cotton mills the supply of waste is just about equal to this demand. Production of cotton goods from which the waste is gathered has fallen to low levels, in some cases hardly 50 per cent of mill capacity being under power.

Consumers appear to be waiting for the first of the year, at which time present contracts run out and dealers will make new contracts at what is felt will be considerably reduced prices. Cotton-waste prices have been holding steady for some time and it is just recently that any recessions have been reported. These have been in the nature of 1 to 2 cents a pound, which brings the present price to about 14 to 17 cents a pound in lots of 100-lb. bales.

Spain as a Market for Street Car Headlights

Street cars seldom have a headlight of an intensity greater than that required to give visible warning of their approach, says the Department of Commerce's special agents series No. 197 entitled "Electrical Goods in Spain." There are practically no interurban lines to need powerful lights, but there ought to be a small market for detachable lights of moderate capacity that would be more efficient than the stationary, built-in lamps now used. At the present time little or no interest is displayed in this equipment by the traction systems, but there are already a number of modern headlights in daily service, so the opportunity is there.

Strong Foreign Demand for Steel Towers

Domestic Demand Greater Than Ever Before Predicted Because of Big Power Projects on the Books

Largely as a result of adverse financial conditions which have made the floating of bonds for financing power extensions very difficult, domestic interest in steel transmission towers remains lacking. Foreign orders and inquiries, on the other hand, are extremely active. Even there a large producer who had a good volume of foreign business on hand three months ago reports that since then, with the exception of inquiries from wireless interests, demand has petered out. Several other producers report no slump in export business as yet, however.

Some of the most promising countries affording markets for transmission towers are Italy, France, Japan, South America and the Scandinavian peninsula, orders being reported both on behalf of power companies and electric railways. One important factor in the increase of this demand abroad is said to be the growing scarcity of fuel and oil in certain European countries, which has led to the more intensive development of natural water-power resources.

On the other hand a great deal of export business is undoubtedly held in abeyance at present because the present level of foreign exchange works so strongly against foreign customers who buy in the United States. With any decided change for the better in that respect and an improvement in financial conditions at home as well it is believed that the demand for transmission line equipment will mount to greater proportions than ever before. This view is based on the extent and number of hydro-electric power and railway projects that are known to be on the boards, both at home and abroad.

Conditions of production are greatly improved. This is largely due to the relief from transportation congestion which delayed supplies of raw material for so long. Little difficulty is now experienced in obtaining all the steel that is needed, and both the supply and the efficiency of labor have improved. Deliveries are consequently much improved, but as the greater part of this product is fabricated to order shipments vary according to the manufacturer, the size of order and the type of material —whether galvanized, etc. In general delivery of about 1,000 steel towers in the slowest instance can be accomplished in six to seven months and in the quickest in about four to five months.

In spite of the view taken by one large producer that lower quotations will not prevail for a long time several other manufacturers see a gradual softening of prices that will come about as a result of the lower levels quoted by independent steel producers.

Rolling Stock

The Austin (Tex.) Street Railway Company will purchase ten new cars of the latest type.

The Princeton Power Company, Princeton, W. Va., owner of the Bluefield street car system, has ordered five cars which it expects to arrive in time to be placed in service about the first of the year.

Detroit United Railway, Detroit, Mich., announces that at least sixteen of the seventeen new front-entrance, side-exit, type 777 cars now under construction in the company's shops should be in service by Jan. 1. Delivery of the ten safety cars which were being built for the company by the American Car Company of St. Louis was expected on Dec. 1. Fifty trailers, also being built by the St. Louis Car Company, will probably not be delivered before next March, it is said.

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., expects delivery of ten new Birney-type safety cars from the factory at St. Louis for its Terre Haute division soon. These cars were ordered last spring but delivery has been delayed several months. They will be put into service immediately, part of the consignment on Wabash Avenue to replace the old type cars in service there and the remainder on other lines to allow some of the cars now in use to be overhauled.

The Detroit (Mich.) Municipal Railway, mentioned in the Nov. 13 issue as purchasing twenty-five safety cars, has specified the following equipment on these cars:

Number of cars ordered	25
Date of order	Nov. 16, 1920
Delivery	45 Days
Builder	Osgood-Bradley
Type	Safety
Seating capacity	32
Weight, total	16,000 lb.
Length over all	28 ft. 0½ in.
Truck wheelbase	8 ft. 0 in.
Width over all	7 ft. 10⅝ in.
Interior trim	Cherry
Roof	Arch
Air brakes	Westinghouse
Axles	Forged Carbon Aera E-2
Bumpers	Mfr's Standard
Car signal system	Nichols-Lintern
Control	K63
Curtain fixtures	Nat'l Lock Washer, Curtain Supply
Curtain material	O'Bannon Diced D. Coated Color
Designation signs	Keystone
Fenders or wheelguards	H. B. Wheel Guard
Heater equipment	Peter Smith
Headlights	O. B.
Lighting fixtures	E. S. Supply Co. No. 25702
Lightning arresters	G. E.
Motors, type and number	G. E. 264
Paint, varnish or enamel	Sherwin-Williams Old Dutch
Seats	Mfr's Standard
Snow scrapers	Root, Air Operated
Step treads	Mason
Tail lights	Nichols-Lintern
Trolley catchers or retrievers	O. B.
Trolley base	O. B.
Trucks	Mfr's Standard
Wheels (type and size)	26-in. Forg. Steel

Track and Roadway

Indiana Service Corporation, Fort Wayne, Ind.—R. M. Feustel, president of the Indiana Service Corporation, has notified the city officials of Fort Wayne, Ind., that his company will extend its tracks on Columbia Avenue to Anthony Boulevard as soon as a proposed new bridge is completed over Delta Lake, which now marks the terminal point of the Columbia Avenue line. It is expected that this bridge will cost about $10,000, half of which will be paid by the board of park commissioners and half by special assessment.

Delta Light & Traction Company, Greenville, Miss. — The improvement program of the Delta Light & Traction Company will include an entire new track on the East End line to Washington Avenue and two new cars will be put into service on this line. The work of rehabilitating the Greenville street railway under an agreement between the city and the Delta Light & Traction Company will cost about $100,000.

Minneapolis (Minn.) Street Railway.—The Minneapolis Street Railway has put into commission a new loop and a new short cut to the North Side, giving that section of the city better transportation to the business district and lessening the trolley traffic on Hennepin Avenue. This new loop connects with a line built across the new Third Avenue bridge to the East Side, and a new Interurban line loop in use for the last two months.

New Jersey & Pennsylvania Traction Company, Trenton, N. J.—Although the City Commission of Trenton, N. J., has instructed City Counsel Charles E. Bird to apply to the Board of Utility Commissioners for an order compelling the New Jersey & Pennsylvania Traction Company to move its tracks on West Hanover Street, Trenton, to the right side of the street and to repair that section of the street, City Counsel Bird will not apply to the commission until the New Jersey Supreme Court has decided whether the old or the new utility board shall function.

Dallas (Tex.) Railways.—The Dallas (Tex.) Railways announces completion of track improvement and paving on Jefferson Avenue from Lancaster to Polk, a distance of about 2 miles, at a cost of $197,000. The work has been under way for more than a year, but has been delayed on account of shortage of crushed stone, asphalt and other paving materials.

Central Texas Electric Railway, Waco, Tex.—John Maxwell of Waco, Tex., has been appointed receiver for the Central Texas Electric Railway, recently organized in Waco for the purpose of building an interurban line from Waco to Temple. The receiver was appointed by Judge H. M. Richey of the Seventy-fourth District Court on petition of E. H. Bruyers, Waco, who alleged that the company is indebted to him in the sum of $4,800 and that it is insolvent. The traction company recently awarded contract for the construction of the first 6 miles of the line to the Central Texas Construction Company, organized as a subsidiary of the traction company.

Mesaba Railway, Virginia, Minn.—The Mesaba Railway has started the laying of tracks along the new right-of-way about 2 miles from Chisholm. This new line, which will extend to Hibbing, Minn., is under the direction of engineers of the Oliver Iron Mining Company. Four miles of track remain to be laid.

Seattle (Wash.) Municipal Railway.—The City Utilities Committee has approved a plan to extend the Alki car line to Douglas Place, one-fourth of a mile distant, at an estimated cost of $15,000.

Power Houses, Shops and Buildings

Boston (Mass.) Elevated Railway.—The trustees of the Boston Elevated Railway have filed a petition asking the 1921 Legislature to authorize the expenditure of $4,421,000 for new shops to be located at Everett and for additional power facilities.

Trade Notes

The M. B. Austin Company announces its removal on Dec. 1 to its own new building at 108-116 South Desplaines Street, Chicago.

Metal & Thermit Corporation, New York City, has opened a branch office at 141 Milk Street, Boston, Mass., in charge of Robert L. Browne, New England district manager.

Heyl & Patterson, Inc., 51 Water Street, Pittsburgh, manufacturer of elevators, hoists, etc., has awarded contract for the construction of a two-story bulding to cost about $60,000.

The Chase Turbine Manufacturing Company, Orange, Mass., has recently established a new sales office at Portland, Me., in charge of Albert M. Dexter, manager.

Taylor-Wharton Iron & Steel Company, High Bridge, N. J., announces that Henry F. Pratt has been appointed Mid-Western sales manager of the company and its subsidiaries, with offices at 502 Denham Building, Denver, Col.

The American Di-electrics, Ltd., 95 Liberty Street, New York City, announces the appointment of E. A. Thornwell, 1026 Atlanta Trust Company Building, Atlanta, Ga., as agent for the Southern States.

The C. M. Sorenson Company, 177 East Eighty-seventh Street, New York City, manufacturer of electrically driven air compressors, etc., has filed notice of increase in capital stock from $30,000 to $200,000.

The Chase-Shawmut Company, Newburyport, Mass., announces that approval by the Underwriters' Laboratories, Inc., has been given on the company's 600-volt line of renewable fuses to supplement approval of the 250-volt line.

The Simplex Wire & Cable Company, 201 Devonshire Street, Boston, Mass., has announced that the E. S. Stickle Company, 305 Union Arcade Building, Pittsburgh, Pa., is representative of the company in Pittsburgh, succeeding the Stickle & Taylor Company (dissolved).

The Safety Car Heating & Lighting Company and the **Pintsch Compressing Company** announce the removal of their general offices to the new plant located at Dixwell and Putnam Avenues, New Haven, Conn. The executive offices and sales office for the northeastern district will be located at 2 Rector Street, New York City, as heretofore, but the Jersey City office will be discontinued.

Dunbar Manufacturing Company, Chicago, Ill., manufacturer of various railway appliances, announces that its corporate name has been changed to the Morton Manufacturing Company, with H. U. Morton, president; H. H. Schroyer, vice-president, and Charles D. Morton, secretary-treasurer. The factory and general offices are situated at 5133-39 West Lake Street, Chicago, and sales representatives are located in Detroit, Cleveland, New York, St. Louis, St. Paul, Portland, Ore.; San Francisco, Chicago, and Sheffield, England.

Mitchell-Rand Manufacturing Company, New York City, manufacturer of insulating material, has concluded arrangements whereby the company will handle and stock the products of the Irvington Varnish & Insulator Company for eastern territory at mill prices.

New Advertising Literature

Oil Conservator.—General Electric Company, in bulletin No. 49,706, just issued, describes the construction and function of its conservator type of oil tank for power transformers.

Steel Poles.—National Tube Company, Pittsburgh, Pa., has issued "National" bulletin 14C, a forty-seven page booklet on "National" tubular steel poles, with attractive photographs of installations.

Accounting Machines. — Remington Typewriter Company, New York City, through its railroad department, has issued a booklet called "Interline Abstracting With a Daily Station and Road Balance."

Welding.—The Metal & Thermit Corporation, New York City, has just issued the third edition of Thermit Welding pamphlet No. 17 on mill and foundry repairs, fourth edition of Thermit Carbon-Free Metals and Alloys pamphlet No. 20, new and revised Thermit Rail-Welding pamphlet No. 39 and a small Thermit Railroad Instruction book No. 41.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
DONALD F. HINE, Editorial Representative A. D. KNOX, Editorial Representative GEORGE BUSHFIELD, Editorial Representative
G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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The Year 1921, Legally and Financially

THE year 1921 promises to bring with it many problems, particularly from the legal and financing standpoints. Forty of the forty-eight state legislatures will be in session and will doubtless take up a great deal of public utility and tax legislation, while the United States Congress will undoubtedly consider a revision of the excess profits and income taxes and of the tariff, the soldiers' bonus, etc. Hence, it may be expected that the legal departments of the electric railways and the legislative committees of the various associations will have a busy year. Their activities will not only be directed to assisting in the formulation of constructive legislation but to interpreting the tax laws that will be passed, both state and federal. It is needless to say, also, that the pending of all of these tax matters, and the likelihood of other enormous government bond issues to cover a soldiers' bonus, etc., will have a marked effect on the ease with which new issues of electric railway securities may be floated. Yet the improving financial condition of the electric railways, resulting from increased earnings and the tendency toward lowering expenses, will have a very helpful counter-effect.

Experience Keeps a Dear School

SEATTLE is up against it. In fact, the city has been up against it ever since it took over the local railway lines of the Puget Sound Traction, Light & Power Company a year ago. The privately owned road was up against it before that. Denied adequate measures of relief, the owners sold out to the city, then under Ole Hanson as Mayor. Ole Hanson was for municipal ownership then. He has since seen a great light, but that doesn't help Seattle now.

The story is an interesting one and has many angles. In fact, it has too many angles and lessons to be dealt with adequately except at considerable length. One series of facts, however, stands out in bold relief. The city now is $500,000 behind in its operation of the municipal railway; at the end of 1921, if the present fare is continued, there will be an estimated deficit of $1,610,452. Employees are being paid by warrants salable now at a discount or payable at some indefinite future date when the city has sufficient money to meet them. The Seattle ticket fare is now 6¼ cents. The cash fare is 10 cents. The latest proposal is to make the ticket fare 8⅓ cents. If that is done and traffic remains constant it is estimated—estimated, mind you—that it will take two years to wipe out the present deficit.

Seattle was considerably a war bride. The heavy hand of the post-war period has now descended upon it. The city is slowing up. Estimates based on the future are decidedly dangerous. Therefore, Mayor Caldwell has preached caution. He is not so sure that the panacea for Seattle's poor showing is in advancing the fares. In consequence of this and other happenings the matter of an increase has gone over for a time. In this move Councilmen were outgeneraled who were appalled at the financial outlook and desired to make the advance in fares effective at once. The lesson of Seattle's failure with municipal ownership and operation is plain to other cities. Those disposed to disregard it can hardly expect to escape a similar experience. They tempt fate.

Keeping Up the Load Factor in Operating Machinery

A GREAT DEAL has been heard of late regarding the matter of "load factor." The term is applied in all kinds of connections, always with a view to expressing the idea of continuity of use of something or other. There is one application in which particularly the term needs to be used and the principle of getting high load factor needs to be worked out. This is in connection with outdoor and indoor machinery, large and small, but particularly large.

There are mechanical operations which have to be performed over and over again, for which machinery is ideally adapted. A machine will save labor and time, and if it does not cost too much in proportion to the work to be done it ought to be used. We are in the habit of rating a machine by the time in which it will save its cost, a very rational way of looking at the matter. Thus, "that tie tamper will buy itself in our work in six months," "that concrete mixer will save its cost in a single season," etc. We cannot understand why managements are sometimes so slow in giving their maintenance department what they need in the way of machinery when the savings to be made seem so apparent.

But there's another side to this question, one that possibly looms large in the manager's mind, namely: Can the device whose purchase is recommended be kept at work sufficiently continuous to enable it to produce the savings of which it is undoubtedly capable? In justice to the device itself, to the manufacturer behind it and to the manager who is asked to buy it, this question ought to have careful consideration. What will the machine save per year, and not per hour, is one question. Another is, can it be used in more than one line of work in case it is not needed all of the time in the job for which it is to be primarily purchased? In other words, how adaptable is it? Proper attention to questions like these will result in the more intelligent purchase or construction of machines and in their more efficient use. Ultimately it will cause the use of more machinery, because each piece in use will be an advertisement for machinery in general.

Having purchased a machine, the operator's next job is to utilize it properly; to keep up its operating load factor. This is a matter of dispatching. Manufacturers have worked this out to a science; in an up-to-date factory very few idle machines are seen. They have to work or get out to make place for more useful tools. There is no reason why the same principle cannot be applied on electric railways even more than it has. All that is needed is a little system. Some time ago we described how the New York State Railways, Rochester Lines, kept track of the movement of their line trucks. This work was done by the telephone operators in the chief engineer's office. It would make an interesting duty for some clerk in each main department to follow the same procedure in connection with all important equipment on the track or the line, and in some cases even in the shops. A graphical record of performance, such as is kept in power plants and substations, would be very instructive in this connection.

Competition and Monopoly

COMPETITION is an industrial stimulus and an antidote for stagnation in development when considered from a certain standpoint and history shows that competition was the cause of developments which led to the monopoly operation of public utilities.

The railway industry is essentially best administered as a monopoly in each transportation district, but competition is never eliminated by theoretical statements. The successful monopoly must advance and develop at such a rate as to ward off and anticipate competition and, in the event of a new invention, must use it in a constructive manner to better its situation as a monopoly furnishing public service.

The Bell system did not give up when the automatic telephone was introduced; it developed the automatic instead of condemning it and adopted the policy of owning it and trying it out. Having been proved practicable. it is being put into operation and will gradually replace the older types as the existing installations depreciate. This organization meets competition and increases its monopoly control by doing its own inventing and developing in telephony and at the same time furnishes service with its existing equipment and protects its capital investment. It maintains itself by being so progressive that competition has no chance to exist.

The street railways were forced to compete with the steam roads and stages in their early history in order to exist. They did not suffer under such a handicap, but developed into our existing systems. Now the street railways are faced with a new competitive situation due to the development of the automobile and the motor bus. The railways cannot solve this situation by using destructive criticism, but they can master the situation, as they have mastered many previous situations, by using constructive methods. They hold the key to the problem in that they know and have experience in transportation.

If the motor bus is a coming transportation agency the street railways should own and develop it; if the street can be redesigned to meet any better the present and growing traffic changes the street railways should do it; if trackless trolleys have a place, the street railways should find it. There never was a time more auspicious for development in transportation through constructive measures, and we look for the street railways to show the same type of progressive management in the handling of competition in transportation as is exhibited by the Bell system in the telephone field.

Power Economy Outside the Power House

AN ELECTRIC railway system is a complex organization at best and departmental heads are apt to grow so that they view their own functions in the organization with a distorted and sometimes narrow perspective. The power department in such an organization is probably the most independent in its operations and furnishes examples to illustrate the complexity of a railway manager's duties. We recall an incident in which a railway power house superintendent had the temerity to request the management to adjust train schedules so as to operate the power units at maximum economy. But this man is no more open to criticism than many railway managers who forget all about the power department after it is once organized.

Economical power production is a managerial rather than a design function. There are no fixed constants in power production, and the purchase and installation of modern equipment under the direction of a competent inside power house operator will not relieve the railway manager of all power responsibilities. The power-house expert can be depended upon to get the most out of the fuel delivered to him when used in connection with the installed equipment, but there is an inherent tendency for him to view his job with the internal operating perspective of the combustion and equipment engineer. Often more money loss occurs before fuel reaches the power house, or after the electrical energy leaves the power house, than all internal economies will save. It is in the broader field of purchase of fuel and use of the power that the touch of the manager should be felt.

A great opportunity for economy and one requiring great attention is that of fuel purchase. We hope to see the day when fuel will be more largely purchased on a B.t.u. basis, and when all purchasing agents will discover that all is not coal that is black. In general, railway power producers pay too much for coal and too little for B.t.u. This subject was discussed more in detail in the issue of Oct. 9, page 701.

Then again the wrong kind or size of coal may be purchased. An equipment in the power house designed for a certain size and type of coal for efficient operation labors under a heavy handicap when any and all kinds and sizes of coal are used. If the coal is too large, air holes and thin spots may occur in the fuel bed; if the coal lumps are too small, the draft apparatus may be too limited; if clinkering or coking coal is used, then other troubles may arise. Power-house equipment and labor both operate inefficiently when variable types and sizes of coal are used to produce power. A close co-operation between the power-house superintendent and the purchasing agent is essential to efficient operation.

There is also room for managerial activity in regard to the use of power after it has been produced. The St. Paul electrification furnishes a startling innovation in this respect—the train dispatcher modifies schedules to control peak demands of power. Of course the inducement for such a policy is the financial clause in the power contract, but it stands to reason that the power company would not offer the inducement unless it saved money. This idea applies in detail only to specific cases, but modern power plants are so numerous that questions of peak load power transfer arrangements, supplementary stations, feeder size and location and schedules offer a fruitful field for economies in power entirely aside from internal economies in the local power plant.

Electric Steel Offers Possibility of Lighter Equipment

ANY improvement in the strength of steel results eventually in a decided gain to the railway industry. The war gave a great impetus in this direction through the development of alloy steels and steels made in the electric furnace. The results of some tests on electric steel which have recently been published indicate that its properties approximate those of crucible steel and that it is superior in tensile strength and torsion to the best open-hearth steel. This is true, even if the steels have the same chemical specifications. It is claimed that the cost is not far in excess of that of open-hearth steel.

The automobile industry has quickly grasped the opportunity to reduce weight by using electric steel, and there would seem to be a considerable field for such a material in the railway industry, particularly in the lightening of rolling stock parts. For axles, electric steel will, according to reported tests, stand twice the torsion of open-hearth steel. It is also reported to suffer less fatigue under shocks.

There will be a time element in such a change. The output of the material is at present somewhat limited, but it is now on the market and the development of additional electric furnace capacity appears to be considerable. The initiative for its use should come from the railway operators, as they are the men to benefit from the reduction of weight of the equipment.

Staten Island Has a Scandal

NEW YORK'S Mayor is horrified. It may not matter that New York is horrified at its Mayor. That is something else again. With it the Mayor has nothing to do. From being interrogated in the building graft scandal, the Mayor has turned to questioner by proxy in a scandal which he has unearthed through Grover Whalen, commissioner of plant and structures. It is a small matter intrinsically, but it involves a big issue. Over on Staten Island, where the city is now operating one-man cars at a 5-cent fare, it was recently discovered that one of the motormen-conductors was a nickel snatcher. This was too much for the auburn-haired denizen of the City Hall, so Mr. Whalen was assigned to bring the offender to book.

Nickel snatchers are not wanted on the city lines. Of course not. How can the city be expected to make a success of its municipal railway undertaking if nickel snatching is not stopped? It needs every nickel it can get. This particular offence was not so grave; it was the cumulative effect of the thing that was to be feared. Since the arrest of the offender it is said that the earnings of the road have increased. How could they very well do anything else? If there is any place in the world where a nickel would be missed it is on this Staten Island road. The miscreant who is charged with pinching nickels there might have known this if he had given the matter more than a moment's careful thought. Anyway there was a technical error in the form of the complaint. Proceedings have been adjourned until Dec. 21. Justice will then probably deal sternly with the offender, if the court does not accept the defendant's plea that he hadn't had time to ring up the fares.

What does it matter if a thousand people are robbed in a day in the great city so long as the fellow on Staten Island who steals a nickel from the city is brought to justice and is held up to his associates as an example of what may befall them if they become careless in their handling of other people's money.

Physical and Mental Examination of Prospective Employees

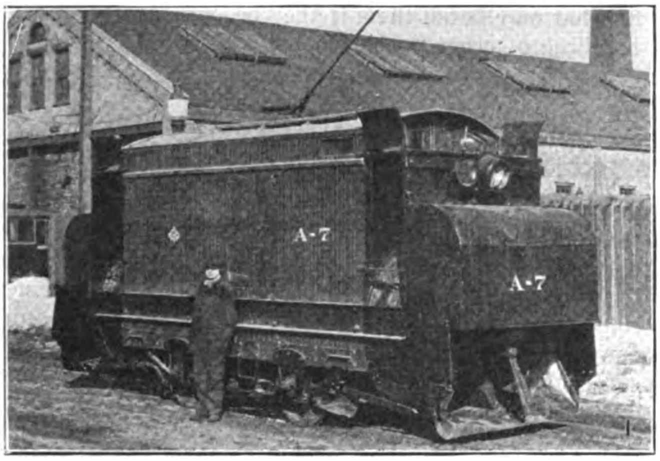
A RECONSTRUCTION period is at hand for electric railways, and it is suggestive of a new sentiment that the American Electric Railway Transportation & Traffic Association should have appointed a committee on personnel which will prepare a report for the next convention on the best methods of hiring and training employees. This subject has been investigated by several committees in past years, but it was dropped during war time when the problem was not so much how to select and train an efficient force as how to secure men of any kind to keep the cars moving. The turn in the tide is now emphasized by the constantly growing number of men applying for positions with electric railway companies, particularly for platform service. These companies are also in a situation where undesirable employees may be weeded out without worry about the possibility of replacements. It is natural, therefore, that the industry through its association should resume its study on the selection and training of employees.

Another factor which is behind the demand for a revival of this particular committee is the growth of employers' liability legislation. Preventive measures in the selection of men physically fit should lessen the burden which companies are facing in the way of compensation for employees injured or killed in hazardous occupations.

Inquiry among industrial plants has indicated that we have only begun to realize the possibilities of the proper selection of workmen from the physical standpoint and that we have just scratched the surface from the mental standpoint. Too many electric railways have been content with a perfunctory investigation as to the physical condition of applicants for train service, and only those employers who have turned this task over for serious study by a capable doctor have begun to get their reward in the weeding out of poor material from applicants at first sight suitable for the work. A man's mental alertness, soundness of judgment and efficiency or skill in his occupation depend to a large extent upon his physical condition. He cannot respond quickly to an emergency without being sound physically. He may not be actually crippled or afflicted with a serious ailment, but the continual consciousness of discomfort resulting, for instance, from fallen arches may easily be a contributing cause to a serious accident. Experience in the weeding out of recruits for our great national army showed how large a proportion of the youth of the country was not up to a proper physical standard.

Psychological tests for prospective employees have never been developed to any great extent in the electric railway field, although many industrial establishments have reported good results from experiments of this kind. The committee on personnel might well look into this feature of selective employment methods because sluggish mental habits, not always detected by physical examination, may easily lead to disastrous accidents or unfit an employee for his duties on the cars. We believe there is a fertile field for development in this branch of employment methods.

Snow-Fighting Equipment of the International Railway



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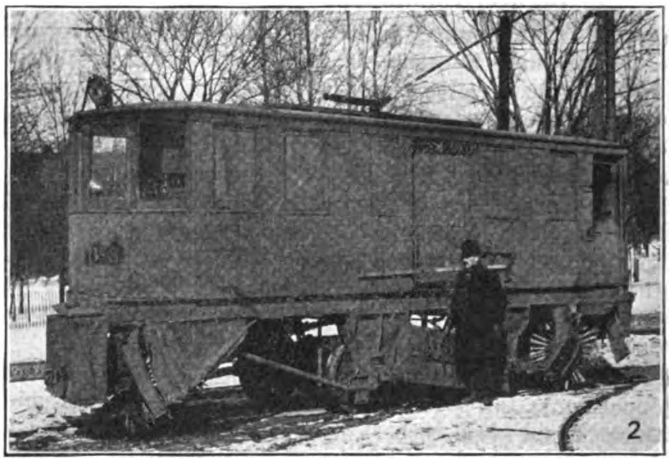

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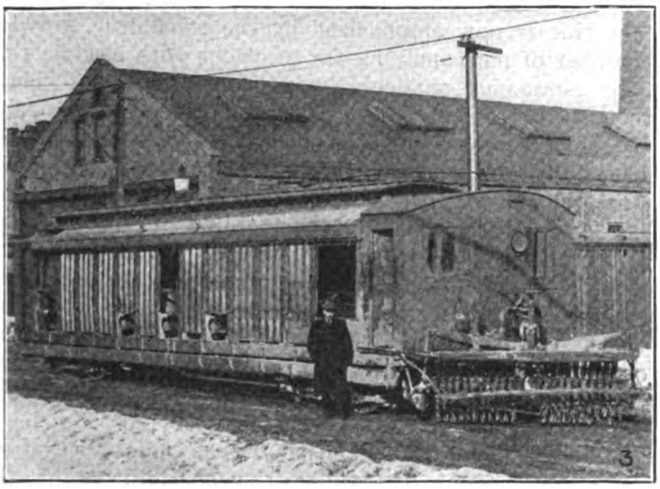

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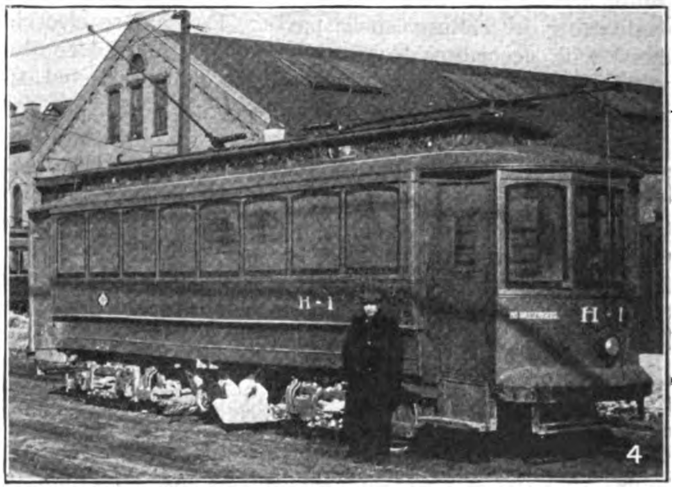

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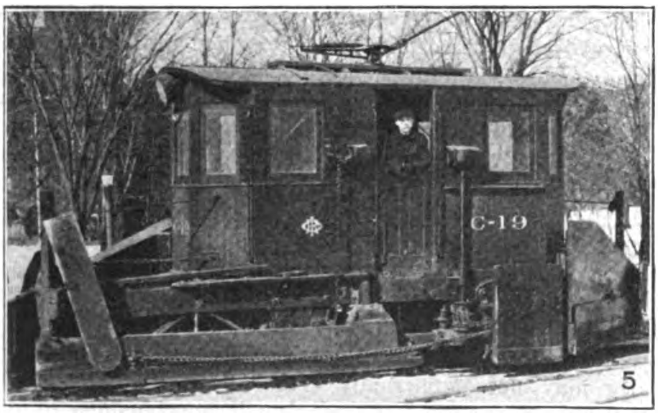

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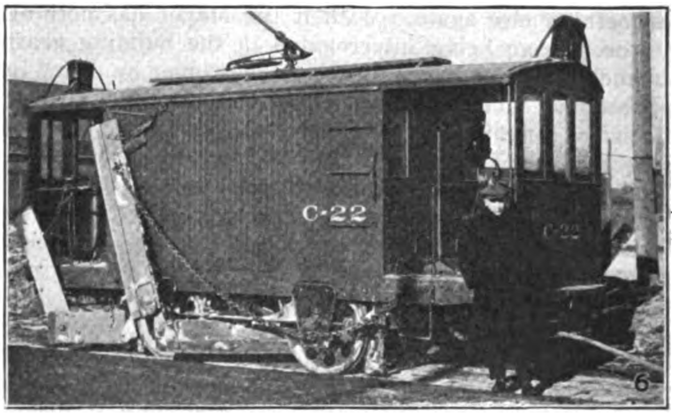

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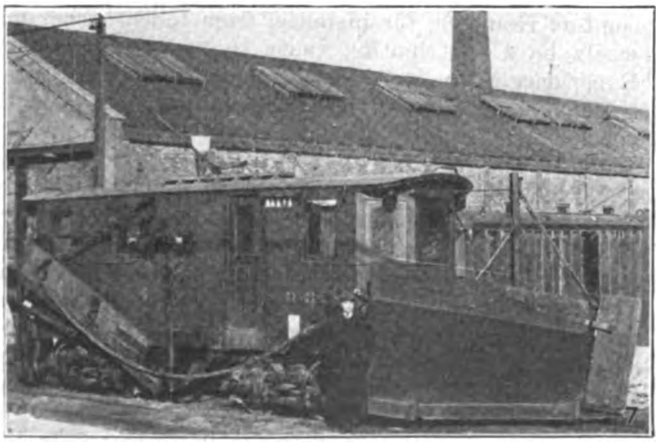

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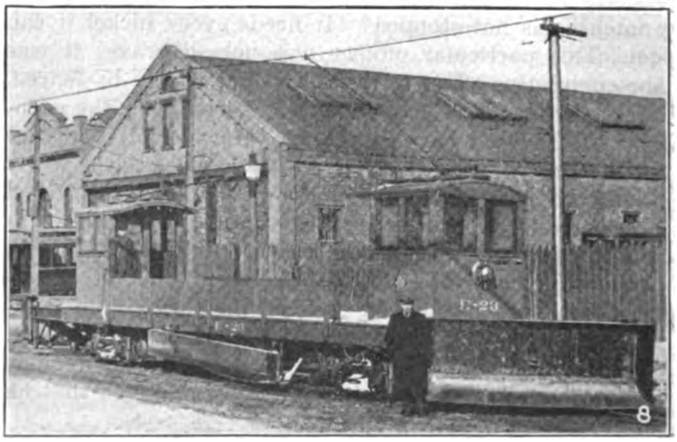

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Fig. 1—Rotary snowplow. Fig. 2—Single-truck snow-sweeper. Fig. 3—Combination open car and sweeper. Fig. 4—Ice digger. Fig. 5—Single-truck shave plow. Fig. 6—Scraper plow. Fig. 7—Double-truck shave plow. Fig. 8—Combination flat car and sweeper.

Does It Pay to Prepare for Winter Operation?

Some Facts and Figures Compiled from Records of the International Railway Would Indicate an Affirmative Answer—What Do Your Records Show, Mr. Manager?

By JOHN S. DEAN
Railway Motor Engineering Department, Westinghouse Electric & Manufacturing Company

THIS question, which is of vital importance, has been the subject of much discussion during the past year and should be given further careful thought and consideration by all operating men on electric railway properties located in the snow belt. To help crystallize this thought into some definite plan of action, the following data have been obtained through the courtesy of J. H. Hulme, superintendent of equipment International Railway, Buffalo, N. Y., and are submitted to show what can be accomplished by systematic preparation and planning to combat the severe operating conditions incident to the winter season.

The city of Buffalo, N. Y., with a population of 500,000 people, is on the 43-deg. latitude parallel and the Weather Bureau reports show that for the past thirty years this region has received an average of 75.9 in. of snow each winter, with a maximum of 126.4 in. (1909-1910) and a minimum of 22.4 in. (1889-1890). The maximum snow for any one month was 46.6 in., which occurred during the month of January, 1891. Operating under these climatic conditions, the local railway company has learned its lessons from past experience.

The International Railway Company, which controls all of the city railways and all but two of the interurban lines entering the city of Buffalo, operates 230 miles of city and 204 miles of suburban and interurban tracks. To handle its traffic requires on the average about 880 cars, the overhauling, maintenance and inspection of which are taken care of at one main shop, located in the section of the city known as Cold Springs, and nine operating barns conveniently placed at strategic points along the system.

PREPAREDNESS THE WATCHWORD

This railway company, realizing the importance of keeping the cars in good operating condition to reduce pull-ins to a minimum and make it possible to maintain schedules during the severe winter season, is a firm believer in preparedness and has worked out a few basic principles which have been found to be very beneficial in connection with the operation of the road. These include keeping barns and pits clean, well lighted and comfortable, making systematic and regular inspection and overhauling of all equipments, keeping an available supply of spare parts on hand, dipping and baking armatures, both old and new; protecting motors and detail equipment by suitable covers and guards, maintaining ample snow-fighting equipment, overhauling all snow-fighting equipment before winter and providing trained snow-fighting crews for all available apparatus.

TABLE I—SNOW-FIGHTING EQUIPMENT USED BY INTERNATIONAL RAILWAY

Total Cars	Class	Types of Apparatus	Single or Double Trucks	Driving Motors per Car, Hp.	Total Weight, Tons	Aux. Motor Broom or Fan, Hp.	Shown in Fig. No.
3	A	Rotary plow..........	Single	2-25	12	2-35	1
3	A	Rotary plow..........	Single	2-30	12	2-35	1
10	B	Sweeper..............	Single	2-50	10	1-40	2
4	600	Combination open and sweeper............	Double	4-50	21	1-60	3
4	H	Ice digger............	Double	4-40	21¼	1-40	4
22	C	Shear plow...........	Single	2-50	13	....	5
12	C	Scraper plow.........	Single	2-30	9	....	6
3	D	Shear plow...........	Double	4-50	30	....	7
1	E	Combination flat and plow...............	Double	4-50	22	....	8
3	E	Combination flat and plow...............	Double	4-40	22	....	8

Up to the present time this company has found that with the snow-fighting equipment recorded in Table I it has been able to keep the right-of-way cleared of snow for regular traffic. This equipment is distributed over the system, as shown in Table II. All of the cars are mounted on 33-in. wheels and equipped for double-end operation.

METHOD OF ATTACK OF GREAT IMPORTANCE

Too much importance cannot be laid upon the methods used in fighting snow on railway properties. This company has adopted the following fundamental essentials in connection with its snow-fighting program:

Under no conditions are passenger cars used to buck snow. At the first sign of a snowstorm each snow-fighting equipment is manned with a trained crew of three men, who receive a special rate of pay for this service. They are available for immediate action and are ordered out on the road shortly after the snow begins to fall.

A dispatcher located at a central office keeps in telephonic connection with all carhouses and directs the operation of the snow-fighting equipment and records all data on sheets similar to Table II, which gives a complete log of each snowstorm.

Immediately after each storm one of the first things done is to repair all breakdowns and get equipment in good condition for the next snowfall. A reserve force is kept available to prevent working the regular men to the breaking point.

To obtain some definite information as to the equipment failures experienced by this company during the past winter season, the weekly trouble reports were carefully examined and the percentage of crippled cars and of armature failures for each week, covering a period of nine months from September, 1919, to May, 1920, were tabulated. In addition to the above, the maximum snowfall for the above corresponding nine months was obtained from the local Weather Bureau records. These figures were plotted and are shown in an accompanying graph.

WHAT THE RECORDS SHOW

By referring to this graph several outstanding points are to be noted as follows:

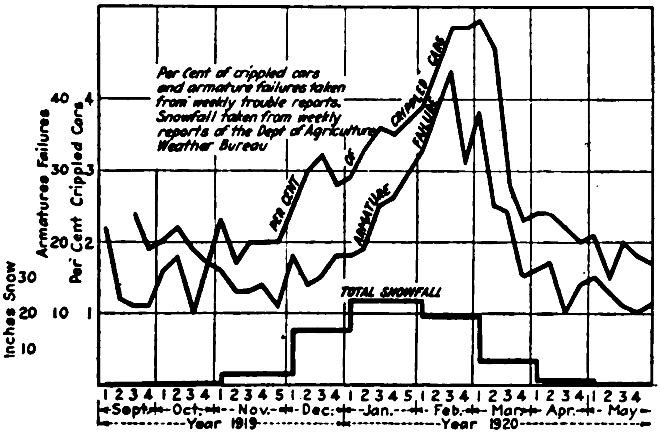
1. The maximum percentage of crippled cars for one week is 5.1 per cent. The average number of cars in service over this period was 880.

2. The maximum number of armature failures for one week is forty-four. With 3,180 armatures in service, this figures 1.4 per cent failed, which is a very creditable record. During this same period some companies operating in the New England territory reported armature failures for one week as high as 9.3 per cent.

3. The peaks on the curves show that the percentage of crippled cars and armature failures lagged about one month behind the peak of the curve representing the snowfall. This condition shows that failures occur about one month after the equipment has been subjected to severe operating conditions during the heavy snowfall.

4. Although not shown graphically, one can picture in his own mind, by drawing upon his imagination while studying these curves, an available supply of cars, schedules being maintained, normal traffic conditions and satisfied patrons.

In reviewing the above, it is only fair to state that certain local operating conditions such as wide streets, few heavy grades and the distribution of traffic on this system are favorable to this company and no doubt responsible for a certain percentage of this good showing. However, we should not lose sight of the fact that thorough preparedness and organized team work have played their part in producing these results and are entitled to consideration and a large share of the credit.



RELATION OF EQUIPMENT TROUBLES TO SNOWFALL DURING WINTER 1919-1920

The spirit of appreciation on the part of the officials of their men is shown by the fact that on one occasion when a minor complaint relating to some of the equipment reached the ears of one of the higher officials, instead of censuring the operating official responsible for this line of work he intimated that probably his men were pretty well tired out from the good work recently done in keeping the road operating smoothly during the past severe winter season. He suggested that a banquet be given them in recognition of their services. This affair was made very informal and attended by the officials and the men and was staged very successfully. All expenses were borne by the company, and it was voted a decided success, as it created a better understanding between the men and the officials.

The operating officials of this road, fully awake to the importance of this work, and believing it possible to improve their record of the past year, have been carefully studying the weekly reports of equipment failures and car pull-ins, with the idea of reducing them to a minimum. In connection with this, they have been on the alert to better their snow-fighting facilities and have in mind the following additional improvements: Dipping and baking of completely wound motor frames, standardizing the type of cleating for motor cable leads, improving methods of babbitting bearings, changing from cast-iron to cast-steel wheels on all snow-fighting equipment, adding two new Russell type snow plows, three new combination open-car type sweepers* and one new ice digger to snow-fighting equipment, arranging crews operating snow-fighting equipment so as to be under the direct supervision of the mechanical department.

TABLE II.—RECORD OF DISTRIBUTION OF SNOW-FIGHTING EQUIPMENT

Started snowing 7:15 a.m. Date 12-29-19.
Stopped snowing 6:00 a.m., 12-30-19.

Carhouses	Plows	Sweepers	Time Out	Time In	Remarks
Cold Spring...	C-2	....	3:00 a.m.	8:00 a.m.	Light circuit.
	C-3	....	1:30 a.m.	9:00 a.m.	O.K.
	C-11	....	3:30 a.m.	9:50 a.m.	O.K.
	C-30	....	....	....	
	C-31	....	3:00 a.m.	3:30 p.m.	Broken wing hook
	C-43	....	1:30 a.m.	9:40 a.m.	O K.
	D-3	....	2:30 a.m.	1:30 a.m.	O.K.
	E-24	....	11:45 p.m.	11:30 a.m.	Grounded field No. 2
	A-4	....	....	....	
	A-5	....	....	....	
	A-8	....	....	....	
	.....	B-7	12:15 a.m.	9:30 a.m.	Broom worn out No. 2 end
	.....	669	12:00 M.	8:30 a.m.	O.K.
	.....	685	12:00 M.	8:30 a.m.	O.K.
Forest.......	C-14	....	1:30 a.m.	3:40 a.m.	Wing broken
	C-19	....	3:50 a.m.	1:40 a.m.	O.K.
	C-25	....	....	....	
	.....	B-3	12:25 a.m.	8:00 a.m.	O.K.
Hertel.......	C-5	....	1:15 a.m.	4:15 a.m.	Grounded field No. 2
	C-9	....	3:00 a.m.	8:30 a.m.	O.K.
	C-16	....	2:10 a.m.	6:30 a.m.	Brakes found O.K.
	C-22	....	5:15 a.m.	9:00 a.m.	O.K.
	C-28	....	5:30 a.m.	7:00 a.m.	O.K.
	E-21	....	5:15 a.m.	10:15 a.m.	O.K.
	D-1	....	12:30 a.m.	12:30 p.m.	O.K.
	A-3	....	....	....	
	A-6	....	....	....	
	.....	665	1:35 a.m.	8-25 a.m.	Broom worn out
	.....	674	12:30 a.m.	7:15 a.m.	O.K.
Walden......	C-15	....	5:45 a.m.	10:15 a.m.	O.K.
	C-17	....	2:00 a.m.	9:20 a.m.	O.K.
	C-20	....	....	....	
	.....	B-2	12:30 a.m.	9:10 a.m.	Broom worn out No. 1 end
Broadway....	C-1	....	....	....	
	C-4	....	1:40 a.m.	6:55 a.m.	Broken chain
	C-7	....	1:30 a.m.	7:45 a.m.	Broken chain
	C-24	....	5:20 a.m.	8:30 a.m.	O.K.
	C-26	....	....	....	
	C-29	....	4:30 a.m.	9:00 a.m.	O.K.
	C-40	....	1:00 a.m.	11:30 a.m.	Broken chain
	E-23	....	....	....	
	.....	B-5	11:55 p.m.	10:30 a.m.	Broom worn out No. 1 end
	.....	B-6	12:30 a.m.	7:30 a.m.	Broom worn out No. 1 end
	.....	B-10	12:00 M.	7:20 a.m.	Broom worn out No. 1 end
Seneca.......	C-8	....	2:00 a.m.	6:55 a.m.	O.K.
	C-18	....	2:50 a.m.	9:15 a.m.	O.K.
	C-21	....	....	....	
	C-23	....	....	....	
	E-22	....	4:55 a.m.	11:15 a.m.	O.K.
	.....	B-1	12:25 a.m.	6:35 a.m.	O.K.
	.....	B-8	12:50 a.m.	7:15 a.m.	Broom worn out No. 2 end
Lockport.....	C-30	....	7:50 a.m.	11:30 a.m.	O.K.
	C-41	....	....	....	
Niagara Falls..	C-10	....	2:10 a.m.	3:45 p.m.	O.K.
	C-13	....	12:00 M.	10:00 a.m.	O.K.
	D-2	....	....	....	
	A-7	....	....	....	
	.....	B-9	....	....	
Whirlpool....	C-38	....	5:30 a.m.	3:00 p.m.	O.K.

Signed N. PERSONS.

THINGS EVERY COMPANY CAN DO

It will be granted that the solution to this problem is not the same for all railway companies. However, it is reasonable to assume that a few fundamentals can be segregated and applied to practically every railway company operating within the zone of snow. The most important of these are as follows:

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*This is an attachment which is applied to standard open cars and was described by Mr. Hulme in the ELECTRIC RAILWAY JOURNAL, Jan. 18, 1919.

Maintain comfortable, clean and well-lighted carhouses and shops.

Provide for regular and systematic inspection and maintenance of equipment.

Keep motors and detail equipment well protected by suitable covers and guards.

Dip and bake armatures.

Do not use passenger cars to buck snow.

Provide adequate snow-fighting apparatus.

Take immediate action in connection with fighting snowstorms.

No one will question the fact that the things outlined above will cost considerable money and require a large expenditure of time and energy to put them into effect, but it should not be ignored that where such essentials have been neglected, the experiences of the past few winters recall some appalling results. It is no secret that many railway companies spent enormous sums of money trying to keep their roads open and cars operating for a few months during the past winter. The results at best were very unsatisfactory to both the operating company and the traveling public. It is safe to say that if half the money spent for these emergencies had been used in systematic preparation to meet such conditions the results would have been very much more gratifying. Bearing these things in mind, each operator should ask himself this question, "Does it pay to prepare for winter operation?" then reason out some practical answer and get busy immediately.

Paints Used by Electric Railways

Some Fundamental Requirements for Protecting Railway Equipment and Structures from Deteriorating Influences and Producing a Pleasing Appearance

By NORMAN LITCHFIELD

THE use of paint by electric railways naturally falls into two groups, the one for buildings and structures and the other for passenger cars. Such freight cars as are used belong, on account of the character of the paint used, in the building and structures group. There are also two fundamental reasons for the use of paint, the primary one being to protect equipment and structures from the deteriorating effect of the weather and the secondary one being to present a pleasing appearance. The latter reason is really the controlling one in connection with passenger cars, because it is apt to be the paint which forms the basis of the public's judgment on the company's property. Gears may be noiseless, flat wheels may be unknown, detentions may be few, but if the cars and structures need a coat of paint the property looks neglected, and the traveling public forms its opinion accordingly.

In the achievement of the desired results it is of course essential that an economical procedure be pursued, the word "economical" being used in its true sense, and not as "cheap." Methods of painting and the materials to be used are usually decided on by the executive, but often they become the concern of those whose judgment is biased by favoritism, or at least affected by a lack of knowledge of what constitutes a durable protective covering. The whole subject of painting is furthermore one which was but little understood until a comparatively short time ago, and even now is undergoing considerable development. It is therefore difficult to form a correct judgment and it still remains a highly technical subject. Therefore, whatever remarks are made herein should not be taken as intimating that the author feels that any specification, in itself, can replace integrity, experience and skill on the part of the manufacturer. The making of paint is such a complicated process that it calls pre-eminently for these qualities. There are, however, a few fundamentals that the user may keep in mind to his advantage, and while all of these are well known to the chemist it has been the author's experience that they are not generally recognized by users.

To begin with, it is absolutely essential that the article to be painted should be clean and dry, for no paint, no matter how high its qualities, will hold over a dirty or wet surface. Methods of cleaning may vary all the way from simple wire brushing to "pickling" or sand-blasting. For different objects and materials each has its advantages and the more elaborate methods necessarily add considerably to the cost and lessen production. These facts must be borne in mind, for it is doubtful whether such methods as sand-blasting will pay in many instances. A questionable instance is that recently recommended by the committee on standards of the equipment painting division of the American Railroad Association. This committee said "that the new steel (freight) car upon completion of construction should have the exterior thoroughly cleaned and prepared by sand-blasting." As before stated, such a procedure would add considerably to the first cost of the car and except for thin sheets this seems hardly justifiable. So the user must decide as to how good a preparation his material needs before the application of the priming coat. One thing which cannot be stated too positively is that the surface must be dry. Any object which is wet or "frosted" will not long retain its coating and it is well to recognize the fact at the outset.

PIGMENTS CAN BE DIVIDED INTO TWO GROUPS

Having thus given some consideration to the surface of the material, it then becomes essential to have some understanding of just what a paint is. A good definition is that found in a series published by the American Society for Testing Materials: "Paint is a mixture of pigment with vehicle intended to be spread in thin coats for decoration, or protection, or both; pigment is the fine, solid particles used in the preparation of paint and substantially insoluble in the vehicle; vehicle is the liquid portion of a paint."

From a protective standpoint the priming coat is of the utmost importance. The pigments used in primers generally fall into two groups: (1) Oxides of lead, zinc and iron and (2) carbon and graphite. Mention is not made of the salts of chromium in the foregoing, on account of their expense.

Of the oxides of lead, the one with which users are most familiar is that known as "red lead," which consists generally of the sesquioxide (Pb_3O_4) with a certain admixture of litharge (PbO). It has for many years been considered one of the finest protective coatings for steel which it is possible to obtain.

"White lead," or "corroded white lead," consists of basic carbonate of lead. It is used largely as a priming coat for wood, either with or without tinting. "Sublimed white lead" is a mixture of the sulphate and oxide of lead. "Sublimed blue lead" is a mixture of lead and zinc compounds with some carbon and lead sulphide. Both the sublimed white lead and the sublimed blue lead are made by a smelting process, which it is claimed give them an ability to withstand heat and gases which attack other pigments.

Among the zinc pigments the chief is "white zinc," or zinc oxide. Another important one is "lithopone," which is a compound of sulphide of zinc and sulphide of barium.

The chief iron pigments are the red and brown oxides, which are both different varieties of iron sesquioxide or ferric oxide (Fe_2O_3). Carbon and graphite are both used in the uncombined state, the carbon pigment being formed by burning either petroleum or natural gas. Graphite is found as a mineral, and in addition an artificial graphite is now being made. To lessen the cost of the lead paints it is quite customary to substitute a certain amount of "barytes" (barium sulphate) for some of the lead salts, and these are not objectionable if not used in too great quantities.

In addition to the true pigment, experience has shown that to make satisfactory paint a certain amount of "inert" material must be added; that is to say, a material which does not combine with or affect the other material in any way. One authority gives as the reason for this that it provides particles of different size, which thus fill up the voids better, just as for the same reason aggregates of different size are used in the manufacture of concrete. These inert materials are generally silicious in their nature, such as silicate of magnesium, commonly known as "asbestine" silica, and aluminum silicate (china clay). They are in no sense adulterants, for, as before explained, experience has shown that their presence is necessary.

RUST PREVENTION IS ESSENTIAL FOR STEEL

It has long been recognized that some pigments offer a greater resistance to rust than others, and a great deal of attention has been given this subject in the past few years, numerous experiments having been made both in the laboratory and the field. An elaborate service test was conducted by the paint committee of the American Society for Testing Materials over a period of six years, commencing in 1908 and terminating in 1914.

In this test steel panels were carefully prepared with as perfect a surface as possible and exposed to the salt air of Atlantic City, N. J. A system of credit points was worked out covering the various qualities of the pigment, a total of ten being considered perfect. The panels were examined by each member of the committee before painting, and at intervals thereafter, each inspector making and recording his own observations separately. These individual observations were published each year, and at the close of the six years' test an average was obtained.

The composition of the pigments is given on page 79 of the A. S. T. M. Proceedings for 1910. The pigments were each ground in quantities given in table form in the report, in two-thirds of a gallon of raw linseed oil and one-third of a gallon of boiled linseed oil. No drier was included because of the unknown factor which would be introduced by the lead content of such drier. The final results are given on page 259 of the 1914 Proceedings and are as follows, ten being considered perfect:

American vermilion (basic lead chromate)	7.5
Sublimed blue lead	6.0
Burnt umber, zinc lead, etc.	5.5
Lamp black, graphite and barytes	5.5
Red oxide of iron with barytes	5.0
Carbon black and barytes	5.0
Chrome green	5.0
White lead and barytes	5.0
Zinc oxide and chromate	4.5
Willow charcoal	4.5
Red lead	4.0
Zinc chromate	4.0
Zinc and lead chromate	4.0
Magnetic black oxide of iron	4.0
Natural graphite	4.0
Artificial graphite	0.0

Perhaps the most interesting feature of the above list is the comparatively low rating of the red lead. The "comparatively" is used advisedly, inasmuch as it should not be understood that red lead is not a good primer, for it is, but simply that it does not stand pre-eminent, as once thought. Another interesting point is the high standing of the oxide of iron. It is this paint which is familiar to all as the dark red or brown freight car color. Later tests indicate that the iron oxides are very desirable primers, which seems quite reasonable from their kinship to rust itself. Another form of this pigment (iron oxide) has been familiar to all car builders and users for years as "metallic" paint, and its good qualities, known to all, are substantiated by the most recent tests.

In addition to the purely protective qualities of the pigments, there is the question as to whether the pigment will prevent or encourage the spread of rust under the paint film once a spot of rust has started. A pigment which prevents or discourages such spread is said to be "water inhibitive." Extensive experiments have been carried on to determine the relative action of pigments in this respect, and while too great faith cannot be placed on the results of "accelerated" tests, the fact seems to be fairly well established that there is a difference between pigments in this regard and that two of the pigments show marked characteristics, namely, blue lead, as preventing the action, and carbon, as stimulating it. For this reason it is considered that pigments other than carbon are more desirable for a priming coat, although carbon is still extensively and to a degree successfully used as a primer, and in any event is an excellent finishing coat.

Paint may be purchased mixed ready for use, but customarily it is obtained in a semi-paste form, which is thinned by the user to the desired consistency. The liquid portion of the semi-paste is or should be pure linseed oil, this being used generally raw, not boiled. Other oils are sometimes mixed with the linseed, but this is not considered the best practice.

For thinning the semi-paste paint the old and still the best practice is to use a mixture of linseed oil and turpentine with the addition of a suitable amount of drier or so-called "Japan." The cost of linseed oil and turpentine, however, has brought about the use of substitute materials, some of which have proved successful and are in general use by the most reputable paint manufacturers. Any substitutes used should always be mixed with a certain amount of linseed oil, and furthermore it is claimed that they to some extent add desirable properties which linseed oil alone will not give. Among the oils used are China wood oil, Soya bean oil and Menhaden fish oil. The thinner commonly used in place of turpentine is that known as mineral spirits, which is a hydrocarbon distillate (benzine).

While linseed oil itself has a drying tendency, it is customary to add a certain amount of drier or "Japan." Driers are composed of salts of lead, manganese or cobalt boiled in linseed oil and thinned with turpentine or a mixture of turpentine and mineral spirits. Resins or gums (not rosin) may also be used. Common salts entering into the composition are chiefly litharge (oxide of lead, PbO) and sugar of lead (lead acetate).

The above is the barest sketch of the constituents of paint, and when the story is told of the materials in the paint, but one-half of the total is known, as the dissection of paint is much like dissection of the human body, giving much information, but information of a type which is not of much value without a knowledge of the personality of the man, which is only known by intimate experience. So with paint. Probably no material is so difficult of analysis as paint, and in no material is it more necessary to have integrity of manufacture. The railway engineer must therefore convince himself, either by experience and study or by consultation with those in whom he has confidence, what type and composition of paint will be most suitable for his particular purposes, and then draw his specifications to suit, so that the reputable manufacturers may give him or his purchasing agents prices honestly made, all on the same basis and with the intention of furnishing an article which will meet the railway specifications and be compounded in the best manner known to the art. Let his chemist check it if he will, but it is certain that chemical analysis cannot take the place of experience and integrity in preparing and compounding a satisfactory paint.

SOME PAINTING SPECIFICATIONS FOR CARS

Standard specifications for paint are practically nonexistent, except as far as individual manufacturers or users are concerned. Hopes were entertained that as a result of the tests made by the committee on preservative coatings for steel of the American Society for Testing Materials that society would prepare standard specifications, but up to date the committee, we understand, has not felt that its work has progressed to the point where it can safely issue any standards on the subject.

Numerous railway specifications are extant, but as these are more or less private in character they are not generally published and are somewhat apt to reflect either the particular ideas of the chemist who prepared them or some especial condition or set of conditions prevailing on his road and not directly applicable to the general user.

The recent operation of the steam railroads by the United States Railroad Administration, however, caused the issuance of a quite complete set of painting specifications for freight cars, and it may be of interest to review the main features of these specifications.

Specification R80 covers the general requirements for paint and painting materials. In it provision is made for matching standard tints, submission of samples, etc. A variation of 2 per cent either way is permitted from the percentage of total pigment portion or total liquid portion. The individual constituents are also permitted to vary 2 per cent either way.

Specification R82 covers the painting of wooden box cars. This requires the outside wood work to be painted with one coat of dark red oxide primer and two coats of dark red oxide finishing paint. The steel work in the superstructure has one coat of red lead primer and one coat black finishing paint. The underframe (steel) gets one coat of red lead primer and one coat of black finishing paint.

MATERIALS USED FOR DIFFERENT COATS

The composition of these paints is as follows:

Red Lead Primer.—Two volumes of reinforced red lead semi-paste paint and one volume of standard thinning mixture. The red lead semi-paste is covered by specification R810 and calls for: "Pigment 82 per cent and liquid 18 per cent, the pigment portion to consist of red lead, not less than 65 per cent, and the remainder to be silicious matter, such as aluminum silicate, magnesium silicate, silica, or a mixture thereof. The red lead shall contain not less than 85 per cent true red lead (Pb_3O_4), the remainder to be litharge (PbO). The liquid portion shall consist of raw linseed oil."

Red Oxide Finishing Coat.—One volume dark red oxide semi-paste paint, 1½ volumes standard thinning mixture. The dark red oxide semi-paste is covered by specification 812-A, which requires that grinding proportions shall be: Pigment 70 per cent and liquid 30 per cent. The pigment portion shall consist of ferric oxide, not less than 30 per cent, and the remainder shall be silica or silicious earth pigments. The liquid portion shall consist of raw linseed oil.

The black finishing paint used on the underbody steel work consists of 1 volume black semi-paste paint and 1½ volumes standard thinning mixture.

The black semi-paste paint is covered by specification R811, which requires that the grinding proportions shall be pigment 50 per cent and liquid 50 per cent. The pigment portion shall consist of lamp black, not less than 20 per cent; red lead, not less than 5 per cent, and the remainder shall be shale black, aluminum silicate, magnesium silicate, or a mixture thereof.

The lamp black shall be of such quality as to produce the standard color and shall not contain more than 2 per cent of ash. The liquid portion shall consist of raw linseed oil. The thinning mixture used throughout in all these paints is covered by specification 822A, which requires that "the mixture shall consist of the following materials by weight: Fixed oils, minimum, 40 per cent; drier, maximum, 10 per cent, and mineral spirit, maximum, 50 per cent." The term "fixed oils" is used in the specification in contradistinction to the volatile products.

The specification goes on to say that "the fixed oil portion shall contain at least 50 per cent of linseed oil, the remainder being drying or semi-drying oils." A better wording would have been, the remainder being "other" drying or semi-drying oils, inasmuch as linseed oil itself is the "drying" oil par excellence. The specification then proceeds, "the drier may be of the oleate, linoleate or resinate type. If resinate is used, the rosin shall be practically all neutralized."

With the painting of passenger cars we become more concerned with the decorative than with the protective side of the subject. In general a higher quality of paint is required, containing a more finely ground pigment, and of course a much greater degree of attention is paid to the preparation of the surface of both wooden and steel cars. In fact, it may be said that too much attention has been paid in the past to obtaining an exceedingly smooth surface and a high polish. The painting of passenger cars in the past has been based on the methods which grew up in the painting of the expensive and highly polished horse-drawn private carriages just as the railway coach itself was an outgrowth from the stage coach, which it closely resembled in its early years. Thus a typical schedule for the painting of exterior of steel passenger cars was as follows:

SCHEDULE FOR PAINTING STEEL CARS

"Steel parts are to be sand-blasted and primed with a metallic primer, giving sufficient time to dry thoroughly, which will take approximately two days. On the third day a coat of surfacer is applied, and when dry the rough places are filled in with putty and a surfacer compound. After this has dried, three coats of surfaces are applied. The surface is then rubbed down smooth with pumice stone and water and is then ready for the application of the body color, of which it is customary to apply two coats. The lettering and striping is then applied and the surface given three coats of varnish."

This is obviously a very elaborate and costly process, extending over some eighteen days, and in reality is one which will not bear analysis. To produce on a commercial vehicle traveling through the dust and grime of our cities a highly polished surface of a character which we would not think of attempting to produce on the most expensive private house, which as a general thing lasts as a structure many more years than the average car, seems ridiculous. Shorter and quicker methods are therefore coming into vogue, a typical schedule being:

First coat, metallic primer; second coat, body color; third coat, surfacer compound and putty; fourth coat, body color; fifth coat, varnish, and sixth coat, varnish. Others are substituting enamel paint for the body color and varnish, with a good deal of success and a reduction in cost.

CARS PAINTED WITH ENAMEL

A recent recommendation of the committee on maintenance and care of paint and varnish of the paint division of the A. R. A. is "that when cars are painted with enamel without varnish the car should be primed and surfaced in the usual way and be given two coats of oil varnish enamel, which dries very slowly." Clear varnish enamel does not give the same surface as oil varnish enamel. The "surfaces" referred to in the foregoing are of the same nature as the "rough stuff" of the old carriage painters, this being described by Sabine in his work "The Technology of Paints and Varnishes," as follows:

"Rough Stuff.—A silicious filler, ground to a moderate degree of fineness mixed with some white lead. The liquid is essentially a rubbing varnish. The thing aimed at is to make a sort of paint which will dry rapidly to a very hard surface, capable of being ground down to a smooth, glassy finish, and at the same time have about the same rate of expansion and contraction as the foundation on which it rests, so that it will not crack and come off."

The body color pigment is usually ground in Japan and thinned with turpentine, the Japan being a "liquid made by cooking gum shellac with linseed oil in a varnish kettle, litharge being usually added to give drying properties." The pigments used are as a general thing those already listed in this article, the desired color or shade being obtained by the addition of organic coloring matter. Thus the familiar "Tuscan Red" is composed of 75 per cent or more sesquioxide of iron with some carbonate of lime and about 15 per cent organic coloring matter.

With regard to the protective properties of the various coats applied to passenger cars, interesting comment is made in a recent paper presented by C. H. Hammond before the paint division already mentioned, as follows:

"The steel primer is a thin varnish-like substance and is not recommended as a protection to steel when used alone. It must itself be protected by other paints. Surfacer is simply another form of putty and the only reason it is used is to obtain a level surface. The two color coats are made up of body color ground in Japan and thinned to a working consistency by the mixing in of turpentine or turpentine substitute. In these three classes of materials, the priming coat, the surface coats and the color coats will not protect steel from rusting. The real protection from rust is the varnish, two or three coats to be applied on top of all the previous unstable coats."

OLD METHOD OF PAINTING UNSATISFACTORY

Mr. Hammond goes on to state that the old method of painting does not in his judgment give satisfactory results, and that in reality one coat of body color and three coats of varnish are all that a steel passenger car body really needs, "that the body color should be furnished in paste form, ground in equal parts of raw linseed oil and gold size Japan and reduced with raw linseed oil to a consistency that will cover with one coat. The lettering may be done one day following the preceding and on the following day the first coat of varnish can be applied, followed by two more forty-eight hours apart." Some opposition was expressed to these views at the meeting, and we quote them simply to show the tendency away from the old elaborate "coach painting" method.

Other practices are being adopted to lessen the time required to paint a car and to give a durable finish, much attention being given among other things to providing means for artificially drying the paint between coats, thus shortening the time and also baking the paint. Proper facilities have to be provided for heating the air to about 180 deg. and to providing the proper moisture content in the air. It is being done successfully and holds out much promise. Trade preparations are also being used which replace the primer and surfacer coats, thus saving time.

In conclusion it may be said that the whole subject of painting is in a state of flux, the tendency being to break away from elaboration of decoration and finish. This is a proper tendency, but care must be exercised not to forget the fundamentals that cannot be lightly swept away and which depend for their fulfillment largely upon the honesty in the manufacture and care in application.

Cutting Energy Costs in Seattle

Power Department Reduces Car-Mile Energy Consumption on Municipal Railway, Principally by Inducing Economical Operation of the Cars

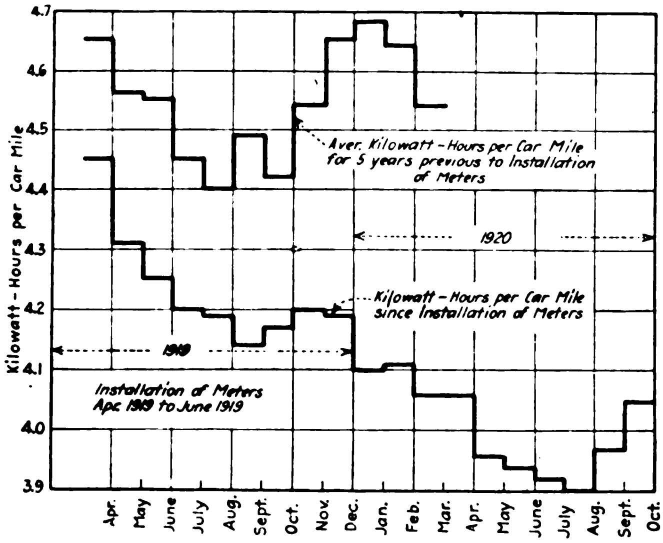
By S. E. GOODWIN
Supervisor of Power Seattle (Wash.) Municipal Street Railway

WHEN the city took over the electric railway lines in Seattle, the power department set for itself the task of saving energy in all possible directions. Energy is purchased by the city on a long-time contract at a rate of 1 cent per kilowatt-hour, delivered to the railway feeders, so that the department is concerned in savings from substation to wheel tread.

Before the purchase of all of the lines in this city, a power-saving campaign had been initiated on the two lines operated by the Seattle Municipal Railway. This campaign, which began early in 1919, was so successful in its results as to lead to its adoption for the enlarged Municipal Railway system.

In order to determine just how much energy was used on the cars, as well as to provide an incentive for careful operation, the kilowatt-hour meter was adopted for use on the cars as best adapted to the desired end. The selection was made after a careful study of other devices used on cars to stimulate careful operation.

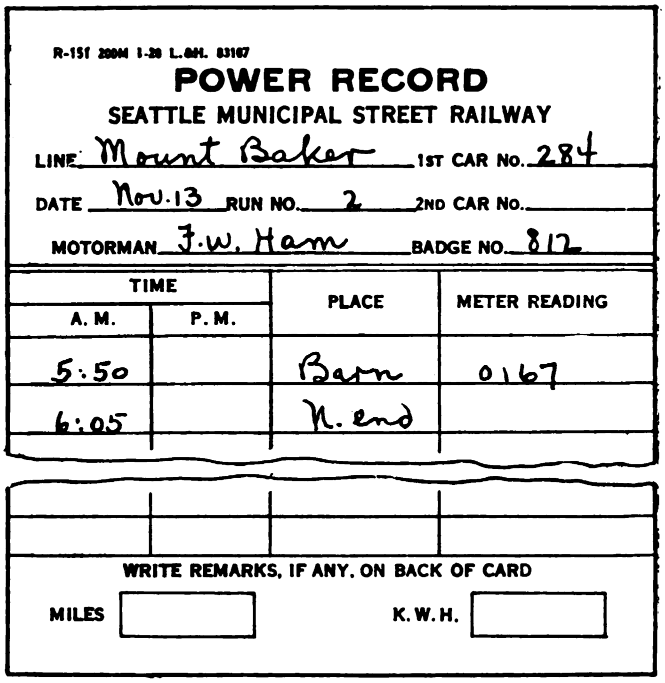
A few cars were equipped for trial with the meters in February, 1919, and the result was so encouraging that about forty-five more equipments were ordered for the remaining cars. Before all of these had been installed the city purchased the railway property from the Puget Sound Traction, Light & Power Company, commencing to operate it on April 1. Additional meters were then ordered for 100 cars operating out of the Fremont carhouse, and in August an order was placed for about 300 additional meters for the remaining cars.



ENERGY CONSUMPTION PER CAR-MILE ON SEATTLE MUNICIPAL STREET RAILWAY, COMPARED WITH PREVIOUS FIVE-YEAR AVERAGE

(Energy measured at car)

During the power-saving campaign the power department made a number of stop-watch tests on several lines over level stretches of from 600 to 1,000 ft. and found as follows: A motorman starting from standstill can, after attaining just enough speed, coast between 50 and 60 per cent of the distance between the stops in the same time that it would have taken him to cover the distance without coasting, but keeping his power on to such a point as to necessitate immediate application of the brakes to bring the car to rest at the same points. This is due, of course, to the fact that by the non-coasting method the motorman builds up a certain speed which has to be overcome by braking, whereas the coasting motorman rolls along at a more uniform speed and consumes no greater total time between stops. This fact is mentioned here, although quite familiar, because with us it was one of the strongest talking points that we have in proving to the men that coasting a good proportion of their mileage does not necessarily cause them to fall behind their schedules.



R-151 200M 1-20 L.&H. 83167

POWER RECORD

SEATTLE MUNICIPAL STREET RAILWAY

LINE Mount Baker 1ST CAR NO. 284
DATE Nov. 13 RUN NO. 2 2ND CAR NO.
MOTORMAN J. W. Ham BADGE NO. 812

TIME		PLACE	METER READING
A. M.	P. M.		
5:50		Barn	0167
6:05		N. end	

WRITE REMARKS, IF ANY, ON BACK OF CARD

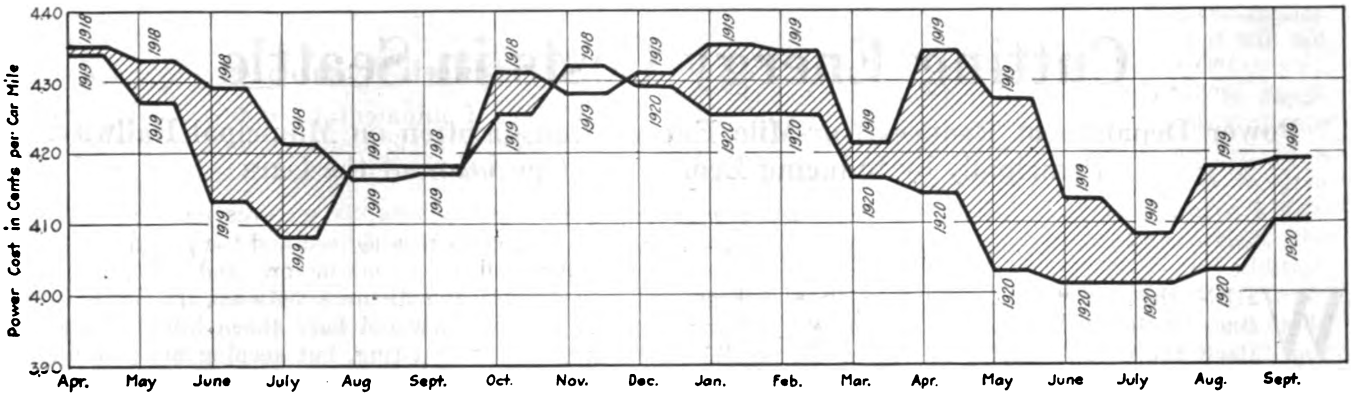
MILES ☐ K.W.H. ☐

SAMPLE POWER RECORD FORM—ORIGINAL 3 IN. X 7 IN.

In inaugurating the power-saving campaign, two instructors of power saving were sent out to ride with motormen and to show them how, by proper feeding of the controller, by the use of more coasting, and by improved braking, they could lower their power records from 5 to 15 per cent. Informal talks were given to small groups in carhouses by instructors, and bulletins on power saving were issued periodically in an effort to interest the motormen in the advantages of power saving.

FOLLOWING UP THE RECORDS

During the first ten months of the power-saving campaign $5 monthly prizes were awarded to the regular and relief men on each line having the lowest energy consumption per car-mile. This scheme was later abandoned, one of the principal reasons being the difference



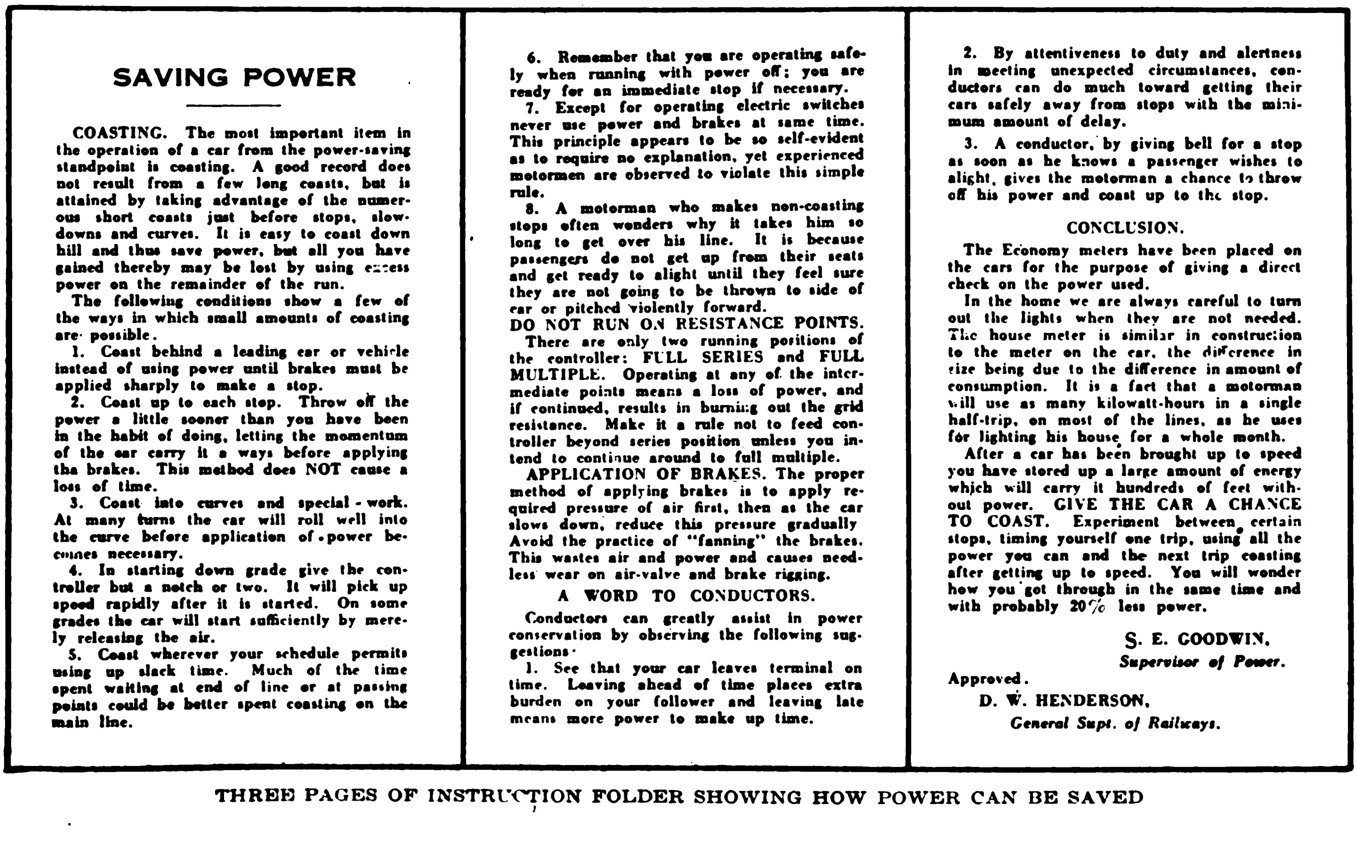
GRAPHICAL RECORD OF COST OF ENERGY IN CENTS PER CAR-MILE, SEATTLE MUNICIPAL STREET RAILWAY, SHOWING EFFECT OF POWER-SAVING CAMPAIGN

in numbers of passengers carried on certain runs and the consequent use of more power to make the extra stops. Difference in types of cars on the same line was also a cause of more or less complaint among the motormen.

Individual records are computed from meter cards. A list of comparative records, without the names, is then typed for each line and a copy sent to each motorman, a check mark being placed opposite his own record; each man thus learns his relative standing, but does not know who made the other standings. With the limited clerical force available for this work, we cannot compute each man's record for each entire month, so we take three lines per week and figure the records for these trainmen for a week or ten days. Each man thus gets a report of his work only about once in two months. It is interesting to note, however, what a good saving has been obtained despite this very limited follow-up. Also, since last May, almost no instruction has been given the motormen, nor is it planned to give more than can be done by the chief motorman incidental to his various other duties. The saving shown, therefore, is due almost entirely to the mere presence of the meters on the cars.

The following data regarding the several types of cars in use in Seattle may be of interest. We have 233 single-end, double-truck cars, weighing from 44,400 to 55,000 lb., and having gear ratios of 15: 71, 17: 69 and 17: 67. The motors are of several types, General Electric No. 80 predominating. There are 154 double-end, double-truck cars varying in weight from 38,000 to 49,000 lb. Thirty-one of these have been converted into one-man cars of the large type. The gear ratio is mostly 17: 67 and the motors General Electric No. 58, No. 67 and No. 80.

Nine rebuilt one-man cars of the small type weigh about 22,000 lb. each and have two GE No. 58 motors with a gear ratio of 16: 67. The safety cars were first put into operation in February, 1918. There are now fifty-four of these, weighing 13,000 lb., with gear ratio of 13: 74 and equipped with Westinghouse No. 506 AN2 motors. In order to make the power consumption comparison with previous years fair, in view of the installation of the more economical safety cars, we have figured



SAVING POWER

COASTING. The most important item in the operation of a car from the power-saving standpoint is coasting. A good record does not result from a few long coasts, but is attained by taking advantage of the numerous short coasts just before stops, slowdowns and curves. It is easy to coast down hill and thus save power, but all you have gained thereby may be lost by using excess power on the remainder of the run.

The following conditions show a few of the ways in which small amounts of coasting are possible.

1. Coast behind a leading car or vehicle instead of using power until brakes must be applied sharply to make a stop.

2. Coast up to each stop. Throw off the power a little sooner than you have been in the habit of doing, letting the momentum of the car carry it a ways before applying the brakes. This method does NOT cause a loss of time.

3. Coast into curves and special-work. At many turns the car will roll well into the curve before application of power becomes necessary.

4. In starting down grade give the controller but a notch or two. It will pick up speed rapidly after it is started. On some grades the car will start sufficiently by merely releasing the air.

5. Coast wherever your schedule permits using up slack time. Much of the time spent waiting at end of line or at passing points could be better spent coasting on the main line.

6. Remember that you are operating safely when running with power off; you are ready for an immediate stop if necessary.

7. Except for operating electric switches never use power and brakes at same time. This principle appears to be so self-evident as to require no explanation, yet experienced motormen are observed to violate this simple rule.

8. A motorman who makes non-coasting stops often wonders why it takes him so long to get over his line. It is because passengers do not get up from their seats and get ready to alight until they feel sure they are not going to be thrown to side of car or pitched violently forward.

DO NOT RUN ON RESISTANCE POINTS.

There are only two running positions of the controller: FULL SERIES and FULL MULTIPLE. Operating at any of the intermediate points means a loss of power, and if continued, results in burning out the grid resistance. Make it a rule not to feed controller beyond series position unless you intend to continue around to full multiple.

APPLICATION OF BRAKES. The proper method of applying brakes is to apply required pressure of air first, then as the car slows down, reduce this pressure gradually Avoid the practice of "fanning" the brakes. This wastes air and power and causes needless wear on air-valve and brake rigging.

A WORD TO CONDUCTORS.

Conductors can greatly assist in power conservation by observing the following suggestions·

1. See that your car leaves terminal on time. Leaving ahead of time places extra burden on your follower and leaving late means more power to make up time.

2. By attentiveness to duty and alertness in meeting unexpected circumstances, conductors can do much toward getting their cars safely away from stops with the minimum amount of delay.

3. A conductor, by giving bell for a stop as soon as he knows a passenger wishes to alight, gives the motorman a chance to throw off his power and coast up to the stop.

CONCLUSION.

The Economy meters have been placed on the cars for the purpose of giving a direct check on the power used.

In the home we are always careful to turn out the lights when they are not needed. The house meter is similar in construction to the meter on the car, the difference in size being due to the difference in amount of consumption. It is a fact that a motorman will use as many kilowatt-hours in a single half-trip, on most of the lines, as he uses for lighting his house for a whole month.

After a car has been brought up to speed you have stored up a large amount of energy which will carry it hundreds of feet without power. GIVE THE CAR A CHANCE TO COAST. Experiment between certain stops, timing yourself one trip, using all the power you can and the next trip coasting after getting up to speed. You will wonder how you got through in the same time and with probably 20% less power.

S. E. GOODWIN,
Supervisor of Power.

Approved.
D. W. HENDERSON,
General Supt. of Railways.

THREE PAGES OF INSTRUCTION FOLDER SHOWING HOW POWER CAN BE SAVED all the safety-car mileage at 60 per cent of the equivalent two-man car mileage, on the basis that the safety cars use 60 per cent as much power as the larger cars. This makes allowance for the small cars, so that the saving in power as shown in the accompanying curves is due entirely to better operation.

BOND TESTING

Power lost in the bonding of the rails is, of course, largely a preventable loss. A survey made immediately after the acquisition of the lines by the city showed 1,222 bonds in need of repair. Bond testers were followed by a paving repair and welding crew from the road department, and this crew replaced defective bonds with new ones of the AW-3 type, Ohio Brass gas weld. A second survey of the entire trackage was completed early last summer, and 1,263 bonds were found to be in need of repair. Of this number, 211 had not been reached by the repair crew since the discovery of the defects on the first test, owing to the need for the services of the welders on numerous construction jobs. The total number of bonds on the system is 48,600; of this number there are now not more than 350 defective.

METER INSPECTION

The Economy meters installed on the cars have now been placed on a regular inspection basis. The meter element is taken out after a run of about nine months and thoroughly cleaned, oiled and tested. An old one-man car has been fitted up with a testing rack and work bench, and this is run to one of the carhouse yard tracks and the meter elements are changed on the cars standing in the yard. Two men are thus able to overhaul from twelve to eighteen meters per day. Upon completion of the work at one carhouse, the test car is moved from yard to yard until all meters have been overhauled.

The kilowatt-hour meters at the substations of the Puget Sound Power & Light Company, which measure 95 per cent of the total railway power, are tested once each month by two of that company's electricians, assisted by a representative of the Municipal Railway. Adjustments are made in the monthly power bills for any discrepancies over 2 per cent in the accuracy of these meters. As the monthly consumption is close to 5,000,000 kw.-hr. it is quite essential that these meters be maintained at a high degree of accuracy.

To return to the power situation on the property in general, the economies which have been effected by the use of meters and otherwise, as mentioned, are reflected in the charts which accompany this article. These charts are self-explanatory; the record speaks for itself. Averaged over the eighteen-month period from April, 1919, to September, 1920, as compared with a similar period one year earlier, there was a net monthly saving due to the use of the meters of about $1,000. In making the calculation we have assumed in the cost of power the following elements: Total cost of energy purchased for railway operation, interest at 5 per cent on the investment in meters and their installation, etc., depreciation of the meters at 5 per cent per annum, superintendence, records, follow-ups, and monthly prizes to March, 1920, when the awarding of the prizes was discontinued.

The watt-hour meters used on the cars are of the "Economy" type, sold by the Economy Electric Devices Company. L. E. Gould, president of this company, and his associates have co-operated with us in making our campaign successful.

Electrical Testing in Omaha

Methods and Equipment Used for Testing Circuit Breakers, Field Coils, Armatures, Etc., Are Described and Pictured

IN THE accompanying five pictures are shown some of the equipment which is used and the practice followed in testing and repairing motors and other electrical equipment in the shops of the Omaha & Council Bluffs Street Railway, Omaha, Neb. At the left of the barrel in Fig. 2 is shown a transformer arranged for testing field coils. The primary of this transformer is connected to the source of energy supply through the small lever-type switch at the left of the switchboard panel seen at the right of the picture. Each of the button contacts of this switch is connected to taps on the primary of the transformer. The condition of the field coil is then tested by reading the voltmeter and ammeter on the switchboard just above the small switch referred to. While the coil is being tested, it is subjected to mechanical pressure by means of two wooden levers 5 ft. long, one of which is shown at the left of the barrel. The voltmeter used in this connection is cut in or out of the circuit by means of the plug which appears on the switchboard just below the meter.

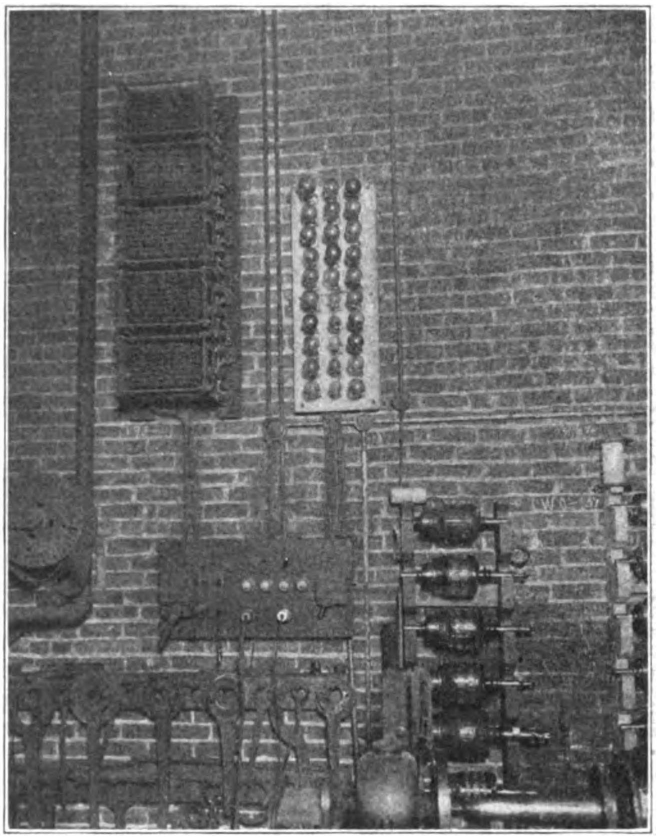


FIG. 1—LAMP BANK AND GRID RESISTORS FOR CONTROLLING TESTING CURRENT

The water rheostat made from a barrel connected with running water and equipped with the necessary adjustable plate, which is seen at the center of Fig. 2, is used in testing circuit breakers. These are mounted on a board between the switchboard and barrel, where pins are so located that any standard breaker can be mounted without the use of tools. Three pairs of leads coming out from the bottom of this board with polarity marked are provided for different types of breakers. The heavy current used in making the test is broken by means of

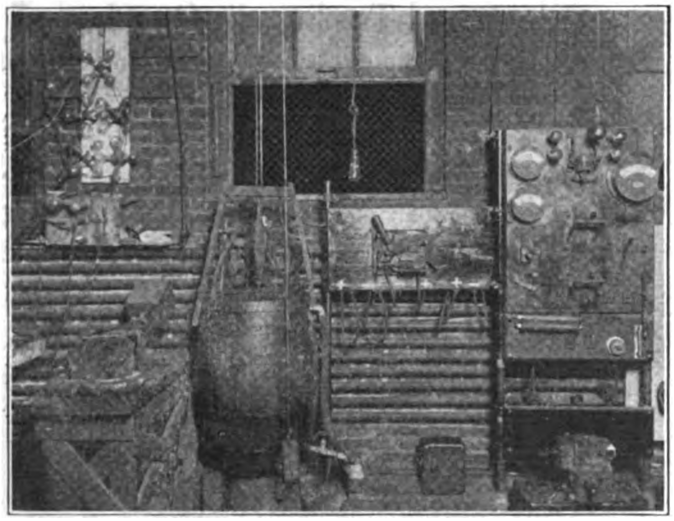


FIG. 2—VARIOUS ELECTRICAL EQUIPMENT USED IN TESTING ARMATURES, FIELD COILS AND CIRCUIT BREAKERS IN THE OMAHA SHOPS

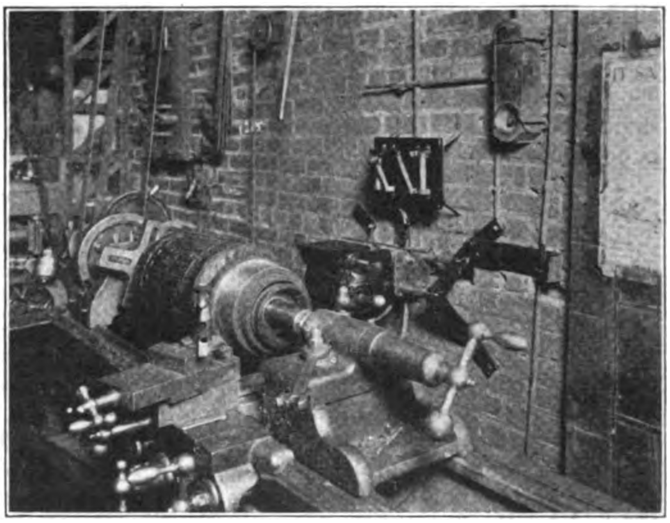


FIG. 3—ADJUSTABLE TRANSFORMER USED FOR TESTING ARMATURES WHILE MOUNTED IN LATHE

the four old circuit breakers mounted on the floor just in front of the switchboard and usually manipulated by foot. Calibration is accomplished by means of the direct-current ammeter which is mounted at the upper right-hand side of the switchboard.

This switchboard also carries other switches for use in connection with a small transformer mounted back of the switchboard and employed for break-down tests of armatures. Old armatures are subjected to 800 volts pressure, while new ones are tested up to 1,600 volts. In making these tests a bank of 220-volt lamps is used in series with the armatures.

Fig. 3 shows a convenient mounting of an armature testing transformer. This is supported behind the lathe used in turning and slotting commutators as well as banding the armatures. When this mechanical work is finished the electrical test for shorts can be very readily and quickly made. The testing transformer is mounted in a special bracket on the wall and it can be adjusted along the wall to line up with the center of any size armature core and toward or away from the wall to come within ⅛ in. of the armature. When adjusted to the right position it is held rigidly by means of a small rod placed through holes in the bracket. When finished all armatures are given a final test with this transformer before being taken out of the lathe.

In Fig. 1 is shown the scheme of control for obtaining the proper current for testing different size armatures. Current for testing main motor armatures is taken through the grid resistance which is seen mounted on the wall. This cuts the current used down to about 30 amp. A circuit breaker is connected in the circuit for protection against a ground. For testing air compressor armatures the current is drawn through the bank of lamps, also mounted on the wall. The amount of current in this case is controlled by the four button-type switches through a range from 1 to 6 amp.

The current thus controlled, as shown in Fig. 1, is applied to any motor under test by means of the small testing crab seen in Fig. 4, which may be clamped on any winding stand and used on any size armature. In making these tests a switchboard-type ammeter, shown to the left in Fig. 4, has been converted to use as a millivoltmeter by connecting in series with it a small compensating coil taken from a wattmeter. This can be adjusted to give a good, clear reading on the meter regardless of the size of wire on the armature.

Fig. 5 shows the unique practice followed in the Omaha shops of gas-welding broken armature leads instead of soldering them. In doing this work the other leads adjacent to the one to be soldered are protected from the hot flame of the acetylene torch by means of a sheet of asbestos, the operator making his weld through a small hole in the sheet.

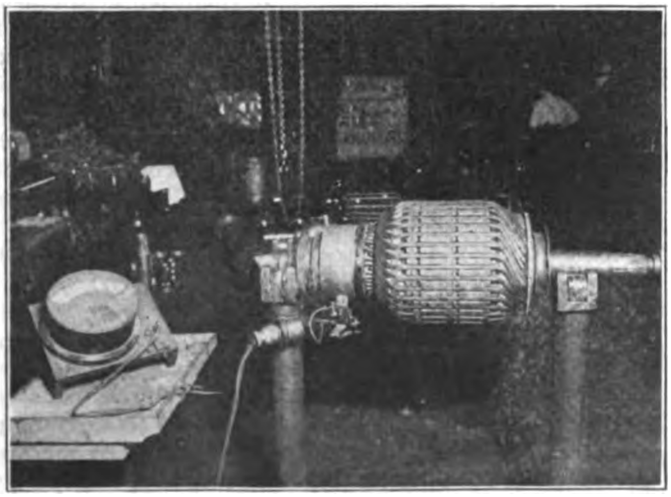


FIG. 4—TESTING CURRENT THROUGH COMMUTATOR

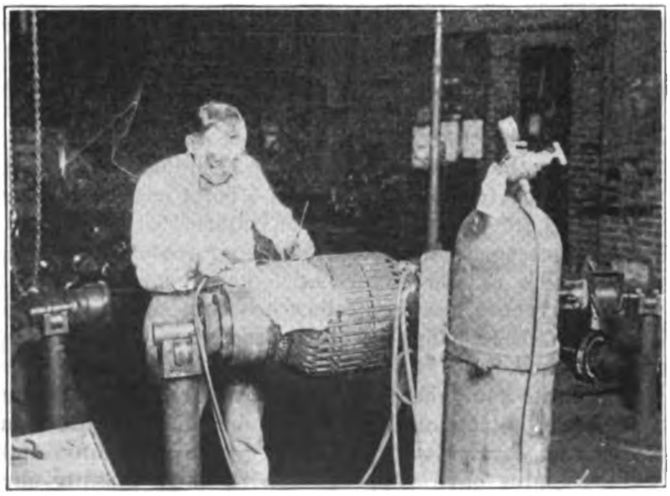
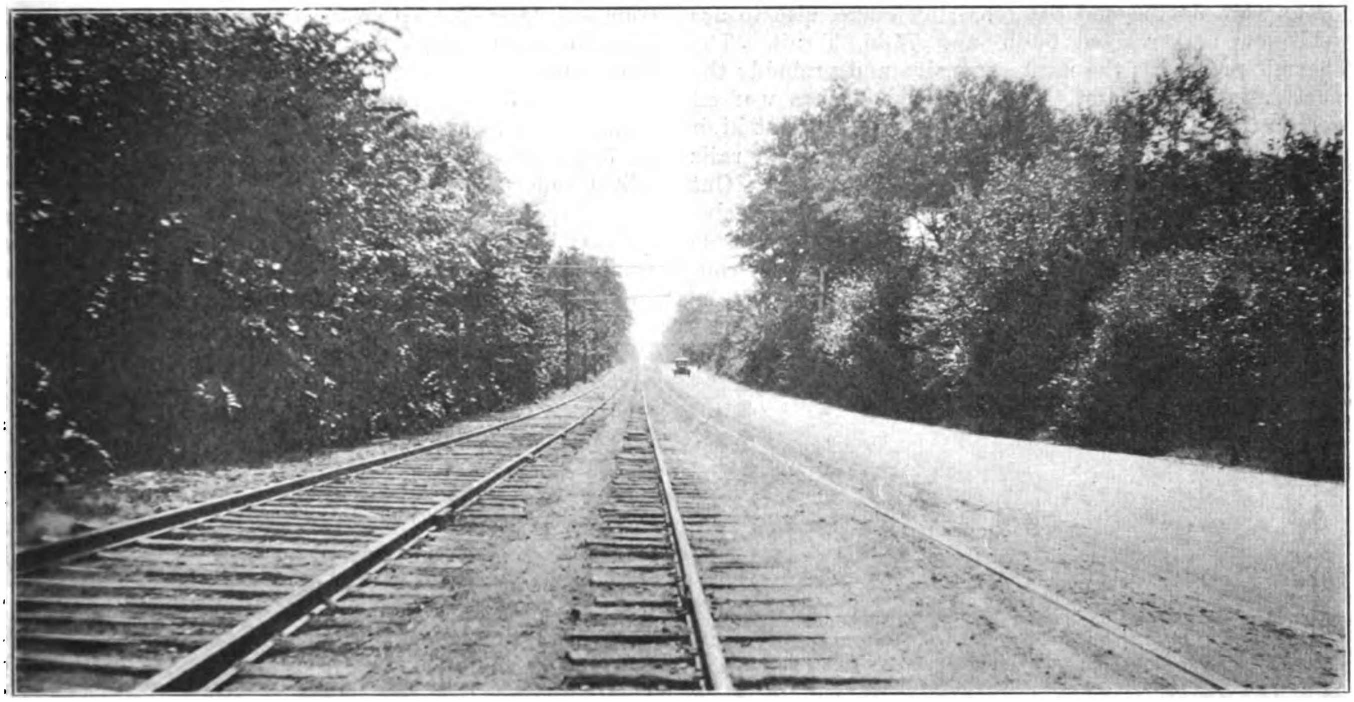


FIG. 5—GAS-WELDING BROKEN ARMATURE LEADS

Maintaining Track Under Public Trustees*

Track Rehabilitating Work, Regrading and Welding Which Were Carried Out by the Eastern Massachusetts Street Railway During the Years 1919 and 1920

BY FRANK B. WALKER
Engineer Maintenance of Way Eastern Massachusetts Street Railway



DOUBLE TRACK LINE RAISED FROM 8 IN. TO 14 IN. TO PROVIDE BETTER DRAINAGE

WHEN the Massachusetts property of the old Bay State Street Railway was acquired by the Eastern Massachusetts Street Railway one of the first problems was to put the tracks in good, safe operating condition and to reduce future maintenance costs. Four points were given especial consideration—joints, ties, ballast and drainage. Among the various items of equipment purchased were two Thermit-welding outfits, twelve Lincoln arc-welding type W machines, six Seymour grinders, making a total of thirteen; fourteen Universal grinders, seven Indianapolis welders, making a total of fourteen; five Erico welders or bonders, one Lincoln bonder, or a total of five; five Ford roadsters, eight Ford trucks, eight Stewart 2-ton trucks and two Stewart 1-ton trucks.

Since June 1, 1919, we have relaid 210,000 ft., or 39.7 miles, of track, overhauled 874,000 ft., or 166 miles; put in 193,000 ties, Lorain-welded 9,300 joints, Lincoln-welded 6,500 joints, Thermit-welded 1,600 joints, or a total of 17,400 welded; put in 520 pieces of special work, put in 1,200 pair new angle bars, taken the vertical bends out of 10,000 joints, surface-welded 9,900 joints and bonded 27,000 joints.

On paved streets we have done very little reconstruction except when it was done concurrently with the city's paving work. If and when a city or town removed the paving from the track zone and our track needed repairs or renewal we did our trackwork and the city did the paving. In case of change in grade or location the city was called upon to pay for not only removing and repaving but for all expense incident to changing grades and line, including ballast lost, etc.

In several cases where tracks were changed from center to side location the city or towns made the new excavation, supplied all the new ballast and uncovered the old track. We removed the old track, laid the new one and the city or towns then repaved the new as well as the old track zones. On country lines we raised our tracks up to or above the level of the highway and on many miles left the track entirely open or half open, depending on local conditions; the purpose in using open or half open section being to secure better drainage and to reduce snow trouble and cost of future maintenance. The trouble with these lines was that they were too low to start with and as the highways were rebuilt from time to time our tracks were left down in the mud. Where state highways are being rebuilt and the grade of the shoulder materially changed the commission is paying for the cost of raising our track to the new grade.

18,000 JOINTS WELDED

It was also realized that one of our greatest causes of bad track was bad joints, so it was decided to have all joints on the system finally welded. We probably had 240,000 joints on the system and welded 3,000 in 1919 and 15,000 in 1920. We still have a long way to go. We have great hopes of the arc-welding process, but, like all such processes, the work must be carefully watched. During the past year we employed several welding experts to start us right, but found that we have to work out our own salvation with our own men really to get anywhere. In making the 1920 budget we planned to Thermit weld all new 9-in. and 7-in. girder rail, to Lorain weld all old good quality 9-in. and 60-lb., 70-lb. and 75-lb. T-rail, where lines needed rehabilitation in long, continuous stretches and where the joints were very bad, and to arc weld 9-in. and 60-lb., 70-lb. and 75-lb. T-rail where the lines were overhauled and where joints were not beyond the repairing stage, also to arc weld new and relayed 60-lb. and 75-lb. T-rail. The Thermit process is the most expensive and probably the most satisfactory joint. The Lorain joint has worked well on the softer or rather older types of rail, but high percentages of breaks come on the higher carbon rails of all classes, whether new or several years old. Out of 28 Lorain joints of 9-in. rail rolled in 1913, twelve broke the first day. We had to Thermit weld them as we had the street all torn up. The track work in connection with the Lorain welding is quite expensive.

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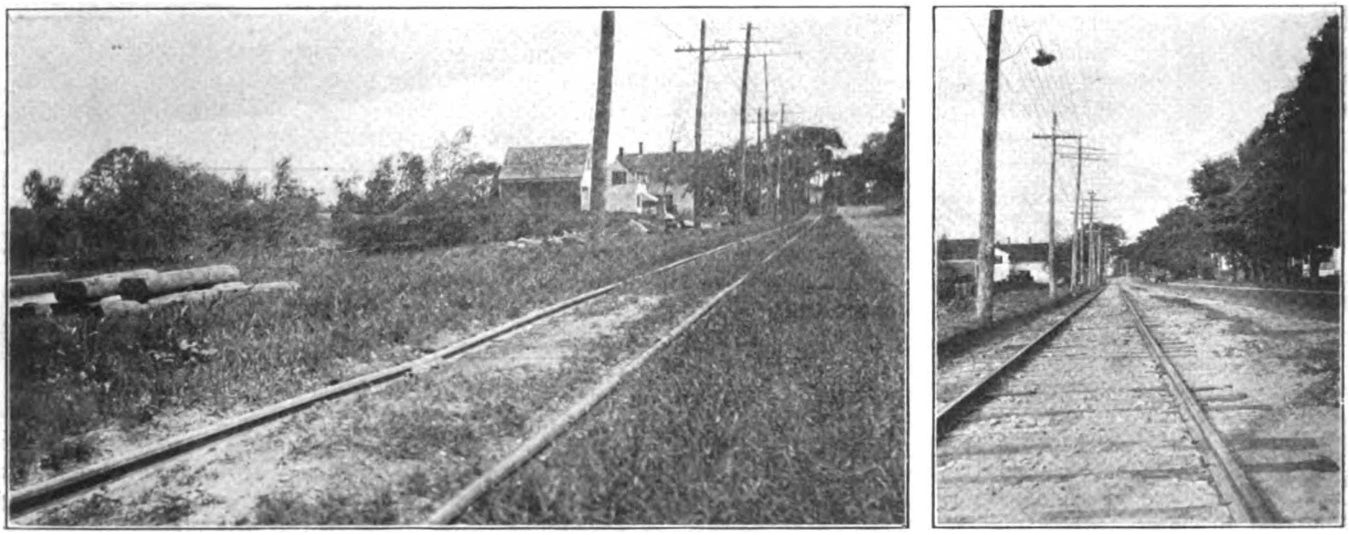
*Abstract of paper read before the New England Street Railway Club, Dec. 2, 1920.

Broken stone is, as we all know, an ideal ballast, but why take out good, firm compacted sand or gravel which has supported a track in paved streets for twenty years or more without trouble and put in broken stone at $4 per cu.yd.? It is absurd and an economic waste. Ballast serves two purposes only—first, to hold the track against movement; second, to assist drainage. I much prefer poor ballast to poor surface drainage. On steam railroad prairie lines in the Dakotas, where no gravel or even sand was available within several hundred miles, we held track on black gumbo mud by pitching the slope from top of tie at center to bottom of tie at ends and then lip slicking down the surface when wet, to form a water shed. Our policy on our country lines here has been to get the track up on ballast if available, but get drainage. Frequently we found our ballast on top of the track instead of under it. We are now putting our ballast under the ties.

We were rarely bothered with poor ballast under our old paved track, but if necessary in relaying we have used 6 in. of good gravel or broken stone. On country lines hundreds of miles were in bad shape, tracks were too low and were almost all backfilled with mud or gravel. We have attempted to raise up such lines where considerable work was done and to leave the track either open or half open. We also suffered in the past from poor drainage, and of all the serious defects in trackwork, we class poor drainage as the worst. We have tried to remedy this by raising up the track and by opening the section similar to steam roads, to dig ditches, to place catch basins and to lay pipes.



BROCKTON-EASTON LINE, WITH 60-LB. T-RAIL BEFORE AND AFTER REHABILITATION

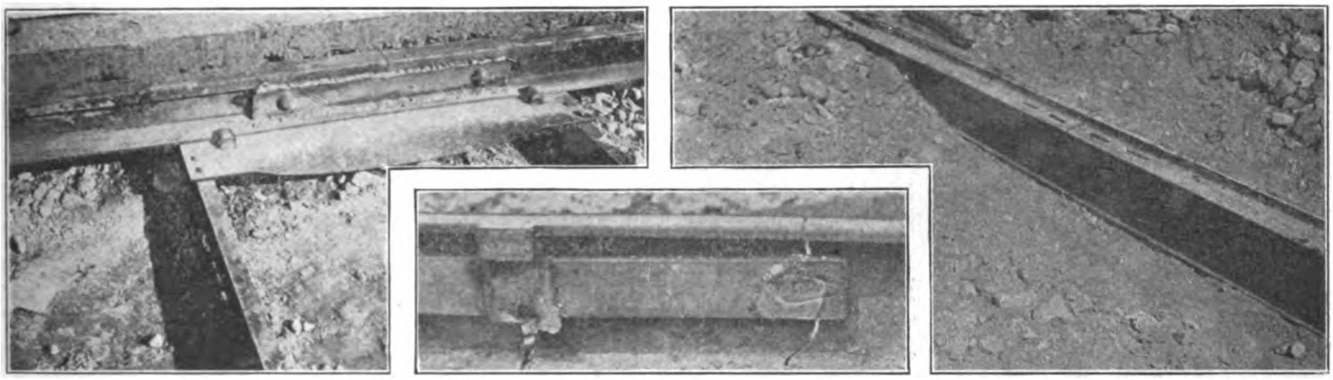
Careful attention was given to the repairs of joints. Trackmen tend to make repairs in a careless or half-hearted way. Mere tightening of bolts will not do the trick on either light T or heavy girder rails. We now insist on having the ties retamped or replaced if necessary, new plates and new bolts put in if the old ones are worn, and in case of cupped joints, these are filled with surface welders and then ground properly. We found many of our welders were surface welding cupped joints without seeing that joints were first properly repaired. We started a campaign to get better grinding. One trouble was found in that grinders, as well as surface welders, did not have true straight edges, and I always carried one in my car to test joints whenever I stopped. Considerable study has been given to instruct our grinders on all classes of work.

On our joint work we have been quite successful in using vertical rail benders. These were built by our trackmen, usually out of old rail, and if the joints were raised higher than the track surface and then tamped up strong they usually held. Frequently it was necessary to rebend some joints. The use of this rail bender ahead of the Lorain welder on badly surface bent 9-in. girder and light T-rails helped materially.

We bought 165,000 chestnut, oak and creosoted pine ties last January and on account of car shortage did not get deliveries, so we purchased 100,000 chestnut ties from the Blue Hill reservation late in the spring, and as these came slowly we had to curtail our work in August on account of the shortage.

Great saving was made by supplying each division with a cutting torch. We even cut bolt holes and ends off new rails until we discovered that we should not use the torch on high carbon rails on account of heat cracks. The torch works fine in cutting out rails for joint repairs and we have hundreds of joints Lorain welded where 12-in. dutchmen were cut in with the torch and the jointing is as good as a saw cut.

Each roadmaster was furnished with a Ford auto-



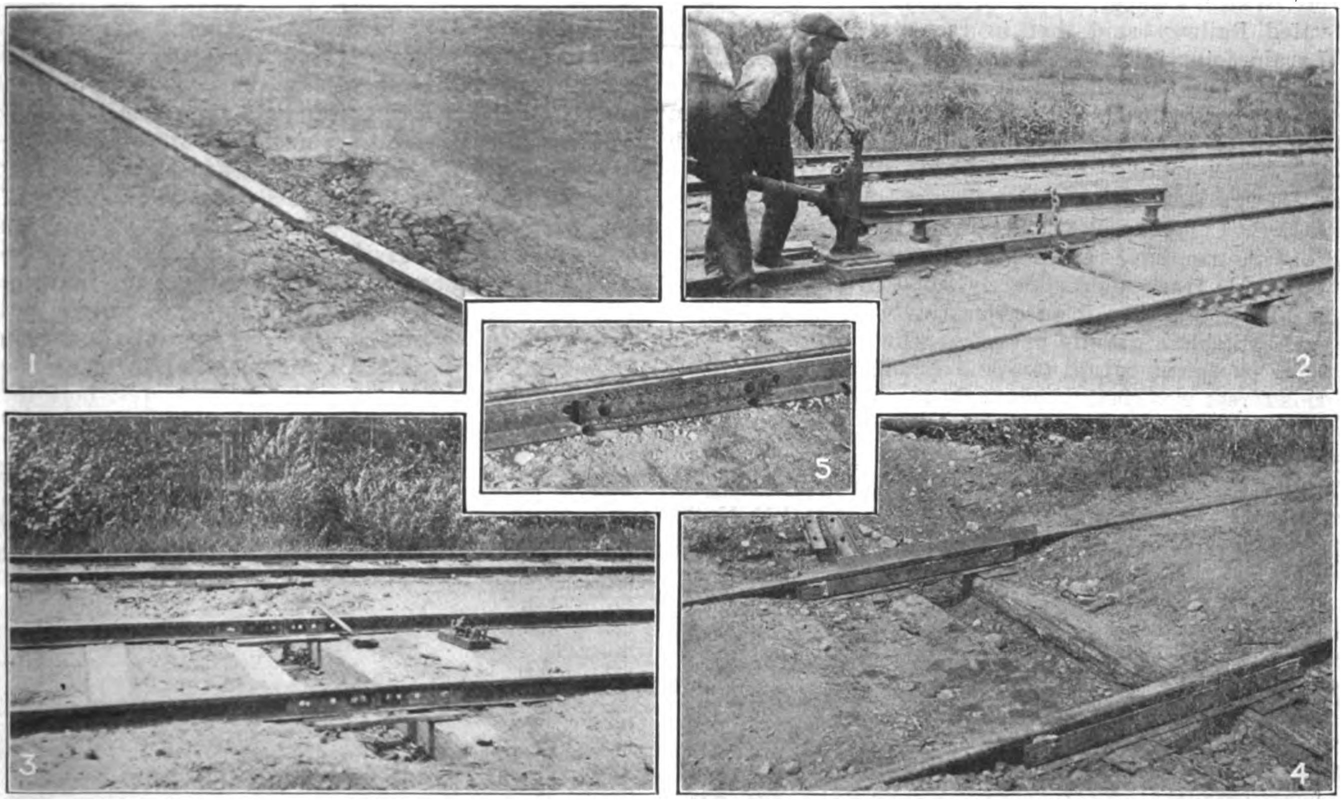
VARIOUS TYPES OF JOINTS REHABILITATED BY WELDING

At left, 7-in., 91-lb. T-rail joint with welded bars and twin steel ties. At right, method of preparing old 9-in. tramhead rail for arc welding. In the center, Lorain welded 9-in. rail with typical failure.

mobile with a light body. These have proved very useful. And on ten divisions we furnished 2-ton Stewart trucks with a large dump body. On the headboard was placed a small hand winch for loading a grinder, welder or bonder onto the truck. The tailboard comes off and the sideboards are designed strong enough for skids, having hooks to hold them on to the truck body. These trucks have proved extremely useful and are going all the time.

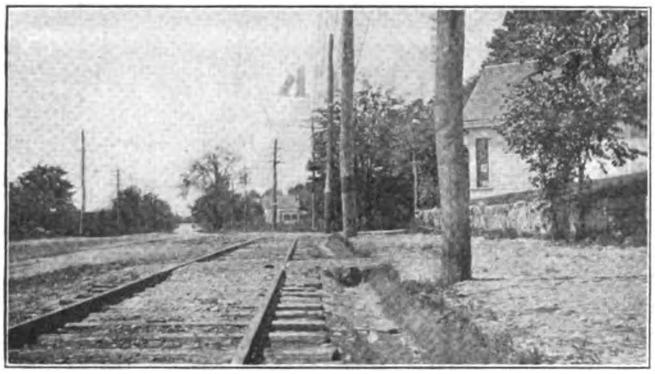
Our derrick cars are used chiefly for rails, large loads of ties and special work, the trucks being used for all sorts of hauling, ties, fastenings, ballast cleaning and getting gangs onto and off work.

We have had some interesting bridge work, but I can take time to mention three jobs only: (1) The replacing of footings under some of the steel columns of the Raynham trestle. This is interesting only as it shows that street railway bridges, like many steam railroad bridges built fifteen or more years ago, usually had poorly designed foundations and the footings were not built high enough. (2) The Thermit welding of the 6-in. turning shaft of the North Chelsea drawbridge. We operate 1,100 cars per day over this bridge and did this welding for the city. It took 125 lb. of metal. The shaft was removed and taken to a shop. A 7-in. billet was cut with a torch and bolted onto a heavy erecting plate with the shaft in line and about a 1½-in. gap. Work was started about 3 p.m., and the weld was poured at midnight and by 7 a.m. was ready for machining. (3) The arc welding of the diagonal bar of the Merrimac River Bridge on Bridge Street, Lowell. This bar, 1¼ in. x 2½ in., was bent by a derailed car. After straightening it was, as we expected, too long. We then conceived the idea of cutting out a 5-in. section and arc welding splice bars onto the ends. Before doing so we set up in our shop yard on a 45-deg. angle a sample bar and spliced and welded it. The sample was 1¼ in. x 2½ in., the splices were 1 1/16 in. x 3½ in. each and the length of

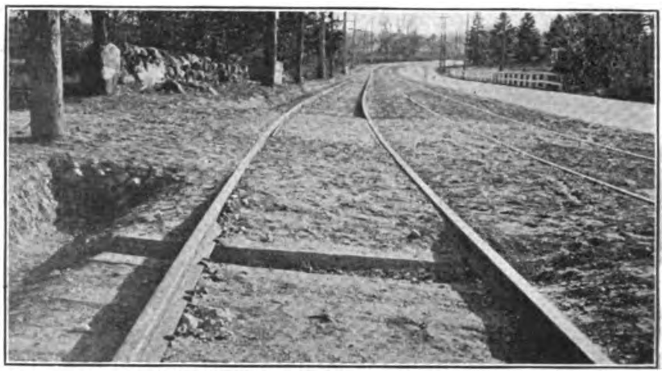


VARIOUS STAGES IN THE REHABILITATION OF BADLY BATTERED JOINTS

1. Condition of joint before work. 2. Vertical rail bender used in raising joints. 3. Second stage in Lorain welding. Joints sand blasted and rail raised on shims. 4. Finished Lorain joint. 5. Lincoln arc-welded joint.



SIDE-LOCATED T-RAIL TRACK, TWENTY YEARS OLD, AFTER REPAIRS



LOWELL-BOSTON LINE WITH ARC-WELDED JOINTS AND IMPROVED DRAINAGE

welds 14 in. This sample after welding was tested out in the Technology laboratory and broke at 208,000 lb., with elastic limit of 138,000 lb. The weld held and the bar broke near the end of the weld. As there were 56 lin. in. of weld on each end, it developed 3,700 lb. per inch of weld.

The bridge weld was completed in January, 1920, and holds without signs of failure. This bridge was built of iron in 1884 and a physical test on the piece we cut out was as follows:

Yield point	46,000 lb. per sq.in.
Tensile strength	56,750 lb. per sq.in.
Elongation	19.0 per cent
Reduction area	34.5 per cent

Our loads on this bridge, which was not designed for cars, cause stresses as high as 20,000 lb. per sq.in.

DISCUSSION ON MR. WALKER'S PAPER

In the discussion which followed the presentation of Mr. Walker's paper, H. M. Steward of the Boston Elevated Railway said that in regard to new rails the Lorain joint is not as successful as with older types of rail, but nevertheless it enables one to rehabilitate track cheaper than with any other type of joint. In regard to hard rail good results were obtained with kerosene torches.

George E. Haggas of the Cumberland County Power & Light Company, Portland, Maine, referred to the work that his men have been doing. He said that on a stretch of double track approximately 3,000 ft. long they used a 6-in. 100-lb. T-rail on cedar ties with gravel ballast and split block granite pavement which consisted of old 9-in. pavement cut in two and relaid. The subsoil on this street was clay, which made it extremely important to provide drainage. One drainage method which has worked out with particular satisfaction is to remove all material for a depth of from 6 to 12 in. below the tie and to fill in this space with ledge rock, and then to provide an outlet from this into the sewer.

H. W. Sanborn of the Rhode Island Company said that in Providence there is an ordinance requiring 6 in. of crushed stone ballast under the ties, which under some conditions seems entirely unnecessary. Mr. Sanborn said he had found in bending 60-lb. rail that while trying to bend both rails at once the bend ran back from the joints. The difficulty was overcome by first raising one rail and then the other.

Thomas W. Williams of the Union Street Railway, New Bedford, Mass., said that in regard to putting new plates on old rails they had found that frequently the rail soon becomes worn at the end and becomes just as loose as before repairs were made. They welded a little strip in place and then ground this off and found it worked very satisfactorily.

In answer to a question as to why a space of 2 in. is left out of the seam weld of the Lincoln weld, Mr. Walker stated that in St. Louis they find more seam uncovering and more cracking where the rail is welded straight through, so they carry the welding up to within an inch of the end, thus leaving 2 in. at the joint. The cracking may be due to some temperature stress or to fractures in the head of the rail and they have found less cracking when this method was followed.

F. I. Hardy of the Eastern Massachusetts Street Railway spoke of the service they had obtained from some track with Indianapolis welded joints. These have now been in service for twelve years without a single break. In rehabilitating old track where the rails and joints were bent, they use the surface bender to bring them back into shape, then turn over the plates, bolt them and weld them with the Indianapolis welder.

BROCKTON-EASTON LINE RAISED FROM 6 IN. TO 2 FT. AND REBALLASTED

READING-WAKEFIELD LINE DURING PROGRESS OF WORK

Field Inspection of Railway Track Paving

Some Practical Notes on the Duties of Inspectors and the Essential Requirements of Satisfactory Specifications for the Ordinary Types of Street Pavements

BY HOWARD H. GEORGE
Engineer Maintenance of Way Public Service Railway, Newark, N. J.

AS LONG as the duty to maintain paving rests with railway companies it should be their aim to see that such work is done with the best materials and according to the best practice consistent with the requirements, and this means reliable inspection of labor and material entering into the work. Some companies are prone to overlook the value of such competent supervision of paving work and consider that an occasional visit of the department head to the work or the presence of an ordinary laborer on the job provides a sufficient safeguard of the company's interests. With the idea of emphasizing the importance of adequate supervision of paving it would be well to consider first some of the duties that devolve upon a paving inspector, the object and intent of such inspection being to secure full compliance with the contract and specifications and the performance of first-class work by the contractor in such minor details as may not be specifically mentioned, but are implied by the contract and specifications.

The inspector should report to and be under the direction of the head of the maintenance-of-way department. He should read carefully and make himself thoroughly familiar with the contract and specifications for the particular work to which he is detailed and he should hold the contractor to a strict compliance with the specifications unless he receives instructions to the contrary from the company official to whom he is responsible.

The inspector should make out daily reports on forms provided for the purpose and also keep in a field-book a detailed record of each day's work, which should contain the following data: (1) The date of his assignment to the contract and the date of its actual commencement and completion; (2) detailed force account for each working day and the amount of material used; (3) condition of weather each day; (4) delays, reasons for and the period of duration; (5) conditions of sidewalks along the line of paving previous to commencement of work, to forestall any future claims for damages; (6) accidents; date of accident, names of persons concerned and witnesses, cause of accident; (7) any neglect or refusal on the part of the contractor to comply with the contract specifications; (8) damages to persons or property by reason of any act or omission on the part of the contractor; (9) oral instructions or orders received from his superior, and any other matters pertaining to the contract that might be worthy of record; (10) a record of the various types of paving used, such as new specification block, clipped or unclipped block relaid, and their kind, type of joints with which paving is laid, such as sand, cement, tar and gravel, etc., and the exact terminating points of each change.

In order that the work at all stages may be so carried on as to cause the least possible interference with the operation of the cars and with a minimum of inconvenience to the public generally the inspector should see that the street is not unnecessarily obstructed and that the contractor provides temporary passageways at crossings and wherever necessary. He must not permit the contractor to stop the operation of cars during the course of the work and should see that no materials are permitted on or near the track that would interfere with the use of the tracks or endanger the safety of passengers.

The inspector should see that all materials, as they are brought on the work, are piled compactly and neatly at such points as he may designate, and in such a way as shall comply with the regulations of the municipal authorities. All loose material, excavated matter and rejected materials should be removed from the site as soon as possible. He should take special care to see that no material is piled around fire hydrants, and that the space in front of them is kept clear at all times and accessible to the fire apparatus. All necessary signals and warning signs should be placed on the work to protect the public, and city monuments and bench marks must be preserved from injury by the contractor. In case it becomes necessary to move or lower any monument the inspector should notify the City Engineering Department and the contractor should not be permitted to move it unless authorized to do so by the City Engineer.

The inspector should examine all material as it is brought on the work and see that it conforms to the specifications before permitting it to be used. Should the inspector at any time suspect that the material used is not in accordance with the specifications samples should be taken by him, with a record of the location, and his superior notified immediately.

DETAILS OF THE WORK

It should be the duty of the inspector to see that no part of the paving is laid at a higher elevation than the top of the head of the rail, unless specially provided for on the plans. He should see that the space adjoining the web between the head and base of the rail is filled either with paving or a suitable rail plaster, and should not permit the contractor to pave against the rail until this space has been filled.

Where welding of the joints is contemplated and for any reason has not been completed prior to the laying of the pavement, if tar and gravel or cement joints are provided for the latter, the inspector should see that this is omitted for a sufficient space around each joint to permit easy removal of the paving block to accommodate the welding apparatus. The inspector should report to his own engineering department any variation from the ordinary paving that requires special measurements and keep sufficient records to enable him to designate such places when called on for them.

The above points cover in a general way instructions prepared for the guidance of paving inspectors on the Public Service Company's line. In addition to these general instructions, the inspector should watch out for the following points, but this is not to be construed by the inspector to mean that they are the only items to be checked, because he is to keep a close supervision over the entire job:

SUSPENSION OF CONCRETE WORK

Cement must be effectually protected from water or dampness. Packages of cement which when turned out contain hard lumps should be rejected. Where the contractor is to place the concrete foundation for the paving the inspector shall see that the specified proportions are strictly adhered to. Where the sand and stone are supplied to the mixing board by wheelbarrows and the cement in bags the inspector shall measure same to see that the contractor is using the right proportions of cement, sand and stone. One standard bag of cement will be considered as 1 cu.ft. and a barrel of cement as 4 cu.ft.

In mixing the concrete the method of gaging the proportions must be accurate and the operation of mixing it by hand must be done on suitable mixing boards. The inspector must see that the concrete is deposited as quickly as it is mixed.

When a concrete mixer is used the inspector must acquaint himself with the theory and principle of operation of that particular type of mixer and be able to detect at any time any change in the proportion or uniformity of the mixture. When the mixer is of the automatic-feed type the inspector must test it at least once during each day's work, at times unexpected by the foreman, by feeding measured quantities of cement, sand and stone, in the proportion specified, into the respective hoppers. If the mixer is gaged properly and feeding freely the measured quantities of materials will be exhausted simultaneously. Should some cement be retained in the cement hopper after the sand and stone are exhausted it is an indication that the mixer is either improperly gaged or that the cement feed is clogged. Whatever the trouble is it must be corrected before the mixing is allowed to continue.

ACCURACY OF MIXER SHOULD BE TESTED

When the contractor employs a concrete mixer into which the materials are not loaded in batches the inspector should not depend for the securing of proper proportions on the accuracy of the machine gaging or the proportion of the shovelers used. The material must be placed in properly proportioned piles, not containing more than 10 cu.yd. in the case of sand, broken stone or gravel, and the inspector must see that the machine exhausts all material simultaneously. Should it be impossible to obtain these results, due to improper piling of material, the inspector must require the use of measuring boxes for proportioning the charges for the mixer.

The test for the degree of mixing or turning will be that all fragments of stone are fully covered with mortar. Grouting of concrete after it has been laid, or the application of neat mortar to the surface, and the sweeping of the surface with street brooms to make it smooth or to cover up defects must not be permitted. Concrete made of fine stone in the stated proportions of mixture may be used for leveling depressions.

The inspector shall see that the concrete is protected from injury while setting and that no hauling or trucking is done over it except on planks, and only after a proper hardness has been reached.

The principal care of the inspector should be to see that the asphalt is not laid at too low a temperature. The minimum temperature permitted by our specifications is 250 deg. F. While the main or interior mass of a wagonload may be well above that temperature, the top and outer part of the load may be, particularly in cold weather, too cold to be safely used. Some of this colder portion may be sufficiently reheated by mixing it with the hotter material, if properly handled in unloading, but any material that is so cold as to be lumpy when unloaded, or, more particularly, when being raked out, should be discarded. This applies to both surface and binder mixtures. The best practical guide is the manner in which the mixture behaves in raking. It should always be so hot that it will, under the rake, break up into a uniform crumbling or powdery mass. If it does not do this it is too cold, whatever its temperature may be.

Before the binder is laid all loose material, rubbish, street dirt and other matter foreign to the concrete surface shall be removed and the concrete surface swept, with street brooms if necessary, properly to clean it. Neither binder nor surface mixture shall be laid upon wet surfaces. Before the spreading of the surface mixture on the binder the latter must be cleaned of all foreign matter and swept if necessary. If the binder course already laid has become covered with mud from wagons or other travel it must be swept clean. No loose fragments of binder material must remain on the surface. Any part of the binder course that may have become broken or loosened must be taken up and new material laid in its place with the same care as the original.

HOW BINDER COURSE IS LAID

Nearly the same care in raking and equally as careful rolling should be required as for the surface course. If the binder is not thoroughly compressed and becomes cold before the surface course is laid it is likely, in the future hot weather, to soften and yield under heavy travel, and thus start small depressions in the pavement.

The joints against a cold edge of previously laid surface must be cut back until solid, fully compressed material of full thickness is reached and the raw edge completely but thinly painted with liquid bitumen. No masses or fragments of cold mixture must be allowed to remain on the surface of the binder, in advance of the placing of the surface course, to be covered up by the latter.

Such cold masses will not be compressed by the roller, but will later, under the hot sun and heavy travel, yield and start depressions in the pavement. Raking requires skill and the tines of the rake must penetrate to the binder, so that the raked material will be a uniform mass from top to bottom.

The inspector must insist upon the roller being placed upon the freshly raked surface just as soon as the material will bear it without being squeezed out or displaced laterally. The tendency is to keep the roller off too long, thus permitting the chilling of the surface and preventing its proper compression. The inspector must not take the contractor's word as to how soon the rolling may be begun, but should have trials made until he is able to judge for himself. The rolling of the heavy roller should be very thorough; the roller should be kept at work constantly until the surface is too cold to be impressed. In operating the roller lengthwise of the street the rolling should begin at the gutters and work toward the center of the street whenever practicable. Cross rolling and diagonal rolling must be insisted upon wherever the width of the street will permit.

Asphalt surfaces must not be laid when rain or snow is falling or so long as the surfaces are wet. Surface mixture raked out and caught in a shower before it is well enough rolled to exclude water must be taken up and discarded.

CARE NECESSARY FOR BLOCK PAVING

The more important things for the inspector to look after are: (a) The quality and shape of the blocks, (b) the sand cushion, (c) the setting of the blocks, (d) the ramming of the surface and (e) the filling of the joints.

Assuming that the general quality of the stone has been approved, the inspector will need only to observe and reject blocks made from soft, weathered or otherwise defective stone. Any material divergence from the correct form or from the sizes specified as permissible will be readily caught by the eye as the blocks are brought to the street and such defective blocks thrown out. The proper dressing of the blocks is important and should be watched carefully. While the inspector is not expected to examine each individual block, close observation of the blocks as they are handled and laid will enable him to detect and reject those that are materially defective in shape or dressing, or excessively wide joints will call attention to them as they are set.

Screened sand must be used for the cushion bed. It should be moderately coarse and must be fairly clean and pure. The tendency with contractors is to use any dirty sand or sandy loam available on the street. Such material, especially if it becomes filled with water, will yield under the blocks and will not support them properly. The sand bed should not vary materially in thickness. It should be laid and graded not more than 50 ft. nor less than 20 ft. in advance of the setting of the blocks.

SETTING THE BLOCKS

Blocks of uniform width and depth must be selected for each course, and each block must be laid upon a full bed of sand and "struck in" at the base, so as to bring the stone in close contact with its neighbor in the preceding course, and thus to insure the closest possible joint. The inspector must see that the joints in the line of traffic are close and that the alignment of the courses is true. This is most important, as a crooked or wavy course lessens the chances of getting close joints, not only along that particular course but along the courses that are to follow. The inspector must see that all longitudinal joints are broken by a lap of at least 3 in.

The operation of ramming is not to be permitted to approach within 20 ft. of the end of the paving. After ramming the surface of the pavement may look somewhat wavy and uneven. The inspector must then see that it is back-rammed. All blocks below the general plane of the surface must be raised and more sand placed thereunder and the blocks rammed again to an even bearing.

Whether sand or grit is used for partly filling the joints before paving cement or pitch is poured, care must be exercised in placing the sand or grit in the joints. Dumping a wheelbarrow load on the surface and then sweeping the joints full is not to be permitted under any circumstances. Sand and grit or gravel should be dried before being used and put into the joints as nearly as possible to a uniform height, as called for in the particular class of granite pavement. For pitch joints the contractor shall remove the gravel for the depth of about 1 in. below the surface before applying the pitch. The latter should be poured into the joint while at such a temperature as to be perfectly fluid.

USE CARE IN CLIPPING OLD BLOCKS

In clipping, care should be taken that all blocks are of as nearly uniform size as possible and that the sides are even and square, in order to insure uniform width of joints. Any block that falls below the minimum specified size after clipping must be rejected. The inspector must use special care in the inspection of brick, asphalt or other artificial block and prevent the use in the pavement of any broken, chipped or otherwise defective blocks. A contractor will often use such brick and lay them with the defective side or face next to the sand cushion. This should not be permitted. The contractor should not be allowed to fill the joints of any stretch or section of paving with cement, pitch or other filler until such paving has been thoroughly examined by the inspector for defective blocks and such blocks replaced by perfect ones.

However carefully lumber may have been inspected before its manufacture into blocks the subsequent seasoning, treating and handling will develop many defects and they will need close observation.

Under certain conditions wood blocks will develop a great many "season cracks," which should not condemn them unless the cracks open for the full depth and to more than one-third of the thickness of the block. "Shakes" result from the separation of the wood along the growth rings and if well defined or open should condemn the block, though in many cases the blocks, after the defective part has been trimmed off, may be used.

The inspector shall see that the required crown is given to the concrete before the same is set, as on account of the even size of blocks any inequality of foundation more easily affects the surface. When these blocks are to be placed under the head of the rail, as in T-rail, the inspector should see that they are placed tight against the web of the rail and that all voids are completely filled, to avoid any loosening by the action of the cars on the adjoining rail.

INSPECTION OF MACADAM PAVING

The inspector must see that the stone is spread in a uniform layer to the specified depth before rolling and that the rolling is continued until the stones are thoroughtly settled into place and show no movement under the roller. The inspector should see that the binder is applied in thin layers and that it is not rolled until dry. The application of binder with intermittent rolling must be continued until all the voids in the stone are filled. Water should then be applied in such quantities that a wave of mud forms in front of the roller. The rolling must continue until the pavement is thoroughly consolidated.

The inspector should see that the road is again rolled after the final coat of screenings is spread over the surface. He shall not accept the same until the surface becomes thoroughly consolidated, hard and smooth. Before the application of a bituminous dressing the inspector must see that the surface is so swept that the ends of the 1½-in. stones are exposed. Such dressing must not be applied except when the temperature is above 50 deg. F. and the weather is clear.

The inspector should bear in mind that the foregoing instructions are general and intended as a guide to be used in connection with and as a supplement to the contract form and specifications. He must not conclude that because no mention is made of some specification provision in these instructions they are of minor importance and may be neglected or violated. The contract specifications govern in every case and he should be held to strict accountability for the enforcement of every and all provisions contained therein.

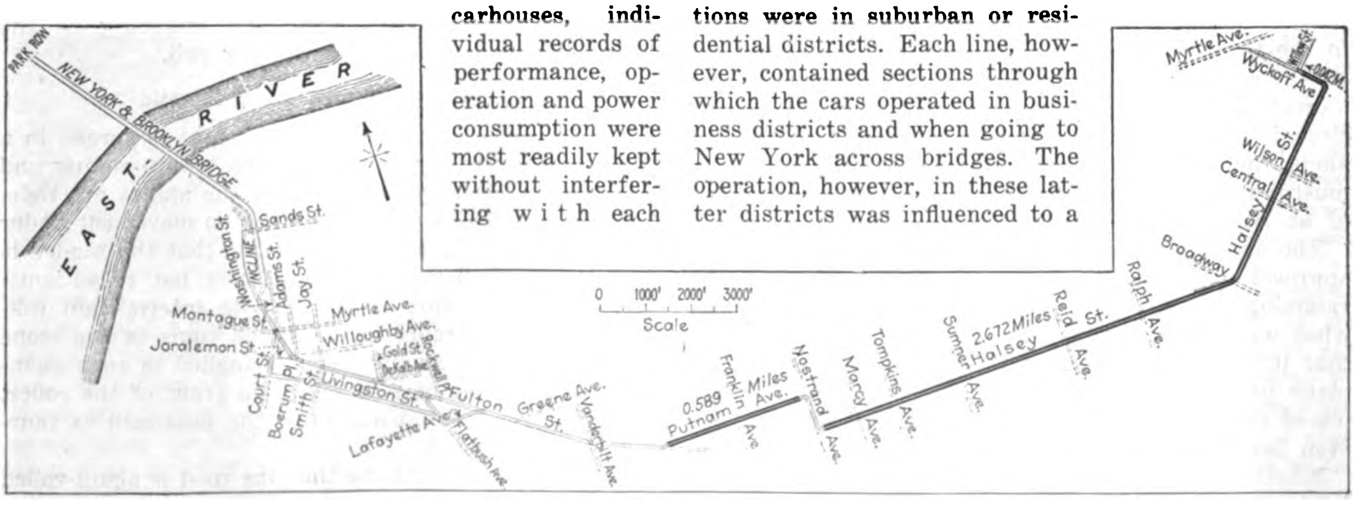
It is believed that most engineers will admit the desirability of securing the services of a competent inspector on paving work, as much so, in fact, as is true in the case of purchasing track or other materials under specifications. It will also probably be conceded that the ordinary laborer or inexperienced engineer would not possess the qualifications necessary to fit him for the work, since, if he does his work properly, he must not only be on the job all the time but must possess certain qualities of judgment which can only be gained through experience and practice. This argument being sound, it is evident, then, that the best results can only be expected through the employment of trained and competent inspectors, and the above outline of some of the points which the latter should be required to look after may serve as a guide where men are being trained for this work.

Power Saved by Use of Checking Devices

Results of a Very Thorough Test Made in Brooklyn (N. Y.) Show That the Economies Effected by a Properly Organized Power-Saving Campaign Should Exceed 15 per Cent

IN ORDER to determine the efficiency of the principal types of car-energy-checking devices now being used, the Brooklyn Rapid Transit Company inaugurated a test during the latter part of 1919. Three different types of these checking instruments were tested, and a sufficient number of each type was used completely to equip three separate lines of the system. In this test 220 cars were used.

Forty-four cars were equipped with coasting recorders of the Rico type and were placed in operation on the Flatbush-Seventh Avenue line. One hundred Economy kilowatt-hour meters were installed on cars and placed in operation on the Greene and Gates Avenue line. Seventy-six Arthur power-saving recorders were installed on cars and placed in operation on the Putnam and Halsey Street line. Previous tests on these lines had shown that the service characteristics were quite similar and were directly comparable. Also, the cars and equipment used on these lines were such as to permit ready comparison without complicated calculations. By confining each type of instrument to cars operating on a separate line and maintained at separate carhouses, individual records of performance, operation and power consumption were most readily kept without interfering with each other. Before this test was started certain sections of all the lines on which it was to be conducted were arranged so that all energy supplied to them was metered through Sangamo kilowatt-hour meters installed in the substations supplying these sections. An accompanying illustration shows a map of the Putnam-Halsey Street line, on which the metered sections are indicated. This arrangement is typical of that which was used on the other lines and serves to illustrate the methods by which accurate readings of the power consumed in operation were obtained for comparable sections over which cars equipped with different types of instruments were operated. In order to facilitate the calculation of the mileage made in metered and non-metered sections by the various cars a table was made for each line, giving the total mileage, the mileage of the metered sections and the mileage of the non-metered sections for the various runs which cars on these lines could make. An accompanying table gives this tabulated mileage for the Putnam-Halsey Street line, which will serve as an illustration of the manner in which these tables were arranged for the other lines. All of the metered sections were in suburban or residential districts. Each line, however, contained sections through which the cars operated in business districts and when going to New York across bridges. The operation, however, in these latter districts was influenced to a



ROUTE MAP OF PUTNAM AND HALSEY STREET LINE

Line________ Direction____ Date______

Car No.	Time In	Meter Reading			Time Out	Time Run	Minutes Power On
		Fulton	B'dway	Wyc.			

Line________ Direction____ Date______

Car No.	Time In	Meter Reading	Time Out	Meter Reading	Time Run	K.W.H.

Line________________________

Date	Number and Type of Cars						Car-Miles	K.W.H. at Sub. Sta.	K.W.H. Per Car-Mile	Avg. Wt. Car Light	Total Passengers	Passengers Per Car	Avg. Wt. Car Loaded	W. H. Ton Mile	Schedule Time Trip	Total Cars
	1400	2500	4500	9000		Total										

Line________________________

Type of Car	Motors	Gear Ratio	Diam. of Wheels	Wt. of Car Light	Wt. of Car Light Tons	

Line________ Direction____ Date______

Car No.	Time In	Time Out	Time Run	Time Coast

FORMS USED FOR RECORDING TEST DATA

large extent by traffic and service conditions which if considered would introduce too great a variation to insure accurate comparison.

Frequent and recent tests had been made of the operation of the cars and equipment over these lines for other purposes, so that a large amount of data was available for use regarding the service characteristics of each section. These data included such records as scheduled speed, number of stops per car-mile, average duration of stops, average number of passengers on car at one time, and other similar data of value and interest in making comparisons.

At the beginning of the test, cars were operated for one week with covers installed over the car instrument faces, so that they could not be read by the motorman. During this period the motormen were supposed to operate in the normal manner in which they had been in the habit of operating their equipment and without particular regard to any great saving in power. During this period, however, records were kept at the substations of the power consumed in the metered sections and records of the equipment used and service characteristics were also kept. These included the number and type of cars operated, the car-miles made, the average weight of the cars, light, the total number of passengers carried, the average passengers per car, the average weight of the car loaded and the scheduled time for the trip. This information, together with the power readings at the substation, enabled computations to be made showing the kilowatt-hours per car-mile and per ton-mile consumed. All this information was carefully tabulated and plotted in the form of graphs for convenience in comparison. For the convenience of those designated to obtain and record this information, various forms were prepared with spaces to be filled in for tabulation. An accompanying illustration shows the headings for some of these forms.

The test was started July 9, 1919, and the preliminary operation with the car power-checking device faces covered ended July 16 at 6 a.m. On that day all instruments were immediately inspected and the shutters were removed from the meter faces. On July 17 readings were taken of the various power-checking instruments installed on the cars by inspectors in order to obtain a comparison of the data recorded on the car and the

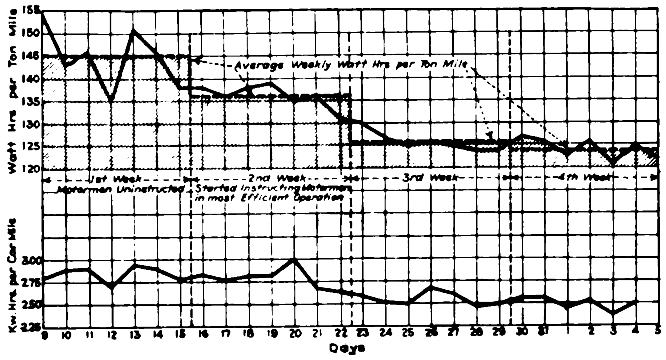
ROUTE MILEAGE FOR PUTNAM AND HALSEY STREET LINE

Route	Metered Section	Non-Metered Section	Total Mileage
Ridgewood depot to Wyckoff and Halsey	0.042	0.314	0.356
Wyckoff and Halsey to Park Row via Fulton Street	3.261	3.524	6.785
Wyckoff and Halsey to Park Row via Livingston Street	3.261	3.703	6.964
Wyckoff and Halsey to Borough Hall via Fulton Street	3.261	1.946	5.207
Wyckoff and Ha'sey to Borough Hall via Livingston Street	3.261	1.947	5.208
Wyckoff and Halsey to Fulton and Flatbush Loop	3.261	1.331	4.592
Wyckoff and Halsey to Halsey Street Depot	0.976	.....	0.976
Halsey Street Depot to Park Row via Fulton Street	2.285	3.524	5,809
Halsey Street Depot to Park Row via Livingston Street	2.285	3.703	5.988
Halsey Street Depot to Borough Hall via Fulton Street	2.285	1.946	4.231
Halsey Street Depot to Borough Hall via Livingston Street	2.285	1.947	4.232
Halsey Street Depot to Fulton and Flatbush Loop	2.285	1.331	3.616
Halsey and Reid to Park Row via Fulton Street	1.621	3.524	5.145
Halsey and Reid to Park Row via Livingston Street	1.621	3.703	5.324
Halsey and Reid to Borough Hall via Fulton Street	1.621	1.946	3.567
Halsey and Reid to Borough Hall via Livingston Street	1.621	1.947	3.568
Halsey and Reid to Fulton and Flatbush Loop	1.621	1.331	2.952
Halsey and Nostrand to Park Row via Fulton Street	0.589	3.524	4.113
Halsey and Nostrand to Park Row via Livingston Street	0.589	3.703	4.292
Halsey and Nostrand to Borough Hall via Fulton Street	0.589	1.946	2.535
Halsey and Nostrand to Borough Hall via Livingston Street	0.589	1.947	2.536
Halsey and Nostrand to Fulton and Flatbush Loop	0.589	1.331	1.920
WYCKOFF AVENUE SHUTTLE			
Wyckoff Avenue and Halsey Street to Myrtle Avenue	0.042	0.364	0.406

power furnished by the substation as indicated by the kilowatt-hour meters. A relation was thus established between the amount of power supplied to the various sections and the amount of coasting as indicated by the cars equipped with coasting recorders, the number of minutes that power was applied as indicated by cars having power-saving recorders and the kilowatt-hour readings as indicated by the instruments on cars with watt-hour meters. Graphs were plotted showing these various relations, together with ratio of kilowatt-hours consumed at substations to car-miles operated.

MOTORMEN INSTRUCTED IN PROPER OPERATION

On July 18 representatives of the several power-checking-device companies visited the inspection depots and explained to the motormen the working of their devices and began instruction in connection with the proper handling of cars so that the men would be able to make the best possible records. The test, together with the recording and calculation of data, then proceeded and various graphs were plotted to show the improvement made by the use of the various devices and the results of the power-saving campaign.



AVERAGE POWER CONSUMPTION GRAPHS FOR TEST PERIOD

It is not the intention of this article to give any comparisons of the various power-checking instruments or the results accomplished by each individual type of instrument, but rather to give general data which might apply to any type. With this idea in view a composite graph has been plotted showing the average watt-hours per ton-mile and the average kilowatt-hours per car-mile which were obtained for the three lines on which the tests were conducted. The average weekly watt-hours per ton-mile for all the lines is also shown. By comparison of these, it will be seen that the average for the fourth week is aproximately 15 per cent less than the average obtained for the first week, before motormen were instructed in the use of the devices.

In general this saving would indicate that if a power-saving campaign would result in the same saving for all the cars operated by the Brooklyn Rapid Transit system the first cost of the power-checking instruments could be saved in from two to three months, and that a further saving of less than 1 per cent would be sufficient to carry the cost of inaugurating a power-saving campaign and maintaining the power-checking instruments as well as covering all carrying charges and operating expenses for the carrying on of this work. Some very surprising results were also indicated as to the difference in power consumption used by a good motorman and a careless one. This ratio considered on a power consumption basis was about in the ratio of 2 to 1.

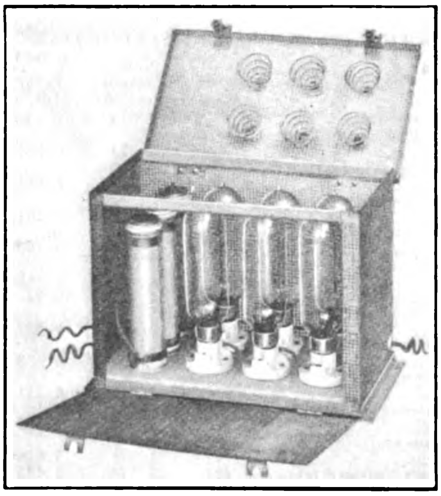
Electric Locomotive Versus Motor Cars

OWING to the intensive study being given to heavy electric traction in Great Britain, the railway papers in that country are considering carefully the several phases of the problem of substituting electric for steam motive power. In its November issue the *Railway Engineer* of London editorially rather favors the locomotive, stating that one of the chief factors which will make for the adoption of electric locomotives for main-line passenger work, rather than motor coaches in conjunction with trailers, is that it will enable the present rolling stock to be employed. On many systems the main-line stock is of high class and capable of being used for many years. The necessity for rendering this obsolete would mitigate against the gradual electrification of the main lines. It would, of course, states the *Railway Engineer*, be possible to convert existing stock to enable it to run as trailer coaches in multiple-unit trains, but the adoption of electric locomotives would obviate this. Again, with electric locomotives the dividing of trains at junctions, slipping of coaches and working of rolling stock over foreign lines all become possible. The use of the electric locomotive also removes from the passenger coaches the noise and vibration inseparable from the motor coach.

Constant Current Regulation for Incandescent Headlights

THE General Electric Company, Schenectady, N. Y., has developed an automatic regulating device which maintains practically normal voltage on the headlight lamps with varying trolley potential. This is called the "Geco Resistor" and has a low initial cost and its maintenance is also very inexpensive, as there are no moving parts or contacts to get out of order.

The device consists of six units mounted in porcelain sockets and three resistance sticks, two of which are used to dim the headlight within city limits. The third stick is to adjust the "Geco" for the maximum trolley voltage of the system. These elements are encased in a perforated metal housing equipped with hinged covers, which provides ready accessibility. On the top cover six conical springs hold the resistor units firmly in the sockets. The "Geco Resistor" has a positive temperature coefficient. With a drop in trolley voltage the resistance of the "Geco" becomes correspondingly less, thus maintaining practically constant current through the headlight lamps. A rise in trolley voltage causes the resistance to increase and governs the flow of current in a similar manner. A special incandescent headlight lamp must be used when operated with the "Geco Resistor."



NEW TYPE RESISTOR FOR INCANDESCENT HEADLIGHTS

Fuel and Transportation the Leading Topics

Mechanical Engineers Hold Annual Convention in New York—Railroad, Motor Truck and Waterway Transportation Discussed — Fuel Sessions Are Well Attended—Wood Floors for Shops and Factories Form Topic of the Forest Products Session

THE forty-first annual meeting of the American Society of Mechanical Engineers was held in the United Engineering Societies Building, New York City, Dec. 7-10, inclusive. The program included a large variety of subjects and separate sessions were held under the auspices of the various sections devoted to fuel, forest products, machine shops, management, railroads, design, research, transportation and power. In addition to the program of papers excursions were made to neighboring power stations and a varied series of informal entertainments was also provided.

The feature of the fuel session, which was held on the afternoon of Tuesday, Dec. 7, was a symposium of papers on fuel supply, conservation and production. This session was opened by Prof. L. P. Breckenridge, Yale University, with a discussion of the fuel supply of the world. The latest available data on the supply, production and use of the various fuels were shown graphically in the form of curves and charts. A few statistics are well worth remembering. Over half the world's supply of coal is located in the United States; about 40 per cent of the annual production of the world's coal is mined in this country, and the annual production in the United States is about 500,000,000 tons of bituminous and about 85,000,000 tons of anthracite coal. The supply of fuel oil in the United States it is estimated will be used up in from twenty to thirty years. Our production, which is about 356,000,000 bbl. annually, is 60 per cent of the world's total output. Professor Breckenridge emphasized the statement that the time has arrived when the fuel problems of the world must be given consideration in a large way. In his plea for thrift and conservation he says:

Suggestions by L. P. Breckenridge for Preventing Waste of Coal

1. Extend improved mining methods.

2. Extend improved methods of preparation of coal at the mines.

3. Reduce hazards of coal mining.

4. Operate mines a maximum number of days per year.

5. Utilize mine waste.

6. Increase use of byproduct coke oven.

7. Extend use of blast-furnace gas for power generation.

8. Extend use of gas producer, gas and heavy oil engines.

9. Develop waterpower.

10. Better the performance of steam locomotives.

11. Purchase of power by small industrial plants.

12. Furnish owners of homes and public buildings with correct and simple instructions for heating.

13. Extend "custom" of coal shortage to induce storage of coal when demand is low.

14. Extend electrification, as the full use of electrical energy offers the most promising means of saving coal. Conservation by co-operation of water power, steam power and electricity opens up large possibilities for saving fuel, capital and labor as outlined in Mr. Murray's super-power scheme.

"The difficulty of securing a supply of coal, coupled with the high price paid for it, has itself brought about a desire to exercise all possible care in its use. The public at large more and more realizes the need of co-operation to secure conservation in some large way. It is in connection with the last plan, 'Co-operation for Conservation' rather than 'Individual Thrift,' that the writer sees the most promising chance for initial success. Especially is this true as a wise first step. Individual thrift should always be practiced, but the large savings of fuel that could be made by co-operation are way beyond anything that would be expected from individual effort. The suggestions for coal conservation which are given are not new; some of them have already begun, but it is only when all of them are fully realized that we shall be able to feel that we are really making satisfactory progress in preventing waste of fuel as well as waste in labor and capital which are required to produce and transport fuel."

The next speaker, David Moffat Meyers, New York, in his paper on fuel conservation, laid much stress, as did Professor Breckenridge, on the need of a definite fuel conservation policy. He said that prevention of waste and conservation involve no experimental features, but merely require the application of well-known engineering principles. How vital the fuel question is as a national issue is not yet realized by the public at large, but when this realization comes a solution may be looked forward to which will check this great and uncontrolled waste.

At the forest products session, held Tuesday afternoon, papers were presented describing various features of the woodworking industry and the equipment and machinery used in wood construction and preservation. A paper on "Creosoted Wood Block Factory Floors," by L. T. Ericson, chief engineer of the Jennison-Wright Company, Toledo, Ohio, is of interest in connection with electric railway shop floors. Mr. Ericson said that the creosoted wood block flooring is a logical development from street paving, but in this development a great many mistakes have been made due to a misunderstanding of the problems involved. The principal reason for most of the troubles encountered with this type of flooring is the fact that wood expands and contracts with various conditions of atmosphere and the moisture content of the blocks. It is, therefore, necessary to lay the individual blocks in such a way as to allow for this change in volume, which in extreme cases may be as much as 5 per cent. The individual units in the floor must be bound tightly in place with a binder which will allow for expansion and contraction and which will exclude water from the under side of the floor. As long as the blocks are held tightly and firmly in place and a smooth surface is maintained the floor will wear almost indefinitely, but as soon as the blocks become loose and the surface becomes rough they will break up into sticks very quickly. The three most essential requisites for success are to use thoroughly air-seasoned lumber, to provide a smooth solid foundation base and to have a waterproof and elastic binder for holding the units in place.

CONDITIONS TO BE MET IN A SUCCESSFUL INSTALLATION

The majority of floors are dry most of the time, consequently the lumber should be thoroughly seasoned in order to keep the shrinkage to the minimum. Blocks cut from green or semi-dry lumber will shrink in volume to such an extent that they will often have to be taken up and relaid. If it is possible to do so it is advisable to use a concrete base for the installation of these floors. The base should be strong enough to carry the entire load and should be finished smooth and level so that it will not be necessary to use a cushion between the concrete and the blocks in order to secure a level floor and uniform bearing for the individual units.

The people do not desire government ownership and operation, and I believe that they are willing to pay such rates and charges as may be necessary to secure successful private operation provided that the roads under private management are able to give and do give such service as the public reasonably desires and is entitled to. If they fail to do this the public will demand a change.

—DANIEL WILLARD.

The use of a sand cushion between the blocks and the concrete, which was almost universally used a few years ago, was largely accountable for a great many of the failures. Sand shifts easily under traffic and heavy loading and also affords pockets for the collection of moisture under the floor. Wherever a cushion is necessary between the concrete and the blocks it is advisable either to use a mixture of portland cement and sand or a bituminous mastic. The latter is preferable in a great many cases on account of being both waterproof and elastic. The sole functions of a cushion should be to level up the inequalities of the base and, in the case of the bituminous cushion, to furnish a waterproofing membrane on the under side of the floor. It is standard practice today to lay the blocks directly upon a smoothly finished concrete base without any cushion whatsoever. It is also customary to give the base a thin, even coating of coal-tar pitch before installing the blocks so that the under side of the blocks may be thoroughly sealed and made waterproof.

The elimination of cushions and the use of a successful waterproof binder in the joints of the blocks, thereby eliminating the possibility of shifting of the base and a loosening of the units, has permitted a reduction in the depth of the blocks used. Factory floors are now being very successfully installed throughout entire manufacturing plants with blocks as shallow as 2 in. in depth.

For dry locations the blocks should be driven up tightly together when installed; there is a tendency, however, for a slight further contraction in the volume of air-seasoned blocks when placed in the floor of a steam-heated room, and therefore it is necessary to provide a binder in the joints to hold the blocks in place after this contraction has occurred and to exclude moisture and foreign matter from seeping under them.

Floors which are to be subjected to considerable moisture or to weather conditions should be laid with ample provision for expansion. It is good practice to provide ample space between the individual units to take care of this expansion. These joints should be flushed full of a waterproof, elastic binder, which should preferably be coal-tar pitch of a consistency which will not soften up under atmospheric or room temperatures.

The progress report of the research sub-committee on "bearing metals" was made at the business meeting on Wednesday, Dec. 8. In this report is described an instrument recently perfected, called the microcharacter, to determine the microcharacteristics of alloys. By means of the use in this instrument of a very accurately cut sapphire point instead of a needle point it has been possible to formulate a tentative scale of microhardness. This instrument makes it possible to test not only various bearing alloys but also steels suitable for journals whether hardened or soft.

A paper on "Static Adjustment of Trucks on Curves" was presented by R. Eksergian, Baldwin Locomotive Works, at the railroad session on Wednesday afternoon. The adjustment of the running gear of a locomotive on curves and the lateral reactions developed are considered from geometrical limitations imposed which govern the length of wheelbase, and the lateral displacement of trucks, together with a study of lateral devices for exerting guiding reactions between truck and the frame of the rigid wheelbase. The speaker then considered the effect of the major lateral reactions developed between the various parts of the running gear.

The effect of the centrifugal force and the overturning moment which it produces, resulting in a change of load on the non-crossed part of the equalization, was next discussed in order to arrive at the proper journal load in the design of the driving and trailing-truck axles. The principal reactions developed in a two- and four-wheel engine truck and formulæ for the flange reaction of the guiding axle are derived in terms of the lateral force exerted at the center pin of the truck. An analysis is made of the lateral forces developed in skewing the rigid wheelbase of a locomotive in curve. Finally formulæ for proper guiding and maximum flange reactions for the entire running gear are developed for three common types of locomotives.

MR. WILLARD REVIEWS TRANSPORTATION SITUATION

At the session on transportation, the leading address was by Daniel Willard, president of the Baltimore & Ohio Railroad. The keynote of Mr. Willard's address was his recommendation to the Council of National Defence of November, 1917, from which he quoted:

> A nation should have a national transportation system and such a system should embrace and make proper use of all available and suitable agencies. The fullest possible economic co-operation should be encouraged and required between all such agencies. Inasmuch as the business of transportation for hire partakes of a monopolistic character, all agencies so used should be subject to governmental regulation in the public interest.
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> * * *
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> Among the many agencies of transportation the following are in most common use: The natural and artificial water-

ways, with the various craft designed to operate thereon; the highways, with the different vehicles and contrivances designed to operate thereon, and the specialized roads, such as electric and steam railways, with the special equipment designed for each. Other agencies may be developed.

* * *

The co-ordinated transportation system of a nation should be so adjusted that each agency will perform the particular function for which it is best adapted, and, speaking broadly, that country which is provided with the most efficient transportation system—other things being equal—ought to be the most prosperous.

He then reviewed what the railroad had done in the period during and subsequent to federal control and emphasized that what had been shown was that if the country is to have a completely articulated transportation system this can be done only by the co-ordination of different transportation agencies, including steam and electric railways, coastwise and inland waterways, the highways, improved and unimproved, the motor truck, etc.

He said he feels sure that the people do not desire government ownership and operation, and he believes that they are willing to pay such rates and charges as may be necessary to secure successful private operation provided that the roads under private management are able to give and do give such service as the public reasonably desires and is entitled to. If they fail to do this the public will demand a change.

He said further that it is in the larger public interest that each transportation agency should be used to the extent that it is economically desirable. To give less use than that of each agency would be wasteful. Some who were interested in a particular agency have tended in the past to try to extend its use beyond proper economic limits, and such mistakes should be avoided. He emphasized the proper economic place of the motor vehicle in short-distance traffic in conjunction with the railway. He closed by saying:

"Whatever may have been the attitude of the railway managers in the past, that is not their attitude at the present time, and I am certain that they will be glad collectively or individually to co-operate with all other transportation agencies in such way as will inure to the greatest public good, because in the end all enterprises of an individual character must be tested by that rule. Whatever contributes to the public good is likely to endure, and anything inimical to the public good is certain to fail."

FEEDERS FOR RAILROADS DISCUSSED

Charles A. Morse, chief engineer Chicago, Rock Island & Pacific Railroad, then addressed the meeting on "Feeders for Railroads." He traced the development of small branch lines from the early days when they could use equipment transferred from main lines to the present, when main line equipment is too heavy for branch line use.

Today, he says, the situation has changed and it is doubtful if branch lines which feed main lines can be substantiated economically. It will bear careful investigation to see whether or not branch rail lines should not be discontinued and their work taken over by motor trucks on hard surfaced roads which the public is compelled to support by taxation anyway. It is not fair to tax main line passengers to support branch lines, and where branch line facilities are continued their extra cost should be charged to those they serve.

After a paper on inland waterways, Francis W. Davis of the Pierce-Arrow Motor Car Company presented a paper on motor trucks, discussing this subject under three heads, first, the field; second, the present status, and third, the improvement of truck transportation.

The field he defined as being in the short haul and at terminals for the motor truck; and as a supplement to electric railways, for the motor bus. Motor transportation is an ally of rail transportation and releases cars for long hauls, where they are most efficient, and acts to conserve rail equipment in general.

Mr. Davis gave figures to show the relative cost and time of shipping by rail and truck for various lengths of haul, from which he concluded that the economical limit where rail was cheaper than truck was about 70 miles. He discussed at length the present status of the motor truck transportation and suggested as improvements for the future development of the highways, to which, he says, the motor vehicles contribute materially in license fees.

He made the final point that the motor industry as a whole will welcome sound and uniform legislation and will aid in securing it.

Whatever contributes to the public good is likely to endure, and anything inimical to the public good is certain to fail. DANIEL WILLARD.

* * *

Motor transportation is an ally of rail transportation and releases cars for long hauls, where they are most efficient, and acts to conserve rail equipment in general. FRANCIS W. DAVIS.

At one of the other sessions of the convention Gustav Lindenthal presented a paper on "The Transportation and Terminal Problem of New York as Affected by the Hudson River." It will be recalled by readers of the JOURNAL that the general transportation problem in and around the metropolitan district of New York was discussed before the American Society of Civil Engineers, New York Section, recently, as reported in the Nov. 27 issue of the JOURNAL, page 1095. This paper of Mr. Lindenthal's should be read in connection with this previous discussion before the Civil Engineers.

Mr. Lindenthal gave many data which were presented at this previous transportation session regarding the population in New Jersey, which is really tributary to the city life of Manhattan in the same degree as the population of about the same size living on Long Island and separated by the East River.

To the local problem across the Hudson River, namely, that of transporting passengers, must be added the big problem of passenger and freight transportation from seven large trunk line railroad systems, and Mr. Lindenthal points out that with the exception of about 300,000 passengers all the rest of the traffic comes by floating equipment across the river as it did eighty years ago.

Mr. Lindenthal's concrete suggestion is the building of a bridge over the Hudson River, located at or below Fifty-ninth Street, where the banks on both sides are high and favorable for bridge construction. The proposed bridge would have two decks 180 ft. wide, the lower accommodating eight railroad tracks and two tracks for a moving platform, the upper deck being set aside for highway traffic, four lines of surface electric railways and twelve lines for vehicles, with two sidewalks.

Necessary connections between elevated railroads and the New York Central tracks along the riverfront on the West Side would be made, as well as with a proposed union passenger station.

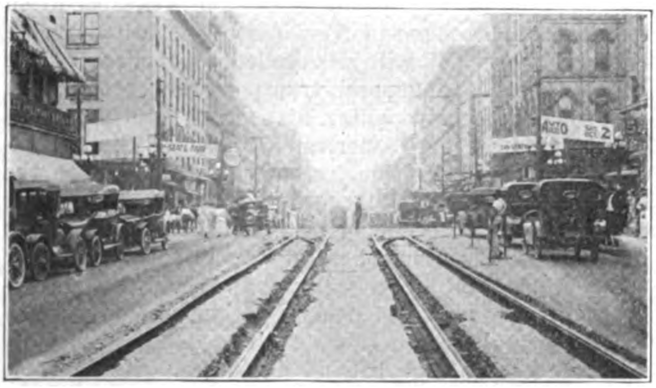
Mr. Lindenthal compares the estimated cost of the bridge of $100,000,000 to the $400,000,000 estimate of twenty under-the-river tunnels which had been proposed to handle similar traffic. He also points out that the bridge would be constructed in much less time.

Mr. Lindenthal then analyzes the passenger traffic on the railroads, the street railways and the moving platform in its distribution on the Manhattan end. He further points out how freight transportation would be made and articulated with the distributing system on Manhattan Island.

One of the features of the plan is a moving platform which would cross Manhattan Island under Fifty-seventh Street and eliminate all crosstown surface passenger transportation for the large number of through passengers which would exist at that point following the completion of the bridge.

Sheet Asphalt Pavement Withstands Severe Service

REPLACEMENT of worn-out tracks in Main Street by the Memphis (Tenn.) Street Railway recently showed the extent to which sheet asphalt pavements will withstand heavy traffic when laid under strict engineering supervision and with proved materials. This asphalt pavement was put down in the fall and winter of 1904-05. The asphalt extended from curb to curb and was laid flush with the track rails. At the time the pavement was originally laid new 90-lb. steel rails were with one operation. Two castings used to support the that replacement was necessary and to carry out this work the asphalt was cut out along the double tracks, as shown in the accompanying illustration. The cutting disclosed that there was still 2 in. of wearing material left in the pavement. At a crossing at Main Street and Madison Avenue it was necessary to take out large sections of the pavement between the tracks in order to replace special trackwork. This pavement was also of asphalt and extended to the rails. The traffic to which it had been subjected was extremely heavy and the wear of the surface had been so uniform as to be scarcely discernible. For the original pavement construction Bermudez Lake asphalt was used. The contractor was the Hornaday Construction Company of Greenwood, Miss.



PAVEMENT CUT AWAY FROM TRACKS TO ALLOW REPLACEMENT OF RAILS

Saving Through Use of Anti-Friction Bearings

Tests Show Considerable Savings Result From Use of Anti-Friction Bearings on Railway Cars and Equipment

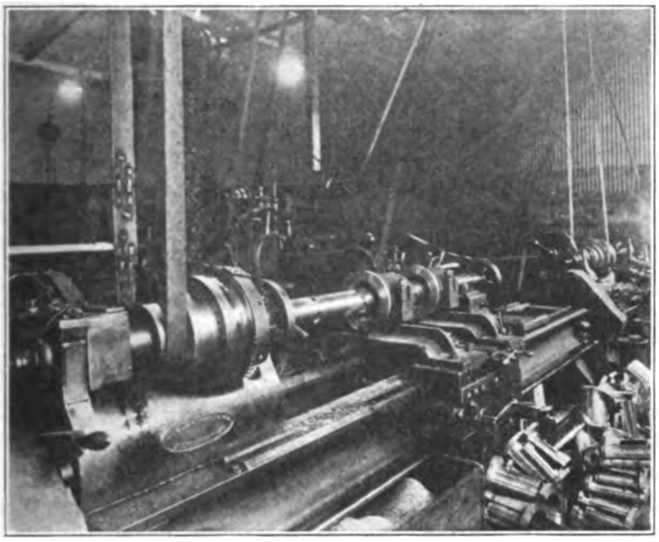
PROBABLY the most extensive use of anti-friction bearings has been on safety cars, and the mechanical troubles experienced with some types have raised a question as to the desirability of their use. The saving in power from the use of anti-friction bearings has been one of the greatest factors in favor of their use. Tests in this country and in Europe have shown savings in power costs of from 20 per cent to 30 per cent. These savings must necessarily vary with the weight of cars, loads, grades, curves, condition of the track, weather, speed, frequency of stops and skill of motormen. Some tests made by the Third Avenue Railway, New York City, showed a saving of approximately 25 per cent in power cost. The car tested weighed 18 tons and had the axles of eight wheels equipped with anti-friction bearings. The truck was a Brill 39-E Maximum traction type. The car was operated between the post office and Fort George, involving a mileage approximately 100 miles per day, with from eight to ten stops per mile.

Much of this saving is due to the decreased frictional resistance of the anti-friction bearings over the sleeve-type bearings in starting a car, and consequently the more frequent the stops and starts the greater will be this saving. Through this reduced friction the acceleration is also increased so that the current in the motors begins to fall off quicker. The coefficient of friction or the measure of frictional resistance for sleeve-type brass bearings on electric railway car truck journals at starting is from 5 per cent to 14 per cent, with an average between 9 and 10 per cent. The coefficient of friction for roller or ball bearings is less than 0.01 per cent. This decrease in journal friction causes a great reduction in the demands upon the motive power necessary to start and therefore this reduction can be applied to accelerating the car, with a consequent material reduction in running schedule.

Upon first consideration one is apt to assume that there will be no difference in the rates of retardation from the two types of bearings. But theoretically there should be an increased rate on cars having anti-friction bearings. The real limit to braking force of any car is the slipping or skidding point of the wheels on the rails. As soon as the wheels skid the retarding force is greatly reduced and a much longer stopping distance results. The usual type of friction bearing surrounds approximately only one-third of the circumference of the axle journals. This permits the brakes to push the wheels with the axle away from its bearing seat and positive resistance to the action of the brake does not occur. This yielding of the axle and wheels results in an unsteady or "chattering" action between the brake shoes and wheels which causes high and low spots in the braking effort produced. With this condition the wheels are more liable to become locked and slip. With anti-friction bearings the box entirely surrounds the journal, thus affording a positive resistance of the wheel to the brake shoes. This increase in retardation or the production of a more steady retardation also has its effect on the scheduled speed of the car and increases the miles per day that can be operated.

Boring Two Sets of Axle Bearings at Once

VARIOUS steps in the finishing of railway motor axle bearings as carried out by the Connecticut Company in its New Haven reclamation shop were described in the ELECTRIC RAILWAY JOURNAL for March 20, 1920, page 585. Since that time a further improvement has been put in use, as illustrated herewith, which makes it possible to bore out two sets of axle bearings with one operation. Two castings used to support the bearings during the boring operation are bolted to the carriage of the finishing lathe. The bearings previously finished on the outside are clamped in these supporting jigs, which provide for accurate lining up and centering, so that the inside when bored out will be central with the outside surface. The boring bar as shown in the illustration is driven by the head stock in the lathe centers. This boring bar has openings to receive the finishing tools, which are clamped securely in position by set screws. When once set up bearings can be readily removed and new ones inserted for boring without disturbing the boring bar or the bottom portion of the supporting jigs. A considerable saving in the time taken to finish axle bearings has thus been effected.



FINISHING TWO AXLE BEARINGS AT ONCE IN NEW HAVEN SHOPS

Careful Oil Handling Reduces Bearing Troubles

AMONG a number of causes leading to hot bearings it has been found that some are due to foreign material in the oil caused by improper handling. A recent publication of the Vacuum Oil Company, entitled "Bearings and Their Lubrication," gives some suggestions of interest.

When the barrels of oil are delivered by the manufacturer, it is important that they be stored under cover. They should never be left in the open exposed to the sun and rain. Rain water particularly, if the barrels are stood on end, will find its way through the staves and gradually dissolves the inside lining of the barrel, causing it to spread throughout the oil. When such oil is used the presence of the lining material will cause excessive heating of the bearings.

When a barrel is opened the bung should be started by striking the staves with a mallet. If an auger is used fine chips of wood and dirt from the outside of the barrel may easily find their way through the opening into the oil. In any case the oil should always be poured through a strainer into the oil can. If this is not done the small chips of wood and other impurities will go into the bearings, with disastrous results.

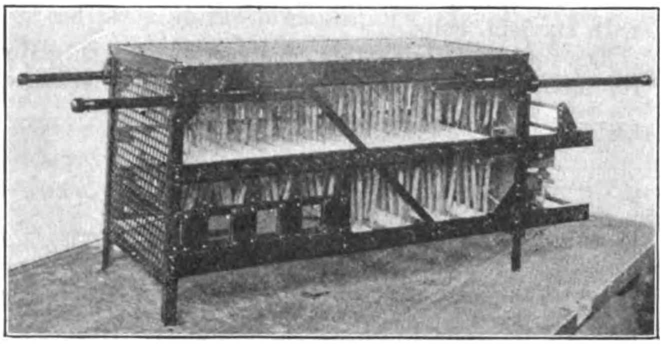
Dirty oil cans are responsible for many hot bearings and cans should therefore be kept scrupulously clean. The cans should be closed at the top or provided with covers, so as to prevent, as far as possible, the entrance of dirt. An oil can should never be used for more than one grade of oil, and in order to prevent mistake the name of the oil should be marked plainly on the can.

When the oil is drawn directly out of the barrels for use the overflow usually runs onto the floor or into "save-alls," which are not always clean. There is always the danger that some of this oil, including the dirt, will be used for lubrication. It is good practice to keep the oil in cabinets, preferably locked, so that the oil will not be tampered with by unauthorized persons. Oil waste may thus be minimized.

New Resistor-Type Arc Welder

THE General Electric Company has developed an electric arc-welding equipment incorporating new features, and especially adapted for welding rail bonds on electric railways. It is also applicable to welding work in shops where energy loss is not objectionable.

The apparatus consists of a wire resistance unit, mounted in a light metal frame, with suitable leads for connecting to the power supply circuit and to the electrode holder. Switches provide a welding current with range of from 60 to 200 amp. in 15-amp. steps. The complete device is easily portable by two men and will not be injured by exposure to the weather. The circuit is controlled through a contactor, operated by means of a push-button switch located close to the electrode holder. This arrangement permits the operator to open the circuit at a point remote from the weld and thus avoid flashing.



RESISTOR-TYPE ARC WELDER

New Adhesive Paper Tapes

THE Irvington Varnish & Insulator Company, Irvington, N. J., announces that it has just perfected a new line of adhesive paper tapes for use in insulating armature coils and for general railway repair work. These tapes can be furnished in widths from ¼ in. up and in rolls of 10, 36, 72 or 100 yd. They are made with several different degrees of tackiness and are specially treated so as to retain their adhesive qualities over long periods so as to permit storing without danger of losing their effectiveness. They have a dielectric strength of 7,500 volts and also possess high mechanical strength.

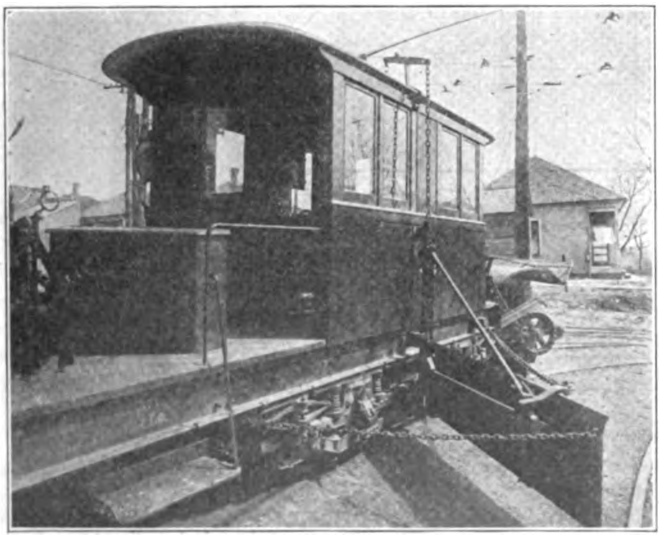
Special Design Sweeper Proves Efficient

Rotary Brush, Consisting of Broom Corn Reinforced by a Facing of Steel Bristles, Has Proved Both Effective and Economical

THE Sioux City (Iowa) Service Company has placed in service the fourth rotary snow sweeper built in the company's shops and embodying several unique features designed by C. M. Feist, master mechanic. The first of these machines was built in 1910, another one in 1916 and two in 1917, so that there has been ample opportunity to try them out thoroughly and determine their worth for keeping the right-of-way clear of snow.

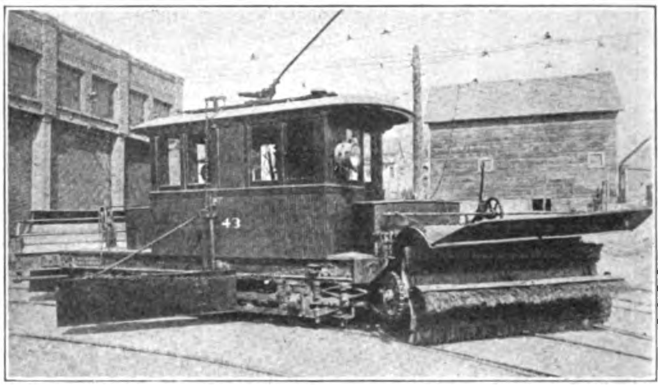
The outstanding feature of construction is the design of the brushes. The foundation for the rotary brush at each end comprises three cast-steel spiders mounted on a 2½-in. shaft which is connected by sprocket and chain to a 30-hp. street railway motor mounted on the platform and housed in a box. A sheet of steel extends the entire length of the brush shaft and is wide enough to project beyond the spokes of the three spiders. This sheet is riveted to the spokes and further strengthened along the outer edge by a ¼-in. x 6-in. mild steel plate riveted in place. The broom sections are fastened to the outer edges of the four webs thus formed. The brooms are made of broom corn and are similar to a floor broom without the handles, for they are well sewed and of the same width top and bottom. They are reinforced by a facing of spring steel bristles made of 22-in. lengths of 0.114 x 0.026-in. flat steel, bent in the middle and laced through holes in a stick of hickory. This stick and the broom are fastened between 2½-in. channels with 1½-in. bolts, and the channels are bolted to the spiders with six ¾-in. bolts.

The idea underlying this construction as a substitute for the usual long rattan bristles is that the steel sheets take the strain in handling crusts of snow and also bear the weight of the snow, while the short well-supported broom corn, extending only about 10 in. beyond the spider, sweeps clean and takes care of the variation in paving level. It is claimed that the sweepers of the Sioux City company have been able to handle snow that the ordinary sweeper would not negotiate.


SPECIALLY DESIGNED SIOUX CITY, IOWA, SNOW SWEEPER SHOWING BRUSH CONSTRUCTION

The broom is driven at a speed of 300 r.p.m., and the speed is controlled by means of a controller and grid resistances and also through an adjustable countershaft.

Another interesting feature of these sweepers is that the side wing is carried in a cradle supported by heavy hinges, with an arrangement whereby the forward pull on the outer end is made from the cradle rather than the wing itself, as is usual. The plate forming the wing is so supported in the cradle as to permit it to be bent backward upon striking any obstruction. This flexibility is obtained by the use of heavy springs which bear against the bottom edge of the wing, permitting it to rise to clear an obstacle and automatically to return to position without breaking.


THE SIDE WING IS SO FLEXIBLY SUPPORTED THAT IT WILL NOT BREAK UPON HITTING AN OBSTRUCTION

The Sioux City sweepers are double-ended and the position of the brush at either end, speed of rotation, etc., are entirely controlled from drums and wheels mounted inside the car body. The main frame of the sweepers is made of 12-in. I-beams for the side members with 12-in. channels bolted across the ends by means of gusset plates. All castings used are steel, of special design, from patterns made in the company's own shops.

In addition to being more effective than the ordinary rattan sweeper, Mr. Feist states that it is more economical to maintain these brushes. One filling of these homemade brushes usually lasts through one winter and the replacement expense is less than for rattan brushes.

Transparent Protectors for Passes

RAILROAD passes, building and plant passes, membership cards, truck drivers' licenses, authorizations of various kinds and many other similar articles, which are generally made of paper and have to be shown frequently, become bent, broken, torn and dirty from handling and carrying about in the pocket. They are generally carried in leather or imitation leather cases and the face of the pass is shown through a transparent cover.

An ingenious substitute for the more or less cumbersome leather case is made by cementing the card between two pieces of transparent sheeting. This can best be done by spraying the pieces of sheeting with a solution of one-third wood alcohol and two-thirds amylacetate, and, after allowing them to dry for about ten minutes to avoid blurring the ink, placing the card between them and uniting them by hydraulic pressure. Satisfactory results can usually be obtained in a somewhat simpler manner by coating the card on both sides with a pyroxylin solution, using a camel's hair brush.

F. A. E. S. President Speaks in Chicago

Herbert Hoover Urges Engineers to Get Behind Federation Movement for Active Part in Great Political and Economic Questions

UNDER the auspices of the general committee of technical societies of Chicago a small group of engineers gathered for dinner at the Engineers' Club Dec. 10 to take advantage of Herbert Hoover's presence in the city and hear what he might have on his mind as the newly elected president of American Engineering Council, through which the Federated American Engineering Societies acts. W. L. Abbott, Commonwealth Edison Company, presided at the meeting. After Mr. Hoover had spoken of the federated movement of the engineers he responded very generously to questions asked him on various world situations, to the great interest and enlightenment of the seventy-five engineers present.

Mr. Hoover said that he had been led to accept the presidency of American Engineering Council because of the opportunity it afforded for great and good influence in coping with the growth of great national associations which is tending toward a division of the population into great economic groups. All of these associations are inspired by a selfish motive and seek to dominate the action of legislative bodies through a "terrorism little less than sovietism," or at the very best are attempting to bring pressure on government. He said that if this selfish purpose is allowed to continue on the part of these numerous associations it would lead to destruction and that we have come to a parting of the ways. In this situation the engineers hold a unique position, for in their great organization there is nothing they could not ask for that would not at the same time be as good for all the population as it would be for the engineers.

Referring to the members of Congress, Mr. Hoover said they have shown a great appreciation of the engineers who have been sent to them to testify before legislative committees by Engineering Council and that they have been glad to find some one upon whom they could depend for exact information not colored by a selfish interest.

Mr. Hoover laid emphasis upon the point that if we are to have the influence in public life of the disinterestedness, detachment and adherence to scientific facts embodied in the engineers, and to keep apart from the influence of the numerous selfish bodies, we must have an organization to do it—some definite engine to perform this work.

As president of the Institute of Mining and Metallurgical Engineers Mr. Hoover said that he had opposed the participation of this association in public matters, and had felt very strongly that it should keep to its function of developing the technical and ethical aspects of the profession. At the same time he has strongly favored going into the Federated Societies in order to provide an influential organization of engineers which would be so constituted as to be able to enter into the great problems facing the public and have this as its primary object. He considered that the movement applied as well to state and municipal affairs as to national matters.

He urged that the matter of the detail laws governing the internal workings of the federation were immaterial and that these could be drawn up or rearranged to meet all requirements. He considered that it was very material that the association be of engineers, that the organization be so constituted that it will sense the sentiment of the engineers of the country before committing them to policies, and that the big thing now is to get behind the movement and lend immediate support so that the work of the federation may be effective during the next twelve months in the solution of the tremendous problems which we now face.

During the course of his speech Mr. Hoover referred to the public regulation of public utilities and other natural monopolies. He said that by taking away rate control the initiative for expansion of facilities to keep pace with the demand for service was also largely taken away. He said that we have yet to devise laws that will protect the public from natural monopoly and at the same time keep this initiative. Under the present system no financial group is ready to take the responsibility of financing the necessary expansion of these monopolistic businesses. He did not want to see government ownership. While this matter of regulation is one of the great problems which the people must solve, he said that "no one in Washington has held his head in his hands ten minutes trying to solve it." On the contrary, the primary effort has been to coin phrases that would get into the headlines and pull votes.

CONFIDENT A BETTER LABOR SITUATION IS POSSIBLE

Mr. Hoover also made a very interesting brief analysis of the labor problem. He said that at present organized labor is between two fires. There is the radical element on one side, demanding the one big union idea, with the object of dictating to government and the ultimate socialization of industries. But labor realizes that this cannot be attained as long as craftsmanship is the basis of the organizations. In other words, it will be necessary to destroy the present structure of the labor organizations before it is possible to bring about any radical change in structure.

On the other side there is capital, which is being counseled in many quarters to take advantage of the present favorable situation to crush out organized labor altogether. Between these two forces Mr. Hoover said that the craft basis of organization may be crushed out, and he thought it was worth while to consider the advisability of supporting this form of organization. He contended that labor will be organized in some manner, regardless of any effort to suppress it.

He said that labor is now earnestly groping for some method of alteration of the whole economic operation of its organizations, to get away from the principle of limited production. It is now seriously proposed that every effort be put toward the problem of how we can get maximum production within reasonable physical limitations. He said that while some people would claim that this attitude of labor was insincere, he believed it was honest and considered it the greatest mental revolution we have ever seen. Mr. Hoover pointed out that the great underlying objection to the closed shop is that it has always meant less production, and he thought that if this could be changed there would be little well-founded objection to the real purposes of organized labor. He contended that if organized labor could be brought into co-operation with organized employers we would see a tremendous advancement in industrial conditions, and he thought that the engineers were the best equipped men to give attention to this problem.

Association News

Topics at Chicago

THE printed program of the mid-year conference of the American Electric Railway Association at Chicago, Feb. 10, shows that addresses will be presented on the following topics, all connected with the main subject of electric railway financing:

"Review of previous financial methods":

> Summary of the changing methods of financing capital improvements from the days of early electrification down to the present, with reasons therefor; influence of low rates of return on such methods, as disclosed by large proportion of capital securities represented by interest-bearing debt; influence of the holding company and probable future; war-time financing; post-war financial methods.

"Present requirements for mortgage securities":

> What competition requires in the way of relation of cash invested to amount of loan; influence of previous history on electric railway investments; margin of earnings over interest charges; flexibility of mortgage provisions; necessity of ample staple earnings as a condition precedent to re-establishment of credit to be derived from automatic regulation or cost-of-service franchises; characteristics of interest-bearing securities which the general market is likely to absorb during the next year or two.

"Necessity for financing by sale of capital shares":

> Importance of providing for return on new capital that will invite the investment of new money through the purchase of issues of capital stock; requirements in the way of franchises or methods of regulation which will support such plans of financing.

"Home-town financing—partial mutual ownership":

> Desirability of large local interest held by car riders; influence on local regulatory ordinances, etc.; cost of capital procurable by this means; methods of distribution.

"Municipal aid in future financing":

> Definition of conditions under which municipal co-operation is required; moral support and abandonment of street railway as political issue; pledge of municipal credit through guarantees; municipal aid for rapid transit in the construction of subways and elevated lines.

"Are financial reorganizations necessary?":

> The criteria for determining the particular conditions which will make financial reorganizations of electric railway corporations probably necessary before their credit can be re-established.

Advocates Support of Bureau

CONTINUATION of the investigation of electrolysis by the Bureau of Standards is urged by Charles L. Henry of the American Electric Railway Association in a letter to the chairman of the appropriations committee of the House of Representatives. The letter, in part, is as follows:

> The Bureau of Standards advises that the Secretary of Commerce has recommended, in his report to Congress, among other items relating to public utilities, that $25,000 be appropriated and made immediately available for the investigation of electrolysis and that the matter would be presented, if at all, to the House by the legislative, executive and judicial appropriation bill.
>
> On account of the change in the make-up of the appropriations committee, I beg to inquire of you as to what branch or subdivision of that committee this bill would come before and the name of the chairman of the subdivision. All public utilities—those which use electricity, and gas and water companies as well—are very much interested in the question of electrolysis and are watching with great interest the development of the exhaustive examination being given to the question by the Bureau of Standards. These utilities have been and are co-operating with the Bureau of Standards in this work and have a committee advising and acting with the Bureau of Standards, composed of a representative from the national association of each one of the public utilities interested and affected. The American Electric Railway Association has as its representative on that advisory committee Mr. Phillips of Pittsburgh, a splendid engineer and a thoroughly reliable and gentlemanly business man. It is believed by all who have been taking part and assisting in the work that the Bureau of Standards will work out a solution of the problem before it in such a way as will be beneficial to all concerned, with a view to doing, in the best way and with the least expense and burden to the utilities, what is necessary to give full protection against the evil effects of electrolysis.
>
> We feel very anxious that the $25,000 appropriation asked —to be immediately available—should be granted, so that this necessary and desirable work of the Bureau of Standards can go forward.

Letter to the Editors

Earnings for November of P. R. T.

PUBLIC SERVICE RAILWAY
NEWARK, N. J., Dec. 13, 1920.

To the Editors:

I notice in the ELECTRIC RAILWAY JOURNAL of Dec. 11 an article headed "P. R. T. Increase Disappointing. Mr. Mitten Appears to Be Vindicated by First Month's Result Under Commission Ruling."

This heading is somewhat misleading, particularly as the figures are misprinted. It is evident from the table that the actual passenger earnings for November, 1920, were $3,656,587 instead of $3,056,587 as printed. This would give a percentage of increase of 21.08 per cent over the previous year, and under the present depressed condition of the industrial situation in Philadelphia there is no reason to think that the normal increase would be more than 5 per cent, and if that was the case the increase attributable to the higher fare would be 15.3 per cent. It seems to me such an increase is about all that could reasonably be expected for the first month the new rate was in effect under present industrial conditions.

The experience of companies making such increases is that it takes some little time before the full benefit from the increase in rate is received.

P. S. YOUNG, Vice-President.

[NOTE.—The position taken by the P. R. T. as given in the note was that while the actual result of the new schedule closely approximates that estimated under the flat rate of 5 cents per passenger without transfers, the economies expected with the latter fare, as in handling the receipts, were not possible with the fare ordered by the commission. The typographical error to which Mr. Young refers occurs in the total or final figure in the table as printed, a "0" appearing in place of a "6."—EDITORS.]

The latest word from Germany indicates that a number of the smaller electric railway systems there have discontinued operation, and most of the larger systems are showing deficits although the fares have been greatly increased. The most favorable feature is that gasoline is so expensive the railways do not fear competition from motor buses or private automobiles.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Commissionership Still Open

Toledo Anxious to Secure More Applicants for the Position of Street Railway Director

After a cursory examination of the applicants for street railway commissioner under the recently adopted Milner cost-of-service ordinance at Toledo, Ohio, by the street railway board of control at its meeting during the week ended Dec. 11, it was decided by the board that Henry E. Riggs, dean of the civil engineering department of the University of Michigan, should be brought to Toledo to give advice to the board in choosing a man for the place.

Professor Riggs is one of the three men who served on the valuation board which fixed the price of the property of the Toledo Railways & Light Company before the ordinance was drawn by the cost-of-service commission. David Goodwillie, at that time city service director, was chairman of the valuation committee. He is the member of the board who made the recommendation to hire Mr. Riggs for expert advice.

The board also announced that further applications would be sought. Written notices were received from fourteen men and one woman. A number of local men have not made written application. They are known to the board as "receptive candidates."

Many of the applications which have come in have been from out-of-town men. Some of them are from electric railway executives and many have come in accompanied by clippings from the ELECTRIC RAILWAY JOURNAL referring to the local situation.

Mr. Goodwillie, at the meeting of the board with Mayor Cornell Schreiber last Thursday, declared that he had concluded that there were three essential qualifications for the man who should have the position:

1. That he be able to deal intelligently and sympathetically with the public. Many questions on rerouting and remaking schedules and altering service will have to be handled by the commissioner before being submitted to the board of control and the Council.
2. That he have the ability to gain and hold the confidence of the City Council. Most of the questions of service have to be taken up directly with the Council for final approval. The commissioner also may be interrogated frequently by Council as to the financial and operating statistics of the company.
3. That he must be able to deal successfully with the railway operating company, because in many cases the commissioner has to function as a go-between in transactions involving the city and the railway.

The field for applicants is open yet as the board desires to secure additional names to consider before the appointment is made.

No definite action has been taken on the salary of the commissioner. The board members are business men, free to set practically any salary.

It is not thought the separation of the property and the final acceptance of the ordinance will be filed by the Toledo Railways & Light Company and the agreement between the Community Traction Company and the present company executed before the actual expiration date of the ninety-day period allowed in the ordinance.

New Subway Entrance Lights

In New York City the entrances to many of the subway lines of the Brooklyn Rapid Transit Company are in close proximity to those of the Interborough Rapid Transit Company. On that account there has been some confusion among railway patrons not familiar with the routes of the two systems. Attempts to make plain the different systems by day by means of signs and maps placed in conspicuous places at the subway entrances have been fairly successful. In order that there may be no confusion at night the Brooklyn Rapid Transit Company is installing at many of the entrances illuminated destination signs similar to those used at garages in directing the auto driver to the supply of gasoline. On these signs names are so displayed that they can be seen at all times.

NEW ILLUMINATED SIGN AT SUBWAY ENTRANCES

In the accompanying illustration one of these lanterns is shown installed at the entrance to a station. The lantern at the far side of the stairs is of the old type of octagonal shape without any lettering. The new lamps are, perhaps, not quite so ornamental as those first installed, but they convey information as well as give light. Moreover, they cost less than the original lamps.

Mr. Murray on Radials

Author of Recent Report Gives Details of Some of Economies of New Haven Railroad

W. S. Murray, electrical engineer of New York, was questioned at the session of the Ontario Hydro-Radial Commission during the week ended Nov. 27 with respect to the report prepared by him on the subject of radials for Ontario. Mr. Murray declared that hydro-radials were a necessity for the province and should be built at the present time, even if short parallel lines could not be acquired. He stated that the New York, New Haven & Hartford Railroad saved $750,000 a year on coal on the electric division and the same amount on motive power and in overcoming train waste.

C. E. Friend, comptroller of the Canadian National Railways, stated that the Niagara, St. Catharines & Toronto electric line was purchased by the Canadian Northern in 1910. At that time the gross income was $268,173 and the operating expenses $168,173. The Canadian Northern paid $2,214,316 for the road and spent an additional $1,425,000 on it. Mr. Friend stated that the Hydro Commission was to pay $3,544,000 for the road when taken over. The gross income for the first nine months of 1920 was $715,000 and the operating expenses $604,000. The net was $111,000 and the surplus $21,000.

E. P. Coleman, general manager of the Dominion Power & Transmission Company, Hamilton, stated that the revenue last year on the Hamilton-Oakville line was $184,476 and operating expenses $178,729. This did not include taxes and other items. The operating deficit was $986 without depreciation.

The Hamilton-Brantford line, 23.19 miles, was valued at $1,809,600 with equipment. It operated at a surplus if depreciation were ignored. The 7-mile Dundas line showed a deficit of $8,174.

George C. Royce, manager of the Toronto-Suburban Railway, said the cost of 68.5 miles of track was $3,600,000, an average of $53,700 per mile. The line showed deficits of $119,170 in 1918 and $102,407 in 1919. For the first nine months of this year a deficit of $30,000 was shown.

During the sittings of the Ontario Hydro-Radial Commission at Toronto during the week ended Dec. 4 much evidence was given by representatives of steam railways to the effect that the electric radial railway system proposed to be constructed by the Hydro Commission on behalf of Ontario municipalities could not possibly be made to pay unless the lines were assured of local freight traffic.

Plan for Lease at Detroit

City and Railway Officials Seek to Avoid Duplication of Facilities—Important Terms of Lease Outlined

The submission of a leasing proposition to city officials of Detroit, Mich., for approval having been authorized at the meeting of the directors of the Detroit United Railway on Dec. 1, negotiations were started proposing the leasing by the city of all the company's lines within the corporate limits when Elliott G. Stevenson, counsel for the Detroit United Railway, Mayor Couzens and members of the Street Railway Commission met on Dec. 6. The plan suggested provides for the taking over by the city of the lines together with the equipment, the company to receive a 6 per cent return on its investment and the city to have the right to purchase the lines at any time. The negotiations were started at the suggestion of city officials.

THE company's proposed plan provides for a board of arbitration consisting of seven members, two members to be appointed by the city, two by the company and three more to be selected by the first four members. This board would place a valuation on the property of the company and would be empowered to agree to the terms of the proposed lease. At any time during the life of the agreement, the city could purchase the lines at a price to be determined by the board.

Valuation Matter First

The first question to be settled will be the basis of valuation. The value placed upon the property by the Detroit United Railway is understood to be approximately $31,000,000. It is believed by the city officials, however, that the company would consent to $27,500,000 and $33,000,000 as minimum and maximum figures for the arbitrators to consider. No proposal has been made to the city for the separate sale of any of the so-called day-to-day agreement lines. According to the Mayor, the main question to be considered now is the leasing of all lines within the city, with the idea of taking up the proposition to purchase at a later date.

If the city leases the lines the company is willing to give an option for purchase. Under the terms of the proposed option the company would allow deductions from the option figure of money invested by the city for maintenance. Present Detroit United cars and cars of the municipal railway would be operated over the company's lines and all the depreciation of the company's tracks and rolling stock would be taken care of by the city.

City's Power Limited

According to the opinion of the Corporation Counsel, the city is not empowered to take over any of the day-to-day agreement lines which the company has built and pay for them out of the bond issue authorized last April until the city system is in operation. A 60 per cent majority of the voters favoring the proposal would then be required before the lines could be purchased. In the event negotiations on a price failed the Detroit United Railway could not be ousted from the day-to-day lines, since the agreement provides that the city purchase the lines if it contemplates their continued operation. In case the city ousted the Detroit United Railway from the day-to-day streets and requested the company to tear up its tracks, new tracks could not be constructed under a construction program. This procedure would necessitate discontinuing operation over the day-to-day streets.

No attempt has been made by the city to cross existing tracks and the opinion has been expressed that under the existing state legislation the municipal lines have no authority for such crossings, either at intersections of electric or steam lines. If the law regulating the crossing of existing tracks has to be amended by the Legislature before the State Utilities Commission can grant the municipality permission to cross existing tracks, at grades, then the municipal system cannot be completed until this problem has been settled.

After the proposition was presented to the Street Railway Commission, Mr. Stevenson left the meeting. The matter is one that will require lengthy consideration before the question is settled. If the city and the company agree to the terms of the proposed agreement the matter will have to be submitted to the voters at a special election. A three-fifths affirmative vote would be required, according to the charter, to ratify the proposal.

Complying with the Mayor's request the Detroit United Railway on Dec. 9 submitted a memorandum containing a general statement relative to the proposed leasing of the company's lines to the city. In the hurried preparation of the outline the company aimed to make the statement sufficiently complete to enable the commission to determine whether it was worth while to proceed further with the matter.

There is one feature in the memorandum that has not been discussed with the Mayor and the commission, namely, the provision relative to the creation and maintenance of a sinking fund. According to Mr. Stevenson, to outline at this time any satisfactory arrangement with reference to how the situation would be dealt with at the end of a lease, if entered into, would be very difficult and involve more consideration and study than he has been able to give to the matter.

He believes that the lease, if entered into, should contain a provision for a sinking fund that would pay for the property at the end of the lease, entitling the city to a transfer of the title to the property unencumbered at that time and the transfer to the company of the accumulated sinking fund, which would then equal the value of the property fixed under the plan discussed.

The following is a memorandum setting forth in a general way the more important of the terms and conditions upon which the company would be willing to enter into an agreement with the city in respect to the street railway system:

1. A lease to the city for a term of thirty years of the street railway system in the city of Detroit with the inclusions and exclusions substantially as set forth in the schedule to the proposed contract signed March 17, 1919, and submitted at the election on April 7, 1919.

2. The rental under such lease to be 6 per cent per annum on the fair value as of Jan. 1, 1921, of the property above referred to. Payments to be made in equal monthly installments out of the revenue accruing from operations.

3. The city to maintain each class of property up to the standard of the physical condition thereof on Jan. 1, 1921.

4. The fair value to be determined by an impartial and disinterested board of arbitrators of seven members, two to be chosen by the city, two by the company and these four to choose the other three. The basis of determining fair value to be the cost thereof as of Jan. 1, 1915, plus additions thereto since that date. The cost at Jan. 1, 1915, shall be ascertained as to labor, materials, etc., at the average prices prevailing Jan. 1, 1910, to Jan. 1, 1915, and as to additions since Jan. 1, 1915, either at the cost as shown by the books of the company or at the market prices prevailing at the date of expenditures. The existing depreciation would, of course, be determined by the board as an incident to determining the fair value.

5. All taxes to be paid by the city.

6. Insurance in the amount usually carried, to be maintained and paid by the city.

7. An option giving the city the right to purchase at the end of any calendar year at the fair value so determined as of Jan. 1, 1921.

8. In the event of the default of the city in paying the rental, taxes, insurance, or maintaining the property, and such default continuing 90 days after notice, the company to have the right to reenter and to operate the property until the default is made good. The city also to have the right to surrender possession to the company at any time on six months' notice, in which event the company shall operate for the benefit of the leasehold estate during the balance of the term of the lease upon and subject to all the terms and conditions of the lease including the same as to the rate of fare.

9. The right to be given the city to assign or sublet to a responsible corporation with capable and experienced managing officials.

10. A sinking fund of 2 per cent per annum on the fair value to be created by paying into the Sinking Fund Commissioners of the city, out of the revenues of each month, $\frac{1}{12}$ of said 2 per cent. This to be invested by the said Sinking Fund Commissioners in bonds yielding at least 4 per cent. Interest to be added to the fund. This will accumulate sufficient to pay for the property at approximately the end of the term, at which time the sinking fund will be turned over to the company (to the extent of the fair value of the property), and the system and property will belong to the city.

11. The company to have the right to run its interurban, passenger and freight cars substantially as at present, for not less than six nor more than ten years upon substantially the same terms as set forth in the proposed contract of March 17, 1919.

12. Materials, supplies, etc., to be treated as set forth in Paragraph 3 of the proposed contract of March 17, 1919.

13. The rate of fare to be fixed in accordance with Sec. 14 of Chapter XIII of the city charter — the rental being included under subdivision (C) of that section and the sinking fund above mentioned being maintained in lieu of that provided in subdivision (D) of that section, which contemplates a purchase.

Not having come to any definite decision relative to the action to be taken on the leasing proposition submitted by the Detroit United Railway, the Street Railway Commission sent a communication to company's attorney asking that the company name a price at which it would sell approximately 55 miles of its city lines which the city officials maintain are day-today lines or lines upon which franchises have expired.

The so-called Fort Street system from Artillery Avenue to Baldwin Avenue and the Woodward Avenue line from the Detroit River to Milwaukee Avenue are the so-called non-franchise lines.

The commission is eager to arrive at an early decision of the matter before it in order to make proper recommendation to the City Council and the people thereon.

It is not thought that the Detroit United Railway will look with favor upon the sale of the lines which the commission named—especially the Fort Street and Woodward Avenue lines. The company does not admit that it is operating on Fort Street without due rights. The claim is made that inasmuch as the city did not take advantage of the Supreme Court decision to order the company off Fort Street but instead ordered it to make improvements and renewals, under existing conditions the decision no longer holds.

Auto Bus Unable to Compete With Pacific Electric

The auto bus has been defeated in its attempt to compete with the Pacific Electric Railway, Los Angeles, Cal., for business between that city and Pasadena and between Los Angeles and Alhambra. On page 684 of the issue of the ELECTRIC RAILWAY JOURNAL of Oct. 2, 1920, were outlined details of the plan of the Pacific Electric Railway to fight the auto bus stage lines that had applied to the California Railroad Commission for rights to operate auto bus lines between Los Angeles and Pasadena and between Los Angeles and Alhambra. The Pacific Electric Railway met this invasion by applying to the commission for permission to withdraw its commutation rates between Los Angeles and Pasadena and between Los Angeles and Alhambra provided the commission granted the bus lines operating rights.

It has now developed that bus line applicants withdrew their requests when it was shown that the commutation rates of the Pacific Electric Railway between Los Angeles and Alhambra were lower than the bus line could afford to meet. The rates offered by the bus line were 17 cents one way and 30 cents round trip, while the one-way fare by interurban is 21 cents and the round-trip rate 36 cents. The commutation fares of the Pacific Electric Railway are from 8 to 16 cents less than the one-way tickets.

Members of the City Commission of Alhambra asked the bus company in entering the field to reduce its fares to meet those of the Pacific Electric lines' commutation fares. The bus company replied that the best it could do would be a straight 15-cent fare each way. In consequence it withdrew its application.

Legislative Gossips Busy

Much Speculation in New York About the New State Administration's Public Utility Program

All sorts of rumors are afloat as to what is to happen to the Public Service Commissions in New York State. Some have it that a single-headed commission is to be created for the entire State; others that the up-state commission is to be organized on the same plan as the Public Service Commission of the First District; others that a single commission of five members is to take over the entire State; and a few express belief that in the final analysis nothing will be done at all.

In some quarters a tendency exists to investigate the personnel, appointment and acts of the members of the Public Service Commission for the Second District. The consensus of opinion seems to be, however, that if any of the appointees of Governor Smith to the up-state district should tender his resignation, it would relieve the incoming administration of much responsibility. Just what legislation will eventually be enacted will be determined when a legislative program is finally settled by the party leaders. On the other hand, the reorganization of the public service commissions may be deferred for another year waiting the opinion of the people on changes in other fundamental laws.

As regards the general traction situation, but more particularly the situation in New York City, Governor-elect Miller at the Saint Regis on Dec. 14 said to the newspaper men:

> I haven't made up my mind on the subject. In fact, I haven't made it up on various problems that will face me after the first of the year.

A question of great importance to the incoming legislature is, "Who will succeed Senator George F. Thompson, frozen out of public life at the recent election, as chairman of the public service committee in the Senate?" Senator Charles J. Hewitt, the next ranking member of the committee, who has specialized on highway legislation the past few years, is slated to be chairman of the Senate finance committee. Senator N. Monroe Marshall graduates from the Senate to the State Treasurership and Senator Clayton R. Lusk is one of the candidates for president pro tem., which by the process of elimination would leave Senator Mortimer Y. Ferris, the sponsor of the Ferris water power constitutional amendment, the logical chairman of this committee, provided he wants it.

However, with only nine Democrats in the Senate in 1921 out of a membership of fifty-one and nearly half of the members new ones, such a reorganization is liable to take place that few of the committees of last year will preserve anything of their identity. This always means a serious set-back in the progress of what might be termed evolutionary legislation; that is legislation which goes over from year to year, finally crystallizing in such shape as it will eventually become law.

In the Assembly, the judiciary committee will no doubt again be presided over by Assemblyman Louis M. Martin, Oneida, who will have with him most of the Republican members of last session unless they receive other committee assignments. He will, however, be without Louis A. Cuvillier, Democrat, New York, defeated, who was one of the chief objectors both in and out of committee to the Jenks measures. It was to the judiciary committee that the Jenks bills, providing for relief to the traction companies, were referred at the last session of the Legislature.

Five Persons Killed in Accident in Kansas City

The second fatal casualty in eighteen months on the system of the Kansas City (Mo.) Railways occurred at 7 p.m. on Dec. 12 when brakes failed to work as a car started down a hill. Examination showed that a ⅞-in. steel bolt connecting the main brake pull rod with the brake cylinder was broken. The absence of this bolt prevented operation of both the air and the hand-brake mechanism. The car had been inspected as usual in the morning and had operated all day. A stop had been made at Thirty-first and Main Streets, the brakes operating; northbound the car was supposed to make a safety stop two blocks further on at Twenty-ninth Street at the top of a long downgrade. The brakes did not work. The car proceeded down an 8 per cent grade five blocks long, left the rails at a curve at Twenty-seventh Street, glanced against another car southbound, then hit a trolley pole and turned on its side wrecked. Five persons were killed and several others, among them the motorman, were injured. The car was of the one-man "safety" type, and to this is attributed the fact that so little damage was done to the car which it struck and to the third car in its path.

Since June 1 the company has carried 190,000,000 pay passengers and about 90,000,000 transfer passengers. The accident on Dec. 12, with five dead, makes a total of six in this period.

Mr. Cameron Acquitted

Bruce Cameron, former superintendent of transportation of the United Railways, St. Louis, Mo., has been acquitted of all charges growing out of the loss more than two years ago of referendum petitions on a city ordinance affecting the United Railways through an order of *nolle prosequi* entered in the Circuit Court of Green County at Springfield, Mo., by Circuit Attorney McDaniel of St. Louis. This action in the case of Mr. Cameron was predicted immediately after Richard McCulloch, president of the company, was acquitted on Sept. 7 of charges of the same general nature. The history of the cases against Mr. McCulloch and Mr. Cameron was reviewed in the ELECTRIC RAILWAY JOURNAL for Sept. 11, page 514, at the time the charges against Mr. McCulloch were dismissed.

Accident on Northern Ohio Line

A head-on collision between a regular passenger train and a freight train occurred at 11:57 a.m. on Dec. 8 on the Akron-Kent-Ravenna Division of the Northern Ohio Traction & Light Company, Akron, Ohio. The accident took place 2½ miles west of Ravenna. Two persons were killed and twenty-two injured.

The freight train, westbound, pulled into the Black Horse Siding to pass the eastbound passenger train. A westbound passenger train attempted to pull in behind the freight to meet the eastbound passenger train at this point also, but the freight had not left enough clearance for it to get in. The motorman on this passenger car whistled for the freight to pull up a little and the latter pulled right out on to the main line, the crew apparently having decided to proceed to Deitrich Siding, less than ½ mile away.

The eastbound passenger train, made up of one of the company's new Peter Witt type cars, was on time. The view between the two sidings is obscured by a curve and the crest of a hill and the passenger and freight came together head on. The motorman of the passenger car was killed, the opposing motorman bruised and burned from the stove, and a trainman deadheading to Akron with his seven-year old son was probably fatally injured and the son killed.

Controversy Over Buses Settled Satisfactorily

An agreement has finally been reached between the Chicago Motor Bus Company and the Lincoln Park Board whereby the inclosed type bus will be permitted to operate on the condition that boulevard pavements will be protected by the redesigning of the bus and a redistribution of the load so that the maximum weight per lineal inch of tire width in contact with the pavement shall not exceed 1,000 lb., and that the maximum weight per square inch of tire in contact with the roadway shall not exceed 210 lb. The Chicago Motor Bus Company operates buses from the downtown loop district north through Lincoln Park on the boulevard system.

For some time now a controversy has existed between the bus company and the Lincoln Park Board over the weight of buses and the compensation for the use of pavement. Several months ago the bus company put in use a new inclosed upper deck bus for handling a larger volume of all-year-round business.

The Park Board objected vigorously because of the weight involved. The new bus is said to weigh 12,500 lb. It seats sixty passengers. The board also raised the objection that the trees along the boulevard would be damaged. The controversy grew and grew until Judge Landis recently made a statement that he would discontinue the operation of the bus line altogether if an agreement could not be reached with the Park Board.

News Notes

To Chicago Via Montreal.—A movement is on foot to arrange for a special car or cars to take the members of the New England Street Railway Club to Chicago via Montreal at the time of the midyear meeting of the American Electric Railway Association on Feb. 10. The plan would be to leave Boston on Feb. 7 at 7 p.m., reaching Chicago on the evening of Feb. 9. This would allow a stopover in Montreal. A. F. Walker, of the sales department of the American Steel & Wire Company, 120 Franklin Street, Boston, has the matter in charge.

Strike in Corpus Christi.—Motormen and conductors of the Corpus Christi (Tex.) Traction Company have gone on strike because the company refused to pay them 65 per cent of actual pay during the time the service is out of commission or hampered by breakdown in the power plant. The company recently broke a connecting rod in the power plant. This hampered service to an extent that cars are not operated at night. The trainmen demanded 65 per cent of regular pay for the time lost on this account. The demand was refused by the company.

Talk of New Grant in Dallas.—Negotiations between the City of Dallas, Tex., and the Dallas Railway looking to the granting of a new franchise embodying new service-at-cost features will be resumed when Mayor Frank W. Wozencraft returns from Mexico City, where he went as a member of the party of Texans to witness the inauguration ceremonies for President Alvaro Obregon. It is regarded as practically assured that these negotiations will result in the drafting of a franchise embodying features suggested recently, and that the franchise will be submitted to the voters of Dallas for their approval at the municipal election to be held in Dallas next Spring.

Station Design Need Not Be Changed.—The Court of Appeals has sustained the contention of the Interborough Rapid Transit Company, New York, that it should not be obliged to reconstruct its stations in Queens so that the Brooklyn Rapid Transit Company can operate over the structures. Under the dual contracts it was provided that extensions in Queens should be built by the Interborough and trackage rights should be granted the Brooklyn Rapid Transit Company. The B. R. T. then designed and constructed cars without clearance sufficient to permit them to pass the station platforms on the I. R. T. lines. Repeated requests were made by the B. R. T. to the Interborough to reconstruct its stations. Finally the matter was taken to the courts.

Municipal Line in Portland.—The Commission of Public Docks has constructed and is the owner of a new railway line operated by the Portland Railway, Light & Power Company, Portland, Ore. The commission's line connects the lines of the Portland Railway, Light & Power Company with Municipal Terminal No. 4. The road consists of 1.1 miles of track with one siding. The Portland Railway will furnish all rolling stock and power and will operate the line at cost for the commission. The commission consists of five members, C. B. Moores, chairman; John H. Brugard, vice-chairman. G. B. Hegardt, chief engineer and chief executive, is in charge of construction and operation.

New Franchise Sought in Hamilton.—The Cincinnati Traction Company acting in behalf of the Ohio Traction Company has applied for approval of a new franchise for operating cars of the Ohio Traction Company in the city of Hamilton. Under the provisions of the ordinance the Cincinnati Traction Company is required to procure the operation of the Cincinnati & Hamilton Traction Company, leased by the Ohio Traction Company, as a part of the railway system of Cincinnati. It is further provided that all receipts of the Cincinnati & Hamilton Traction Company shall be included in the gross receipts, and that all expenses shall be paid out of the receipts. W. C. Culkins, Street Railway Director at Cincinnati, held that if the fare on the Cincinnati & Hamilton Traction Company lines was increased from 5 cents to 8 cents it would benefit the Cincinnati transportation system.

Program of Meeting

Conference on Uniform Vehicle Law

A conference to consider the possibility of uniform traffic legislation for the different states will be held in Washington, D. C., on Jan. 10. This conference is really the outgrowth of the meeting in San Francisco last summer of the International Traffic Officers' Association, at which several drafts of such a law were considered. These were referred to the executive committee of the Traffic Officers' Association, which held a meeting to consider them on Dec. 6-8 in Cleveland. It was at this meeting that the decision to hold the conference in Washington on Jan. 10 was reached. C. M. Talbert, Commissioner of Streets of St. Louis, is acting as chairman in the call for this conference.

Invitations to attend this conference have been extended to various organizations of national scope interested in traffic conditions, among them the American Electric Railway Association, as well as to a number of similar organizations of less than national scope, but having a large membership. Suggestions, modifications or criticisms of the proposed laws should be sent to the drafting committee at least five days before the meeting.

Financial and Corporate

$29,845 Deficit in Rochester

City Street Railway Commissioner Suggests One-Man Cars for Six Non-Paying Lines

Operation of the Rochester lines of the New York State Railways in October under the service-at-cost contract resulted in a deficit of $29,845, according to a report filed with Mayor Edgerton and the Common Council of Rochester by Charles R. Barnes, commissioner of railways of that city. Six lines contribute principally to the deficit and in his report Mr. Barnes outlines plans to make them self-supporting by installing one-man cars on the six routes. The statement for October follows:

Railway operating revenues	$410,561
Operating expenses	320,331
Net railway operating revenues	$82,230
Auxiliary operations—deficit	78
Net operating revenues	$82,152
Taxes assignable to operation	23,743
Operating income	$56,408
Non-operating income	746
Gross income	$59,154
Return on investment	89,000
Deficit	$29,845

Mr. Barnes points out that as in the case of the report for September there were no deductions from revenues in the month of October for renewals and depreciation. The cumulative deficit since the inauguration of the service-at-cost contract totals $105,998. Mr. Barnes states that "this deficit has resulted from operation during months which are generally ones of the lowest revenue and maximum operating expenses." Concerning these losses Commissioner Barnes writes:

> In accordance with the terms of the contract such deficits should be charged against the balancing fund, but due to the fact that the 7-cent fare did not take effect until practically the first of September it did not appear proper to charge the August deficit of $71,325 against the fund at this time, and by mutual agreement between the company and the commissioner such deficit has been transferred to an account, subject to future adjustment.

This disposition of the August deficit results in a balance in the balancing fund as of Oct. 31, 1920, of $265,527. The contract provides that when the balancing fund reaches $200,000 the fare increases. When it reaches $400,000 the fare decreases. The fund was started with $300,000.

The number of passengers, including revenue transfer and free passengers, carried during August was 8,946,767; September, 8,194,984; October, 8,191,265.

Cars were operated 703,537 miles within the city in August, 766,585 in September and 780,889 in October.

Operating revenues in August totaled $362,403; September, $408,648, and October, $410,561. The increased reverue in September and October was due to the 7-cent fare. Operating expense in August totaled $293,535; September, $302,285 and October, $328,331.

Mr. Barnes said:

> The small increase in revenues in October was due to sources other than passenger revenue. The increase of $34,796 in operating expenses in October compared with August was largely due to winter operation and to the increased service. In making the comparisons the number of days in the month has been disregarded. Consideration of these would affect the comparative amounts and percentage relative to the month of September.
>
> Accruals are made for renewals and depreciation for the purpose of creating a fund from which the proportion of the cost of reconstruction or renewals chargeable to operation is paid. No such accrual was made in the month of October nor in September. Work of this character was done during the months of August, September and October, a portion of the cost of which will be charged to the accrual made to this fund in the month of August.

Deficit Being Reduced in St. Paul

Reports show that under the 6-cent fare the St. Paul (Minn.) City Railway, included in the system of the Twin City Rapid Transit Company, has improved its service beyond the requirements stated in the ordinance under which the increase from 5 cents to 6 cents was permitted. Between the period July 19-22 and Nov. 15-19 the company has added fifty-one cars to the morning and seventy-two cars to the evening rush service. The ordinance requires fifty-five cars.

Submission by the company of its monthly report for October shows a deficit of $9,080, despite the 6-cent fare. Deficits are decreasing, however, as shown by report of deficit of $34,372 for August and $23,003 for the month of September.

The report for the month of October follows:

Revenue from transportation	$432,413
Other revenue	4,121
Total revenue	$436,535
Way and structures	4,357
Equipment	50,555
Power	47,721
Conducting transportation	156,733
Traffic	3,576
General and miscellaneous	52,919
Transportation for investment (credit)	1,421
Total operating expenses	$353,642
Net operating revenue	82,893
Taxes	39,203
Operating (gross) income	$43,689
Miscellaneous rents	83
Interest on debt	52,483
Miscellaneous debts	203
Total deductions	$52,769
Deficit	$ 9,080

Revenues reported in August were $363,023, and in September $409,065. Operating expenses reported in August were $309,325, and in September $346,143. During this period the company paid $13,000 more for equipment than it reported in August.

Sees No Redress

Corporation Counsel at Seattle Advises City Must Stand by Its Bargain in Purchasing Local Railway

In a recent opinion as to whether the city of Seattle, Wash., can return the railway properties which it is now operating to Stone & Webster and get back the $15,000,000 of bonds issued in payment for the lines, Corporation Counsel Walter F. Meier expressed the judgment that this cannot be done.

Mayor Hugh M. Caldwell asked for the opinion. He advised Mr. Meier that he understood the Harris Trust & Savings Bank, Chicago, had acquired the bonds in return for the release of a mortgage against the railway property. Mayor Caldwell then raised the point whether "the present holders or subsequent purchasers of the bonds can be bona fide purchasers without notice, so as to acquire any greater rights than the persons to whom the bonds were issued." Mr. Meier said:

> In my opinion, if the present holders or subsequent purchasers of the bonds are in fact bona fide purchasers without notice, they may have greater rights than the party to whom the bonds were originally issued.

In the judgment of Mr. Meier, apparently, the recourse left the city would be in the form of a suit against Stone & Webster. He says:

> If facts can be produced that would defeat the bonds in question, had they remained in the hands of the original holder, such facts, while not assertable against a subsequent bona fide purchaser for value and without notice, may be made the basis for an action against the original holder for the recovery of damages, if any, sustained by the city.

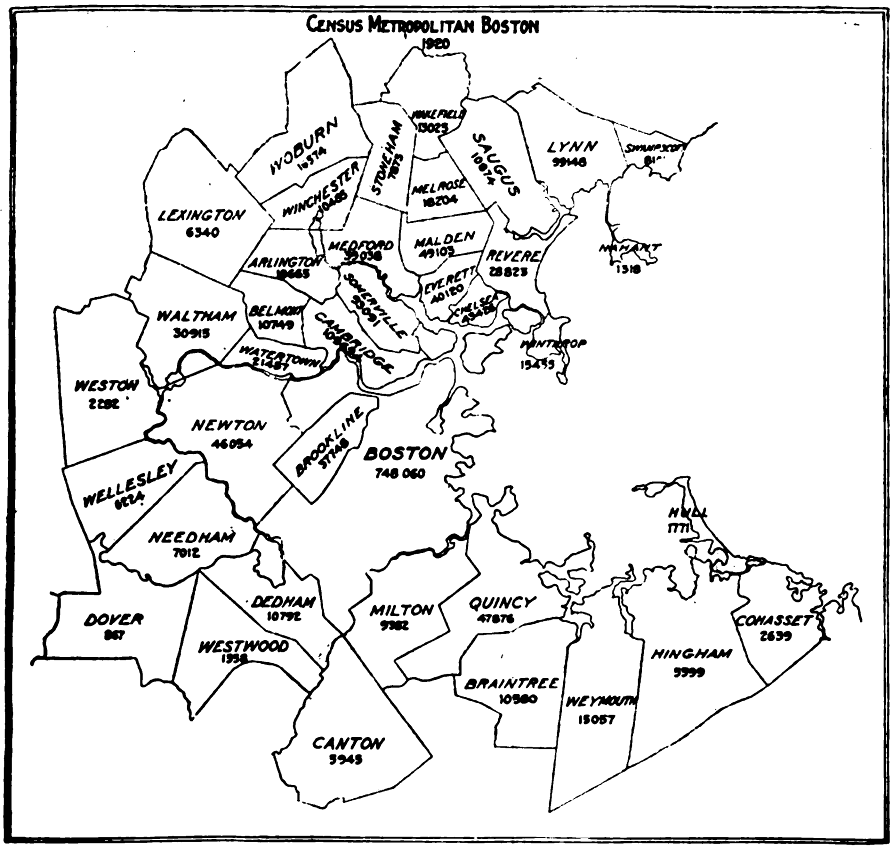
In giving this opinion, Mr. Meier referred to a case at Centralia involving utility bonds which went to the State Supreme Court. The court in this case held "that the same rule or standard which measures the rights and liabilities of individuals should be applied to the business contracts of municipal or public corporations."

The Supreme Court opinion stated:

> When it becomes a question between an innocent purchaser of bonds in the open market and the city purporting to issue them, as to which should be the loser by a breach of duty on the part of the city officers, such question should be solved in favor of the innocent purchasers.

$494,858,000 of Securities in Default

According to the *Wall Street Journal* the aggregate principal amount of public utility company bonds, including gas, electric power and light and traction issues, now in default of interest is $494,858,000. Of this amount issues of traction companies make up the greater part. This authority believes that recent economic developments have turned the tide strongly in favor of utility companies and that from now on all such enterprises should show increased earnings. It says that even though wages do not come down at once, companies are already receiving better service from their employees and can now select better material from those seeking employment.


CENSUS METROPOLITAN BOSTON
1920
WOBURN
16574
WAKEFIELD
13025
STONEHAM
7873
SAUGUS
10874
LYNN
99148
SWAMPSCOTT
WINCHESTER
10485
MELROSE
18204
LEXINGTON
6340
MEDFORD
39038
MALDEN
49103
REVERE
28823
NAHANT
1318
ARLINGTON
18665
SOMERVILLE
93091
EVERETT
40120
CHELSEA
43426
WALTHAM
30915
BELMONT
10749
CAMBRIDGE
WATERTOWN
21457
WINTHROP
15455
WESTON
2282
NEWTON
46054
BROOKLINE
37748
BOSTON
748 060
WELLESLEY
6224
NEEDHAM
7012
HULL
1771
DEDHAM
10792
MILTON
9382
QUINCY
47876
COHASSET
2639
DOVER
867
WESTWOOD
1358
HINGHAM
5999
BRAINTREE
10580
WEYMOUTH
15057
CANTON
5945

MAP SHOWING TERRITORY FEEDING BOSTON ELEVATED RAILWAY

Boston Elevated Showing Good

For the month of October, 1920, the Boston (Mass.) Elevated Railway showed a total operating revenue of $2,934,911, but with heavy maintenance expenses the net revenue of $770,736 was $72,731 less than the corresponding month of 1919. The gross income was $704,851 against $771,222 in 1919. After subtracting rentals, interest on funded debt and miscellaneous deductions the net income was only $203,149 and making allowance for dividends of $126,947 the net was $76,201 against $168,097 for the corresponding month of a year ago. In view of the fact that October month is usually a burdensome one owing to heavy maintenance expenses this showing of the Boston Elevated Railway is favorable. The remaining two months of the year will probably make a still better showing. The company's deficit as of Oct. 1, 1920, was $1,022,000, but it is very probable that the early months of the new year will see a decrease in this deficit.

INCOME STATEMENT—BOSTON ELEVATED RAILWAY

Month Ended Oct. 31, 1920	Actual October 1920	October 1919	Percentage Change Over
Railway operating revenues:			
Revenue from transportation	$2,895,555	$2,780,502	4.1
Revenue from other railway operation	39,140	39,934	—2.0
Profit and loss — delayed items	215	...	....
Total railway operating revenue	$2,934,911	$2,820,436	4.1
Railway operating expenses:			
Way and structures	236,228	289,471	—1.8
Equipment	235,921	213,755	10.4
Power	350,550	241,743	45.1
Conducting transportation	980,535	889,853	10.2
Traffic	456	......	....
General and miscellaneous	193,482	175,145	10.5
Depreciation	167,000	167,000	....
Total railway operating expenses	$2,164,175	$1,976,969	9.5
Net operating revenue	$770,736	$843,466	— 8.6
Taxes assignable to railway operation	111,783	90,649	23.2
Operating income	$658,952	$752,817	—12.5
Non-operating income	45,898	18,405	149.0
Gross income	$704,851	$771,222	— 8.6
Deductions from gross income:			
Rent for leased roads			
W. E. St. Ry. Co.	$219,690	$212,635	3.3
W. E. St. Ry. Co— Tremont subway	14,694	14,574	0.8
Other roads	2,819	4,875	—158.0
Total rent for leased roads	231,565	232,085	— 0.2
Miscellaneous rents (other subways—tunnels)	143,774	113,220	27.0
Interest on funded debt (B.E.)	107,733	115,103	— 6.4
Interest on unfunded debt (notes)	13,626	19,647	—30.7
Miscellaneous deductions	5,002	6,071	—17.6
Total deductions from gross income	$501,702	$ 486,127	3.2
Net income	$203,149	$285,094	—28.7
Dividends (at 5% on common and 7% on preferred)	126,947	116,997	8.5
Net (allowing for dividends)	$76,201	$168,097	—54.6

The Boston Elevated serves a total population of 1,192,003, of whom 748,060 are in Boston proper. The extent of metropolitan Boston is indicated in the accompanying census map. While not all this territory is directly served by the lines of the Boston Elevated Railway, the places included in the metropolitan district all contribute to the business done by the Boston Elevated Railway. The population served by the company is shown in the following table of figures from the census of 1920 and that of 1910:

POPULATION SERVED BY BOSTON ELEVATED RAILWAY SYSTEM

	U. S. Census, 1920	U. S. Census, 1910
Chelsea (a)	17,370	12,980
Everett	40,120	33,484
Malden	49,103	44,404
Medford	39,038	23,150
Somerville	93,091	77,236
Arlington	18,665	11,187
Belmont	10,749	5,542
Cambridge	109,694	104,839
Newton (b)	6,908	5,970
Brookline	37,748	27,792
Boston	748,060	670,585
Watertown	21,457	12,875
	1,192,003	1,030,044

(a) Considering that company tracks only serve 40 per cent of population.

(b) Considering that company tracks only serve 15 per cent of population.

Will You Become a Consistent Saver?

In the belief that every wage earner can be made an investor, Henry L. Doherty & Company, New York, will inaugurate a nationwide thrift and investment campaign to test how many people not accustomed to buying securities can be induced to invest in corporate obligations. This widely known banking concern through its extended experience in public utilities and corporate management believes that there are many people who are anxious to save money, but do not know how to convert their savings into investments. The benefits of thrift both to individuals and to nations are appreciated by many, but very few are aware of the high yields on many gilt-edged securities.

In announcing the plan the company says that it will not boast of success, but that the experiment is worth the money and effort spent upon its tryout. The plan will include an extensive advertising campaign to locate first prospects. No appeal will be made for volunteer workers, but volunteer help will 'be welcomed if offered. W. C. Freeman will engineer the campaign and results of the demonstration will be made public. In conclusion the company says:

> If directly, or by collateral methods, we can make this campaign a success, our greatest desire will be to see a nation-wide thrift and investment campaign inaugurated, a campaign that will be certain to make not merely for better business conditions but for better citizenship and an improved condition for vast numbers of our great population.

Spokane Consolidation Plan Off

All consideration of the consolidation of the local properties of the Washington Water Power Company and the Spokane & Eastern Railway & Power Company, Spokane, Wash., which has been discussed in the interest of efficiency and economy off and on for several years past, is at an end. For several months past committees and engineers representing both companies have gathered data relating to the proposed consolidation. These were in the possession of D. L. Huntington, president of the Washington Water Power Company, on his eastern trip in November. On his return to Spokane recently Mr. Huntington said:

> While in New York and Chicago I had several talks with those interested in the control of the Spokane & Eastern Railway & Power Company. We discussed the question of a consolidation of the railways at considerable length. For various reasons, it is not possible at this time to bring it about.
>
> One of the difficulties confronting the owners of the lines is that the consolidation will involve the expenditure of several hundred thousand dollars. This expenditure would have to be in cash, and no one at the present time wishes to put such large sums into a property which is earning no return on present investment, to say nothing of additional expenditures.
>
> Therefore, it seems that one of the necessary steps to be taken before serious consideration can be given to consolidation will be to place the properties in a condition where they can earn a reasonable return upon the money invested in them and thus justify the expenditure of the further necessary sums that would be called for by consolidation. As every one knows, the cost of money is very high at the present time and it is not forthcoming except to enterprises that can pay liberal returns to attract it.

Hydro Commission Reopens Negotiations for Guelph Radial Railway

Chief Engineer F. A. Gaby and Secretary W. W. Pope of the Hydro Commission met the directors of the Guelph (Ont.) Radial Railway on Dec. 4 and made further overtures for taking over the road.

The commission desires the City Council of Guelph to pass a resolution requesting the Hydro-Electric Power Commission to acquire the Guelph Radial Railway (now owned by the municipality of Guelph) under the agreement already entered into between the hydro and the city. The hydro officials gave the directors to understand that E. C. Drury, the Premier of Ontario, was prepared to have an order-in-council passed covering the proposition.

Under the agreement passed last January the Hydro Commission was to have taken over the Guelph Railway and made it a part of the Hydro-radial system, but Premier Drury objected on the ground that the other municipalities had not been given an opportunity to vote on it, as they were parties to the proposed Ontario Hydro-radial railway system. This resulted in the appointment of the Royal (Sutherland) Commission, which is now investigating the entire Hydro-radial project.

After a long discussion a resolution was passed that the directors were in favor of the City Council passing the resolution submitted by the Hydro-Electric Power Commission provided that the ratepayers of Guelph approve of the same at the next election.

If the ratepayers vote in favor of the proposal, it is expected that the commission will issue $150,000 of bonds to cover the purchase.

The action of the commission in going again to Guelph is generally considered in local circles as indicating the favorable attitude of the Ontario Government toward Hydro-radials.

Financial News Notes

Road Sold for Scrap.—Warwick M. Ogelsby has announced the sale of the Cumberland Railway, Carlisle, Pa., to McGovern & Company, Inc., New York City. The road extends from Carlisle to Newville. This road discontinued operation on Nov. 1. It has previously defaulted in the payment of interest on outstanding bonded indebtedness.

Power Company Takes Over Bluefield Road.—The electric railway in Bluefield and Graham, W. Va., formerly owned and operated by the Appalachian Power Company, has been purchased by the Princeton Power Company, by which operation began on Dec. 1. There will be some rebuilding of track, etc., but the extent of this work had not been determined on Dec. 1.

Extension of Bonds Urged. — The Worcester (Mass.) Consolidated Street Railway, sponsor for the bonds of the Worcester & Clinton Street Railway, amounting to $115,000, has requested the Public Utilities Commission for authority to arrange with owners of the bonds whereby their date of maturity would be extended from January, 1921, to January, 1926. The interest rate would be increased from 5 to 7 per cent.

Twin City Common Dividend.—The Twin City Rapid Transit Company, Minneapolis, Minn., has declared a dividend of $3 a share on the common stock. The dividend is a disbursement out of the current year's earnings. A dividend of $2.50 was paid last February on the common, which it was stated was a disbursement out of 1919 earnings. The regular preferred dividend of 1¾ per cent was declared. Both dividends are payable on Jan. 3.

Franchise Modification Permits Service Resumption.—The Council of Lockport, N. Y., has granted the International Railway, Buffalo, a franchise permitting the resumption of service on Grand and Gooding Streets. Service on these two lines was suspended in August, 1919. Provisions of the franchise, which is effective for ten years, release the company from paying any part of the cost of paving the streets until 1924. Freight cars may be operated on Grand Street on the Olcott division between 11 p.m. and 6 a.m. only.

Arkansas Valley Issue Sold.—A new issue of $600,000 bond secured 8 per cent gold notes of the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., purchased by H. M. Byllesby & Company recently has been practically all sold. The issue was brought out in connection with the recent financing of the Arkansas Valley Company, proceeds of which will provide extensions and improvements to the properties and retire maturing obligations. The notes are dated Nov. 1, 1920, and are due Oct. 1, 1922. They are selling to yield 8.55 per cent.

Intercorporate Affairs a Private Matter.—In a decision handed down by the Superior Court, the Public Service Commission of Pennsylvania has been ordered to refrain from an investigation of the rentals paid by the Philadelphia Rapid Transit Company to the underlying companies. The city and two local business men's associations sought to have the commission investigate, regulate and if possible reduce the rentals of the underlying companies in an effort to clear the transit situation and bring about an equitable rate of fare.

Assessments at Memphis Protested.—The Memphis (Tenn.) Street Railway, through Receivers Elgin and Tutwiler; the Memphis Gas & Electric Company, through Receivers Elgin and Raimer; the Choctaw, Oklahoma & Gulf Railroad and the Memphis Terminal Railroad have filed petitions in the federal court seeking a temporary injunction preventing City Treasurer J. H. Hessen of Memphis from collecting taxes on public utility property at the present assessment. The application will be heard before Federal Judge A. M. J. Cochram, at Maysville, Ky. The appeal of the companies is based specifically on the Fourteenth Amendment to the Constitution. Attorney Miles has delivered a check for $137,750, or about 66 per cent of the total charged against the receivers of the Memphis company.

Service Discontinued By Franklin-Medway Line.—Service between Franklin and Medway, Mass., has been discontinued for an indefinite period by the Milford & Uxbridge Street Railway. The cost of operating this 4-mile stretch of track is prohibitive. Since the beginning of the year the company has paid out $400 a month more than the income to maintain service. The line runs through a hilly and sparsely settled country. For more than a year fourteen round trips were made a day, with an average of eight passengers per trip. Many mill operatives formerly used the line. Now they ride in cars of their own and carry their friends to and from work. Arrangements for increases in fares were considered and one-man cars were operated, but even this was found to be inadequate. Service was discontinued on Nov. 21 last by order of the directors. The Franklin-Medway line is one of the lines of the Medway & Dedham Street Railway. It has been operated by the Milford & Uxbridge Street Railway under lease since October, 1914.

Traffic and Transportation

Further Relief Sought

Washington Railway & Electric Company Asks Straight 8-Cent Fare—Earning Only 4.9 per Cent

A straight fare of 8 cents has been requested by the Washington Railway & Electric Company, Washington, D. C., in a formal petition filed with the Public Utilities Commission of the District of Columbia. The present fare is 8 cents cash with four tokens for 30 cents. In the petition, it is stated that a reduction in traffic would probably follow the proposed increase. The increase of fare early in 1920 is held partly to blame for a decrease of 8.5 per cent in the number of pay passengers, as compared with the similar period of the year preceding. The company asks permission to begin charging the straight 8-cent rate on Jan. 1.

PREDICTS DECREASE IN TRAFFIC

The company estimated that a straight 8-cent fare would yield $325,014 additional revenue if there should be no reduction in the volume of traffic. This increase in revenue would enable the company to earn $1,152,808, or 6.8 per cent. The petition refers to a probable falling-off in traffic in 1921 as follows:

> In our judgment, however, we must look forward to further reduction in the volume of traffic. During six months, ending Oct. 31 last, the number of pay passengers carried on our lines was 39,315,085, or 8.5 per cent less than during the same period of the previous year. It is true that this comparison is made with a period at which a lower rate of fare existed than this year. Nevertheless, there can be no question of the fact that the population of Washington has been reduced, and will be, temporarily, at least, further reduced.

The company estimates that a reduction of at least 2 per cent in traffic would follow the new rate of fare. Such a reduction would mean a falling off of $125,808 in revenue in a year, which would reduce the net amount available for return upon fair value to $1,027,000, equal to 6.1 per cent.

To show the burden placed on the company in the paving of the space between tracks, the company sets forth a list of jobs recently ordered or in contemplation by the commission, amounting to $537,784.

NOW EARNING 4.9 PER CENT

An exhibit filed with the application shows that the total revenue from the various lines of the Washington Railway & Electric system for the six months ended Oct. 31 was $3,125,387. Operating expenses, taxes and miscellaneous items amounted to $2,614,897.

This left $510,489 available for return upon investment. Further deductions amounting to $96,592 had to be made recently, however, to cover additional cost of coal and unforeseen maintenance charges, bringing the amount available for return down to $413,897, or 4.9 per cent upon fair value.

The company presents arguments in favor of a 7 or 8 per cent return. On the question of return the petition states:

> It is respectfully submitted that in fixing reasonable rates the money conditions existing at the present time should be considered in connection with the rate of return on the fair value of the properties which said rates will produce, and the commission should take into consideration the indisputable fact that securities free from risk may be bought where the return is 7 per cent or more. The operation of a street railway property is attended with risks that do not attach to such other securities. The greater the risk the greater the return that should be applied. The cost to the petitioner in obtaining necessary capital is a factor which must be considered in the public interest as well as in justice to the company. It is therefore submitted that the rates of fare yielding a return to the petitioner of not less than 8 per cent upon the fair value of the property as found by the commission would be fair and reasonable.
>
> It should likewise not be overlooked, in justice to the company, that during the period from September, 1918, when we first appeared before the commission for an increase in rates, and since which time we have been nearly continuously before the commission, the several rates fixed by the commission have been insufficient in the sum of approximately $1,275,000 of yielding a 5 per cent return upon fair value of the property as fixed by the commission.

Transfer Charge Favored in Indianapolis

Railway Officials and Members of Indiana Commission Consider It Unwise to Change Basic Fare

Hearings of the original and supplementary petition of the Indianapolis (Ind.) Street Railway for a 2-cent transfer charge and for an investigation into the compensation under contracts between the city company and the various interurban lines entering Indianapolis were held before the State Public Service Commission during the week of Nov. 29. Concluding arguments were given on Dec. 6.

UNDER orders of the commission the Indianapolis Street Railway had filed answers to thirteen questions concerning the use of its tracks by the various interurban lines and the compensation received by the company from concessions and rentals in the passenger terminal building in Indianapolis, which revenues the interurban companies claimed were a result of the joint use of the Indianapolis terminals by the various lines. It was shown that actual payments made by the interurban lines during the year 1919 under present contracts amounted to $244,123. The cost of passenger station service furnished at the Traction Terminal Station amounted to $104,841 in the year 1919. The interurban companies paid the city company for passenger station service $53,585. The company received from station privileges, including baggage and parcels check room, $46,782, which the interurban companies claimed was revenue derived indirectly from the use of the station by the interurban cars. Under the figures shown a deficit in 1919 on passenger station service amounted to $4,473. The total number of car miles on the city lines in Indianapolis for the year 1919 was 12,913,940. This comprised 11,895,824 car miles for the city cars and 1,018,116 car miles for the interurban cars.

The city of Indianapolis contends that the interurban lines have been granted increases in fares and that therefore additional track rentals should be paid the city company and that if additional revenue is derived from this source it will be unnecessary to grant a charge for transfers.

The representatives of the interurban lines stated, their contention being sustained by the commission, that there is no partnership between the city company and the interurbans and that there would be no relation whatever between the earnings of the interurban companies per car mile while operating over the tracks of the city company and the amount paid the street railway, and that the Indianapolis Street Railway was entitled only to a fair compensation for the service rendered the interurbans, including a fair return on property investment made on account of the interurbans. A great deal of evidence was introduced by officials of the Indianapolis Street Railway, the Union Traction Company of Indiana, the Indianapolis & Cincinnati Traction Company and the Interstate Public Service Company as to the question of additional maintenance charges which must be borne by the city company as well as increased kilowatt-hour per car in handling interurban cars weighing approximately forty tons, as against city cars weighing approximately twenty tons.

The commission also heard petitions of the Indianapolis & Cincinnati Traction Company and the T. H., I. & E. Traction Company on Dec. 4 for the right to charge a minimum fare of 10 cents within the city limits of Indianapolis. Under the present contracts with the city the interurban companies can charge only a 5-cent fare from the terminal or other points within the city to the city limits. The commission announced that these petitions would be considered in connection with the petitions of the Indianapolis Street Railway for increased rates.

In the closing arguments the Indianapolis Street Railway sought to show that the derived revenue from the proposed 2-cent transfer charge will be approximately $300,000. This sum will be required to offset increased taxes and fuel for power during 1921, and if the anticipated increase in revenue is received it will make the estimated net operating revenue of the company $1,087,000 for the year, applicable to the payment of fixed charges and dividends, which is justified according to the railway by the fact that this amount is approximately 7 per cent on a valuation of $15,000,000, which was suggested by the city as a fair valuation when it proposed that the company should operate on a service-at-cost basis. Since that time the company has added $500,000 in improvements to the value of the system.

Immediate Relief Asked

The attorney for the city company suggested that the commission permit the railway to put into effect immediately a transfer charge and that the commission appoint some expert to make a survey of the situation relating to proper charges to the interurban companies for track, power and terminal facilities. It was pointed out that such an investigation would probably take six months.

Upon inquiry by the commission as to whether the company would prefer a 6-cent fare to the transfer charge it was stated that the company officials, as well as members of the commission, considered it unwise at this time to increase the basic fare beyond 5 cents.

As a further result of the hearing the Indianapolis Street Railway has requested the State Board of Tax Commissioners to reduce the valuation on its property from the amount of approximately $18,000,000 assessed to a value of approximately $15,000,000, which has been the figure assumed by the city as a fair physical value of the property in its arguments before the Public Service Commission on the fare increase question. The company contends that if such action is not taken by the board the valuation in the hearing before the commission should be raised to equal the tax assessment.

Ten Cents in Each Zone

The Cumberland & Westernport Electric Railway, Cumberland, Md., on Dec. 1 raised its fare in each zone from 7 cents to 10 cents. The increase was made under authority of the State Public Service Commission. The commission directed the railway to sell monthly commutation tickets, good for fifty-six rides, at the rate of 7½ cents a zone. The company must also transport miners, traveling in miners' cars, at the rate of 7 cents a zone, and must sell tickets to clergymen and school children at the rate of fifty tickets for $2.50. In its petition for an increase the management asserted that if a proper allowance for depreciation was made the granting of a 7-cent zone fare would fail to produce a fair return of 8 per cent on the valuation of $1,888,304 for the property.

Eight Cents in Des Moines

Court Directs Increases in Fares and Service—Points Out Fallacy of Proposal for Return to Five-Cent Charge

Judge Martin J. Wade of the federal court entered an order on Dec. 11 putting into effect an 8-cent fare in Des Moines as soon as the Des Moines City Railway puts into operation a 40 per cent increase in service which is ordered in the court's decree fixing the fare. Ten tickets will be sold for 75 cents and five for 38 cents. According to officials of the company it will be at least Dec. 20 before the necessary schedules can be worked out and full arrangements made for operating under the new plan. The court's order follows generally the recommendations made to Judge Wade by the three masters in chancery appointed to investigate the situation in Des Moines, although there are some minor changes such as continuing the present 2½-cent fare to school children and high school pupils.

JUDGE WADE'S order came after a turbulent week in the controversy between the city and the receivers for the railway. Early in the week the City Council had passed an ordinance making it a misdemeanor, subject to $100 fine, for the company to place in effect a fare higher than 5 cents. This is the fare provided in the franchise voted the Des Moines City Railway four years ago.

City Threatens Arrests

City attorneys announced that if after Friday morning the company attempted to collect a 6-cent fare, which has been in effect since last August, company officials and trainmen would be arrested as violators of the new ordinance. Judge Wade quashed this plan by means of an injunction issued late Thursday afternoon.

The early part of the week was given over to final hearings by the attorneys for the city and receivers on the recommendations of the masters. Statements by Corporation Counsel Byers that the masters were prejudiced and that the receivers had been partial to the interests of the company called forth a spirited refutation from Judge Wade.

In entering his order Judge Wade said:

> Counsel for the city, with apparent sincerity, urged a return to the 5-cent fare as a means of raising more money, and at the same time urged an enlarged service. The truth is that Des Moines had a 5-cent fare from 1916 until last August, when the new wage scale compelled the receivers to pay out several hundred thousand dollars a year in increased wages. The only solution was to reduce the service.
>
> ### Labor Costs $562,689 More
>
> The city in its franchise ordinance fixed a 5-cent fare. This was regarded as binding until the Supreme Court of Iowa held otherwise. When the franchise was granted, wages of men were about 30 cents an hour; now they are 70 cents an hour. There has been added to the cost of operation, since the 5-cent fare was agreed upon as fair and just, for labor alone on the present reduced service $562,689. In other words, the receivers now pay out on the present schedule $562,689 more for labor each year than was paid out the first year of the franchise.
>
> If full service were restored under the present wage scale, the receivers would pay out for wages alone for 1921 $1,021,345 more than was paid out in the first year under the franchise. Still it is urged that return to a fare which the city established in 1916 would pay this $1,021.345 of increased wages. The receivers collect now about 35,000,000 fares a year. To pay the increase in the wages of the men alone, at a 5-cent fare and full service, would require practically 21,000,000 more rides a year.
>
> Increased expenditure for wages is only one item. The fuel cost in 1916 was $77,626. For 1921 it will approximate $218.912—an increase of $151,285. This, added to the wage increase, would require additional fares amounting to $1,172,631, upon normal service. Still many people have been made to believe that a 5-cent fare and full service would produce this money.
>
> These are only two items. Every other element that enters into maintenance and transportation has practically doubled over 1916 and still there are those who talk about a 5-cent fare.
>
> No one disputes that fares in the average city for the past two years have been much higher than the fares in Des Moines. There seems to be some notion abroad that Des Moines is exempt from ordinary economic rules and that in some way public service can be rendered for less in Des Moines than anywhere else.

Refutes City's Argument

Judge Wade then gave considerable attention to the financial condition of the company and called attention to the fact that at the time the franchise was voted this condition was known to the citizens of Des Moines. In continuing he said:

> The extra one cent allowed in the 6-cent fare was to pay the increased wages of the men. The representatives of the city of Des Moines have approved and insisted upon payment of every increase of the wages of the men. I thought the 6-cent fare might bring in enough money to pay the current increase, and gradually pay the back pay of the men, but experience has shown that it will not do so. In this emergency, I did not trust to my own judgment as to what should be done.
>
> Three men of high standing have recommended an 8-cent fare. The people of Des Moines are entitled to better service, but some one must pay for it, and there is no mystery about where the money must come from. It must come from the people who use the cars. I have asked for light. I ordered the masters to listen to suggestions from any body of citizens of Des Moines. The only definite suggestion for getting more money is to return to a 5-cent fare with increased service—the absurdity of which is so self-apparent that it is unworthy of discussion.

The decision in the Ottumwa City Railway case referred to by Judge Wade is expected during the present week.

Attorneys for the city have announced that they will appeal Judge Wade's ruling to the Supreme Court of the United States.

Officials of the Des Moines City Railway estimate that the service established by the terms of the order will require 175 additional trainmen, fifty additional shop men, three more trouble men and four more in the wrecking crews. One hundred and thirty-two cars will be put in service during the rush hours as against 103 at present; during the lean hours there will be seventy-eight as against forty-six.

The 6-cent fare was granted last summer to enable the company to meet the demands of its employees for higher wages. The men struck, but returned to work when the new wage scale was made retroactive.

Municipal Railway Considers Increase

Seattle City Lines Will Be $1,610,000 Behind at End of 1921 Under Present Fare—Ordinance for Higher Rate Before Council

At a meeting of the City Council of Seattle, Wash., as a whole on Dec. 2, the emergency ordinance, effective in thirty days, providing for an increase in fares on the Seattle Municipal Railway from 6¼ to 8⅓ cents, or 33⅓ per cent, was passed by a vote of six of the seven Councilmen present. On the following day, however, a majority of the Council attempted to run the blockade with the ordinance with an emergency clause attached, making the measure effective immediately. In this they failed. The ordinance has now been referred back to the city utilities committee where it will stay until some ambitious Councilman again blows the breath of life into its nostrils. In order to pass an emergency measure effective immediately the ordinance must have the votes of seven Councilmen and the approval of the Mayor. Mayor Caldwell had promised to approve the fare increase measure.

UNDER the terms of the ordinance transfer privileges were allowed only through payment of a 10-cent cash fare, the present cash rate, except in cases where the rides originate or terminate on the cable lines, when payment of the 8⅓-cent fare would entitle patrons to a transfer.

RAILWAY $500,000 BEHIND

City officials were extremely anxious to have the order become effective at once, as the railway lines are now $500,000 behind and were to be placed on a warrant basis on Dec. 10. Mayor Caldwell pointed out that "it would be unreasonable to expect the railway employees to discount their wages 10 or 15 per cent in order to receive their pay and that the city could not be said to have done all in its power to fulfill its contract obligations if it left the fare at 6¼ cents." He pointed to the higher rates in other cities.

Mayor Caldwell further said that the railway lines were approximately $500,000 "in the red," and that the city treasurer had co-operated with the city officials to the extent of paying railway bills, although there was insufficient money in the railway fund for this purpose. He relied upon the legislative body, consisting of the Council and the Mayor, to protect him in making these payments. His bondsmen have insisted that further payments be not made in the absence of funds available for the specific purpose, and the lines would have been placed on a warrant basis if the emergency measure increasing fares were not passed.

The petition of a delegation of Seattle ministers asking that the new ordinance include a provision granting Sunday school children the 2½-cent fare the same as public school children was denied by the utilities committee.

FACES $1,610,452 DEFICIT

Estimates prepared show that it will take two years under the new fare to wipe out the present deficit of the railway lines. Estimates of revenues and expenditures of the Municipal Railway for 1921 based on the present 6¼-cent fare indicate there would be a deficit of $1,610,452 in addition to the present deficit of more than $500,000 at the end of the year. On the basis of a fare of 8⅓ cents it was set forth there would be a surplus of $230,844 at the end of a year to apply on the present deficit.

The ordinance provided for three cash fares for a quarter, instead of the present two fares for 15 cents; cash fares for school children, 3 cents; for two, 5 cents; ten tickets for 35 cents. No change was provided in children's fare. Token fares were to be 8⅓ cents, three for 25 cents; six for 50 cents, twelve for $1. It was proposed to charge an additional fare on the Highland Park and Lake Burien line from the city limits to points beyond. Last July the fare was raised from 5 to 6¼ cents.

According to estimates for 1921 the total receipts based on an 8⅓-cent fare would be $7,910,795, with total expenditures of $7,679,951, leaving a surplus of $230,844 at the end of the year. The revenue for 1921 based on the 6¼-cent fare is estimated at $6,069,498, with total expenditures of $7,679,951. This would leave a deficit of $1,610,452. No provision is made in the estimates for any possible reduction in the number of car riders due to proposed increase in fares.

MAYOR FAVORS INCREASE

In discussing the proposed increase Mayor Hugh M. Caldwell stated that in view of the existing and imminent unemployment situation the increasing of fares at the present time was particularly unfortunate and would doubtless work some hardship. He called attention, however, to the fact that the ordinance under which the bonds were issued to pay for the railway obligated the city to charge a sufficient rate to meet the obligations of the principal, interest and operating expenses, if it is possible to do this, at least until matters should be changed by vote of the people or by court proceedings if it should develop that the latter are possible. The Mayor said:

> We have sold and are preparing to sell other utility bonds for the development of the light and power plant, including the Skagit project, and enlarging the water system. I have therefore concluded that it is the duty of the city toward its other utilities to endeavor to live up to the contract under which the public acquired bonds from the city. In other words, any change from that upon which we started or any relief from existing contracts should be had in some other manner than by refusing to charge a rate on the utility that will permit of our keeping our obligations in so far as it is possible for this to be done.
>
> If the charging of an 8⅓-cent fare so decreases the railway traffic as to make the estimates erroneous upon which we are acting, the problem will have to be faced in the light of such developments. If the estimates are correct, it would take us two years in which to wipe out the present deficit.
>
> I have already expressed myself as believing that the theory of this purchase at this price was fundamentally wrong, and that it cannot be entirely carried out on that basis. I still adhere to this view, but it does not relieve us of the necessity or duty of increasing the revenues, at least to the extent provided for in this ordinance.

Mayor Caldwell stated that his proposed investigations of the purchase of the railway lines, for which the Council made an appropriation to cover his expenses, has been delayed by matters "seemingly beyond control," but that he expects to conclude same and make a report on the matter to the Council within thirty days.

Poor Service Chief Ground for Complaint

An analysis of the complaints reported in the annual report of the California Railroad Commission for the fiscal year of 1919-1920, recently issued, shows that poor service by utilities was the source of more dissatisfaction among consumers than were increases in rates. The complaints based on rates aggregated only 487 out of a total of 2,663. The complaints on rates were distributed as follows:

108 against telephone and telegraph companies.
104 against electric light and power companies.
99 against water companies.
12 against gas companies.
38 against auto stage and truck lines.
16 against electric railway lines.
62 against steam railroads.

The complaints on the score of poor service were directed against every class of utility operating within the State, the totals on some of the utilities being as follows:

361 against telephone and telegraph companies.
256 against water companies.
170 against electric light and power companies.
97 against gas companies.
70 against auto stages and truck lines.
49 against steam railroads.
35 against electric railways.

Buses Versus Higher Fare in Flint

Application has been made by the Detroit (Mich.) United Railway to the Common Council of Flint, Mich., for a readjustment of fares in that city. Detailed figures have been presented to the Council showing that if jitney bus competition is to be permitted to continue as in the past a 2-cent increase in fare will be necessary, but that if the jitneys are eliminated the company believes that it will be able to operate, for the present at least, on the basis of a 6-cent cash fare. The fare on the city lines is now 5 cents.

Service in Flint has been operated at a loss for some time past, but it had been hoped that because of the rapid growth of the city and resultant increase in business, it might be possible to continue at the present rate. This hope, however, has not been realized and with the excessive cost of money, material and labor it has been found necessary to ask, temporarily at least, an increase in the rate. The company's investment in Flint is approximately $3,000,000 and a $500,000 extension program is under way.

During the first six months of this year 10,717,163 revenue passengers were carried at a cost of $744,908 or an average cost per passenger of 6.9506 cents. For the month of July, this year, 1,819,442 passengers were carried at a cost of $143,674.56, or 7.8966 cents per passenger. This is 2.9 cents in excess of what the company actually collected from each passenger.

A count recently made shows that Flint jitney buses in one day carried more than 8,000 passengers equivalent to $400 per day or $146,000 per annum taken from the car lines. This jitney service parallels the car tracks and picks up passengers that would otherwise help defray the expense of operation of the railway lines. Statistical data submitted to the Council show that the cost of service rendered in that city every year since 1911 has been greatly in excess of the amount collected from the passengers.

Way Opened for Increase

The Missouri Public Service Commission will in a few days take up the petition of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, for an increase in fare from 7 cents to 10 cents. Consideration of this petition, filed in July as request for a 9-cent fare and later amended to ask for a rate of 10 cents, was interrupted by injunction proceedings, and the resulting order of Federal Judge Arba S. Van Valkenburgh invalidating the commission's method of reaching valuations of public utilities. Judge Van Valkenburgh's decision was reviewed at length in the issue of Nov. 27, page 1122.

Under the decree of Judge Van Valkenburgh it seemed that the commission would be in contempt should it make any modification of its previous rate order without a revaluation of the company's property.

A modification of Judge Van Valkenburgh's decree has cleared the way for immediate action on the St. Joseph petition. Under his new order, the commission is protected in action regarding rates, and at the same time the position of the federal court respecting improper methods of valuation is maintained. His modification of the injunction decree follows:

> It is ordered, adjudged and decreed that the decree for injunction entered in the case of the St. Joseph Railway, Light, Heat and Power Company vs. Public Service Commission of the State of Missouri, et al, on the 13th day of November, 1920, be and the same hereby is so modified as to permit the Public Service Commission to fix interim fares and steam heat rates for said St. Joseph Railway, Light Heat and Power Company upon such valuation as the commission itself may determine to be reasonable and proper. Such fares and rates to be effective during the pendency of an appeal to be prosecuted by said Public Service Commission from said judgment and decision of this court, or until otherwise ordered by the commission prior to the final determination of such appeal.
>
> It is further ordered that any such action of the Public Service Commission shall not be considered to be in violation of the decree and injunction of this court, and that it shall not in any way prejudice the right of said Public Service Commission to prosecute its appeal from such judgment and decree, and shall not prejudice its rights on such appeal.

Christmas Duty in Baltimore—"Save a Life"

"Cutting down the high cost of Christmas" is the target at which is aimed a "No-Accident-Campaign" by the United Railways & Electric Company, Baltimore. In its presentation of the doctrine of safety to its employees and the public the company is directing attention to December's bad reputation in the matter of wasting life, and limb, and time. It ventures the incontrovertible assertion that the cost in fatalities and casualties is far greater than the community should have to pay for its holiday season. In order to reduce this needless waste, therefore, the company calls for the co-operation of its own forces and the people at large in a general safety crusade. Several new ideas are being employed to drive home with extraordinary force the points it is desired to fix indelibly in the minds of those who must apply themselves diligently to the campaign if the wished for results are to be obtained.

One of the pieces of literature that has been distributed to every employee of the company is a card, one side of which bears a December calendar, with the dates printed in very small type in large white spaces. Employees are asked to carry these calendars throughout the month, and to check off their "safe days"—the days in which they are free from accidents. It is believed the moral effect of this idea will be a big force in keeping the men alert to the interests of safety. The same card bears on its reverse side the portrait of a wide-eyed, intelligent little kiddie and a simply worded appeal from him in behalf of all children to the grown-ups to "make it a Merry Christmas; not a sorry Christmas."

Large posters have been placed in all the carhouses directing attention to the "No-Accident-Campaign," and the trainmen are being drilled daily in their responsibilities by representatives of the Safety Department. Car cards and leaflets in racks in the cars urge public co-operation in the campaign.

Trolley News, distributed to the public by the United Railways, has devoted a great deal of space in the current issue to safety. It says:

> But with all the care taken by the company and its employees there remains a responsibility with the public of co-operating in thoughtful endeavors to avoid and avert accidents.

Cities' Power Over Buses

A number of principles to be followed in the regulation of jitneys by municipalities in Massachusetts are laid down in an order issued recently by the State Department of Public Utilities. The department acted on the petitions from the Holyoke Street Railway and the Springfield Street Railway relative to the operation of buses in the town of Chicopee. The petitions asked for amendment or revocation of an ordinance passed some time ago by the Chicopee Board of Aldermen. The department held that the power under which the town authorities acted was very broad, adding:

> We are disinclined to alter or amend rules adopted by the licensing authority of a city that seem on the whole reasonably to insure the safety of the public and to protect the interests of the petitioners.

A majority of the rules laid down by the Board of Aldermen were approved by the department. The bond to be filed by each operator was ordered increased to a minimum of $2,500. The regulations as approved by the department further provide that:

> Motor vehicles shall not stop within fifty feet of the regular stopping places of street railway cars.
>
> No change shall be made by the jitney owners in the rate of charges or in the schedule of operation except after seven days' notice filed with the city clerk.
>
> Every jitney shall come to a full stop immediately before crossing the tracks of any railroad at grade.
>
> Every jitney owner shall report immediately, fully, in writing, to the city treasurer, any injury to a passenger or other person and any accident resulting in substantial damage to property in which any motor vehicle which he is licensed to operate is involved.
>
> The local authorities may suspend or revoke any jitney license for the violation of any state law for the operation of motor vehicles, or violation of the city traffic ordinances or the violation of rules prescribed by the board, or for any other cause deemed by the Aldermen to be sufficient.

May Raise Spokane Fares

The Washington Water Power Company and the Spokane & Eastern Railway & Power Company, operating the two electric railway systems of Spokane, Wash., on Dec. 7 sent to the State Public Service Commission notice of a 25 per cent proposed increase in fares. This will make the rate 8 cents instead of 6 as at present.

The increase is to be effective on Jan. 8, thirty days after its filing. No charge is proposed for transfers nor is the present 4-cent rate for school children to be changed. In connection with this application for increased rates, President D. L. Huntington of the Water Power company said:

> We have tried for months to operate successfully on a 6-cent fare, but we find it impossible to earn a fair return on the money actually invested in the property. Consequently, we have filed the new tariff.
>
> The company has endeavored to keep the public thoroughly posted in regard to the results of operations for many months past by giving each month complete financial and operating statistics to the city authorities and through them to the newspapers.
>
> A study of these statistics will reveal how far the 6-cent fare falls below the cost of operation. Our men have asked for shorter hours, as they are now working longer hours than is common in cities in this part of the United States. To readjust these working hours without increasing the daily pay roll will put a considerable burden upon the operating expenses of the company. This cannot be done under present conditions.
>
> Statistics obtained by us from 505 cities in the United States with an aggregate population of 33,300,000 show that in twenty-four of these cities with a population of 17,658, or 53.8 per cent of the total population, a higher fare than 6 cents is collected.

Early in 1919 the railways in Spokane asked for a 7-cent fare with a charge for transfers. The commission granted an increase of 1 cent, making the rate of 6 cents, with the understanding that if it did not prove sufficient the case could be reopened. Seattle and Tacoma have both since advanced their fares. Spokane is said to have one of the lowest fares in the Northwest.

Discrimination in Fares in Cleveland

The City Council of Cleveland, Ohio, has adopted a resolution authorizing the Cleveland Railway to establish a reduced rate of fare for school children, unless this lower rate imperils the general rate of fare for all car riders.

The directors of the Cleveland Railway are not expected to act favorably on any reduction in rate for school children. This has been presaged in a letter written by John J. Stanley, president of the Cleveland Railway, to Street Railway Commissioner Fielder Sanders, in which he says the plan should be rejected. Mr. Stanley said:

> Service-at-cost rests on one fare alike to all; that fare, the cost of transportation. The fixing of a rate of fare for a special class at less than the cost of service is a violation of those fundamentals and in conflict with the most important provisions of our Cleveland ordinance.
>
> I cannot believe that Council is ready to change so radically the arrangement under which Cleveland, for nearly eleven years, has enjoyed better transportation at lower rates of fare than any other city in the world.

The City Council now has in its street railroad committee another resolution in which the reduced rate of fare for school children is fixed at 3 cents a ride or forty tickets for a dollar.

New Jersey Increase Suspended

Orders suspending until April 1 next proposed increases in fares on the lines of the Public Service Railway, Newark, N. J., were issued on Dec. 11 by the Board of Public Utility Commissioners. The railway intended that its 10-cent fare should become effective Jan. 1. Accompanying the suspensions were announcements of public hearings to inquire into the reasonableness of the proposed rates. These hearings will be held by the board at its office in Newark beginning Jan. 13.

Transportation News Notes

Eight Cents Asked in Asheville.—The Asheville Power & Light Company, Asheville, N. C., has filed with the State Corporation Commission an application for authority to raise its cash fare on its Asheville city lines from 7 cents to 8 cents. The company proposes to sell four tickets for 30 cents. The present rate took effect about a year ago.

Would Charge 8 Cents.—The Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa., has filed with the State Public Service Commission notice of an advance of fare from 7 to 8 cents, effective Dec. 26, between Morrisville and Torresdale and intermediate stations. Special car rates are also advanced.

Asks Lower School Rates.—Randal J. Condon, superintendent of schools of Cincinnati, Ohio, has started a movement to have the fare for school children using the cars of the Cincinnati Traction Company reduced to 5 cents. Considerable pressure has been brought to bear in Cincinnati to further this plan. The matter was referred to City Solicitor Saul Zielonke, who held that to put the new plan into effect it would be necessary to amend the present franchise of the railway.

Early Commuters Favored. — The Galveston-Houston Electric Railway, Galveston, Tex., has inaugurated an early morning service for the benefit of those persons living along the line who desire to get into the cities of Galveston and Houston in time for early business duties. The first car now leaves Galveston and Houston terminal stations at 5 a.m. instead of at 6 a.m. as formerly. This service will enable persons to reach either city in time for business duties at 7 o'clock.

Seven Cents in Cairo.—The Cairo Railway & Light System, Cairo, Ill., has received permission from the State Public Utilities Commission to charge a 7-cent fare on its Cairo City lines. The company is directed to sell four tickets for 25 cents. The commission has issued an order directing the Springfield Consolidated Railway, Springfield, to install a cash rate of 3 cents for school children and to sell twenty-five school tickets for the sum of 75 cents.

Would Charge Ten Cents.—The Concord Electric Railways, Concord, N. H., has filed with the State Public Service Commission a new schedule of rates under which it proposes to increase the cash fare within the Concord city limits from 6 cents to 10 cents. The company seeks to sell ten-trip tickets, each good for a ride in a single zone, for 80 cents. On the interurban line no change is contemplated in the rate of 2 cents in each zone, but a minimum fare of 10 cents instead of 6 cents is proposed.

Grants Temporary Increase. — The Georgia Railway & Power Company, Atlanta, Ga., has received permission to collect a 7-cent fare on its line in College Park. The railway is required to give a rebate slip good for 2 cents to each person paying the new rate, and to post a bond of $250,000 pending determination by the courts of its right to charge the 7-cent fare. The fare has been 5 cents. Citizens of College Park have brought suit to restrain the company from charging the higher rate on the ground that the franchise granted to the company limits the fare to 5 cents.

Must Obey Road Rules.—Trolley cars in the State of Connecticut must obey the state regulations regarding the rules of the road, according to a recent ruling of Motor Vehicle Commissioner Robbins B. Stoeckel. The point was raised following an accident in which a state policeman was killed recently. The electric car kept on instead of waiting for an automobile to come in from the right. Commissioner Stoeckel will urge the General Assembly at its next sitting in January to make trolley cars conform to the regular highway rules that apply to all classes of motor-driven vehicles.

All Work for Safety.—Steam and electric lines, civic, church and school organizations, business houses and professional men of Indianapolis, Ind., co-operated last week in the observance of "safety week." Every accident, no matter how trivial, was reported to the police stations in order that the cause of each might be recorded. The week's observance began on Monday with the blowing of whistles and the ringing of bells. Speeches were made in the schools and at public meetings daily and the newspapers devoted much space to the publication of news relating to means for the prevention of accidents.

Further Increases in Service Impossible.—The Duluth (Minn.) Street Railway cannot on account of its limited facilities and financial condition grant any further increase in the service which it is now giving during the early morning and late evening hours, Herbert Warren, vice-president and general manager of the company, has announced. Mr. Warren was in conference with J. A. Farrell, city commissioner, on the question of a better service for Duluth. Commissioner Farrell will make his report and recommendations to the City Council at an early date so that final action can be taken by the city.

Transfer Points Increased in Fort Wayne.—The meaning in the phrase "Transfer Corner," which for a third of a century has been used to designate one of the principal corners in Fort Wayne, Ind., was entirely lost recently when the Indiana Service Corporation put into effect new transfer rules which change the transfer point from this corner to different points along the various lines. The change was put into effect for the purpose of relieving the growing congestion at this corner. The change was so radical that there was considerable confusion among passengers who had for many years been transferring from one line to another at this point, but the riders quickly accustomed themselves to the new conditions brought about by the change.

Additional Supervisors in Buffalo.—Herbert G. Tulley, president of the International Railway, Buffalo, N. Y., announces new plans for the supervision of traffic on the company's city lines. A special night superintendent has been placed in charge of traffic Saturday nights. The hours of the traffic supervisors have been rearranged so the largest number of men will be employed in the rush hours. Nine more supervisors will be employed during the evening rush hours than a year ago. Buffalo has an average of five supervisors at a carhouse. With the employment of additional supervisors in the rush hour periods, Mr. Tulley believes traffic can be quickened in the congested districts.

Personal Mention

Publicity Work Started

A. G. Whidden Begins Active Campaign for Arkansas Association—Will Use Space in Daily Newspapers

A. G. Whidden, advertising manager of the Arkansas Light & Power Company and the Pine Bluff Company, Pine Bluff, Ark., has entered actively upon his duties as manager of the Public Relations Section of the Arkansas Utilities Association. This section has been formed to place before the people of Arkansas the truth about the State's public utilities. C. J. Griffith, manager of the Little Rock Railway & Electric Company, is its chairman.

Under the direction of Mr. Whidden a campaign has been started to show the public what the utilities mean in every way. In addition to using space in the daily newspapers of Little Rock, Pine Bluff and other cities, the committee is issuing a series of bulletins and other public utility material. The committee has adopted the policy of using paid space in the newspapers for placing utility information before the public. It is Mr. Whidden's opinion that this is the best method of obtaining the good-will of the newspaper men and of showing them that the committee does not expect them to bear the burden of its campaign.

Mr. Whidden is a native of New Orleans. His experience has been in newspaper work rather than in the utility or steam railroad fields. He entered the newspaper business in Louisiana, where at various times he edited several weekly and afternoon daily papers. He also edited dailies in Arkansas, Texas and Mississippi. His last newspaper work was in Pine Bluff, Ark., where he served at one time or another as advertising manager, business manager and managing editor of the *Morning Graphic*.

During the war Mr. Whidden served with the Army Y. M. C. A., for which he handled the recruiting campaign in Louisiana. He also directed camp publicity work at Camp Pike, Ark., and acted as state publicity director of the United War Work Campaign in Louisiana. He joined the Arkansas Light & Power Company and the Pine Bluff Company as advertising manager in August of this year. He will continue his connection with these companies.

New Post for F. J. Stevens

F. J. Stevens has been appointed master mechanic of the New York & Queens County Railway, the Long Island Electric Railway and the New York & Long Island Traction Company, New York. N. Y. Mr. Stevens was formerly master mechanic of the Atlantic City & Shore Railroad, Atlantic City, N. J. Until about four years ago he was superintendent of equipment of the Fort Wayne & Northern Indiana Traction Company, now the Indiana Service Corporation, Fort Wayne, Ind.

A Christmas Message

"Dan" Fisher of Texas Surprises His Friends Again in His Inimitable Way —Passing Another Milestone

Everybody in Texas and the great Southwest knows Dan Fisher of Dallas —big-hearted bachelor, idolized "big brother" of newsboys, urchins and all kiddies generally, and discriminating connoisseur of oil paintings and good books.

DAN FISHER OF TEXAS

Dan Fisher has been an electrical utility man all his life. He is a past-president of the Southwestern Electrical & Gas Association, probably the biggest sectional utility body in the country. In Dallas they tell this story: One day the president of his company, knowing that Dan had started his career as a railroad stenographer, entered Dan's office and with eyes twinkling said: "Mr. Fisher, all the stenographers are away, but I have a very important letter to dictate. Would you mind taking it?" Then he dictated: "Mr. Daniel G. Fisher, You are hereby appointed assistant general manager of this company, effective at once!"

But after several years of "double-distilled hell" in the operating end, Dan determined to get back into general administrative work, and, besides taking charge of publicity, wisely decided that the only perfect existence is that of an editor. His cheerful magazine, *Texas Utility News*, brings a veritable Gulf breeze and a breath of magnolia into those offices which wait for it each month. Dan is a vice-president of the Association Advertising Clubs of the World and occasionally preaches a lay sermon from the pulpit. The newsboys of Dallas have crowned him king, and 150,000 kiddies attended the Children's Day events which he directed at the Dallas Fair this fall.

Every Christmas time this kindly Texas philosopher sends to those fortunates who are on his mailing list messages of Christmas greeting that are distinctive and full of heart-warming friendliness. This Christmas the message from Dan is in the form of the following verse:

HERE'S A CHEER FER YOU
CHRISTMAS MORNIN'

We're passin' another milestone,
To the rim uv the great divide.
You 'nd me's gettin' closer, ol' pardner,
As the long, hard trail we ride.

Where the hoof prints p'int just one way,
With no returnin' tracks.
Where the herds are driftin' onward,
But none are comin' back.

You an' me hain't nigh so coltish
An' gunhandy 's we uster be.
Old age is a creepin' slowly
But shorely 'pon you an me.

My gun hand's gittin' wabbly
An' my temper's coolin' down.
The Prince uv Peace has shorely got me,
Fer I smile instid uv frown.

Here's a cheer fer you Christmas mornin'
An' a hope that the years to come
Deal kindly with you, my good friend,
Till your work in this range is done.

An' when God goes to cuttin' the cattle
May He herd you off to the right,
To a range uv eternal sunshine
In a land where there ain't no night.

Mr. Campbell Returns to York

Gordon Campbell, president of the York (Pa.) Railways, has returned to York and has resumed the active management of that property and of the Edison Light & Power Company, also of that city.

In the summer of 1919 Mr. Campbell was appointed vice-president of the Municipal Service Company, Philadelphia, Pa., which controls a number of traction and lighting companies, including the Citizens' Traction Company, Oil City, Pa., and the Youngstown & Suburban Railway, Youngstown, Ohio.

Mr. Campbell's return to York was made at the earnest solicitation of the board of directors of the York Railways in order that he might devote his entire attention to the local properties. Mr. Campbell became identified with these properties in 1908. Prior to that time he was associated with public utilities in Denver, Col.; Newark, N. J.; Providence, R. I., and Washington, D. C. He has long been active in the work of the associations in the utility fields and served two terms as president of the Pennsylvania Street Railway Association.

Mr. Earlywine Made C. E. R. A. Secretary

L. E. Earlywine, assistant secretary of the Central Electric Railway Association, since June, 1915, was elected secretary of the association at the Indianapolis meeting on Dec. 3. Mr. Earlywine succeeds the late A. L. Neereamer, who died last July.

Mr. Earlywine was born near Georgetown, Ind., on Oct. 13, 1887. Practically all of his business experience has been in the railway field. He began with the Big Four in 1910 as chief clerk to the general foreman of the Indianapolis shops. In 1911 he was made private secretary to the division superintendent of the Cincinnati, Hamilton & Dayton Railroad, and in 1913 took charge of the statistical work of that railroad. He continued as statistician of the company until he resigned to assist Mr. Neereamer with the various work of the C. E. R. A. Mr. Earlywine's election as secretary of the association makes him also secretary of the Central Electric Railway Accountants' Association and chairman of the Central Electric Railway Traffic Association, which are subsidiaries. He will supervise the compilation of joint tariffs, the collection of data, the keeping of the member companies advised of the activities of the state commissions and the Interstate Commerce Commission and the numerous other activities of the association.

L. E. EARLYWINE

O. L. Flowers Steps Up

O. L. Flowers, who held the controller of the first electric car ever run through the streets of Clarksburg, W. Va., has been appointed general inspector of the Fairmont and Clarksburg Divisions of the Monongahela Valley Traction Company, Fairmont. The office is a new one, having been created as a part of the railway's program of promoting the welfare of its patrons. Mr. Flowers will make a general survey of conditions throughout the company's system, with particular reference to seeing that the patrons are accorded courteous treatment. Mr. Flowers has been freight agent of the company for several months. He is succeeded in that position by Foster Ash, who has been his assistant. Mr. Flowers has been in the service of the company for fourteen years, or since it was organized, having started in the service as a motorman.

Electrification Committee Named

A. S. Baldwin Heads Body Which Will Supervise Illinois Central Work—W. M. Vandersluis Engineer

President C. H. Markham of the Illinois Central Railroad has appointed an electrification commission to determine the system and general design and plans for the electrification of the Chicago terminal of that railroad.

The members of this commission are A. S. Baldwin, vice-president and formerly chief engineer of the Illinois Central, chairman; Daniel J. Brumley, chief engineer, Chicago Terminal Commission; Bion J. Arnold, consulting engineer, Chicago; George Gibbs, of Gibbs & Hill, consulting engineers, New York; Cary T. Hutchinson, consulting engineer, New York, and W. M. Vandersluis, signal engineer Illinois Central Railroad. Mr. Vandersluis will serve as engineer-secretary of the commission.

WORK TO START AT ONCE

Messrs. Arnold, Gibbs and Hutchinson have been prominently connected with other electrification projects. Colonel Arnold was a member of the commission which was responsible for the electrification plans of the New York Central terminal in New York City. He has also acted as consulting engineer for the electrification of the Port Huron-Sarnia section of the Grand Trunk, the Erie Railroad at Rochester and the Deadwood-Lead City line of the Burlington Railroad. The firm of which Mr. Gibbs is senior member had charge of the electrification of the Long Island Railroad, the Pennsylvania's suburban service in Philadelphia, and part of the Norfolk & Western work. Mr. Hutchinson planned the electrification of the Cascade Tunnel division of the Great Northern.

The commission is to begin work immediately, it is understood, with the probability that a report will be made within six months. The commission will determine what system of electrification should be used, taking all factors into consideration. After this important preliminary work is completed, it is probable that the commission will be retained as a permanent body to design and superintend the installation of the system adopted. Under the ordinance in which the electrification of the Illinois Central is provided for, the work must begin in 1922. All of the work done by the Illinois Central Railroad in the Chicago terminal area during the last year has been laid out with the future needs of the electrified system in mind. This includes yard layout and the steel cars purchased for present use in suburban service but suitable for later equipment with motors and control.

Present indications are that the suburban service will be handled entirely with multiple-unit cars, and that electric locomotives will come into use only when the electric operation is extended to the through trains.

Promotion for A. K. Plummer

A. K. Plummer is the newly appointed director of traffic of the Los Angeles (Cal.) Railway. Mr. Plummer succeeds F. E. Denison, who has resigned because of ill health. As director of traffic Mr. Plummer will oversee the activities of the traffic supervisors.

A street railway veteran of horse-car days, Mr. Plummer has grown up with the Los Angeles system. Before going to Los Angeles in 1903 he drove a horse-car in San Francisco. For three years he served as a motorman on one of the Los Angeles city lines. He was then promoted to inspector. Three years ago he was again advanced, this time to traveling instructor. He continued in this position until the time of his recent appointment to be director of traffic.

A. K. PLUMMER

Commission Consolidates Steam and Electric Divisions

The Public Service Commission for the Second District of New York has consolidated its divisions covering steam and electric railroads into the Division of Railroads with Charles R. Vanneman, since Oct. 1, 1914, chief of the Division of Steam Railroads, as chief of the Consolidated Divisions and Ray G. Winans, assistant inspector in the Division of Electric Railroads, as chief inspector of electric railroads.

Charles R. Barnes, the chief of the Division of Electric Railroads, resigned recently to become the head of the commission operating the railway in Rochester under a service-at-cost agreement between the city and the New York State Railways. Mr. Winans had been assistant to Mr. Barnes since Jan. 6, 1911.

Mr. Vanneman, the chief of the consolidated divisions, has been with the Public Service Commission, Second District, since March 3, 1910.

Colonel Kealy's Resignation Accepted

Retires as Operating Head of Kansas City Railways, but Will Probably Be Employed by Receivers as Consultant

Col. Philip J. Kealy, president of the Kansas City (Mo.) Railways, will retire from any direct participation in the operation of the property on Jan. 1. His resignation as operating head of the company was tendered the present receivers upon their appointment on Oct. 21. Since that time Colonel Kealy has remained, assisting the receivers in getting started on their new work. The receivers have endeavored to have Colonel Kealy reconsider his resignation and remain with them in the operation of the property. Failing in having Colonel Kealy remain and devote all his time to the operation, there is every likelihood that he will be used in a consultant and advisory capacity as it is his present intention to remain in Kansas City and make it his home.

ALTHOUGH he has resigned as an operating official, Colonel Kealy still remains president of the corporation, which will continue its existence as at present during the receivership. By appointment by the company he is also company member of the Board of Control. The status of the Board of Control is still an open question which will probably be settled soon. Under the franchise there is a member appointed by the city, which position is now filled by Col. E. M. Stayton, and a company member appointed by the company directors. This board has jurisdiction over service, purchases, capital improvements, etc., and in the past has done much of the engineering work for the company organization.

BOARD'S STATUS UNSETTLED

The court, while not ruling definitely upon the board, took the position, when the question was raised upon appointment of the receivers, that there should be no division of authority, and that as far as any authoritative action is concerned the board would be directly under the control of the receivers. Regardless of what will be done with the board, all the present records and system of keeping capital accounts will be continued under the receivership by various departments of the company's organization. The board may still continue technically so that the city's and company's interests may be watched by their representatives during the receivership, and such assistance as may be called for rendered to the receivers.

A sketch of Colonel Kealy appeared in the ELECTRIC RAILWAY JOURNAL, Feb. 12, 1916, page 337, upon his appointment as president. He came to Kansas City as assistant to Bion J. Arnold on the valuation of the property of the Metropolitan Street Railway, taken in 1912 under the direction of the United States Federal Court. Upon its completion he was retained as engineering adviser to Fred J. Harvey and R. J. Dunham, receivers. In the franchise negotiations that followed, he, with L. R. Ash, City Engineer, was author of the Kealy-Ash plan of settlement, which was adopted as a basis for the present franchise. He was named in the new grant as the company's representative on the Board of Control. In February, 1916, he was elected president of the company and company member of the Board of Control, succeeding John M. Egan. Colonel Kealy is first vice-president of the American Electric Railway Association.

Colonel Kealy turns over to the receivers the best operating organization the company ever had in its history, with service at the highest point ever given in Kansas City. Following a strike which began Dec. 11 two years ago, practically all of the company's equipment has been rehabilitated and Colonel Kealy, with his associates, has built up since that time an entirely new operating organization. There is no union at present on the property. All matters affecting the welfare of the employees are settled collectively under the shop committee system. Although no interest has been paid since June, 1919, on the company's bonded indebtedness maintenance work has not been deferred nor has service been allowed to suffer. The receivers, therefore, took over a property in almost perfect operating condition.

COL. P. J. KEALY

The Kansas City Railways, in order to secure fare increases, has had to appear before the commissions in two states, Kansas and Missouri, and has successfully conducted three fare cases before these bodies. Even when a receivership was deemed necessary because of disagreements arising in the bondholders' committee the property was rapidly getting on its feet financially. Despite extraordinary increases in the price of coal in the past six months the six months' operation ending Dec. 31, 1920, will show a net of approximately $500,000 as against one of $90,000 for the six months ended Dec. 31, 1919.

F. G. Buffe, general manager of the company, will be retained by the receivers as general manager for the receivers, in which position he will succeed Colonel Kealy as chief executive officer of the company for the receivers. There will probably be no other important change in the present operating organization.

W. E. Rolston, superintendent of power for the company, has resigned, effective Jan. 1, to enter the employ of the Sioux City (Ia.) Service Company. Mr. Rolston entered the employ of the Kansas City Railways on Nov. 12, 1919. He has been in charge of the extensive reconstruction program at the company's power plant. Mr. Rolston becomes superintendent of power for the Sioux City Service Company.

The department now headed by Mr. Rolston will be combined with the electrical distribution department, and all power matters, both generation and distribution, will be handled directly under the supervision of R. W. Bailey, assistant general manager for the Kansas properties, who has direct jurisdiction over electrical distribution.

RECEIVER PRAISES COLONEL KEALY

"Colonel Kealy has made a splendid record with the property," said Col. F. Fleming, one of the receivers. "He has accomplished much in building the service, and the organization he has developed is strongly loyal to the company. He has accomplished these results under adverse conditions and overcome serious handicaps."

Colonel Fleming spoke with deep appreciation, and even with admiration, of the ability with which Colonel Kealy had developed the equipment, personnel and service of the Kansas City Railways and of his comprehensive and accurate knowledge of the many details of electric railway property, operation and financing.

John E. Kurtz Appointed to Missouri Commission

Governor Gardner of Missouri on Dec. 9, on recommendation of Governor-elect Arthur M. Hyde, appointed John E. Kurtz, Republican, of Kansas City a member of the State Public Service Commission, to fill the vacancy caused by resignation of Judge John Kennish.

When Judge Kennish resigned late in November to become chief counsel for the receivers of the Kansas City Railways he advised Mr. Hyde that he would leave the appointment to him. The Governor said he would appoint any one suggested by Mr. Hyde or would leave the place vacant until the change of administration.

Mr. Kurtz is a lawyer. He will serve under the present appointment until April 15. He will be reappointed by Governor Hyde if he desires to remain on the commission for a full term of six years.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

New Corporation to Broaden Export Field

Potential Capacity of One Billion Dollars Behind Organization to Supply Credit for Foreign Buying

A corporation to be known as the Foreign Trade Financing Corporation will be launched immediately, it is announced, as the result of a conference of representatives of agriculture, finance and business from all parts of the United States called by the president of the American Bankers' Association in Chicago on Dec. 10 and 11. To quote from the resolutions passed at that meeting: "The operation of this organization will result in the broadening of the export market, thus relieving this country of surplus stocks of all kinds, with the result of stabilizing prices and benefiting all lines of trade, agriculture and manufacturing, and will have an especial tendency to encourage production."

A capital of $100,000,000 was authorized, giving a potential capacity of one billion dollars under the Edge act, under which the corporation will be organized. Among the committee of thirty named to supervise the formation of the corporation are found the names of Herbert Hoover and E. M. Herr, president the Westinghouse Electric & Manufacturing Company. It is the intention to get this organization to a functioning point at a very early date, and the entry of such a force in the export finance field should go a long way toward brightening up conditions in all lines of manufacturing.

Easier Market on Cement

Manufacturers' Price Drops Slightly Under Light Demand and Decreased Production

Within the past two months the general slackening of business that has affected many items, combined with the normal seasonal lessening of demand at this time, has served to relieve the previous tight condition of the cement market. In the Oct. 16 issue of the ELECTRIC RAILWAY JOURNAL it was stated that stocks of cement were practically nil, demand far in excess of supply and orders accepted for delivery not much before Dec. 1.

Since that time conditions have changed, as at present the volume of new orders coming to virtually all manufacturers can be said to be very low. Electric traction companies are giving no indication that construction programs next spring will call for any large ordering of cement on their part. Nevertheless producers remain optimistic as to prospects for general demand for their product coming back strong in 1921.

Manufacturers' stocks, on the whole, are still either at a low level or depleted, but in spite of the fact that production is being materially curtailed at present supplies are expected to build up in good shape during the present winter. Deliveries are now made in good time, in some instances from stock and in others within a few days. Cancellations, except where standing orders for shipment of a certain number of barrels per week have been cut, have apparently not been received in large volume; rather the new orders have ceased coming in. Prices within the last two weeks have eased off slightly. Manufacturers generally reduced the price 20 cents per barrel, while the cut with dealers has been even larger, as cement is now quoted at $4.80 per barrel, delivered in truck lots at New York, compared with $5.10 recently.

Quiet Market for Special Trackwork

Prospects for 1921 Business Uncertain, with Electric Railways Displaying Little Interest—Brisk Inquiries from Steam Roads, but Producers Are Keeping Rail Stocks at Low Level

Although a good volume of rail orders for 1921 is being received at present, the market for special trackwork, on the other hand, remains even quieter than is usual at this period. Producers generally are conservative in expressing an opinion regarding prospects for next year's business in frogs, switches, crossings and the more complicated layouts. Steam railroads are entering the market for this material and the number of inquiries reported from that source indicates a good volume of orders through next year. On the other hand, electric traction companies as yet have displayed little or no interest in covering their requirements and the orders placed in that quarter are not expected to be extra heavy.

One of the large makers of special trackwork still has orders on the books from both steam and electric lines sufficient to carry through the winter season. This condition is not general, however, as the fall season just passed fell considerably below the standard of other years in the amount of track laying that was done. Consequently mills are pretty well caught up on their old orders now and deliveries can be accomplished in good time. Foreign buying is light, though the need for this material abroad is known to be large.

Although some producers who do not roll their own rails, particularly those who specialize on girder-rail layouts, are waiting for actual orders before buying rails, this cannot be said to be a general policy. In spite of the fact that a leading maker of this class reports having covered his full rail requirements for 1921 many of the other mills that do not do their own rolling are endeavoring to keep rail stocks as low as possible. These efforts are meeting with success as the result of hand-to-mouth buying. Consequently, it is pointed out, traction companies that place late orders for spring delivery may very possibly run up against long shipments, especially on girder-rail trackwork. This 'is not only because girder rail stocks are small but the mills rolling this type will not roll for the small tonnages that are often placed under the many different existing specifications. To overcome this factor of orders being held up until a sufficient tonnage of each specification accumulates to make it worth while for mills to roll, traction companies, it is stated, are more and more standardizing on the A.E.R.A. standard rail.

Production conditions with respect to raw material, labor and transportation are fairly favorable and continue to improve. Prices hold steady and the consensus of opinion is that no reduction on special trackwork may be expected until labor costs have undergone a material downward revision.

Twenty American Street Cars for Finland

Helsingfors, Finland, has received twenty American street cars which were ordered by the local tramways company for service in the city there, according to Consul Leslie A. Davis. It is expected, he says, that the sale of these cars in Finland will lead to further sales, not only in that country but also in Norway, Sweden, Denmark and other countries of northern Europe.

There is a demand there also for street-car rails, maintenance equipment, machinery for repair shops, snow plows and sweepers, street sprinklers, steel-wire brooms with ice chisel on end of handle and similar articles. Owing, however, to the present unfavorable rate of exchange there would probably be difficulty in obtaining the necessary currency license for their importation at this time.

Senate Committee Recommends Regulation of Coal Industry

Repudiation of Coal Contracts, High Prices and Irregularities of Deliveries Sharply Criticised in Report Made Before United States Senate This Week

A severe arraignment of the coal industry was made before the United States Senate this week in a preliminary report of the Senate committee on production and reconstruction, headed by Senator Calder of New York. This committee, which has been investigating the coal situation for some time, recommends regulation of the coal industry to cure existing evils. The repudiation of coal contracts, high prices and irregularity of deliveries were sharply criticised.

The text of the coal section of the report is as follows:

"The nation is dependent upon coal as its chief source of heat and power, yet the production and distribution of coal are badly organized and subject to manipulation at the expense of the people.

"Coal profiteering, especially as it has followed the priority orders issued by the Interstate Commerce Commission, has continued unchecked by the Department of Justice and is a national disgrace. Coal speculation has been permitted to monopolize the transportation facilities of the country, retarding necessary construction and increasing the basic cost of manufacture and distribution of commodities in general. It has bled the home owners, public utilities, and the industries.

EVILS OF CONTRACT REPUDIATION

"The imperative necessity of continuity of supply of fuel demands the fulfillment of contractual relations in this industry more than in any other, and yet one of the primary causes for the disgraceful and disastrous conditions during the past six months has been the repudiation of contracts. An exceptional demand not only brings about reckless and unwarranted repudiation of contracts made for delivery of coal but the substitution of inferior quality at higher prices. Indeed, coal contracts are so drawn as to be breakable in delivery, in quality and in price.

"Our investigation into the coal situation has convinced us that the private interests now in control of the production and distribution of coal, in spite of efforts by some, are actually unable to prevent a continuance or a repetition of the present deplorable situation, and that it is the duty of the government to take such reasonable and practicable steps as it may to remedy the evil.

"An inherent responsibility of the government is the protection of its people. To assure the mining, transportation and distribution of coal at fair prices is a public duty from which the government cannot escape. But your committee believes that governmental administration of the production and distribution of coal should be a last resort, as governmental activities should always be directed toward encouragement of private initiative and enterprise.

"While the fulfillment of contractual relations is of first importance to the stabilization of the industry in the interest of the consumer, the producer, and labor as well, your committee believes that the government should at all times be informed as to coal distribution and at this time recommends:

"That all coal operators, wholesalers, jobbers and retailers be compelled by statute to file at regular and frequent periods with some federal agency reports on the total tonnage produced or handled, the size and quality thereof, the amount of tonnage contracted for, the amount sold on contract and at spot sale, to whom, together with the prices made or received under such contracts or sales, and producers and distributers to make regular reports sufficient to determine their costs and profits and the corporate inter-relations or the communities of interest, if any, between companies producing and distributing coal.

"With this and collateral information in the hands of federal authorities for possible use by the Department of Justice and other government agencies, prevailing evils as to irregularity in deliveries, inferiority of quality, profiteering in prices and undue monopoly of transportation facilities should to a great extent be eliminated. But if no other remedy can be devised it may be necessary to enact some form of federal licensing to meet the situation.

"Fuel thrift by the small user and fuel thrift by the large user through storage, scientific combustion and transmission should be strongly encouraged by the federal government."

Armature and Field-Coil Market Firm

Large Roads Buying Pretty Well on Shipping Schedules of One Month —Armatures Two Months

Buying of armature and field coils is progressing at a rate only sufficient to cover expected demands for the near future. Shipments from the winding mills can be made from one month up, and although many of the larger roads are ordering a good many sets of armature coils for delivery, so many each month for the next few months, the same cannot be said of the smaller lines. If a heavy winter comes on unexpectedly there may be some difficulty in securing delivery of even a small number of coils to take care of the burnouts occasioned by such weather. Repair parts and replacements for safety cars are coming to be virtually stock items, and armature coils, field coils and complete armatures can be had on almost immediate shipment. Complete armatures for cars larger than safety cars are being quoted on sixty-day shipment.

There has been no change in prices of these parts and with labor prices at their present scale manufacturers see no chance for a downward revision in the very near future.

Specifications Out for Fifty Motor Cars for Chicago

The Chicago Surface Lines is sending out specifications for new motor cars of which fifty are to be purchased immediately, together with trucks and other equipment for fifty trailers now under construction in the company's West Side shops. The new cars are to be of the plain arch-roof, double-end type with bulkheads, closed vestibules and pneumatically operated doors. They are to be equipped with four motors with capacity to haul trailers in continuous service all day and through the tunnels involving 9 to 11 per cent grades. The following table gives the general dimensions:

Length of body over corner posts	32 ft. 9 in.
Length of car over bumpers	48 ft. 11 in.
Width over all at drip rails	8 ft. 6 in.
Width over posts at belt rail	8 ft. 3⅞ in.
Height from rail to top of trolley board	11 ft. 7½ in.
Height from rail to first step	15½ in.
Height from first step to platform floor	13½ in.
Height from platform floor to car body floor	10 in.
Truck centers	20 ft. 3½ in.
Wheel base of trucks	4 ft. 11 in.
Diameter of wheels	31 in.
Seating capacity, including five on platforms	49
Estimated weight	46,000 lb.

The bodies are to be of all-steel construction up to the window rail with a wood superstructure. They will be ventilated with draft-type ventilators and a compensating air intake at each end. This will conform to the standard practice now used on Chicago cars except that they will be the first arch-roof cars to be supplied to this system. The seats are to have spring cushions and form-shape backs, weighing approximately 56 lb. per seat. The rails and stanchions are to be of aluminum and aluminum conduit will be used for the heaters and wherever it can be substituted for other metal. The motor circuits and all other wiring will be run in Duraduct or equivalent material. The windows will be fitted with storm sash covering only the lower sash. The window rails are to be made of bronze tubing in sections fitting in between the side posts. This is a weight-saving plan, which also stiffens the car body, that was worked out in connection with the new trailer design described in detail in ELECTRIC RAILWAY JOURNAL for July 17, 1920, page 110.

The car equipment will include automatic couplers, including the air and electrical connections, and K-type control. In addition to the equipment necessary for the motor cars bids will be requested on fifty pairs of trucks for the trailers and for seats, couplers, curtains, door engines, heaters, headlining, etc., for the trailers. The dimensions of the trailers under construction in the company's shops are such as to match up with the new motor cars. These dimensions are the same as listed above for the motor cars except for the following:

Length of bumpers...........	47 ft.	6 in.
Height from rail to top of trolley board	10 ft.	9½ in.
Height from rail to well......		15⅜ in.
Height from well to top of cross-sill		10⅜ in.
Ramp in floor from center well to bolster		5⅜ in.
Truck centers..................	25 ft.	
Wheel base of trucks.........	4 ft.	4 in.
Diameter of wheels..........		22 in.

The best delivery possible is requested on both motor cars and trailer equipment.

Rolling Stock

The New York, New Haven & Hartford Railroad, New Haven, Conn., is in the market for eight multiple-unit control cars and fourteen trailers.

Brockton & Plymouth Street Railway Company, Plymouth, Mass., has placed a contract with the Wason Manufacturing Co. for one safety car at a cost of $7,550.

Franchises

Wheeling (W. Va.) Traction Company.—At a meeting of the Bellaire (Ohio) City Council held on Dec. 3 the Wheeling Traction Company controversy, which has been hanging fire for three years, during which time the company has been operating without a franchise in Bellaire, was brought up again. Council President McFarland was authorized to invite General Manager C. P. Billings, of the traction company, to confer with Council shortly when the franchise matter will be taken up again.

Frontier Electric Railway, Buffalo, N. Y.—The municipal authorities of North Tonawanda, N. Y., are arranging to revise the franchise of the Frontier Electric Railway, Buffalo, to make the provisions of the North Tonawanda franchise, regarding the time of starting and completing the line, conform to similar clauses in the Tonawanda franchise. The changes were requested by the railway. The company desires an extension of time before starting construction of the Buffalo-Niagara Falls electric line, pleading it now would be impossible to finance the project because of the unsettled market in building materials.

Corpus Christi Railway & Light Company, Corpus Christi, Tex.—A controversy seems likely involving the status of the franchise of the Corpus Christi Railway & Light Company. The City Council some time ago granted a special franchise to the company conditioned on the expenditure of $100,000 to $200,000 in improvements and betterments during the six months immediately following May 26, 1920. These improvements have not been made and the general opinion seems to be that the special franchise has automatically ceased. The company, however, asserts that its franchise has not expired and is disposed to resist by legal action any steps looking to declaring the franchise forfeited.

Track and Roadway

Cincinnati & Dayton Traction Company, Hamilton, Ohio.—In order to co-operate with paving improvements which the city authorities will undertake in Hamilton the Cincinnati & Dayton Traction Company will move the tracks on Mt. Pleasant from the side of the roadway to the center.

Hydro-Electric Power Commission, Ontario, Canada—The Hydro-Electric Power Commission of Ontario is preparing reports and estimates regarding the cost of an electric railway from St. Thomas to Simcoe.

Hydro-Electric Power Commission, Ontario, Canada.—The railway committee of the Hamilton (Ont.) City Council has indorsed the suggestion of Engineer Agate of the Hydro Commission requesting the Grand Trunk Railway to construct the supports of four bridges which would conserve the right-of-way along the Grand Trunk Railway through Hamilton for proposed radial lines. The committee further authorized the city solicitor to apply to the Dominion Railway Board for an order conserving the right-of-way of the Grand Trunk for the radial trackage. The proposed bridges are to be located at Macnab, John, Catharine and Mary Streets in the city of Hamilton.

International Railway, Buffalo, N. Y.—The International Railway, Buffalo, has made an investigation of the cost of replacing certain tracks of the old Niagara Falls line in the city of North Tonawanda and found it would cost approximately $18,000. The company has informed the municipal authorities that it could not make the improvements at this time as requested by the city.

Power Houses, Shops and Buildings

Austin (Tex.) Street Railway.—The Austin Street Railway will install new machinery and electric generating equipment in its power plant with a view to improving the service maintained in the city of Austin.

Southern Pacific Company, Portland, Ore.—Work has been started on the rebuilding of the Lyric Theater building in Portland as a depot for the electric lines of the Southern Pacific Company. Contractors have sublet the work to local firms and the alteration is under way. The estimated cost of rebuilding is placed at $60,000.

Trade Notes

The National Safety Car and Equipment Company, St. Louis, Mo., announces its removal to the National Building, 200-214 South Theresa Avenue.

The Star Brass Works, 3114-23 Carroll Avenue, Chicago, manufacturer of spray cooling systems, has established a Pacific Coast office in the Rialto Building, San Francisco, Cal., in charge of L. M. Page.

The Illinois Stoker Company, Alton, Ill., announces the appointment of the Ernest E. Lee Company, 115 South Dearborn Street, Chicago, as district representative for Iowa, Wisconsin, Michigan, northern Indiana and northern Illinois.

J. W. Murphy, former sales manager of the Esterline Company, has established a manufacturers' agency under the name of the J. W. Murphy Company at 108 South La Salle Street, Chicago. The company will handle Esterline and Duncan meters as well as some other parallel lines.

J. C. Kopf, formerly manager of the engineering department of the Duff Manufacturing Company, has been appointed research engineer and placed in charge of a newly established research department. F. W. Schwerin has been appointed manager of engineering.

The Economy Electric Devices Company, Chicago, Ill., has pending a contract with the Cincinnati (Ohio) Traction Company for the sale of 550 Sangamo Economy watt-hour meters. The traction company has asked the street railway director to approve the contract.

The American Car & Foundry Company's Helmbacher Rolling Mills plant at Madison, Ill., was destroyed by fire on Dec. 15. Officials estimate the damage at $1,000,000. The buildings destroyed were a group constructed of wood and steel, a two-story office building, air reduction plant and thirty-five freight cars.

Bleachery for Insulation Making.—The bleachery which the Irvington Varnish & Insulator Company installed in its Irvington (N. J.) works about a year ago has a capacity of about 1,500,000 sq.yd. of cloth per month. It is equipped with machinery for obtaining the special finishes required on cotton fabric to be used for insulation.

New Advertising Literature

Valves.—The Scott Valve Manufacturing Company, Detroit, Mich., has issued catalog No. 12, containing 185 pages, in which it describes and illustrates its different types of valves.

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

HENRY W. BLAKE and HAROLD V. BOZELL, Editors HENRY H. NORRIS, Managing Editor
HARRY L. BROWN, Western Editor N. A. BOWERS, Pacific Coast Editor H. S. KNOWLTON, New England Editor C. W. SQUIER, Associate Editor C. W. STOCKS, Associate Editor
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G. J. MACMURRAY, News Editor W. R. ANDERSON, Assistant News Editor

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Eight to Twenty Years for Meditation

DISORDER in the strike in Brooklyn last summer was sporadic. No general reign of terror existed, such as at Denver and other places where railway men have gone out recently. Still, the disorder assumed serious proportions at times. In one such outburst death resulted from the violence of the strikers. The strike has long since been forgotten, but not the strikers. It is one thing to strike, but it is another to be disorderly. Five strike rioters formerly in the service of the Brooklyn Rapid Transit Company whose activity resulted in the death of a young man pleaded guilty recently to manslaughter. They have been sentenced to Sing Sing. The lawyers for the men made a plea for clemency. Judge Cropsey, who passed sentence on the accused men, disagreed with their counsel. To the offenders he said: "You are all guilty of murder. I think every consideration was shown you when the District Attorney accepted your plea of manslaughter. You had the right to strike, but you did not have the right to interfere with any one who wanted to work." In thus expressing itself the court reflected the attitude of the general public in regard to those who practice strong-arm methods. The men under sentence to Sing Sing will have from eight to twenty years to ponder over Judge Cropsey's words. Organized labor everywhere should take the remarks of the court to heart at once.

Will National or State Commissions Establish Intrastate Rates?

THE controversy over what authority will control intrastate rates of interstate carriers is a subject of far greater importance to the steam railroads than to the electric railways. But there is one phase of the question in which the electric railways are greatly concerned, and that is the policy of commissions toward utilities which will follow the decision of the Supreme Court determining where the rate-making power lies. Wherever this power is found to rest, we sincerely trust that the governing authorities will have both the will and the power to make it possible for the utilities adequately to serve the public.

If there is to be rivalry in this matter of control between states and national commissions, let it be a rivalry to see which can best build up the utilities and increase the service which they are giving to the public at rates which while not being extortionate shall yet pay adequately for the cost of the service. Several of the states, through their commissions, have already taken the attitude that a solution to the steam railroad problem is needed and that the rates authorized by the Interstate Commerce Commission should have a fair trial in intrastate as well as interstate service. The California commission, for example, in its announcement to the carriers last summer apparently considered that obtaining service was of paramount importance. It realized that any questions of defining the relative authority of state and federal commissions could be considered just as fairly without delaying the relief the carriers needed in order to render service. This is a broadminded attitude which can well be accepted by others as the proper one to follow.

Somebody Has Commenced to Regulate the Highways

WE INQUIRED editorially some time ago (Aug. 14, page 303): "Who Will Regulate the Improved Highways?" pointing out at the time, and since, the rapid destruction of the public roads by motor trucks and the complicated but pressing questions of some sort of fair division of charges for the use of the roads. Electric railways and trunk lines are keenly interested in this allocation of charges and regulation of the present almost uncontrolled competition on the part of the motor trucks.

It is a pleasure for electric railway men and a healthy thing for the motor truck industry and for the public to note that Commissioner Bennett of Connecticut, in charge of the state highways, has commenced to regulate with an iron but just hand. Mindful of the effects of overloading, he has limited the gross weight of truck and load to 20,000 lb. and is enforcing the order. Connecticut, like many other small Eastern states, is commencing to feel the effects of trans-state shipments from which it derives no benefit but the roads for which the state provides free of charge to the motor industry.

As a result of the order, many motor truck men who have been loading up to fourteen tons gross are complaining that they cannot make their business pay under the limitations set. All this is true, too, without any attempt to make any additional charges upon the truck business.

Chicago, through her Lincoln Park Board, has set a similar limitation upon weight and weight distribution of the motor buses which operate through Lincoln Park.

All this looks good and sensible. It is not that the electric railways are glad to see any unjust restrictions placed upon a legitimate means of transportation, for the electric railway, as we have often pointed out, is the logical agency to operate motor vehicles within certain limits. But the electric railway which knows that, when all factors are considered, rail haul is frequently more economical is glad to see the regulation of competing agencies commence to take proper form. As we said before, the problem is very complex. We hope for a fair solution. Commissioner Bennett has at least made a good start in the matter.

A Psychological Moment for the Railway Movies

WITH the Pennsylvania Board of Censors in the lead there is appearing a widespread feeling against a certain form of movie film which it is said has become so common that it is the usual thing seen, and a change is wanted. We refer to the film whose story is based either on the "eternal triangle" —most common—or the luring vampire. Not that there is a noticeable falling off in movie attendance, but even the movie "fan" is beginning to ask why something else can't be found for a story.

If this is so and the movie people are at all on the lookout for new material—and they seem to show evidences of good business judgment—why is not now a psychological time to put forth a railway scenario such as has been discussed in these columns for the past three months and two samples of which were given in the issue of the JOURNAL for Nov. 27?

The Runaway Street Car Problem Again

THE casualties following the runaway of a street car on a steep grade in Kansas City last week bring up forcibly again the question of possible means for avoiding such an occurrence. Runaway accidents fortunately are uncommon, thanks to the safeguards which equipment designers have provided to prevent a car from getting away from the control of the motorman when on a grade, but when these accidents occur they are apt to be serious.

In Kansas City the accident was caused by the breaking of a ⅞-in. steel bolt in the clevis connecting the main brake pull rod with the brake cylinder piston, thus disconnecting both the air and hand-brake mechanisms. With the brakes thus inoperative, the car rushed down an 8 per cent grade, grazing or striking two other cars and a steel pole, and finally went to pieces after striking the second car. To the fact that the car was of the safety type and unusually light may be attributed the small injury to the cars hit. The "one-man" feature has been attacked, but it is hard to see how the presence of a conductor in the car would have prevented the accident. The evidence is not clear as to whether the motorman tried to reverse his motors or break the circuit and put the motors in the full parallel so that they would tend to retard the car. Probably he did not.

Measures to avoid an accident of this kind may take two forms. On roads with steep grades over private right-of-way the derail with sand track stop has been used. Derails have been installed to some extent also on hills in paved streets, but obviously they are not so satisfactory in such locations. In the second place, possible improvements in the usual car brake rigging might be made. One of these is the employment of box jaws on all rods and other connections, as was exhibited for use on surface cars at the Atlantic City convention for the first time last October. With this design the parts would still engage even if a pin broke or came out. As we remember it, this construction was first applied to safety cars in Oswego, N. Y., last summer. Another possible plan would be a series of stops such as have been worked out for double-truck cars, by which the rigging on one truck, if disabled, comes against a stop, leaving the rigging on the other truck operative.

Duplicate brake rigging could also be used, so that if one set should give way the other would be available, but clearly one set is better if it can be kept in good operating condition.

Use of But One Form of Propulsion Is Not an Innate Necessity

IN DISCUSSING the present and possible future development of the motor bus in its relation to mass transportation some long-time electric railway operators place more stress upon the means used for propulsion of public vehicles than on the purposes which such vehicles are intended to serve. They seem to feel that there is an inevitable and indissoluble connection between transit over rails and the carriage of large numbers of people. Surely, it is not well to look at the matter in this narrow way. The function of a public utility transportation system, as distinguished from individually hired or individually owned conveyances, is to carry the masses in the cheapest and most comfortable fashion. It simply happens that between the passing of the horse bus and the development of the self-propelled vehicle the horse car and then the electric car running on rails offered the only practical means for wholesale urban transportation. At bottom, those who give this service have but one problem regardless of the time. It is to adopt or adapt anything whatsoever that will enable them to carry out their special undertaking still better.

This eclectic attitude is compelled all the more by the fact that a monopoly of mass transportation must also include services where there are no "masses," or where the masses come only at irregular intervals. To meet such conditions the operator owes it to his stockholders to fulfill his monopoly obligations with the least possible loss. He will therefore look into any and every mode of transport equipment available, since it is *his* business to move people and not to worry about the type of equipment used. This is particularly the case where extensions have to be made. At present prices for track construction, buses may often be found more economical than cars, and it is fortunate for the railway manager that both are available.

The Norfolk Report Has Valuable Features

IN THIS issue the third and last of the series on the Norfolk (Va.) traction situation is presented. The report which these articles have analyzed has not been formally accepted by the city as yet, so far as we are advised, but it has apparently been well received by both city and company. Comment on the report, as a piece of public utility engineering work, is pertinent. In general it contains no radically new facts or ideas. It does, however, present some of these in a new light and it is very outspoken and frank on all points.

As to valuation, that moot question and the rock upon which so many otherwise satisfactory agreements are wrecked, Mr. Taylor says frankly that his decision is not subject to mathematical proof; it is nothing more than a "judicial" determination after certain "indices" of value are known. This, it appears, is only acting upon the recognition of the fact that the final determination of value as made by a commission is always upon such a basis, admittedly or not. While engineers in the past have no doubt frequently arrived at their final figures in this manner, it is not customary so to admit. The test of such a method will rest upon some court decision ultimately, but court decisions will be unnecessary when cities and utilities can agree upon a business-like method of dealing with each other.

Mr. Taylor's arguments on "historical investment," the right of the company to press for an appreciation of its past deficiency in earnings, and the theory of "service" depreciation all have novel elements which should be both interesting and useful to railway men and to commissions in their work of utility regulation.

Mr. Taylor's position in Norfolk was strengthened by the conditions under which we are informed he made the study. These were that the city and company desired a business-like settlement of their relations; that the city, employing Mr. Taylor, recognized him as a partisan of neither side and that the city recognized the right of capital legitimately invested in public utilities to be protected both as to principal and return.

Cutting the Coat to Fit the Cloth

WITH individuals as well as corporations, the more difficult it is to make ends meet the more urgent is it to follow some kind of a budget plan of estimating receipts and expenses. Moreover this plan must be effective in exerting control over expenses and, if possible, in stimulating growth in receipts. It is cold comfort, if any comfort at all, to make up estimates, if these contain merely inert figures with no suggestive power of improvement. If, however, the budget is recognized as a potent influence in the operation of a property, it is worth a considerable effort in compilation and administration. In connection with an application for increase in railway fares the existence of a going budget system could not but impress a public utilities commission favorably.

The attention of the ELECTRIC RAILWAY JOURNAL having been recently directed to the dearth of information regarding the budget plans of electric railways, the editors arranged for a short article on the system which has been in successful use by the Boston Elevated Railway for a decade or more. It was, we believe, inaugurated by C. D. Emmons when he was general manager of this railway, and it has been found especially useful under the trustee operation. The article appears in this issue and we plan to follow it with others on the same subject, bringing out as many of its aspects as possible. If any other railway can "go the Boston Elevated one better" as to budgets now is a good time to say so.

A word of caution, however, in regard to budgets may not be out of order, especially where they are made to exert control instantaneously. This is that momentary fluctuations in expenses should not be permitted to cause a cutting of service or of maintenance activities, which in the end will react unfavorably on the balance sheet; in fact, may prove to be a boomerang. The budget has just as important a function to perform in stimulating the getting of new business as in tightening the pursestrings. The adage suggested at the head of this article is all right as far as it goes, but sometimes it is necessary also to get more cloth.

Syracuse Loses an Opportunity

PROPOSED operation at service-at-cost has been rejected in Syracuse, N. Y. Chaos has followed. The New York State Railways, operating at a cumulative loss at 6 cents, has cut service and asked the Public Service Commission for a 10-cent fare. The city has rushed to the same commission for relief, contending that "the regulations and practices of the respondent are improper, unjust, unreasonable and illegal," charges which, the city forgets, the company may well bring against it for its negative attitude.

Negotiations looking toward a basis for the permanent settlement of the railway situation in Syracuse have been conducted for nine months. During this time a special commission reported in favor of a service-at-cost proposal and engineers employed by the city returned a property value of $12,450,000. While all this has been going on in Syracuse the city of Rochester, in which the New York State Railways also operates, has approved service-at-cost and is now operating at a 7-cent fare under the new grant.

The disposition in some quarters has been strong to contrast the two cities and to make much of the fact that the Public Service Commission had approved a provisional valuation as the basis of the Rochester service-at-cost contract at a rate of something more than $58,000 to every 1,000 inhabitants, as against the appraisal of about $70,000 per 1,000 inhabitants for Syracuse. This great discovery was made by the Syracuse *Herald*, with which it has degenerated into a fetish.

It is of course foolish to contrast figures in this way, but a gullible public has evidently been impressed by the seeming deadly parallel. If this were all there were to valuation, then the value of a railway in any city could be obtained by multiplying a given base figure by the number of thousands of inhabitants in the city under consideration. This of course reduces the criticism which has been advanced at Syracuse, plausible though it may sound, to an absurdity. Density of population and the existing number of miles of track and number of cars are forgotten. Further, in the criticism of the valuation under review, the fact has been ignored that during the past few years several independent valuations have been made of the Syracuse lines. In one of these, McClellan & Campion reported the fair value of the property used in the public service in the Syracuse district as of June 30, 1920, based on present day prices, to be $21,012,201; based on average prices, 1915 to 1919, $16,663,300; and based on pre-war prices, $12,006,134. So $12,450,000 sounds reasonable.

It seems to us that if any comparisons were to be made between the two cities they had better be on the basis of the sense displayed by one city and the senselessness displayed by the other. Service-at-cost may not be the panacea for railway ills that some would hold it to be, but Rochester, under service-at-cost, has a means now of adjusting its railways problem amicably from time to time as questions calling for settlement arise. Syracuse, on the other hand, appears to be in for the perpetuation of the bickering which has been ushered in with the failure of the grant. Rochester is in a position where it can carry on; Syracuse is not. Credit has been restored to the Rochester lines and the program of improvements to be carried out as written into the new grant will soon be well on its way to realization. Syracuse, on the other hand, is slipping from bad to worse.

The Public Service Commissions of the Bay State

The Massachusetts Commission Is of Particular Interest Because of Its Early History and the Precedents It Has Established, Which Have Since Been Followed by Many Other States

THE BAY STATE CAPITOL, WHICH TOWERS ABOVE THE BOSTON COMMON

WHEN Public Service Commissions or Railroad Commissions are mentioned, the mind reverts at once to the State of Massachusetts, which was the pioneer in railroad and later in other public utility regulation.

Although the State has always recognized the railroads as having some obligations under its jurisdiction, probably the first provision for the control of the railroads by a State commission will be found in the Acts of 1864 of the Massachusetts Legislature. The wording of this act, entitled "An Act Providing for the Appointment of a Board of Railroad Commissioners, and Relating to Railroad Crossings at Grade," Acts of 1864, Chap. 152, quoted in part below, is surprisingly similar to many more recent provisions.

> There shall be a board of railroad commissioners, consisting of three persons, appointed and commissioned by the Governor, with advice and consent of the Council, and subject to removal in like manner—said commissioners, upon the application of any railroad corporation authorized to construct its road across a turnpike, highway, or townway, or of the proprietors of the turnpike, or the selectmen of the town, or the mayor and aldermen of the city in which the crossing is situated, after due notice to the railroad corporation, the proprietors of the turnpike, and such mayor and aldermen, or selectmen, not themselves being the applicants, and to any other persons or parties as they may direct, and after hearing the parties, may, if public necessity requires, authorize and require the railroad corporation to construct their railroad at such crossing, upon a level with such turnpike or way, in such manner as they may direct.
>
> If a corporation unreasonably neglects or refuses to comply with any order made under the preceding section, it shall forfeit for every such refusal or neglect a sum not exceeding one thousand dollars.

A feature in this act which would no doubt be considered a hardship by the railroads at present reads as follows:

> In all cases heard before commissioners under the provisions of this act, the expenses and costs attending the same, including the compensation of the commissioners, shall be paid by the railroad corporation. The compensation of the commissioners shall be $10 each per diem and traveling expenses.

The supervision of this commission over the railroads and the restrictions with regard to railway operation were gradually increased by legislative enactments during the subsequent years. In the eighties, a commission was provided for by the Legislature, to be appointed by the superior court, to study the needs and recommend the abolition of grade crossings.

The origin of commission regulation of gas utilities in Massachusetts is also of especial historical interest. The late Prof. William B. Rogers of Massachusetts Institute of Technology was asked by the Mayor and Board of Aldermen of the city of Boston, early in the year 1864, to make an investigation of the gas supply of the city. In the report, which is still a valuable record, submitted in response to this request, May 2, 1864, Prof. Rogers indicated the results of a most careful and scientific analysis of the candle-power and chemical content of the illuminating gas furnished the city at that time. The tests showed that 16.28 candle-power of illumination was available from a standard open burner through which 5 cu.ft. of gas was supplied per hour. This was probably the first thorough test which had been made, at least by parties without the corporation. As a result of this report the city authorities, and later the State of Massachusetts, inaugurated an increasingly rigid inspection, analysis and regulation under the direction of Professor Rogers as "Inspector of Meters and Gas," of the gas supply provided by the various corporations. This is believed to be the earliest attempt to regulate the quality of service rendered by utilities other than railroads by means of municipal or state boards.

In 1885 a board was created to have general supervision of gas companies and in 1887 the board's jurisdiction was extended to electric light companies. The gas inspection division, which originated as a distinct organization in the early sixties, was made a division of the board in 1902. On Nov. 30, 1919, the board ceased to exist, its powers being taken over by the newly created Commission of the Department of Public Utilities, as described later in this article.

In 1902 the Board of Railroad Commissioners still consisted of three commissioners appointed by the Governor for three-year terms. The salaries at this time were $5,000 for the chairman, and $4,000 for each of the other members. A clerk was provided, to be appointed by the Governor, at a salary of $2,500. The assistant clerk and inspectors were selected by the commission and were paid by the state $1,200 and $1,500 per annum respectively. The accountant's salary was established with a maximum of $2,500. Other expenditures of the commission were very definitely limited by law and a detailed annual report required for such expenditures.

An interesting provision for the payment of the expenses of the commission, although not so severe upon the railways as that previously quoted, still placed the burden upon the utilities. It is worded thus:

> The annual expenses of the board, including............ shall be apportioned by the tax commissioner among the several railroads and street railway corporations and, on or before the first day of July in each year, he shall assess upon each of said corporations its share of such expenses, in proportion to its gross earnings from the transportation of persons and property for the year last preceding the year in which the assessment is made; and such assessments shall be collected in the same manner as taxes upon corporations.

The organization of the Railroad Commission and the number of members included therein have been changed by frequent amendments. In the acts of 1906 it was composed of three members and called the Board of Railroad Commissioners. In 1913 the board was changed to five members and renamed the Public Service Commission. Two additional members were appointed by the Governor under the provision of this law. All the terms ranging from one to five years were to be assigned by the Governor regardless of the length of unexpired term of any member of the old board. New members were to be appointed subsequently for five-year terms. The salaries were raised in the law of 1913 to $8,500 for the chairman and $8,000 each for the other commissioners. No more than three commissioners could be appointed from any one political party under this enactment.

The work of the new commission was made by this act to include the common carriers, electric and steam, steamship lines, and the telephone and telegraph companies, as well as to include the functions of the old Highway Commission. The latter was merged into the Public Service Commission. It was permitted to inquire into the rates, regulations, practices, equipment and services of the common carriers, and be represented at public hearings before legislative committees, etc. It was authorized to examine the books and documents of the railroads and to prescribe forms for their accounts. Further provision was made in this Act of 1913 for the representatives of the commission to enter the premises of the utility to inspect its property or for any purpose consistent with the provisions of the act.

It was provided that the fair valuation of the property of the common carriers should be investigated by the commission when it was deemed necessary in order to carry out any provision of the act. Access to all books and documents was granted the commission for such purpose.

EARLY DECISIONS ON SECURITY ISSUES REQUIRED

Not only was it required that bonds or notes of more than twelve months' duration should be approved by the commission, but it was further specified that decision upon such an issue should be rendered within thirty days after the final hearing thereon. The law definitely provided that any mortgage executed by a railroad company should secure all bonds, notes and other evidences of indebtedness previously issued and then outstanding on equal terms with any other indebtedness secured by the mortgage.

Provision was made for such obligations to an amount which, when added to the amount of all its then outstanding bonds, notes and other evidences of indebtedness, would not cause the aggregate amount to exceed twice the amount of the capital stock of the corporation actually paid in at the time. Directors, other officers or stockholders who knowingly vote upon measures in opposition to this requirement may, under this act, be fined and imprisoned. Considerable protection was therefore provided against radical capitalization of utilities.

Zone systems for railroad fares were provided for, it should be noted, in the legislative act itself, which permitted the commission after investigation "to authorize a common carrier in special cases to charge less for longer than for shorter distances for the transportation of passengers or property, whenever in the opinion of the commission such authorization is consistent with the public interests."

Advocates of the electrification of steam roads will be interested in the definite provision in the Law of 1913 which granted authority to the commission to order, after a proper hearing, a railroad company to operate its lines or fractions thereof by electricity instead of steam power and to prescribe the time within which the work of electrification should be done.

Jurisdiction by the supreme judicial court was provided in equity to review, annul, modify or amend any rulings or orders of the commission which are unlawful *to the extent only of such unlawfulness.* Such court proceedings reviewing orders of the commission have preference over all other civil proceedings pending in such a court, except election cases.

CHANGES OF ORGANIZATION

The number of members constituting the commission, and therefore its personnel, have been frequently changed by the Massachusetts Legislature. As previously stated the staff in 1913 consisted of five men. The Acts of 1918 reduced the commission again to three men. The members at the time the act took effect retired and the Governor, with advice and consent of the Council, appointed one member for one year, one for two years and one for three years. Two were appointed from the former commission. The term of office was changed to three years.

ESTABLISHMENT OF PRESENT COMMISSION

In 1919, a more radical change was made in the Public Service Commission Law which again altered the organization of the staff. Chapter 350 of this general act, which is entitled "An Act to Organize in Departments the Executive and Administrative Functions of the Commonwealth," was approved July 23, 1919, and went into complete effect Dec. 1, 1919. As it changes quite radically the executive and administrative functions of the State and places the Public Service Commission in a rather unique relation to the other departments of the Commonwealth, a brief outline of its provisions may be of interest.

A "Department of Public Utilities" is established by the new act upon the same status as fourteen other departments, prominent among which were to be found those of Agriculture, Banking and Insurance, Corporations and Taxation, Education, Labor and Industries, Public Health, Public Works, etc. All executive and administrative offices, boards, commissions and other governmental organizations and agencies, except those serving directly under the Governor, or the Governor and Council, are placed in this department. Those not definitely provided for in the act are placed, by order of the Governor, under the direction and control of the departments above mentioned, subject to the direction of the Governor and the advice of the Council.

The Public Service Commission, existing under the Acts of 1913 and 1918, and the Board of Gas and Electric Light Commissioners, existing under the Acts of 1914, were abolished and all their rights, powers, duties and obligations were transferred to the Department of Public Utilities.

The latter department consists of five members appointed by the Governor with advice and consent of the Council. Their first terms range from one to five years, the standard length of term thereafter being five years. The Governor designates the chairman. The chairman receives such an annual salary as the Governor and Council may determine, not exceeding $8,000, and the other commissioners receive salaries not exceeding $7,000.

The chairman is not charged with any administrative functions, nor is it intended that any members of the commission nor the secretary shall devote his whole time to the work of the department.

In the hearing of all matters other than those of formal or administrative character, at least two commissioners are expected to participate, and in a decision, three members are required. In every case a majority of those participating is necessary for a decision. With the consent of all parties concerned in a matter coming before the commission, the hearing may be held by a single commissioner.

All the classes of corporations previously subjected to the jurisdiction of the Public Service Commission and the Board of Gas and Electric Light Commissioners are now regulated by the new department. As the railroads, with the exception of the Boston Elevated Railroad and the West End Railway, were formerly under the Public Service Commission and the telegraph and telephone companies were placed under it in 1918, practically the entire group of public utilities, including the highways in 1918, are now controlled by the Department of Public Utilities. The general court makes annual appropriations for the department and designates the portion to be used for salaries of employees and expenses in connection with the functions previously performed by the Board of Gas and Electric Light Commissioners.

SPECIAL STATE CONTROL OF TWO RAILWAY SYSTEMS

The two electric railway systems mentioned as exceptions to the jurisdiction of the former commission and the Department of Public Utilities as organized at present are regulated by the State more directly as provided in a special act of the Legislature in 1918. This act, Chapter 159, is entitled, "An Act to Provide for the Public Operation of the Boston Elevated Railway Company." It was approved May 22, 1918, and accepted by the company June 3, 1918.

This unique legislative proceeding provides for a board of trustees of five persons, appointed by the Governor, with the advice and consent of the Council. Their term of office is ten years and their annual salaries of $5,000 each are paid by the corporation. The board appoints its own chairman. If, after the term has expired, operation by the State is to be continued, trustees are to be appointed by the Governor for the succeeding period. The trustees manage and operate the railroad during their term of office. They have power to appoint and remove from office the president, treasurer, clerk and all other officers except the directors.

The powers of this board of trustees are rather more sweeping than those usually granted a public service commission. They may establish and regulate fares, including the issue and withdrawal of transfer privileges, and may determine the charges, if any, to be made for such transfers. The character and extent of service to be furnished are also within their jurisdiction. In these respects their authority is final and is not subject to the approval, control or direction of any state board or commission.

The trustees act as agents of the corporation and not of the State. The company is liable for acts of negligence, etc., just as in the case of other utilities and is not in any way freed from taxation by the State. The trustees are not personally liable. The corporation may make contracts and issue stocks and bonds as before. The stockholders elect directors to represent their interests, but the latter have no voice in the actual management of the railroad.

Another unique feature of the provision is to the effect that a reserve fund is to be provided of $3,000,000 in cash from the sale of cumulative preferred stock (par $100) approved by the present stockholders and not exceeding 7 per cent dividend. This is subject to retirement by the trustees or after the period of public operation at 105 with accrued dividends. This issue of stock does not require the approval of the Department of Public Utilities. Of this reserve $1,000,000 is to be set aside as a reserve fund to provide for deficit in income, while $2,000,000 is to be used by the trustees for additions and improvements.

The trustees fix the rate of fare from time to time to insure sufficient income to meet the cost of service, including operating expenses, taxes, rentals, interest on all debt, depreciation, obsolescence, losses, charges properly made to surplus, fixed dividends on all preferred stock and the following dividends upon common stock: 5 per cent first two years; 5½ per cent next two years; 6 per cent balance of period of public operation.

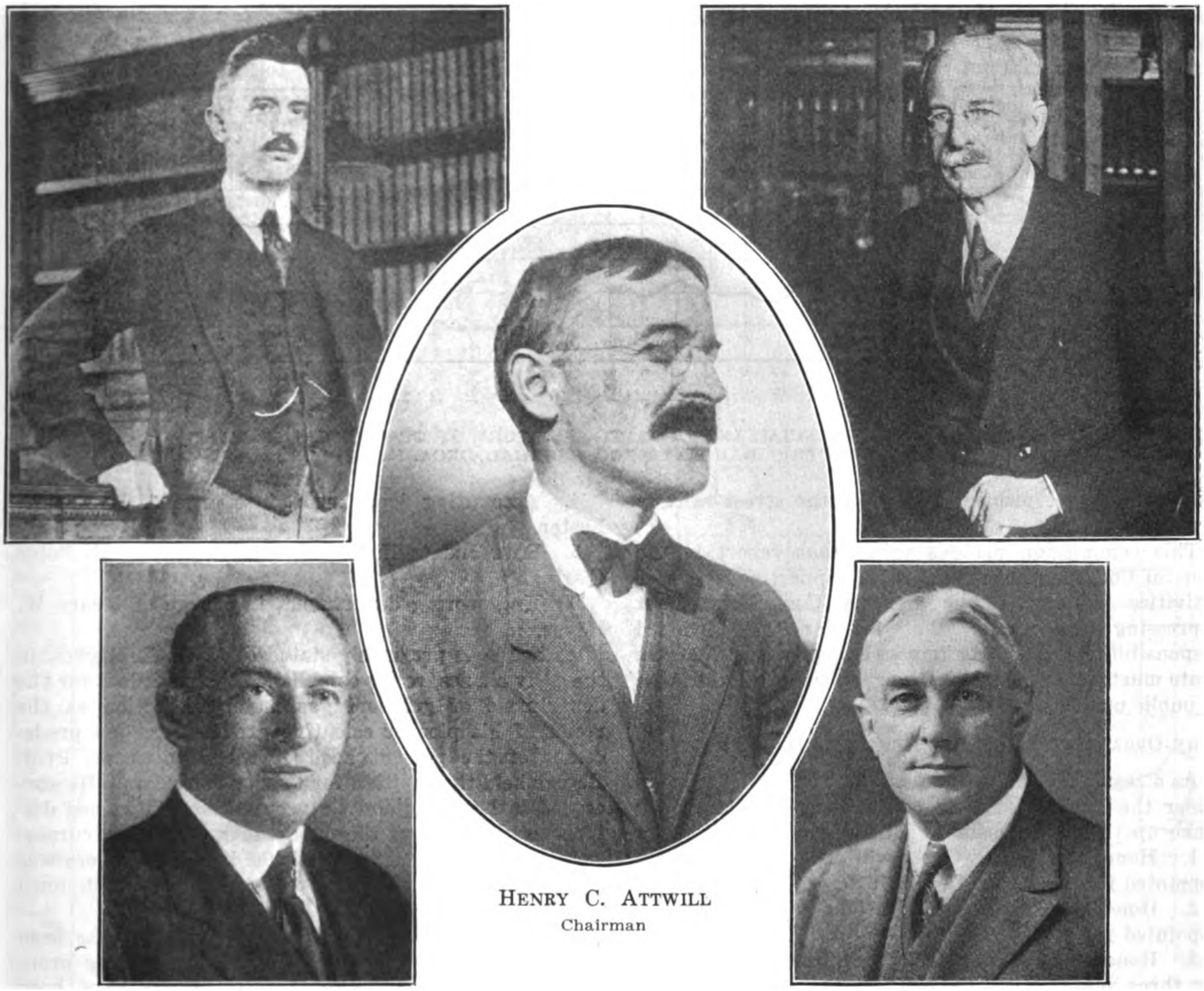
Common dividends are to be paid quarterly but none is to exceed the rates indicated. Provision is further made for the reimbursement of the fund by the State, when depleted.

The trustees are permitted to borrow money to pay the obligations pending such reimbursement. When the fund exceeds the required payments indicated, provision is made for the trustees to pay back past deficits to the State. This is distributed among the cities and towns in which the railroad operates in proportion to the amounts they have been assessed to pay deficits. Annual prescribed changes in rates for fare are to be placed in operation in case the income is too low or too great to maintain the reserve within predetermined bounds.

Such public management of the railroad may continue beyond the ten-year period prescribed until the State elects to discontinue the process. In such a case two years' notice must be given.

A provision in 1911 for the control of the West End Railway by the Boston Elevated Railway Company causes the former to come within the jurisdiction of this act.

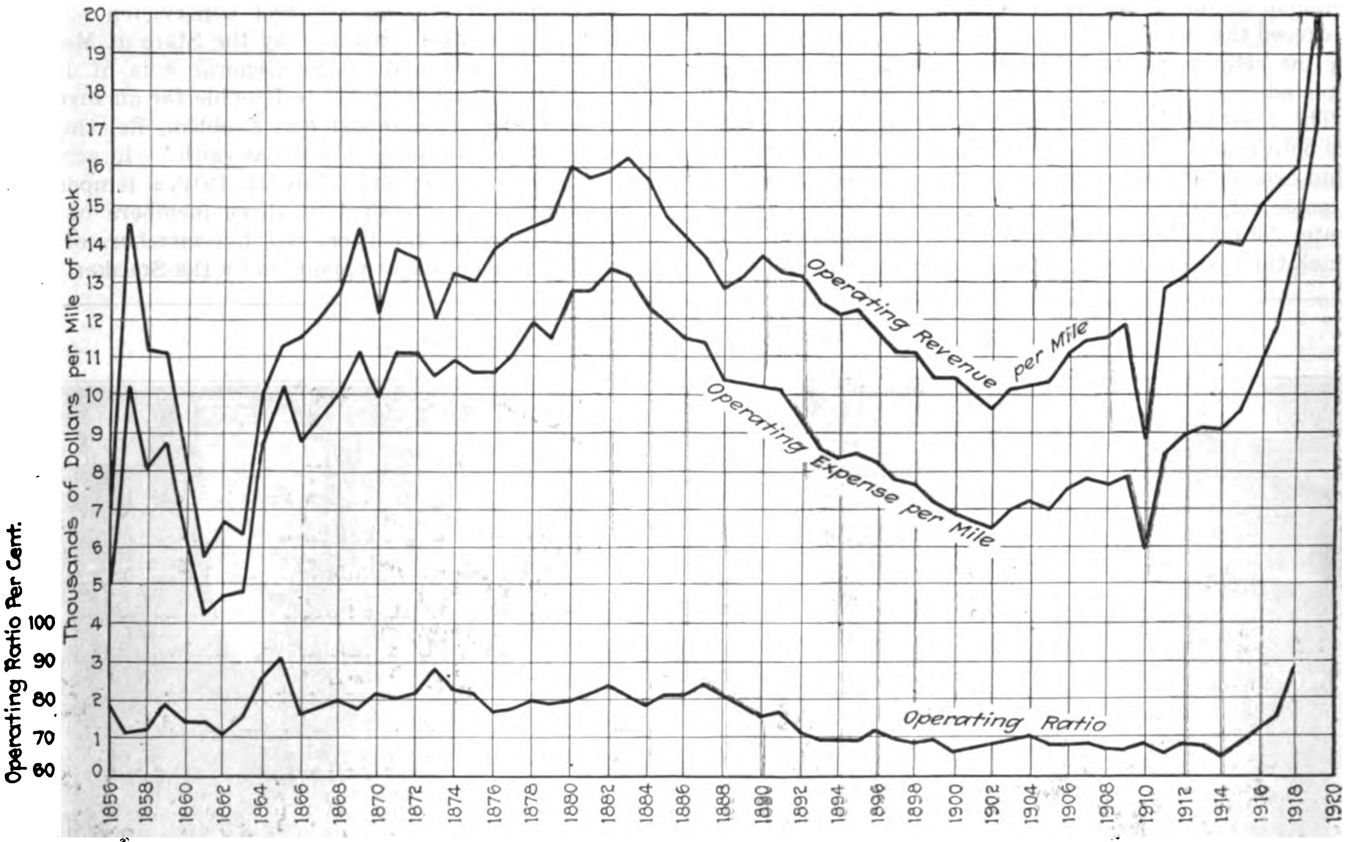
MASSACHUSETTS' FIVE COMMISSIONERS



HENRY C. ATTWILL
Chairman

UPPER LEFT, HENRY G. WELLS; UPPER RIGHT, EVERETT E. STONE;
LOWER LEFT, DAVID A. ELLIS; LOWER RIGHT, ALONZO R. WEED

An example of still more direct supervision of the operation of the street railways by the State of Massachusetts is to be found in the General Acts of 1919, Chapter 359, entitled "An Act to Provide for an Investigation by a Special Commission of Problems Relating to the Street Railways of the Commonwealth." In accordance with this act, approved July 24, 1919, a temporary commission was established of three members of the Senate appointed by the President, five members of the House of Representatives appointed by the Speaker, and five persons, not members of the general court, appointed by the Governor, with the advice and consent of the Council. The duty of this commission was to make an investigation and study of the street railway situation of the Commonwealth with a view to determining what action may be required to promote the public welfare and convenience in relation thereto, what action should be taken for the purpose of securing lower fares, what portion of the expenses of operation if any, should be borne by the public treasury, what means should be used for the purpose of providing adequate and low priced transportation, and whether and to what extent public



AN INSTRUCTIVE FINANCIAL AND OPERATING HISTORY OF THE MASSACHUSETTS ELECTRIC RAILWAYS FOR SEVERAL DECADES

ownership is the proper solution of the street railway problem.

This commission made a voluminous report to the General Court in November, 1919, supporting the past activities of the Public Service Commission, but expressing the opinion that too large and varied responsibilities are being imposed thereon and that the State must take a more direct part in the administration of public utilities.

THE ORGANIZATION OF THE DEPARTMENT OF UTILITIES

As a result of the appointments by Governor Coolidge under the Legislative Acts of 1919 the following men make up the Department of Utilities:

1. Honorable Henry C. Attwill of Lynn, chairman, appointed for five years, Dec. 1, 1919.
2. Honorable Everett E. Stone of Springfield, appointed for four years.
3. Honorable Alonzo R. Weed of Newton, appointed for three years.
4. Honorable David A. Ellis of Boston, appointed for two years.
5. Honorable Henry G. Wells of Haverhill, appointed for one year.

Andrew A. Highlands, for many years secretary of the Railroad Commission, was named as secretary for the new department. Allan Brooks is assistant secretary.

The organization of the work of the department involves the following sub-departments or divisions:

1. Inspection of gas and gas meters, in charge of Charles D. Jenkins, inspector of gas and gas meters.
2. Railroads and street railways, in charge of Henry W. Seward, chief inspector.
3. Telephone and telegraph inspection, in charge of William H. O'Brien, chief of division.
4. Accounting department, in charge of Justice W. Lester.
5. Rate and tariff division, in charge of C. Peter Clark.
6. Engineering department, in charge of Henry W. Hayes.

As has been previously stated Prof. W. B. Rogers, in the early sixties, really established the precedent for the department of gas and gas meter inspection as the result of his pioneer scientific gas testing. As predecessor of the present head of the department, Prof. Rogers held the position for twenty-two years. He succeeded in breaking down a very marked ingrained distrust, on the part of the public, of gas meter accuracy. The testing laboratory established by Prof. Rogers was in operation for forty-five years in one location until recently moved to the State House.

The rendering of good service by a utility has been recognized by the commission as an engineering problem and competent professional engineers have been employed to direct the work of the various divisions. C. D. Jenkins, for eleven years assistant to Prof. Rogers, and now in charge of the gas division, imported gas testing apparatus from England in 1895 and as a result of his report to the Legislature upon the practical calorific values of gas, the original statutory candle-power standard was changed to a B.t.u. minimum of 528 units. Daily tests are required of the gas corporations and weekly averages, high and low values are recorded. Gas plants of 15,000,000 cu.ft. capacity and larger are required to maintain testing stations and unannounced check tests are also made by the inspectors employed by the department. Three successive violations of the specifications of any one element in the gas service render the utility liable for a fine of $100.

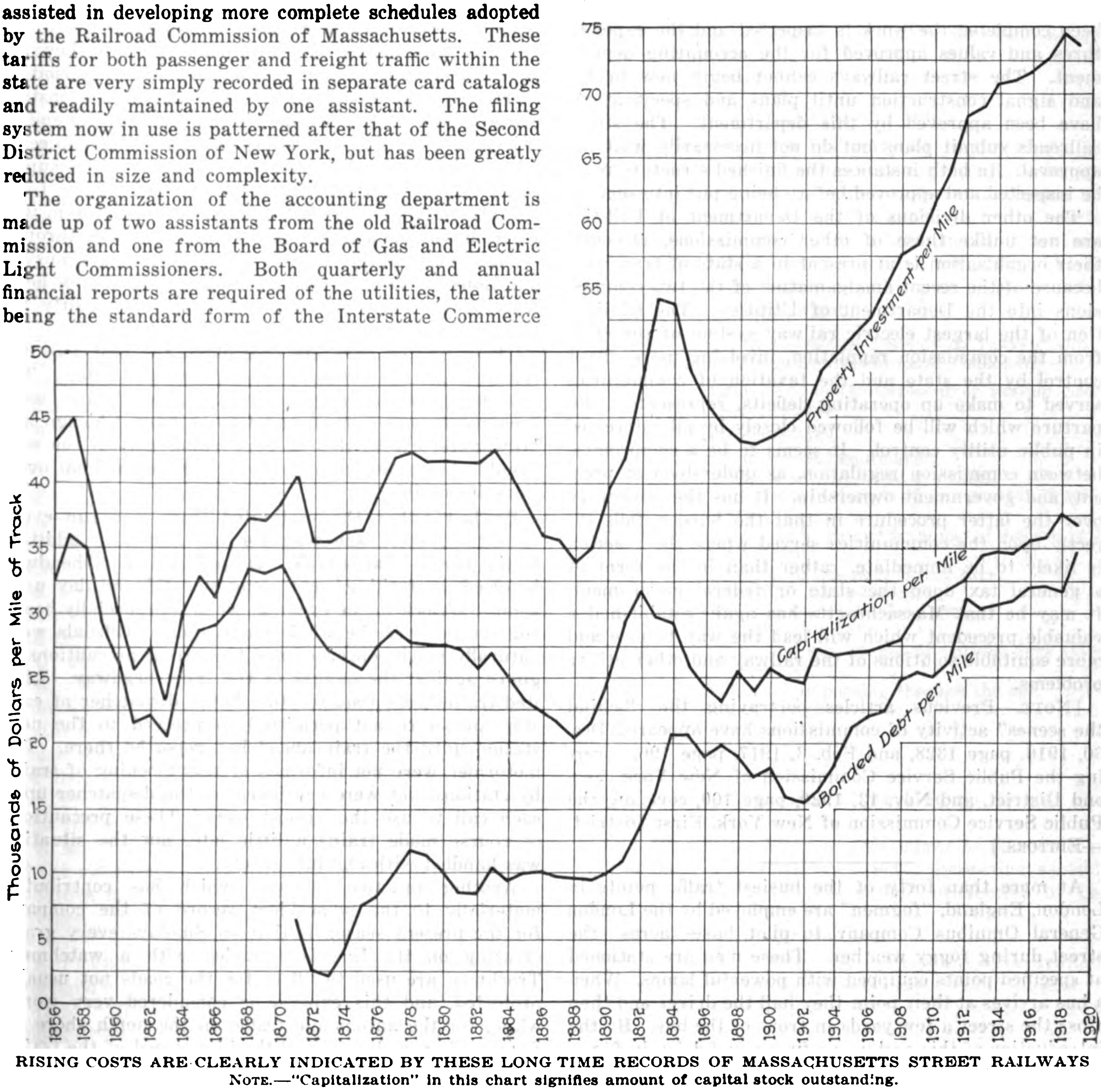
Electric meters are tested by the department only upon complaint. This work, which never reaches large proportions, is done at the Massachusetts Institute of Technology. The margin of error for gas meters is plus or minus 2 per cent and for electric meters 5 per cent. Either the corporation or the consumer may request a test, but in all cases the fee goes to the State. If the meter is found to be within the specified range of allowable error, the fee is paid by the consumer, otherwise by the corporation.

In connection with all the activities of the various departments of this commission the impression is evident that the work is being done with relatively little formality and few detailed or elaborate records. For example, although reports by utilities of serious accidents are required, as in other states, no forms are used and telephone or script statements are typewritten upon their receipt in very informal fashion.

In the regulation of rates and railroad tariffs by the State, Massachusetts was again the leader. In New York State dummy tariffs had been outlined which assisted in developing more complete schedules adopted by the Railroad Commission of Massachusetts. These tariffs for both passenger and freight traffic within the state are very simply recorded in separate card catalogs and readily maintained by one assistant. The filing system now in use is patterned after that of the Second District Commission of New York, but has been greatly reduced in size and complexity.

The organization of the accounting department is made up of two assistants from the old Railroad Commission and one from the Board of Gas and Electric Light Commissioners. Both quarterly and annual financial reports are required of the utilities, the latter being the standard form of the Interstate Commerce Commission. This commission makes use of the "Original Cost" basis for valuation of utilities for the determination of rates and security issues and expects the utilities to keep a continuous inventory of their plant and equipment. The so-called "Straight-Line" method of determining depreciation reserves is universally adopted in contrast to the "Sinking-Fund" system in use in some states. A very complete record of the capitalization, subdivided into the various classes of bonds and stocks, together with the invested valuation of all the utilities regulated, is maintained by the accounting department. In this record are also filed the docket number, date of order and amount of additional securities applied for and approved by the commission from time to time. The specific purpose of the issue is also recorded. This record is found to be of great practical value as each new application for increased capitalization is presented for consideration.

In this connection particular interest attaches to the accompanying curves, which probably represent the most complete financial records of the street railways of any



RISING COSTS ARE CLEARLY INDICATED BY THESE LONG TIME RECORDS OF MASSACHUSETTS STREET RAILWAYS

NOTE.—"Capitalization" in this chart signifies amount of capital stock outstanding.

state in existence. Beginning in the year 1856, with the few small street railways in existence at that time and extending through the period of extensive electric railway installations in the nineties, the curves show the variations in bonded indebtedness, capital stock, investments, operating ratio, etc., up to and including the year 1919. The convergence of the curves in the later years, indicating the relatively increased amount of the indebtedness in proportion to stock issues, is particularly striking.

HOW DEPARTMENTS ARE CONDUCTED

In the engineering department an interesting arrangement is noted, as a result of legislative enactment, to the effect that the engineer in charge, Henry W. Hayes, devotes a portion of his time to the work of the Attorney-General of the state, particularly in connection with investigations and hearings upon grade-crossing elimination problems. This work has been relatively light, however, during the last few years. This department checks estimates upon needed improvements requested by the utilities and after the installation has been completed the work is inspected and the expenditures and values approved for the accounting department. The street railways cannot begin new bridge and signal construction until plans and specifications have been approved by this department. The steam railroads submit plans but do not necessarily wait for approval. In both instances the finished structure must be inspected and approved before being put into service.

The other divisions of the Department of Utilities are not unlike those of other commissions, although their organization is at present in a state of transition because of the recent amalgamation of the two commissions into the Department of Utilities. The elimination of the largest electric railway system of the state from the commission regulation, involving more direct control by the state and the taxation of communities served to make up operating deficits, represents a departure which will be followed closely by all interested in public utility control. It seems to be a compromise between commission regulation, as understood at present, and government ownership. It has the advantage over the latter procedure in that the burden falls directly upon the communities served where the reaction is likely to be immediate, rather than in the form of a general tax upon the state or federal government. It may be that Massachusetts has again established a valuable precedent which will lead the way to new and more equitable solutions of the railway and other utility problems.

[NOTE.—Previous articles portraying the "behind the scenes" activity of commissions have appeared Dec. 30, 1916, page 1328, and Feb. 3, 1917, page 196, covering the Public Service Commission of New York, Second District, and Nov. 13, 1920, page 100, covering the Public Service Commission of New York, First District. —EDITORS.]

At more than forty of the busiest traffic points in London, England, "fogmen" are employed by the London General Omnibus Company to pilot buses across the street during foggy weather. These men are stationed at specified points equipped with powerful lamps. When a bus arrives at their point they hail the driver and then cross the street a few yards in front of the bus. By the introduction of this system confusion and delay in foggy weather is reduced to a minimum.

Training Motormen for Limited Runs

Very High Speeds on Chicago, North Shore & Milwaukee Involve Exceptional Responsibility, Requiring Special Training of Men

THE Chicago, North Shore & Milwaukee Railroad operates limited trains hourly each way between Milwaukee and Chicago at very high rate of speed. While this high-speed service is very popular and has attracted a considerable patronage to the road, the operating officials are very much alert to the dangers which accompany such service and they are consequently taking exceptional caution in the selection and training of men and in surrounding the service with safeguards in every other respect.

In the selection of motormen for these limited runs, M. J. Feron, general superintendent, requires as a preliminary training that these men shall have worked as motormen on the local passenger service of the North Shore Line for at least six months prior to receiving any consideration for an assignment on a limited car. Only the best men are given an opportunity to try out for these runs. If accepted for trial, they are required to run on the limited cars for a period of thirty days, during which time they are under constant attendance and instruction. If approved at the end of this period by the instructor, they are then subjected to questioning by the local superintendent, the superintendent of transportation on the North Shore Line, and are then finally sent to Chicago to Mr. Feron, who passes finally upon them. He puts the candidate through a rigid examination and if the latter cannot answer questions to the entire satisfaction of Mr. Feron he is rejected and has no further opportunity to qualify for the position.

These limited runs are considered the best jobs the company has, and they are much sought after. The men get nine hours' pay for the seven hours' work required to make one round trip between Chicago and Milwaukee. With this short working period, the men should always be fresh and any negligence from overwork impossible.

On last Labor Day a limited train was run every twenty minutes each way for ten hours, in addition to the heavy local service. Despite the short headway involved, everything went along smoothly all day until about 8 o'clock in the evening, when an especially heavy fog settled over the whole north shore. Officials were naturally much concerned and took great precautions to guard against the danger of the short headway. Limited trains were required to call the dispatcher at each stop and were not permitted to proceed to the next station until the train ahead had reported there. The motormen were not informed of this blocking of trains by stations, but were cautioned by the dispatcher upon each call to use the utmost care. These precautions of course made trains a little late, but the situation was handled with absolute safety.

Another practice followed which has contributed materially to the no-accident record of the company for the present season is that on Sundays every grade crossing on the line is provided with a watchman. Trackmen are used to fill in for the roads not usually protected, and this expense is considered very worth while, for the automobile traffic on the north shore on Sundays is very heavy, and the high speed of the trains makes special safety measures advisable.

Getting the Utmost Out of the Cars

A Dialogue Arising Out of an Overcrowded Condition of the Cars and Bringing Out the Points Involved in Scientifically Determining Whether More Cars Are Needed, How Many and What Kind

BY E. A. W.

THE SCENE is laid in the executive office of any medium or large sized street railway company. The dramatis personæ are a general manager and the superintendent of transportation. The plot opens something like this:

G. M. "Jim, are you putting everything that can roll out on the streets during rush hours these days?"

S. T. "Chief, we surely are. I'm even robbing the shops of overhauls and painting jobs. We need cars and need them badly."

G. M. "How much additional equipment could you use to advantage and on what lines?"

S. T. "We need 100 additional cars and 150 if you'll let me retire to the 'boneyard' the 39-footers with two-motor equipment."

G. M. "You've carefully checked your requirements and 100 is the least number it is possible to get along with?"

S. T. "Don't put it so strong, Chief. We are *getting along now.* But the lost fares, passed up passengers, packed cars, and continual growl from our patrons can only be relieved by putting 100 more cars on the road."

G. M. "This estimate of yours no doubt has been carefully checked; but, Jim, have you tried to get better use of our present equipment by means of turn-backs on long-haul, sparsely settled lines, increasing schedule speeds through careful time-point studies of each line, reduction of overhauling and painting time, use of skip-stops, rerouting, etc., etc?"

HE GAVE THOSE POINTS SOME CONSIDERATION

S. T. "Well, we have given those points some consideration, but of course this matter is so involved we have only hit the high spots. My thirty years' experience handling traffic tells me that more cars are needed, and these other matters, if studied, will only reduce the number slightly, if at all. Think of the expense and time involved in making such a study."

G. M. "But, Jim, purchasing 100 cars today is a costly matter. Not only has the price of equipment doubled, but we shall need additional car house and shop facilities and substation and generating capacity, all of which means heavy investment with our paper selling for about half what it did before the war."

S. T. "I know, Chief; but think of the increased earnings 100 more cars would bring in."

G. M. "I'm not so sure, Jim. We are handling most of the riders now, perhaps losing some. More cars and facilities mean a heavy increase in operating and fixed charges. You haven't told me the type of car we ought to buy."

S. T. "Why not get the same type as our present standard?"

G. M. "Have you thought of the safety car?"

S. T. "Well, some; but frankly I can't see it for our service. They are probably good in other places, but our conditions are different."

G. M. "The old story, Jim. By the way, do you think I have enough facts and information to go before my board of directors and get a million for new cars and what goes with them? If you had to go good for the million, Jim, would you feel that we had gone into this matter as thoroughly as we should?"

S. T. (faltering). "No, but--the time required to make— Oh, hell, Chief, we ought to step carefully. A million dollars! I never thought about it just this way. I'll tell you what I'll do. Give me two days to mull this over and I'll try to draw up a program which will give you a real basis on which to go after the new cars that we need."

G. M. "Go to it!"

JIM BEGINS TO STUDY

As a preliminary to his study of requirements, the S. T. began to jot down the various things to be considered in arriving at a sound basis of conclusion and was astonished to find how many things had a bearing on his problem. Several days later he sat down with the G. M. and went over an outline something like the following, desiring support for his plan of study before undertaking to carry it out.

POINTS TO BE CONSIDERED IN A STUDY OF TRAFFIC AND ROLLING STOCK CONDITIONS AND FORECAST.

I. *Historical Outline of the Development of Rolling Stock, Including Present Types.*
  A. Present equipment.
    1. List of present equipment,
    2. Complete set of typical drawings,
    3. Brief history of each of the present types of cars.
  B. Advantages to be gained from use of modern types of equipment.
    1. Birney type one-man safety cars.
    2. Peter Witt pay-pass cars.
    3. Center entrance stepless cars.
    4. Near-side-stop cars.
  C. Discussion and advantages of various fare collection methods.
    1. Collection by passing through the car.
    2. Pay-as-you-enter.
    3. Pay-pass.
    4. Prepayment area.
    5. Use of metal tokens.

G. M. "What's the idea of working up data on fare collection methods?"

S. T. "You'll see later on. We ought to get our ideas on the table, and when we discuss increasing schedule speeds we will select the method productive of best results."

G. M. "All right, let's go on."

S. T. "In considering this matter we have available several very complete reports and recent checks. I don't think we need to go into a long detailed traffic study now as that would take too much time. We can make fairly accurate deductions from data at hand or that can soon be obtained. But we ought to cover the points in Section II pretty well in order intelligently to forecast the future.

II. *Growth of Traffic and Predictions for the Future, Showing the Necessity for Increased Service.*

- A. Natural growth of city.
  1. In population.
  2. In territory.
     - a. Comparison with other cities.
     - b. Study of pin maps showing locations of buildings and car lines; also on the same map public and private garages are separately designated.
     - c. Maps locating points of 25, 50 and 75 per cent of street car travel on each line.
     - d. Discussion.
- B. Influence of the automobile.
  1. On average load.
  2. On peak loads.
  3. On seasonal fluctuations.
  4. On schedule speeds.
- C. Transfer privilege.
  - Restriction of extension.
- D. Traffic studies.
  1. Number of passengers on each line, rush hour, peak load points.
  2. Frequency of service required, expressed in seats.
  3. Average length of standing rides during the rush hour.
  4. Location of turn-back points.
     - a. Downtown—To get crowds now passed up by cars on various routes outside most central congested point.
     - b. Outlying points.
  5. Frequency of service during rush hours necessary beyond turn-back points.
- E. Necessity of uniformity in service to keep diversity factor low.

G. M. "Why do you indicate garages on the map and make a distinction between those for public and those for private use?"

S. T. "It seems to me that in a town the size of ours the number of garages in a section gives a direct indication of the travel to be expected from that section. Moreover, the increase in the number of garages should be a gage of the effect automobiles are having on street railway travel. The reason for designating between public and private garages is to show the great increase in this class of commercial business. It is logical to assume that a private garage back of a residence would have only one car, but a large public garage might have several hundred, and the rapidity with which these are being built deserves as careful attention on the part of the street railway manager as any other thing that might affect his business."

G. M. "Now explain what you mean by keeping diversity factor low, Jim?"

S. T. "There are present in the travel characteristics of every line certain periods of time during rush hours when an accumulation of passengers for that line is more rapid than ordinarily. These momentary peaks may affect one or possibly two trips only. However, if they occur regularly their identity should be established, recognized and provided for. It is this fact that makes it necessary to have uniform service so that Mr. Doolittle's diversity factor or ratio of maximum loaded car to the average car load will be low. Mr. Doolittle was pleased to term this ratio 'diversity factor' as it is the measure of the diversity between carloads for different times of the day. If these points are clear I would like to present to you an outline of the methods which we can follow to get more use from our present facilities. I have grouped these under Section III."

III. *Discussion of Means of Increasing Service.*

1. Increasing schedule speeds. Results to be obtained from hypothetical speeds.
2. By reducing the excess car-miles, due to dead cars going to or from carhouses, or excess service on the outer ends of long lines.
3. By the purchase of additional rolling stock.
4. Justification of increase in service from the standpoint of net returns from added service. Increase in riding habit to be expected from an increase in service. This would cover possibilities of short haul riders on present routes where considerable walking is apparent. This matter might well include a consideration of the use of present equipment under one-man operation between rush hours.
5. Saving in time of cars out of service due to pull-ins, inspection, overhauling, painting, etc., by reducing time now required to accomplish such work.
6. Additional trackage on present single track lines, either as double track or closed sidings.

S. T. "Some of these points involve so many important things that I have detailed them more particularly. In line with your thought about getting better use of our facilities this is a most important subject. Most of the information needed is available and requires editing and slight revision to make it useful in this study."

IV. *Increasing Schedule Speeds.*

- A. Theory.
  1. Rate of acceleration and braking.
  2. Number of stops and slowdowns.
  3. Skip-stops. (Find the proper place on each line outside of a central zone where skip-stop operation should be commenced.)
  4. Density of traffic and its proper regulation.
  5. Rerouting.
  6. Rapidity in boarding and alighting.
  7. Pay-enter and pay-leave on safety cars.
  8. Condition of track and overhead.
  9. Supervision,
     - a. Use of headway recorders,
     - b. Use of peak load checks,
     - c. Use of traffic charts,
     - d. Office study of traffic records,
     - e. Use of facilities by track department in street work that will reduce delays such as track trucks, portable cross-overs, oxyacetylene and electric welders.
  10. Power distribution and return system.
  11. Trainmen's efficiency.
      - a. Training car men.
      - b. Follow up on knowledge of rules.
      - c. Follow-up on coasting.
      - d. Stationing inspectors at centers of congestion.
      - e. Collection of fare and distribution of transfers.
        - Increasing the use of metal tokens.
        - Pay-pass possibilities.
  12. Prepayment areas.
- B. Discussion of each line in accordance with the above.

G. M. "I notice you have covered certain items under 'increasing schedule speeds,' the importance of which I fail to grasp. For example, what do you mean by the item 'condition of track and overhead'?"

S. T. "Since we have been paying such enormous prices for materials and labor, we have been forced to defer certain maintenance work. We have some sections of track that need repairs, so we have to make allowance in our schedule speeds for this bad condition. The same applies to the overhead, although in this case it is more a lack of copper than any physical condition that affects us."

G. M. "How about the item 'power distribution and return system'?"

S. T. "We intend to cover our power situation more fully than this report contemplates, but certain sections are overloaded and cause so serious a drop in voltage that during rush hours it slows up car speeds materially. We intend to cover this point for each line.

"If you are through with the schedule speed matters, let's look at the next division of the outline."

V. *Reduction of Unused Car Mileage.*

A. Theory.
  1. Effect on increased use of cars by proposed turn-backs.
  2. Decreasing dead trailer mileage and dead extra car mileage.
B. Discussion of each line.

S. T. "Our system developed without much plan—as you are aware. As we increased the number of our cars sometimes we failed to increase our carhouse facilities. As a result, we have cars housed at considerable distances from the lines over which they operate. This results in considerable dead mileage each day, so we thought some reassignments could be worked out that would reduce dead mileage expense."

G. M. "Now we come to the heavy part, I see: 'purchase of new rolling stock'."

VI. *Purchase of New Rolling Stock.*

A. New cars needed if all present equipment remains in service. This would be the minimum requirement and sufficient only for our growing needs.
B. New cars needed assuming the retirement of certain equipment now obsolete or rapidly becoming so.
C. Extra equipment required if carhouse work is done in the day time instead of nights.
D. Extra equipment needed if the carhouse work is done at night and each car is put in the same run daily, thereby getting the same motorman.
E. Discussion of each line, showing the number of new cars and types necessary for each.
F. Use of auto buses.
  a. As feeders from outlying districts needing transportation between car line and such district.
  b. To supplement car service taking care of close-in short-haul business.
  c. To run on regular routes over streets downtown, and in outlying districts not having street car facilities.
G. Kind and number of new equipment to buy:
  a. One-man safety cars.
  b. Peter Witt motor cars,
  c. Peter Witt trailers.

G. M. "I can't find much fault with your detail. When you have it worked out we ought to know fairly accurately what we will have to buy and what results we can expect; and I can see now the reason for the detail that precedes this 'purchase of new rolling stock' section. You have done a good job; is there any more to it?"

S. T. "Why, Chief, you wanted the whole story for your board of directors, and I've only got started. We have the most important matter of all ahead of us—costs. But before we come to that I believe we can do some remodeling as suggested here":

VII. *Remodeling Present Rolling Stock.*

We may be able to do much in this direction. We are hauling trailers over grades with two-motor cars with a serious slowing up of service. Considerable economy may be realized by instituting changes covered in the following items—enough to warrant consideration of them in this study:

A. Abandonment of 39-ft. two-motor cars and utilization of motors under these cars to make four-motor cars out of certain other two-motor cars, at present unable to haul trailers.
B. Remotoring four-motor cars at present equipped with GE-58 motors with modern light-weight motors.
C. Rebuilding center-entrance type bodies for pay-pass collection and operation by one man before and after rush hours.
D. Possibilities of reduction in weight of present equipment.
  1. Nature of changes.
  2. Saving in power.
  3. Increase in schedule speed.
    a. Loading time,
    b. Acceleration and braking,
    c. Running time.
  4. Decreasing number of step accidents.
E. Use of helical gears instead of spur gears.
  1. Saving in power.
  2. Reduction of noise.
  3. Reduction of motor trouble, from vibration.

VIII. *Other Facilities Rendered Necessary.*

A. Mechanical department facilities and methods.
  1. Divorcing division repair work from general shops.
  2. Night work vs. day work at carhouses and placing each car on same run. Advantages and disadvantages.
  3. Daylight work.
    a. Truck shop.
    b. Machine shop.
    c. Blacksmith shop.
    d. Armature shop.
    e. Wood shop.
    f. Paint shop.
    g. Carhouses.
    h. Résumé.
B. Power department changes and additions needed.
  1. Generating equipment.
  2. Converting equipment.
  3. Transmission and distribution system.
C. Track betterments needed; discussion of each line.
D. Overhead and bonding; discussion of each line.
E. Increase in storeroom facilities to accommodate increase in stock of parts for new equipment.

IX. *Cost of Providing Additional Service.*

S. T. "Now we come to costs, and in the following we have attempted to cover this subject in a general way; the detailed estimates will be on file in the engineering department. I am forced to confess that when we first talked this matter over, I did not have any idea that it involved so many ramifications and the vitals of so many departments. But I can see now that all these things must be taken into account.

A. Purchase of additional rolling stock.
B. Remodeling present rolling stock.
C. Changes in mechanical department and carhouses.
D. Power equipment.
E. Special work for turn-backs.
F. Track renewals and betterments.
G. Overhead and bonding.
H. Storeroom and yard facilities.
I. Summary.

X. *Financial Aspects.*

A. Additional revenue possible from increased and bettered service.
B. Investment required, divided between construction and maintenance.
C. Effect of operating costs of—
  1. Decreased power,
  2. Decreased maintenance of cars and track,
  3. Decreased accidents,
  4. Increased car-hours and car-trips,
  5. Added fixed charges due to increasing capital investment.
  6. Decreased labor due to one-man operation,
    a. Safety cars.
    b. Existing equipment.

D. Source of funds.
  1. From revenue.
  2. From capital.

S. T. "Under this section we aimed to summarize the apparent conclusions that a careful reading and study of the foregoing would make manifest, taking into consideration the operating, construction and financial features jointly, and thereby arriving at a proper and feasible solution and program."

XI. *Summary, Conclusions and Recommendations.*

A. New equipment.
B. Changes in existing equipment.
C. Shops and carhouses.
D. Power.
E. Track, overhead and bonding.
F. Training methods and type of men to be selected for safety car operation.
G. Lines best suited to safety car operation and suggested schedules and spacing.
H. Lines on which present equipment changed to one-man safety type can be operated before and after the rush hours and the savings resulting therefrom.

XII. *Suggested Program. Rate at which various steps can be carried out.*

G. M. "This matter is of course regulated by the financial ability of the company to secure funds to carry out the work, also by the physical limitations imposed by organization, purchasing, deliveries, and carrying out the adopted changes under operation, and educating the public to the changes involved."

S. T. "You are right. We will include in the report a program of carrying out the work also, so that your board, when once it has authorized the funds for this purpose, won't expect the job done two days later. We will have a lot to do and it can't be done 'yesterday' or even in a week."

G. M. "Well, Jim, if you have missed anything, it isn't important. Frankly, I, too, little realized what a real study to get better use of our facilities would lead us into. Get busy and compile the data and I'll use my most persuasive arts with that hard-headed but human and likable old board of mine."

The Electric Railway Budget

Boston Elevated Finds Monthly Revision of Estimates Necessary—The Budget Serves Several Useful Purposes

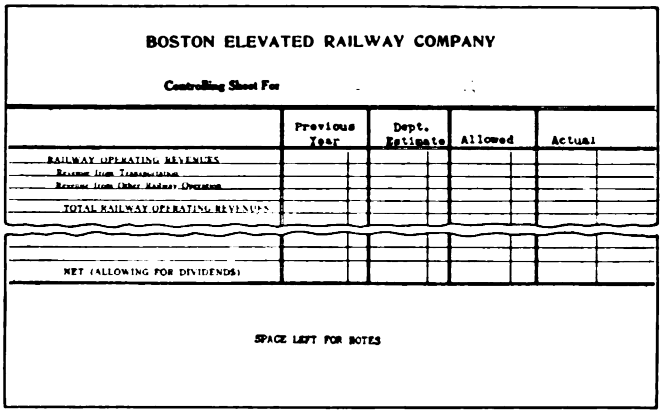
By E. M. FLINT
Assistant to the General Manager Boston Elevated Railway

As we read the criticisms of extravagant expenditures by the national government and the necessity for the adoption of an adequate budget system to insure that government departments shall be conducted on a business-like basis we are increasingly convinced that a budget system is the backbone of all successful business enterprises. Yet it is surprising that few details of such systems are available, especially as applied to the street railway industry. That such a system has been adopted by some street railway companies with satisfactory results is indicated by the statements to that effect in their annual reports. There is no doubt that a budget system, perfected to meet the requirements of the particular industry, is helpful in enabling an executive to plan ahead and keep a definite check on the expenditure of money.

The system in use by the Boston Elevated Railway, which is described in this article, differs from other systems which are known to the writer in that instead of being confined to an annual budget it is made more flexible by having in addition to the annual budget a monthly budget also. It has been found to be practically impossible to anticipate a year in advance all of the difficulties with which the company will have to contend throughout the year, necessitating changes in the program determined upon when the annual budget was prepared. For instance, it is not possible to ascertain to what extent expenditures must be incurred for track work in connection with the reconstruction of streets by municipal authorities, nor is it possible accurately to estimate a year in advance the cost of snow removal. Earnings, which are the basis of the budget, are materially affected by unforeseen weather conditions. If, however, the annual budget is used for a guide, and monthly budgets are prepared also, the system becomes much more flexible. Many of the difficulties suggested can be anticipated reasonably well in advance and can be provided for in the monthly budget by the postponement of less important work.

The printed forms which are used by the Boston Elevated follow the Interstate Commerce Commission method of accounting. This makes it possible to check with the auditing department the expenditures under any account number and to avoid conflicting statements.

The summary sheet, as reproduced in part, and the other forms, represented by the sample reproduced on the opposite page, show the amounts each department is authorized to spend, subdivided by the various account numbers.



BOSTON ELEVATED RAILWAY COMPANY

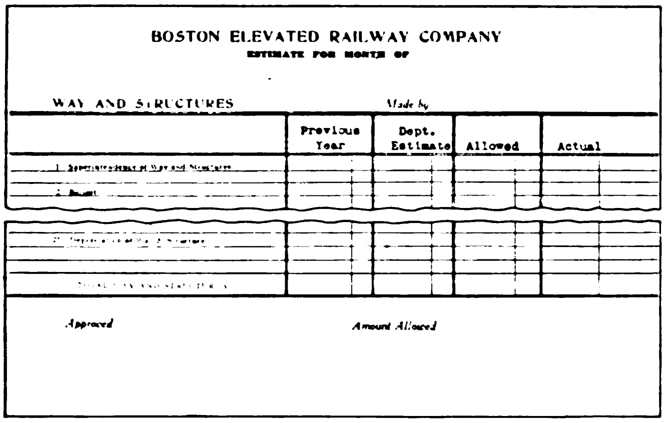
Controlling Sheet For

	Previous Year	Dept. Estimate	Allowed	Actual
RAILWAY OPERATING REVENUES				
Revenue from Transportation				
Revenue from Other Railway Operations				
TOTAL RAILWAY OPERATING REVENUES				
NET (ALLOWING FOR DIVIDENDS)				

SPACE LEFT FOR NOTES

FORM "A," USED FOR GENERAL SUMMARY OF BUDGET
(Actual size of this and other budget sheets 8½ x 14 in.)

The annual budget is prepared after each department head has made a careful survey and has presented a written report with estimates covering the requirements of his department for the year. The reports are discussed at meetings of department heads and less important work eliminated to meet the estimate of money available for operating and maintenance requirements.



BOSTON ELEVATED RAILWAY COMPANY
ESTIMATE FOR MONTH OF

WAY AND STRUCTURES
Made by

	Previous Year	Dept. Estimate	Allowed	Actual
1. Superintendence of Way and Structures				
2. Ballast				
25. Depreciation of Way and Structures				
TOTAL WAY AND STRUCTURES				

Approved
Amount Allowed

FORM WHICH IS USED FOR ITEMIZED DEPARTMENTAL BUDGETS

When the program for the year is determined upon, estimated expenditures are distributed to account numbers on the budget forms. This is done on the detail sheets by the respective departments and submitted to the general manager's office, where they are summarized on form "A."

The complete list of items appearing on form "A" is as follows:

RAILWAY OPERATING REVENUES
Revenue from transportation
Revenue from other railway operation

TOTAL RAILWAY OPERATING REVENUES

RAILWAY OPERATING EXPENSES
Way and structures   Equipment
Power   Conducting transportation
Traffic   General and miscellaneous

TOTAL RAILWAY OPERATING EXPENSES

Per cent of operating expenses to operating revenues
Net revenue—railway operations

TAXES ASSIGNABLE TO RAILWAY OPERATION
Operating income

NON-OPERATING INCOME
Gross income

DEDUCTIONS FROM GROSS INCOME
Rent for leased roads
W. E. St. Ry. Co.
W. E. St. Ry. Co. Tremont subway
Other roads
Total rent for leased roads
Miscellaneous rents (other subway tunnels)
Interest on funded debt (B. E.)
Interest on unfunded debt (Notes)
Miscellaneous deductions

TOTAL DEDUCTIONS FROM GROSS INCOME

NET INCOME

DIVIDENDS (at 5 per cent on common and 7 per cent on preferred)

NET
(Allowing for Dividends)

Departments are required to keep a close check on all their expenditures and to know approximately the amounts of money spent from their allowances at all times. This is not difficult, because the budget forms adhere to the Interstate Commerce Commission method of accounting used by the company.

With a statement before him, at weekly meetings of department heads, showing the daily and accumulated earnings each month, and the percentage of increase as compared with the estimates used in the budget, the general manager has fairly accurate continuous information as to whether or not the expenditures allowed by the monthly budget are likely to exceed the earnings and can take such action as may be necessary to avoid it.

Furthermore, the budget system tends to promote the closest kind of co-operation and to insure that every dollar is being spent where it will do the most good. Department heads are enthusiastic supporters of the budget because it enables them to plan ahead and to know definitely the amount of money at their disposal.

The clerical work required under this plan is negligible compared with the results obtained. As a matter of fact the budget superseded a miscellaneous assortment of statements intended to accomplish the same purpose, without any increase in the clerical force, and established a uniform method of accounting.

Since it is essential that full value be received for every dollar spent the budget, to those who have had experience with it, seems absolutely necessary.

The items which appear on the five general budget forms, devoted respectively to way and structures, equipment, power, conducting transportation and general and miscellaneous, are as follows:

WAY AND STRUCTURES

1. Superintendence of way and structures.
2. Ballast.
3. Ties.
4. Rails.
5. Rail fastenings and joints.
6. Special work.
8. Track and roadway labor.
9. Miscellaneous track and roadway expenses.
10. Paving.
11. Cleaning and sanding track.

12. Removal of snow and ice.
13. Tunnels and subways.
14. Structure and foundations.
15. Bridges, trestles and culverts.
16. Crossings, fences and signs.

17. Signal and interlocking apparatus.
18. Telephone and telegraph lines.

19. Other miscellaneous way expenses.
20. Poles and fixtures.
21. Underground conduits.
22. Distribution system.
23. Miscellaneous electric line expenses.
24. Maintenance of buildings, fixtures and grounds.
25. Depreciation of way and structures.

EQUIPMENT

29. Superintendence of equipment.
30. Passenger and combination cars.
31. Freight, express and mail cars.
32. Service cars.
33. Electric equipment of cars.

36. Shop equipment.
37. Miscellaneous shop expenses.

38. Vehicles and horses.
39. Miscellaneous equipment expenses.
40. Depreciation of equipment.
41. Equipment retired.

POWER

45. Superintendence of power.
46. Power plant buildings, fixtures and grounds.
47. Power-plant equipment.
48. Substation equipment.
49. Transmission system.

50. Depreciation of power-plant buildings and equipment.
52. Power-plant employees.
53. Fuel for power.
54. Water for power.
55. Lubricants for power.
56. Miscellaneous supplies and expenses of power plants.
57. Substation employees.
58. Substation supplies and expenses.
59. Power purchased.
60. Power exchanged.
61. Power transferred, Cr.

CONDUCTING TRANSPORTATION

63. Superintendence of transportation.
64. Passenger conductors, motormen and trainmen.
65. Freight conductors and motormen.
66. Miscellaneous car-service employees.
67. Miscellaneous car-service expenses.
68. Station employees.
69. Station expenses.
70. Carhouse employees.
71. Carhouse expenses.
72. Operation of signal and interlocking apparatus.
73. Operation of electric and telephone lines.

78. Other transportation expenses.

TRAFFIC

79. Superintendence of solicitation.
80. Advertising.
82. Miscellaneous traffic expenses.

GENERAL AND MISCELLANEOUS

83. Salaries and expenses of general officers.
84. Salaries and expenses of general office clerks.

85. General office supplies and expenses.
86. Law expenses.
87. Relief department expenses.
88. Pensions and gratuities.

89. Miscellaneous general expenses.
92. Injuries and damages.
93. Insurance.
94. Stationery and printing.
95. Store expenses.
96. Garage and stable expenses.
97. Rent of tracks and facilities.
98. Rent of equipment.

Skip-Stop Still Used

Statistics from Seventeen Street Railway Companies Which Have Continued It, Giving Data on Its Use

CLEVELAND has the honor of being the first city to institute the skip-stop on a considerable scale. This system was introduced in 1912 by Peter Witt, but little was done until the war, when the necessity for conservation in energy and fuel, the impossibility of increasing rolling stock and the added congestion on the streets due to the heavy industrial and vehicular traffic so interfered with the schedules and operation of railway companies that the skip-stop obtained a prominent place in railway operation.

To determine the present status of the skip-stop, the American Electric Railway Association has recently issued a data sheet which furnishes some very interesting information. Of forty large street railway companies using the skip-stop during the war, seventeen companies have continued it. Six of these companies have increased the use of the skip-stop on their systems, five have decreased it and six have made no change in its installation since the war. Sixteen of these companies use the skip-stop in regular service.

DISTANCE BETWEEN STOPS

The general principle in arranging stops seems to be to equalize the spacing, but in some cases a different spacing is used for the congested districts and city traffic from that used in the suburban districts. The stops used by most companies in the cities vary from 600 to 700 ft., the general average being about eight to the mile. In suburban districts three or four companies have a distance between stops of about 850 ft. and one reports 1,000 ft.

One of the great features of the skip-stop is the fact that it makes possible an increased scheduled speed. The percentage increase of the companies reporting varies from 7 per cent to 24.4 per cent, with an average figure of about 17½ per cent. An average figure for speed without skip-stops seems to be 8.5 miles per hour, and the use of skip-stops makes possible a speed of 9.5 miles per hour. However, in connection with these speed figures it must not be forgotten that the increased use of safety cars has had some effect on the figures. The decrease in power consumption per car-mile because of the use of the skip-stop varies from 4½ to 10 per cent, an average figure being about 5½ per cent. With skip-stops the power consumption on an average is about 2.5 kw.-hr. per car-mile, while without skip-stops under the same conditions the power consumption would be about 3 kw.-hr. per car-mile. But again in considering these figures, it must not be forgotten that during the war the platform men and the operators on the street car were measurably less efficient than those now operating on the different systems.

In discussing the advantages of the skip-stop, thirty-seven individual companies reported various advantages for skip-stops, briefly outlined as follows: Increased speed, less power, better service at less cost, better regulation of service, saving in equipment, more comfort in riding, due to fewer stops and faster speeds; reduction of accidents, reduction in time schedule without increasing car speeds, giving more rapid service, equalizing the distances between stops makes possible additional trips without increasing the number of cars, gives more regular service, eliminates congestion, which makes possible more regular headways; saves maintenance of brake shoes.

In discussing the disadvantages of the skip-stops, thirty-five individual companies reported, and twelve of the thirty-five said they could see no disadvantages whatsoever in the use of the skip-stop. Others alleged the following: Lack of incentive for short distance riders, opposition of public opinion, increases the use of automobiles and jitneys, the owners of corner property object, inexperienced and new operators confuse stops and thus irritate passengers, inconveniences the passengers because they have to walk to the stops, strangers in the city do not understand the system, in small cities where the cars operate on a ten or fifteen-minute headway the skip-stops encourage walking as the distances are short.

The seventeen street railway companies which are now using the skip-stop report that they contemplated retaining it as long as possible, as it has proved extremely valuable in the operation of their systems.

The companies now using the skip-stop mentioned in this tabulation are the following:

Capital Traction Company, Washington.
Chicago Surface Lines, Chicago, Ill.
Cleveland Railway, Cleveland, Ohio.
Detroit United Railway, Detroit, Mich.
Empire State Railroad Corporation, Syracuse, N. Y.
Houston Electric Company, Houston, Tex.
Indiana Service Corporation, Ft. Wayne, Ind.
International Railway, Buffalo, N. Y.
Kansas City Railways, Kansas City, Mo.
Milford & Uxbridge Street Railway, Milford, Mass.
Mobile Light & Railway Company, Mobile, Ala.
Northern Texas Traction Company, Fort Worth, Tex.
Omaha & Council Bluffs Railway, Omaha, Neb.
Ottawa Electric Railway, Ottawa, Ont.
Pacific Electric Railway, Los Angeles, Cal.
Toledo Railways & Light Company, Toledo, Ohio.
Washington Railway & Electric Company, Washington, D. C.

Water Power Valuations

IN A RECENT pamphlet Edward J. Cheney, engineer, 61 Broadway, New York, has digested the opinion of a large number of court and public service commissions with reference to the principles and methods used in arriving at the value of water rights in connection with different classes of cases which arise. On account of the similarity of the valuation of land to that of water rights, leading decisions with respect to land values have been included in instances where no cases on water rights were discovered.

Mr. Cheney summarizes the result of his study as follows:

> The courts approved, for all purposes, market value, determined as at private sale between a willing buyer and a willing seller after all circumstances and conditions have been considered. The commissions have a strong leaning toward market value determined in the same way, tempered somewhat by consideration of cost of promotion (if recently acquired), but with a general disposition to be liberal and to reward promoters for the effort and outlay. In rate cases there is some tendency toward vagueness and generality along the lines of Smyth vs. Ames (169 U. S., 466). There is also some sentiment for the sharing of benefits between owners and public, but no method has been outlined for carrying out this idea.

A new type of bus is to be put into operation in London which will seat fifty-seven passengers, as compared with forty-six passengers in the present large-capacity buses.

Norfolk's Traction Situation—III

Operating Conditions Considered—Fare Policy Is Outlined on a Flat Fare Basis—Rerouting Suggestions Are Made and Jitney Competition Is Shown to Be Detrimental to City's Best Interests

IN THE first two articles of this three-part series on the traction situation in Norfolk, Va., the recommendations of Messrs. Taylor and Cocke with reference to franchise provisions and the valuation for rate base were outlined. Their report also includes an analysis of the operating condition of the railway property and makes recommendations as to fare policy, how the net income may be increased, rerouting, jitney competition and certain rehabilitations which should be made.

ANALYSIS OF INCOME, EXPENSES AND FIXED CHARGES

Owing to an increase in the rate of fare during 1919 (5 cents to Oct. 1, 1919, and 6 cents thereafter), and to a wage increase in October and because expenditures for maintenance and renewal reserves were below normal during 1919, the actual accounts for that year showed an apparent surplus over fixed charges of $130,853. A careful analysis and adjustment of the accounts reveals that instead of a surplus there was actually a deficit of $157,939 after fixed charges. Actual and correct income statements follow in condensed form:

	Actual Year to Apr. 30, 1920	Corrected Year to Apr. 30, 1920
Gross revenue	$1,935,978	$2,119,269
Maintenance—track and roadway	162,000	168,000
Renewal reserves	....	316,408
Maintenance—overhead,	56,642	57,222
Buildings	8,208	8,208
Care of equipment and shop expense	191,449	194,249
Power	154,185	163,347
Wages—M. & C.	452,292	510,292
Other operations of cars	157,796	162,142
Damages and legal expenses	121,607	132,607
General administration	83,014	85,064
	$1,387,294	$1,798,291
Operating income	548,684	320,978
Taxes	86,493	114,583
Fixed charges	331,338	365,334
Surplus after fixed charges	$130,853	(a) $157,939

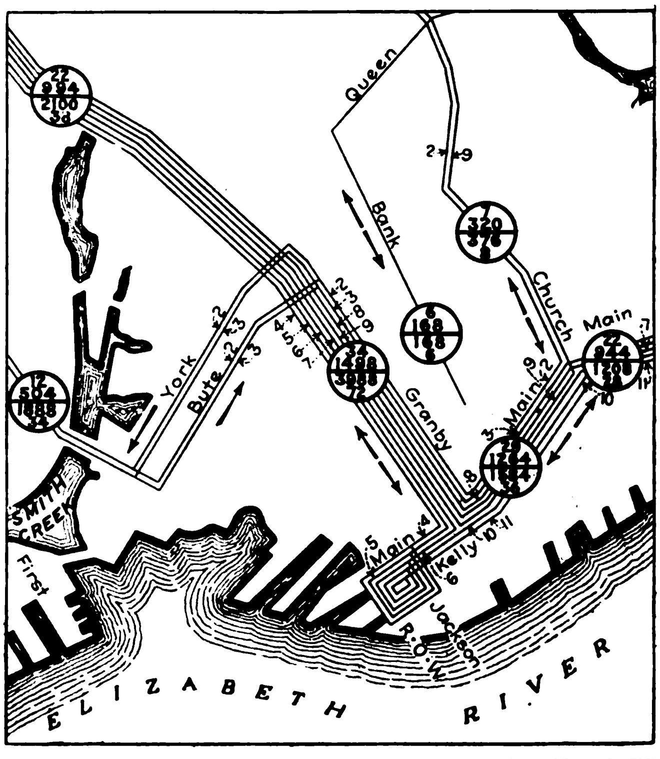
Total annual deficiency below 8 per cent on $8,750,000 valuation $492,605

(a) Deficit.

STUDY OF PROFITS AND LOSSES BY LINES AND ZONES

An allocation of all revenues and expenses (both actual and corrected) was made by lines and by fare zones based upon analysis of all items of expense with respect to the unit of property or service with which they vary or to which they may be considered as chargeable for allocation purposes. The results are summarized in the following table:

	Upon Basis of Actual Expenditures, Year Ending April 30, 1920.		Upon Basis of Actual Expenditures Corrected to Give True Cost.	
	Deficit After Paying Fixed Charges	Surplus After Paying Fixed Charges	Deficit After Paying Fixed Charges	Surplus After Paying Fixed Charges
Zone No. 1	$40,146	$199,715	$150,924	$16,468
Net surplus or deficit	....	159,569	134,456	......
Zone No. 2	73,813	54,141	85,916	73,900
Net surplus or deficit	19,672	....	12,016	......
Zone No. 3	9,045	....	11,367	......
Net surplus or deficit	9.045	....	11,367	......
Total, all zones	$123,003	$253,856	$248,207	$90,368
Net surplus or deficit	....	130,853	157,839	......



ROUTING OF CARS, WITH NUMBERS OF CARS AND SEATS, BEFORE REROUTING PLANS WERE SUGGESTED

The foregoing study reveals that 85.2 per cent of the deficit from all zones is ascribable to operations in the first zone, which corresponds substantially to the area within the city limits. With reference to the cost differentials involved, the report says:

> The large loss chargeable to city, as compared with county service, is due principally to the fact that the cost of maintenance and renewal reserve per mile of track in paved city streets is about 3.4 times as great as maintenance and renewals per mile of open track on county lines operating mostly on private right of way. Expressed upon a total money basis, the cost of maintenance and renewal reserves for 67.2 miles of city track with overhead lines amounts to $467,515, while cost of similar work and reserves on 35.4 miles of county track (more than half of city track distance), amounts only to $74,867.
>
> Another important cause of increased cost of service within city, as compared with county districts, is the low speed at which cars must be operated in built up sections. Car speeds average 7.7 and 12.3 m.p.h. in city and county respectively. Wages of motormen and conductors amount to 11.7 cents per car-mile of service within city limits and 7.3 cents per car-mile on county lines outside of city. In other words the average car-mile operated in Norfolk city streets consumes 7.8 minutes and costs on the average 60 per cent more for platform wages than does the car-mile operated on county lines, which consumes only 4.88 minutes.

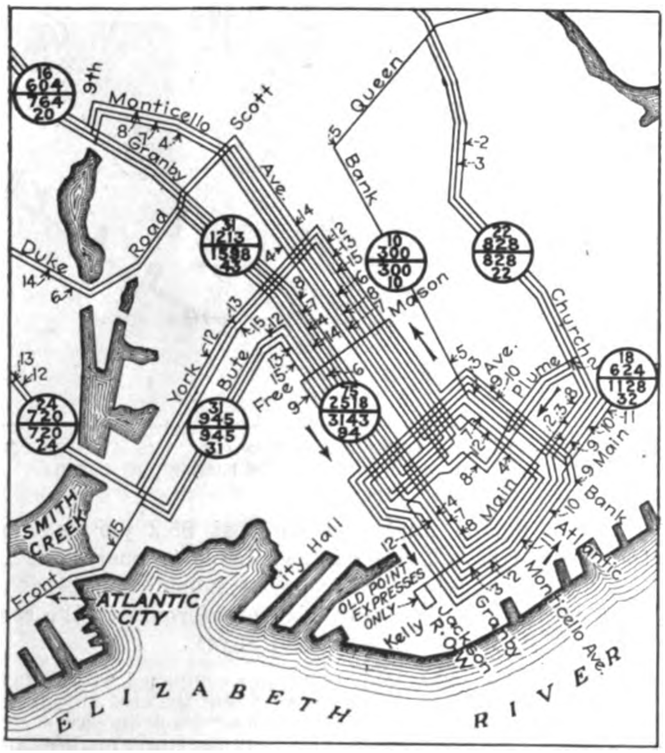
With reference to Zones 2 and 3, which are substantially outside the city limits, the report emphasizes the unprofitable result of wide seasonal variations in traffic, requiring maintenance of idle equipment nine months for service during three months of the year. The effect of this and of low average traffic density on outlying lines as compared with city lines is reflected in the following tabulation of fixed charges per car-mile and per car-hour.

	Fixed Charges per Car-Mile Cents	Fixed Charges per Car-Hour
Zone 1 — City	6	$0.46
Zone 2 — County	11	1.38
Zone 3 — County	17	2.09

As a result of the study made the conclusion was reached that additional revenue should be secured through introduction of an additional fare zone on county lines and that net income from operations within city limits should be increased by methods other than an increase in the basic 6-cent fare within the city, to which reference is made later.

FARES AND FARE POLICIES

It is pointed out that an 8-cent or 9-cent fare will be necessary to yield 8 per cent on the established valuation if present conditions are continued with respect to:



RECOMMENDED ROUTING, SHOWING APPLICATION OF ONE-WAY STREETS IN DELIVERY DISTRICT[*]

(1) Routing; (2) continued use of heavy two-man cars where one-man safety cars would be more economical; (3) jitney competition, which depletes railway earnings to the extent of about $350,000 per year; (4) burdensome franchise conditions, including unjust paving obligations, and diversion of revenue from sale of transfers to the city treasury; (5) abnormal maintenance due to the depleted condition of the property.

City Fares: No increase in city fares is recommended for the reason that while the company is entitled to charge rates which will yield a fair return, net income can be increased by specified economies in operations and by increasing traffic in part through extended and improved service. The proposed improvements and economies, however, are shown to be dependent upon municipal co-operation in the matter of franchise revision, traffic regulation, and the elimination of jitney competition. It is, however, made clear that it will be necessary to raise the city base fare if the specified program does not produce adequate net income.

The factors which should be considered in determining the proper form of such increase are discussed at length. With respect to this it is stated that while the form of increase is a matter of no concern to the company so long as it provides adequate revenues, it is of real importance from a civic standpoint. The position is taken that uniform fares with substantial transfer privileges encourages desirable development of the city unrestricted by unnatural barriers of fare differentials and provides equal opportunity for the population at large to enjoy the advantages of city parks, recreation centers and educational institutions maintained by general taxation. While widespread shifts of population would occur only after long continued operation under a zone fare system, it is considered that ultimately such a system is bound to show its effect in warping the areas of development into the districts of minimum transportation costs.

That conditions in American cities which have developed over wide areas upon the flat fare principle differ widely from those in foreign cities whose growth has occurred under zone fare systems is maintained by the manner in which this subject is treated. The analogy is drawn that if zone fares can be justified on the "cost of service" basis then rates for water, gas or electric service could with equal logic be increased in outlying districts on the ground that more facilities are required to reach them than to reach the districts adjacent to the source of supply. In the case of street railway service, the use of long haul facilities likewise carries with it the inconvenience of a long ride, which considered with other factors leads to the conclusion that from the passenger's standpoint the value of a long ride to him is no greater than the value of a shorter ride as he is buying a transportation service primarily, and not a length of ride.

The suitability of city zone fares is considered to depend largely upon the broad question of the "value of the service" to the passenger as measured by his own standards and cannot be justified upon the sole basis of theoretical "cost of service" per mile of ride.

The report argues at length on these points, suggesting a great deal which space does not permit treating at length. It holds that the flat uniform fare stimulates the riding habit because it encourages expansion of residential sections and thus broadens the market for the sale of transportation. The inference is that a demand for transportation is thus created, which is firm and durable as compared with that produced by fostering of short-haul traffic at the expense of general development of a company's transportation market considered as a whole.

Transfer Charge of 2 Cents Retained Temporarily: While as a policy free transfers are advocated, it was determined that 90 per cent of Norfolk's travel is to and from the business district. While the bulk of the 2-cent transfer business is in the light-load direction in the business district and therefore adds little to the cost of operation, it was found necessary to continue the existing transfer charge temporarily, but instead of paying all transfer revenues over to the city, as the company now does, it is recommended that this revenue be retained by the company. When the company's net income shall have been increased to the desired amount through the adoption of the proposed co-operative program it is provided that the transfer charge should be abolished.

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[*] Routing of cars westwardly on City Hall Avenue is temporary only pending construction of single track in Plume Street to accommodate all westbound trolleys in the delivery looping operation, thus eliminating route crossings in City Hall Avenue.

County Zones Changed: The seasonal variations on all lines which operate across the city limits are pointed out as one cause for their unprofitable status. No important economies can be effected in the outlying zones; and hence, in keeping with the conclusions reached from the study of profits and losses by lines and by zones it was recommended that additional revenue be secured outside the city limits through a change in zone limits, which will produce an increase in annual revenue of $265,000, based on detailed estimates and traffic analyses made for each county line.

Summarizing, the fare situation at Norfolk was handled by recommending the continuance, for the present, of the flat uniform 6-cent fare within the city limits, additional revenue from the county zones to be secured largely by changes in zone limits, and net income to be further increased by the elimination of jitney competition, use of safety cars, rerouting and relief of congestion by one-way streets and other traffic regulations, relocation of car stops, reduction of maintenance costs by rehabilitation, increased traffic by extended and improved service, and by revision of franchises with the elimination of obsolete and unjust franchise obligations.

COMPREHENSIVE REHABILITATION PROGRAM RECOMMENDED

Upward of $1,000,000 could be expended on new construction to advantage. Of this, $221,831 for track construction and $330,000 for fifty Birney safety cars is already under contract.

The rehabilitation program of $830,572 includes the relaying of 314,475 ft. of single track, the rehabilitation of cars to the extent of $150,000 and the removal of track and paving repairs to the extent of $132,755. The necessity of completing the more important part of this program in order to improve service, reduce cost and conserve equipment was emphasized.*

REROUTING SUGGESTED

The Norfolk street railway system is of the radial or fan type and the principal feature of the service problem centered largely in the congested conditions in the narrow streets leading into the delivery district. Most of the cars entered and emerged from this district along one narrow street, and operations as found were seriously interfered with by head-on crossings and by unrestricted vehicular traffic.

The obvious expedient of one-way traffic, both with respect to trolley and vehicles, was recommended, and a plan was devised for the co-ordination of all street traffic.

Originally all looping occurred on a single-track loop in the trucking district, occasioning great loss of time. The looping system as laid out and now partially in effect will occur as a simple operation of entering on one street, turning and emerging on another without interference between lines at any point. The group of routes entering the district from the north will loop independently of the routes entering from the south and east. The accompanying maps show the delivery district operation as found and as rerouted.

That jitneys constitute an immense handicap to the traction company in its efforts to provide good service is apparent from the fact that jitneys carry 6,000,000 passengers annually as compared with the 38,000,000 railway passengers in the city and county. As is usually the case, the jitneys in Norfolk cater only to the short rider within the built-up sections of the city.

The report clearly describes the ruinous effect of jitney operations and after an interesting discussion of the subject concludes that:

"The bald truth of the matter is that Norfolk must make a choice between backing her jitneys or backing her street railways."

The report recommends that definite and binding assurance be given to the company by municipal edict providing for the elimination of jitneys upon the inauguration of agreed-upon improvements in street railway facilities.

Overhead Contact System in Heavy Traction

SIR PHILIP DAWSON recently contributed to the Institution of Electrical Engineers of Great Britain a paper on "Electric Railway Contact Systems." Among general principles he points out that the overhead construction and the collector arrangement on the coaches or locomotives must be such as to make it certain that the collector bow will never be liable to come off the contact wire and must also follow the contact wire with the utmost flexibility. For this reason the ordinary trolley wire construction utilized for tramway purposes is unsuitable. In other words, the risk of a collector coming off the contact wire must be no greater than the risk existing today that the wheels of a truck will come off the track. The overhead construction must be designed and put up in such a manner that, while the risk of failure is minimized, the cost of maintenance and the time required for renewal or replacement of any individual portion requiring attention should be reduced to a minimum. At the same time the investment cost must be kept low.

The author points out that the principles adopted in 1907 on the Brighton Railway have been demonstrated by experience in Germany and the United States to have been the correct ones. These were as follows: (1) The conductor wire should be as flexible as possible and all hard spots should be avoided; (2) double insulation is essential and the mechanical as well as the electrical factor of safety of the insulators in overhead construction must be very considerable; (3) all insulators should be placed in positions where they will be least subjected to the direct effect of the hot gases given off the steam locomotives; (4) with the exception of complicated yards and crossovers, the up and down lines should be sectionalized so as to permit them to be cut out independently, while the complicated crossover roads and yards are designed in such a way as to be sufficiently short to be coasted over; (5) insulators should be utilized only under compression, and elastic substances should always be placed between the insulator and its solid support as well as between it and the mechanical construction which it supports; (6) provision should be made when designing insulators that there is no possibility of moisture or water collecting and freezing, thereby fracturing the insulation.

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*The discussion over this and other financial matters in the report was given in the ELECTRIC RAILWAY JOURNAL, Oct. 2, 1920, page 688.

Economical Sectional Pavement for Crossings

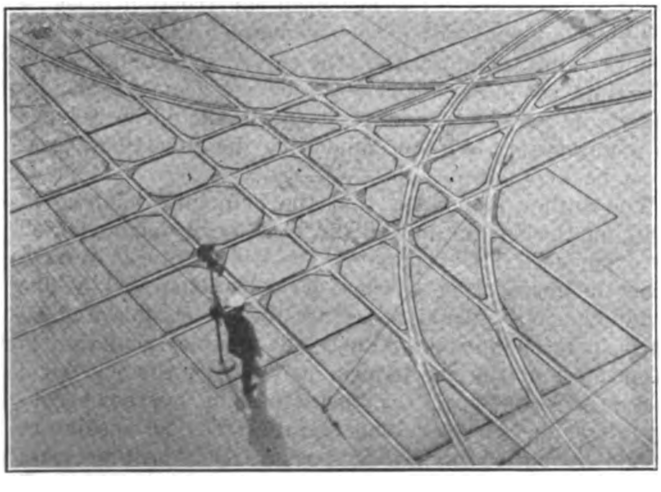
Toledo Railways & Light Company's Street Crossings Are Made Accessible for Tamping by Removable Sectional Construction of Pavement

By A. Swartz
Assistant Manager Toledo (Ohio) Railways & Light Company

MOST electric railway engineers have to contend with maintenance of crossings with steam railways having a great deal of heavy traffic, and where city ordinances require a smooth driveway across steam railways it is quite a job to tear out the paving for the purpose of tamping up the crossings. This job is necessary three or four times a year, so that it becomes quite an expensive burden. In Toledo the street railway company maintains nearly all of the railroad crossings, which number around 200, so that this item is an exceptionally expensive one for the company. The company's roadmaster, P. H. Farrell, struck on the idea of providing a paving across these intersections which could be easily removed and patented his idea with the thought that it would be a commercial success.

We have had one intersection of a double-track electric line with a double-track steam railway over which heavy traffic is carried paved with this patent crossing pavement for four years, and the success we have had has proved to our satisfaction that it is a great labor saver.

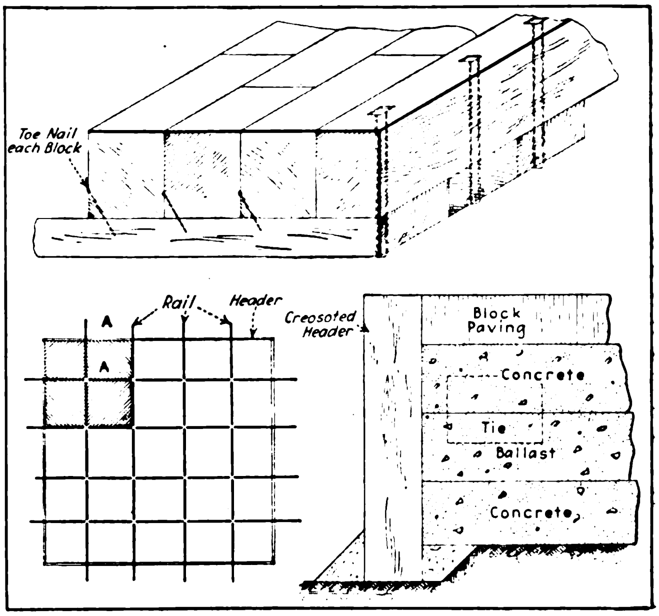
This paving is built up by first providing a floor and a framework which fits carefully in the diamonds or squares of the crossing and which rests upon the flanges of the rails. This box is then paved with wood blocks, each block being nailed to the floor. All the timber used is creosoted, which of course gives a great deal more life to the timber than untreated timber. In the center of each diamond or square a ring is bolted to the floor of the paving to allow each square to be easily taken out with a derrick, so that the track gang may then tamp the crossing. If the derrick is not handy two men with a pinch bar can easily pry up one of the squares.



A TYPICAL CROSSOVER IN TOLEDO WHERE THE REMOVABLE SECTIONAL CONSTRUCTION HAS SPEEDED UP REPAIR WORK

Prior to the use of such paving it sometimes took two to four days to tamp up four crossings, whereas with the new type of paving the work can be readily done in one day. So much success has resulted with the first installation that it was decided to go further with it and to use it in special work intersections in the downtown district, where it will be readily seen that instead of rectangular forms all sorts of shapes would be encountered in making the sections of the patented paving.

The method of constructing special work intersections in Toledo has been to first provide a concrete foundation, on top of which about 2 in. of crushed stone ballast is placed. Above the ballast is placed a bed of concrete on which to lay paving materials. This requires a great deal of labor when it becomes necessary to replace the special work or to surface it. With the new paving we have simply placed ballast on top of the foundation to the top of the tie and form our paving with the patented sections. The top layer of concrete had thus been eliminated and the special work made very accessible for replacement or for surfacing. Some of the paving sections are very ill-shaped and of such a size that to take them out requires the use of a derrick to lift them by means of the ring in the center. The regular street paving is carried forward to the point where the patented paving is to be encountered, between which and the regular paving we have placed wood block crossways of the track to act as a curb for the regular street paving.



METHOD OF CONSTRUCTION AND LAYING REMOVABLE PAVING SECTIONS

All engineers will admit that the secret of good track and special work is proper drainage, so that this fact must not be lost sight of in constructing the type of intersection. To take care of the drainage we have built the concrete foundation with a grade toward a hidden catchbasin, the top of which is even with the top of the concrete foundation. These catchbasins are provided with an iron mesh screen so as to hold back the ballast, but at the same time they permit drainage to enter the catchbasins, which are connected with the sewer inlets in the street corner.

We had one particularly bad double-track crossing in the city where the drainage was very poor; in fact, the intersection lay in a dip of the street grade of both streets so that the crossings received the full benefit of all rain. In the summer of 1919, while repaving this street, we determined to drain this crossing properly and pave it with patent paving. We built a concrete foundation to support the crossings. The foundation was about 25 ft. square, laid with a grade toward one corner and a drainage valley on the line of the diagonal of the square, thus draining into a catch basin which was connected with the sewer inlet. The crossings were laid on crushed stone as described and the patent paving was installed. We have gone through one winter and an exceptionally rainy summer with the best of results so far.

At another point where we have installed the patented crossing pavement where one double-track line crosses another double-track line it was necessary for us to take up the pavement and renew the bolts in the crossings. One foreman and four men did this work and renewed 300 bolts in two nights, working from midnight until 5:30 a.m. After the first night's work they replaced the paving and traffic was carried over the crossings without any interruption, and the next night the paving was again taken up and the work finished, so that there was no delay to traffic necessary. Had the ordinary type of paving been installed, such as brick, Medina, woodblock or any other type, it can be seen that it would have been necessary to do a great deal of work to renew these bolts. We believe that the job would have been open about a week and that it would have cost us about $300 for labor, whereas the way we did it it cost us $55.

This patented paving is in the hands of the Jennison-Wright Company of Toledo, Ohio, and was described in the ELECTRIC RAILWAY JOURNAL for July 5, 1919, page 30. The name of "Kreolite Krossings" has been chosen for this construction. A similar replacement type of construction was described in the ELECTRIC RAILWAY JOURNAL of Aug. 14, 1920, page 326.

A Few High-Lights

Interesting Parts of the Discussion at Fall Conference of British Municipal Tramways Association, Whose Proceedings Were Abstracted Recently

IN THE issue of this paper for Dec. 4, 1920, page 1149, a report was given of the Municipal Tramway Association (British) conference at Cardiff. In some of the papers and the subsequent discussions some interesting statements were made on various subjects, as quoted below:

Speaking of the abuse which always comes subsequent to a showing of necessity of increase in fares, Councilor Higham, chairman of the Blackburn Corporation Tramways Committee, said: "It is always clearly shown that the proper way to increase revenue is to reduce fares instead of increasing them and to lengthen rides in lieu of shortening them, until you are almost forced to the conclusion that the people to manage tramway undertakings most efficiently are those who never had any experience with them, and that if you only reduce fares to the vanishing point you will have ample revenue to meet all your obligations."

In the discussion on fares, J. F. D. Moffett of Belfast said that when he went to Belfast he had to tackle the fare question immediately, but, he said, "I was told immediately this was brought up that if I knew anything about tramway matters at all, I ought to be able to put the finances of the undertaking into a proper state without bothering about fares. 'What about the conductors?' I was asked. 'Are they not missing fares?' I was assured that if they got in all the fares they missed, the problem would be settled. I could not convince the officials that the missed fares, which tramway managers, as we all know, try to reduce to a minimum, are almost a negligible quantity, but after a lot of abuse and a lot of criticism the corporation finally decided to move in the matter."

J. B. Hamilton, general manager Leeds City Tramways, in discussing the fare situation, said: "During the last three years, concurrently with the continued demands for higher wages, most tramway undertakings have come forward and increased their fares." But the speaker said that from his personal experiences while there was a falling off in passengers when the fares were raised, the deficit in numbers was made good again in a short time.

H. Mozley, general manager Corporation Tramways, Burnley, argued that there were serious losses sustained by fares missed by conductors. Mr. Mozley said that there was a method of preventing the overlooking of fares, which, strange to say, was almost confined in its operation to his own system. The method lay in the collection of tickets by the conductor. The missed fares on the British tramways resulted in a net loss of £500,000 a year, yet a simple system could be put into operation which would prevent that loss. The system is as follows: When a car is within a quarter of a mile of the terminus the conductor collects the issued tickets from every passenger.

G. Barnard, general manager Corporation Tramways, Bolton, said: "In my numerous visits to Burnley I have never had my ticket collected, and on most occasions I have never even been asked for it."

A. L. C. Fell, general manager London County Council Tramways, said at one point: "It should be noted that the journals of all the trail cars in London are fitted with radial ball bearings. Tests taken on the level showed the tractive effort at the drawbar to be 17.02 lb. per ton of load with these bearings as against 38.03 lb. per ton of load when the journals were fitted with round bearings, and to this fact low energy consumption can be partly attributed." Mr. Fell gave the following statistics obtained from metered readings on cars in regular service in London, with and without trailers respectively, averaged over a period of forty-five weeks: Tractor and trailer, 2.87 units per car-mile; tractor only, 2.04 units per car-mile.

The passenger-seating capacity of the tractor was seventy-eight and the trailer forty-six.

Diesel Electric Cars on the Swedish Railways

THE scarcity of coal in Sweden and the encouraging results obtained from experiments made in 1913 with the Diesel electric drive for cars have caused further favorable development of this type of car for interurban use. An article appearing in the *Génie Civil* of Oct. 16, 1920, gives some test and operating data on these cars. One of the latest design cars, equipped with an 8-cylinder, 160-hp. Diesel engine and pulling two trailers, made a trip of 69 miles with eight stops in about three hours. The weight of this train, including 139 passengers, was 91 tons and the fuel consumption was about 0.017 lb. per ton-mile. Records kept for the operation over several years showed that fuel cost for the Diesel electric cars was about 6 per cent of that required for steam operation under identical conditions.

Examination Questions for Trainmen

List of Questions Used in Examining Men by Omaha & Council Bluffs Company on Which High Grade Is Required

THE transportation department of the Omaha & Council Bluffs Street Railway, Omaha, Neb., has been making use for several years of a training school for motormen and conductors, which is equipped similar to many other company schools throughout the country, with decided success. After this preliminary training has been completed, and within thirty days from the date they are entered on the roll, all trainmen in Omaha are called in and required to undergo a written examination, which must be passed with a grade for motormen of at least 75 and for conductors of 90. The questions used in these examinations are changed periodically. The questions which appear at the present time on the printed examination blanks are as follows:

MOTORMEN'S EXAMINATION QUESTIONS

1. (a) Name in order the principal pieces of electrical apparatus through which the current passes from trolley to ground. (b) Give the location of each. (c) Give the location of wires connecting each.

2. (a) How would a two-motor car act with a broken motor lead, and what should be done? (b) How would a four-motor car act with a broken motor lead, and what should be done? (c) How would a motor car act with a broken resistance grid or resistance lead? (d) How would you know that a resistance lead or grid was broken?

3. (a) Explain fully how you are enabled to stop a car with a two-motor equipment without line power or brakes. (b) Explain fully how you are enabled to stop a car with a four-motor equipment without line power or brakes.

4. (a) Have you read the rules in the rule book? Are you familiar with them? (b) Answer Rule 81 here . . . (c) If in doubt about a rule or bulletin, what would you do? (d) What is the emergency stop signal?

5. (a) What is to be reported on the regular accident blank? (b) Is it necessary to answer *all* questions on accident blanks? (c) Who is responsible for getting witness names? (d) Are you familiar with Rules 32 and 33?

6. What is the rule in regard to speed on track crossings, curves or switches?

7. (a) What is a circuit breaker? Explains its duty. (b) What is a fuse? Explain its duty. (c) What is a controller? Explain its duty. (d) Should a controller be thrown from a higher to a lower point? (e) How should a controller be fed up when the motor is cut out? (f) In case of controller arcing what is your duty? (g) What is a resistance? Explain its duty. (h) Should a car be allowed to run on resistance points? (i) What is a choke coil? Explain its duty. (j) What is a lightning arrester? Explain its duty.

8. In case you do not get power on the first point, what is the first thing for you to do to ascertain the trouble?

9. (a) What is the rule regarding hand brakes? (b) If air brakes become disabled what should be done?

10. (a) What is a motorman's air valve? (b) Explain its different positions. (c) Should frequent applications of air be made, or should stop be effected with one or at any rate not over two applications? (d) What is an application of air? (e) What is an air governor? (f) What is an air compressor? (g) In case your air gage shows no air, or pressure goes down, what is the first thing to do? (h) Is it necessary to keep close watch on the air gage?

11. (a) What is always the first thing to do before examining the parts of your car, either in vestibule or underneath? (b) What is always your first consideration in case of hazard of injury to person or damage to property?

12. (a) If motor trouble of any kind develops, how would you determine which motor or set of motors was defective? (b) What is the difference in motor conections between a two- and four-motor equipment? (c) How do you cut out a motor at the controller, and give what motor or combination of motors is connected to each cut-out switch? (d) What is a motor?

13. (a) What is your duty regarding broken trolley wires? (b) Span wires? (c) Exit doors? (d) Use of sand?

14. (a) What is your duty running through fog, smoke or other places where your view is obscured? (b) What is the rule regarding two or more cars coupled together, especially at electric switches?

CONDUCTOR'S EXAMINATION QUESTIONS

1. (a) Are you familiar with the proper way to make out a trip slip? An intermediate? A deposit slip? A refund slip? When are refunds made? (b) Which directions are out on trip sheet? (c) Which directions are in on trip sheet?

2. (a) Have you read the fare box rules? (b) Are you familiar with them? (c) Where are registers or fare boxes to be set back to zero? (d) If fare box gets out of order, what would you do? (e) If register gets out of order, what would you do? (f) When should tickets and coupons or employees' pass tickets be canceled? (g) When should fare be collected? (h) Should fares be registered separately?

3. (a) What is to be reported on regular accident blanks? (b) Is it necessary to answer *all* questions on accident blanks? (c) Who is responsible for getting witness names? (d) Are you familiar with Rules 32 and 33? (e) Should you converse with, or give witness names or any information to any one concerning an accident except to the proper company officials? Who are they? (f) What is the proper thing to do in case of a serious accident? (g) What is your duty regarding passengers who are seemingly about to alight from a moving car?

4. (a) In case it is necessary to back your car, where should your position on the car be? (b) Why?

5. (a) What is the rule pertaining to children riding free? (b) Should children not paying fare be permitted to occupy seats to the exclusion of paying passengers?

6. (a) Have you read the rules in the rule book? (b) Are you familiar with them? (c) If in doubt about a rule or bulletin order, what would you do? (d) When is the proper time to look at bulletin boards?

7. What is the rule pertaining to badges that are presented by passengers in citizens' clothes?

8. (a) What are the two best things to use when dealing with the public? (b) In your dealings with passengers when you are in doubt, what are you to do? (c) What is the order regarding collection of fares at end of line? (d) What is the rule regarding conductor depositing passenger's fare? (e) What is the order regarding making up trip slips, such as counting tickets, transfers, hat checks, on a moving car?

9. (a) Who is responsible for waiting for passengers at transfer points?

10. What is the general order in regard to carrying packages on the car?

11. (a) What is the conductor's duty in regard to keeping car clean? (b) In case you receive a dirty car, what is your duty?

12. What is your duty regarding slippery steps and platforms?

13. (a) If your car should become disabled or derailed and conditions were such that it could not be seen readily by drivers of vehicles or motormen on approaching cars, what is your duty? (b) What is always the first consideration in case of hazard of injury to persons or damage to property?

14. (a) When do you issue transfers? (b) What does the originating line mean on a transfer? (c) Why is it necessary to punch the originating line correctly on a transfer? (d) Should a transfer be issued back to the originating line? (e) If after issuing a transfer a passenger changes his mind and wishes to go by another route, should you accommodate him? How? (f) Should you at any time punch a transfer twice so that it would mean two distinct things? (g) How would you determine the time allowance to be given on a transfer? (h) Should your car become disabled, or for any other reason it becomes necessary to transfer passengers to another car, how would you proceed? (i) When transfers are tendered on which the time has expired or which are furnished for a different transfer point, what is the proper thing for conductor to do?

15. What is the rule governing railway crossing?

16. (a) What is the emergency bell signal? (b) When should it be given?

17. (a) Under what conditions would the ejectment of a passenger be warranted? (b) Before taking it upon yourself to eject a passenger from the car, what should you do?

18. (a) What is your duty regarding broken trolley wires? (b) Span wires? (c) Trolley retrievers?

19. In case a passenger has been carried by his destination, what is the conductor's duty?

20. What is the order regarding ventilators?

21. In case of a serious blockade, such as fires, or broken down vehicles, what is your duty?

ELECTRIC RAILWAY PUBLICITY

Devoted to How to Tell the Story

Telling the Public About the Jitneys

EDMUND W. WAKELEE, vice-president of the Public Service Railway Company, is favoring the patrons of the Public Service Corporation and at the same time is placing the company's analysis of the jitney situation before these patrons by mailing to them a copy of his address on "The Street Railways, the Jitneys and the Public," delivered before the fifth annual convention of the New Jersey Utilities Association at Atlantic City on Oct. 30. The address is sent out in an attractively printed booklet.

Mr. Wakelee differentiates between the motor buses which furnish service on independent routes built up under proper franchises or which furnish feeders to other existing methods of transportation and those jitneys which are being operated under mere permits, which add nothing to the development of cities, but increase congestion; which operate under practically pirate methods, and which financially are neither organized nor responsible. He presents an excellent analysis of the transportation demands of the public and the relation of the jitney thereto, and also shows the part the electric railway has played in this problem.

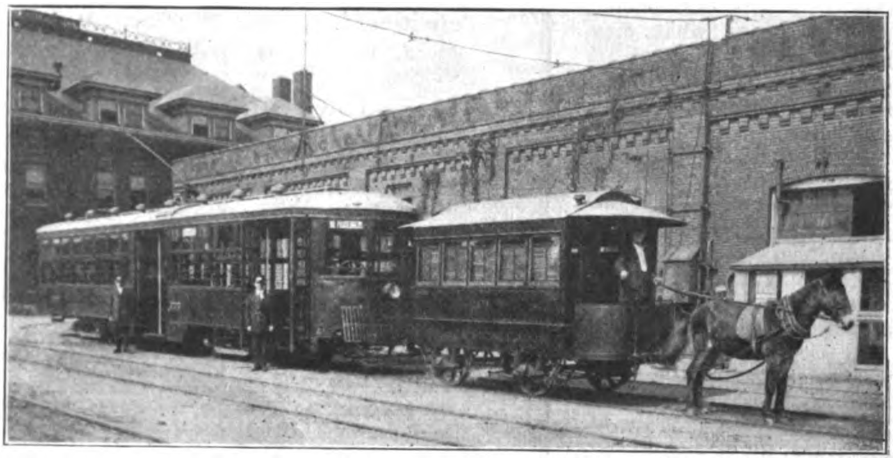
Improvements in Transportation Methods Capitalized

Novel Form of Publicity Used in St. Louis

A NOVEL type of publicity, designed to give the riding public an appreciation of the difference in values offered by the traction company of today and that of twenty-five years ago, was used recently by the United Railways of St. Louis. This consisted of an exhibit, comprising the oldest car in the possession of the company and the newest car, just built and not as yet put into service. The display was placed on an unused track on one of the busy downtown streets and remained there for several days, attracting a great deal of attention from the public. After remaining on view downtown for several days the exhibit was taken around to the various public schools to give the pupils an opportunity to see how their grandfathers traveled.

"Bellefontaine 33," as the old mule car was known, was built in 1875 and was used until 1895. It was "unearthed" recently at the end of the Tower Grove line, where it was formerly used as a waiting station. It was half buried in the dirt, but paint and new trucks worked wonders. Then, in charge of Patrick O'Hare, who has been in the service of the various St. Louis traction companies for forty-five years, the old car, drawn by a shaky and wheezing mule, was sent on its journey to downtown St. Louis. The run took forty-three minutes. The new car, operating under its own power, made the run in ten minutes.

Those who viewed the exhibit were impressed with the fact that the two cars represented epochs having little in common. This contrast between the old and the new was made more vivid by the distribution of a pamphlet describing the cars on display and sketching the conditions under which each operated. This pamphlet summarized the development of the traction industry as follows:



PRESENT-DAY AS COMPARED WITH ANCIENT METHODS

Car 33—Built in 1875. Cost $700. Length, 10 ft. Power, mule. Seating capacity, 14. Heat, none. Cost to heat, 3 cents for straw on floor. Light, two single-burner oil lamps. Cost to light, 2¼ cents per day. Ventilators, none. Wages of crew, per hour, 9⅜ cents (one man).

Car 777—Built in 1920. Cost $15,000. Length, 50.5 ft. Power, electric. Seating capacity, 60. Heat, Peter Smith forced ventilation heater. Cost to heat—77 cents per day. Light, twenty electric lamps. Cost to light, 13 cents per day. Ventilators, sixteen. Wages of crew, per hour, $1.30 (two men).

Fares—1875, 7 cents cash (five tickets for 25 cents). 1920, 7 cents.

Maximum length of ride on Bellefontaine line in 1875—2.5 miles.

Maximum length of ride on Bellefontaine line in 1920, 15.8 miles (without transfer).

In 1875—No transfers.

In 1920—Free tranfers for any city destination.

Average speed of cars in 1920, over four times that in 1875.

Prior to United Railways consolidation in 1899 it took four fares to go from City Hall to Baden—now only one fare.

U. R. present trackage, 460 miles.

Cars in actual service over 1,800 per day (this has increased 100 during receivership). 110 additional cars now under construction.

Number of employees, 6,000.

American Association News

Engineering Association Committee Assignments

(Personnel of committees not yet complete)

Committee on buildings and structures, chairman D. E. Crouse, chief engineer Rochester & Syracuse Railroad, Inc., Syracuse, N. Y.

1. Continue study of equipment for prepayment and postpayment of fares. It is recommended that the committee get in touch with the president of the Transportation & Traffic Association, looking to the appointment of a representative to co-operate with the committee, one who is familiar with this phase of transportation.

2. Report on design of typical shop buildings and shop layouts for property of moderate size. Include results of a study of the practice on progressive properties. Co-operate in this matter with the committee on equipment. The design of shop layout should be consistent with modern plans of routing work through a shop, and this year attention should be confined to what may be termed the "centralized shop plan." It is assumed that the equipment to be carried will be of modern type. The shop layout should also be considered with reference to the impression to be created upon the public.

3. Study existing standards and specifications with a view to possible revision.

4. Co-operate with the way committee in the preparation of specifications relating to preservation of structural timber.

Committee on equipment, chairman Daniel Durie, general superintendent West Penn Railways, Connellsville, Pa.

1. Continue the study of brake shoes, brakeshoe heads and brakeshoe keys.

2. Revise standard tread and flange contours for steel wheels as referred back to the committee by the convention.

3. Prepare standard wheel contour for cast-iron wheels.

4. Revise specifications of carbon steel wheels, referred back to the committee by the association, and take up this matter with the American Society for Testing Materials and the American Railway Engineering Association.

5. Continue study of helical gears.

6. Report on car arrangement and design which are attractive to the public and conduce to comfort, convenience and efficiency of operation.

Program of the

Mid-Year Conference

of the

American Electric Railway Association

to be held at

The Drake, Chicago, Feb. 10, 1921

Main Topic:

Electric Railway Financing

The Papers to Be Presented Are:

1. **Previous Methods of Electric Railway Finance.**
   By JAMES F. FOGARTY, secretary the North American Company, New York.
2. **Present Requirements for Mortgage Securities.**
   By F. K. SHRADER, Halsey, Stuart & Company, Chicago.
3. **Home-Town Financing—Partial Mutual Ownership.**
   By S. B. WAY, vice-president and general manager the Milwaukee Electric Railway & Light Company, Milwaukee.
4. **Necessity of Financing by Sale of Capital Shares.**
   By CHESTER COREY, vice-president Harris Trust & Savings Bank, Chicago.
5. **Municipal Aid in Electric Railway Financing.**
   By MELVIN A. TRAYLOR, president First Trust & Savings Bank, Chicago.

7. Continue study of life of wearing parts of electrical equipment.

8. Report on personal observations of members of committee or their representatives on life of wearing parts on selected properties, and on shop practices relating to improving wearing qualities of parts. The object of this assignment is the collection of first-hand data on the subject. A reel or two of motion picture films might be prepared in connection with this study of the life of wearing parts.

9. Report on present status of direct-current lightning arresters.

10. Study existing standards and specifications with a view to possible revision.

11. Co-operate with the way committee on the possible advantages of curved contours for treads of new wheels.

12. Co-operate with the committee on buildings and structures on the design of a typical shop building and shop layout for a property of moderate size.

Committee on heavy traction, chairman Sydney Withington, acting electrical engineer New York, New Haven & Hartford Railroad, New Haven, Conn.

1. Co-operate with the American Railway Engineering Association regarding progress in heavy electric traction, with a view to keeping the members of the American Electric Railway Engineering Association posted on developments in this field. In this connection cover foreign practice as well as that in the United States.

2. Continue the compilation of statistics regarding electric locomotives.

3. Continue the study of electric switching engines.

4. Study the subject of multiple-unit cars vs. electric locomotives in passenger service, and report on the percentage of service given by means of such cars.

Committee on power distribution, chairman Charles R. Harte, construction engineer the Connecticut Company, New Haven, Conn.

1. Review the overhead crossing specifications.

2. Outline specifications for catenary overhead construction.

3. Continue study of standard stranding of cables.

4. Continue study of standard specifications for wires and cables.

5. Study subject of composition of trolley wire and limits of economical wear, together with causes contributing to wear.

6. Report on present status of direct-current lightning arresters in collaboration with the committee on equipment.

7. Co-operate with the committee on way matters in the preparation of specifications for preservation of wood power transmission poles.

Committee on power generation, chairman A. B. Stitzer, chief engineer Republic Engineers, Inc., New York.

1. Continue study of a form of contract for purchase of power.

2. Continue study of the comparative costs of steam produced from coal and from gas and other special fuels.

3. Report on the progress which has

been made up to date of the report with the so-called super-power plan described at the convention by W. S. Murray.

4. Report on multiple-unit automatic substations, including financial comparisons with manual substation operation.

Committee on way matters, chairman R. C. Cram, engineer surface roadway, Brooklyn Rapid Transit Company, Brooklyn, N. Y.

1. Standardization of frogs and track centers in special trackwork layouts.

2. Report, in co-operation with the committee on equipment, on the possible advantages of curved contours for treads on new wheels.

3. Investigate the 'application of curved treads to the association standard girder guard and plain girder rails, and the need, in any event, for changing the slope of the tread of the guard rail to agree with the slope of the association standard wheel treads.

4. Investigate the subject of arc-weld joints.

5. Prepare specifications for special trackwork of rail-bound-insert, composite and insert types.

6. Revise girder-rail specifications in respect to methods of tests with particular reference to the impression test proposed by the American Society for Testing Materials.

7. Report on designs of steel and other forms of substitute ties for use in paved streets.

8. Prepare specifications for wood preservation with respect to the several uses of wood or timber in its various forms in the electric railway industry. This matter should be taken up in conjunction with the committees on buildings and structures and on power distribution. The committee on way matters should confine itself particularly to specifications for wood-block paving.

Committee on apprentice systems, chairman F. R. Phillips, superintendent of equipment Pittsburgh Railways, Pittsburgh, Pa. (No detailed assignments yet made.)

Other members of this committee are H. A. Johnson, organization engineer the Metropolitan West Side Elevated Railway, Chicago, Ill., and L. C. Datz, engineer American Cities Company, Birmingham, Ala.

T. & T. Association Committee Assignments and Personnel

Following are details of the committee membership and assignments for three important 1920-1921 committees of the Transportation & Traffic Association:

Committee on economics of schedules, chairman Edward Dana, general manager Boston Elevated Railway, Boston, Mass.; Donald Goodrich, Twin City Rapid Transit Company, Minneapolis, Minn.; E. H. Ives, Detroit United Railway, Detroit, Mich.; H. C. Moser, Fifth Avenue Coach Company, New York City; Samuel Riddle, Louisville Railway, Louisville, Ky.; J. A. Stoll, United Railways & Electric Company, Baltimore, Md.

The committee is to continue the study of economics of schedules; to develop further the definitions and analyses of car-hours and crew-hours, bearing in mind the discussion at the last convention, and with the aid of the accountant members to formulate a definite procedure for keeping operating schedule statistics of member companies on a basis which will make them comparable. Further study should be given to the question of variable running time and a definite recommendation for this committee is wanted on this matter. It is suggested also that this committee include in its report a summary of recent methods developed for improving the handling of traffic in congested centers, along the lines of work done in Boston, Washington and Kansas City by John A. Beeler, also at any other points where the committee feels that steps have been taken of a character to facilitate movement of passengers and cars in congested areas.

Committee on express and freight (chairman to be appointed); W. P. Bristol, the Connecticut Company, Hartford, Conn.; J. H. Crall, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; F. D. Norviel, Union Traction Company of Indiana, Anderson, Ind.; W. S. Rodger, Detroit United Railway, Detroit, Mich.; T. H. Stoffel, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.; C. E. Thompson, Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.; A. F. Van Deinse, Columbus, Delaware & Marion Electric Company, Marion, Ohio.

This committee is to continue the study of the costs of handling express and freight service and if possible, with the aid of the accounting members, bring it to a conclusion. Further study of how additional business can be obtained from freight and package or express traffic should be made, with particular references to motor truck competition.

Committee on safety work (chairman to be appointed); W. H. Boyce, Beaver Valley Traction Company, New Brighton, Pa.; C. B. Scott, Chicago Edison Company, Chicago, Ill.; E. M. Walker, Terre Haute Traction & Light Company, Terre Haute, Ind.

This committee is to work with a similar committee from the Claims Association on developing methods for public safety work and the utilization of the National Safety Council's plans and methods for decreasing injury and hazard in public streets. C. M. Talbert, Commissioner of Streets and Sewers, St. Louis, Mo., who is chairman of the public safety section of the National Safety Council, is preparing a program of work in which he feels this committee can assist. The public safety section desires to obtain the assistance of electric railways in the adoption of a standard public accident report to be used in all cities of 25,000 population or over. The committee should be prepared to recommend to member companies how they can fit in and push forward the work of the local councils of the N. S. C.

Special Committee on National Reports

President Gadsden is naming a special committee on the Federal Electric Railways Commission report and also on the report of the public utilities committee of the Chamber of Commerce of the United States. This committee will be requested to make a report at the Chicago conference on February 10.

Electric Lines Not Under Railroad Labor Board

The United States Railroad Labor Board handed down a decision on Dec. 18 interpreting the Esch-Cummins transportation act to mean that the board does not have jurisdiction over any interurban or electric lines. Appeals from employees on various electric railways asking the board to hear their grievances were denied. The decision is said to affect every electric interurban line in the country, and many city transportation systems owned by interurban companies.

Arguments in the case were heard several months ago. Members of the board stated at the time their belief that, regardless of which side won, the matter would be appealed to the United States Supreme Court for interpretation of the transportation act.

The board held that the meaning of Congress in the transportation act was to exempt all electric lines "not operating as a part of a general steam railroad system of transportation." The fact that some electric lines haul freight, exchange cars with steam lines, operate in interstate traffic, or use in part the tracks of a steam line does not bring those lines within the provisions of the law, the decision says.

The board also points out that the Interstate Commerce Commission granted the interurbans a freight rate increase, but decided that it had no jurisdiction over the passenger business.

Senator Cummins of Iowa, chairman of the Senate Interstate Commerce Committee and one of the framers of the transportation act, is reported to have said that the decision of the Railroad Labor Board that the act did not apply to interurban electric lines was not in accord with the intention of the framers of the measure.

The hearings before the Railway Labor Board in Chicago have been referred to previously in the ELECTRIC RAILWAY JOURNAL, notably in the case of the Washington & Old Dominion Railway, reviewed in the issue of this paper for Oct. 9, page 730.

News of the Electric Railways

FINANCIAL AND CORPORATE • TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Street Collection Successful

Front-End Fare Collectors Help to Handle Rush-Hour Traffic in Milwaukee

Success in expediting traffic during the evening rush hours at heavy loading points has been achieved by the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., through the employment of a number of front-end fare collectors. The company now utilizes for this purpose approximately twenty-five men, though this number varies somewhat with the season of the year and the extent of traffic handled.

The men are recruited from a number of sources. Some are engineering and college students working their way through school, a number are office employees of the company who find this a convenient way of supplementing their earnings. Some are men who have short runs, which they finish out by doing street duty, and the rest are men taken from the extra list. All men employed as front-end fare collectors receive special instruction.

SUPERVISOR AND COLLECTOR IN ONE

Since the Milwaukee Electric Railway & Light Company was one of the first companies in the country to employ front-end fare collectors some of the men have been performing this work for a number of years and have therefore become highly proficient. Such men when placed at important loading points really combine the duties of a supervisor with those of the front-end fare collector.

Collectors report at the car station nearest to their post to receive their fare box and other supplies. They then travel to their post in time to report to the dispatcher over the company dispatching phone system at 4:30 p.m. They remain on duty until 6:15 p.m., when they again report to the dispatcher and then return to the car station to turn in the fare box and account for tickets sold, etc. Though the work lasts from 4:30 to 6:15 p.m. collectors are paid the standard trainmen's rate for two and one-half hours; that is, an allowance for traveling time to and from the car station to point of duty.

The men are equipped with change makers and with locked, non-registering fare boxes which they carry over the shoulder by means of a leather strap. The boxes weigh approximately seven pounds. They are somewhat smaller and lighter than the similar boxes in use on the cars.

Upon reporting at his post a collector stations himself at the intersection in position to load through the front door the first car to arrive. He calls the destination of the car, collects fares, makes change, sells tickets and issues transfers, just as do the regular conductors. When all passengers desiring to enter through the front door have done so the collector moves on to the rear door and assists the conductor in closing it. If a second car has arrived and is being loaded he similarly assists in the loading of the second car. At certain intersections switches have to be manually thrown. If a switchman or supervisor is not present the collector as a rule also acts as switchman.

The accompanying illustration shows a collector in action at West Water and Sycamore Streets, Milwaukee. This is one of the busy intersections in the city, six or seven car lines passing through it. It is taken care of at present by a front-end collector and a supervisor. Any one watching the men at work realizes how tremendously they help to speed up the traffic at this particular point.

FRONT-END COLLECTOR AT WORK

New Grant Suggested at Findlay

To retain the local service of the Toledo, Bowling Green & Southern Traction Company, at Findlay, Ohio, a joint committee of the City Council and Chamber of Commerce as a street railway arbitration committee has taken up the task of drafting a service-at-cost ordinance. The railway has asked the Ohio Public Utilities Commission for permission to discontinue service. The committee will ask that the hearing be deferred again. It was to come up for final settlement on Dec. 17. The committee members feel that a compromise may be effected before that month expires. The report of the commission's appraiser, who valued the property, has arrived at Findlay, but its contents have not been made known.

Open Shop in Buffalo

Wage Increase Arbitration Broken Off by International Railway—Many Applicants for Employment

Owing to a pronounced change in business conditions since last spring. resulting in many applications for employment and a downward trend in wages in all lines, the International Railway, Buffalo, N. Y., announces it will proceed no further with the wage arbitration proceedings involving increases for its employees.

Herbert G. Tulley, president of the International, has made public a letter which Charlton Ogburn, New York, the third arbitrator, has sent to Governor Smith tendering his resignation. Inability of the company to get its employees to agree to terms of arbitration was stated by Mr. Ogburn as his reason for resigning.

Mr. Tulley says that although six months have elapsed since the company appointed its representative to the board there has been no indication of the acceptance of the conditions it laid down by the representatives of the men. The union employees have had no agreement with the International since the last wage contract expired April 30 last. The company now maintains it is running the railway on the open shop basis.

WAGE EFFORT FAILS

The principal condition of the International Railway which never was accepted by the men was that whatever wage increase, if any, was agreed to by the arbitration board should date from the time any fare increase was put into effect that was made necessary by a wage increase. The men always have insisted that the award, if any, should be retroactive to April 30, the date the old contract expired.

As a result of the changed business conditions, "resulting in many applications for employment and a downward trend of wages in all lines," and the resignation of Mr. Ogburn as the umpire on the board, President Tulley explains that "the company would not now be justified in proceeding further with the wage arbitration."

The resignation of Mr. Ogburn and the company's decision to withdraw from the arbitration proceedings mean the complete failure of the efforts of the union's representatives to secure a wage increase for the men.

Mr. Tulley says he will continue to operate on the open shop basis. There will be no discrimination against members of the union, but the general feeling is that the men will resign from the organization because they have found it can no longer be of assistance to them.

Labor Precedents Established

Kansas Court of Industrial Relations Hands Down Interesting Decision in Interurban Case

The nine-hour day is equitable for electric railway workers; Sunday work in electric railway shops is a necessary routine of this industry and not subject to over-time wage payments, and the number of men in freight crews on interurbans is a matter for foremen to decide. These are a few important conclusions of the Court of Industrial Relations for the State of Kansas. The decisions establish precedent. They were made with reference to the operation of the Joplin & Pittsburg Railway, contract features having been submitted to the court by the company and the employees.

TWO QUESTIONS CONSIDERED

In deciding against the eight-hour day for interurban railway trainmen, the court considered two aspects of the question—the interests of the men and feasibility of the eight-hour day plan in the operation of the railway. The work, the court found, was not such as to make a nine-hour day exhausting and the men were not deprived of social rights by such a day. The court had investigated the results which would follow the establishment of an eight-hour day for trainmen. A schedule was prepared on this basis, supposing operation of trains for eighteen hours a day, and it was disclosed that the reduction of the hours per day to eight would involve an additional expense of $25,000 a year for the company. This expense could not be borne, the court said, without curtailment of service to the public, or reducing of wages.

SUNDAY WORK NOT PROFITABLE

Clyde Taylor presented the facts and arguments for the company at the various hearings. He laid stress on the fact that interurban service required seven-day operation of the shop, in order that equipment might be in usable and proper shape for accommodation of patrons. The company, he had pointed out, did not profit by Sunday work in the shop, and it should not be penalized, by being required to pay higher wages for its essential and routine operation of the shop on Sundays. The court took this view, stating that "it is not proper to penalize the company for Sunday work which is absolutely necessary."

REQUEST REFUSED

The request of the men for a ruling requiring the use of three men on freight car strings of three cars or more is denied, on the ground that the employment of three men would serve no public benefit, but would be an unjust burden on the company, to be reflected later in poorer service or lower wages.

An interesting feature of the opinion of the court is that in reference to carhouse men on an eight-hour basis. Several months ago the men, who are paid by the hour, asked that the ten-hour day be reduced to eight. The company acceded, the men receiving pay of course for only eight hours. In these eight hours, as the company stated, the men had done the same amount of work that they formerly did in ten. The court, therefore, said that the men should receive pay for ten hours—a finding acceptable to the company. The increased efficiency, company representatives said, naturally warranted the larger wage.

THE COURT'S DOUBLE FUNCTION

The opinion in this case is providing persons favorable to the present organization of the court, with illustration of the advantage of this method of handling industrial cases. It is observed that the court, in considering the matter of Sunday work for electric interurban companies, the employment of a larger number of men than customary on freight car handling, and the readjustment of hours of labor, looked at the problem judicially from its position as a Public Utilities Commission and also from its position as a Court of Industrial Relations. It weighed the interests of the public, the interests of the men, and the ability of the company to continue uninterruptedly in the service of the public under conditions of employment such as were requested.

ADJUSTMENT REACHED AMICABLY

Throughout the hearings, there was no element of controversy or hostility, no effort to gain a present advantage as an offset to possible detrimental findings by another body. All of the equities of the situation were handled by the one court, in Kansas, in the one series of hearings, and the one program of investigation of conditions by accountants and representatives of the court.

New Subway Bond Issue Planned

Transit Construction Commissioner John H. Delaney of New York City has submitted to the Board of Estimate an application for a new bond issue of $25,981,000 to provide for carrying on construction work upon the city-owned rapid transit system during 1921. Of this amount more than $11,000,000 is for the Interborough system and more than $14,000,000 for the New York Municipal Railway (B. R. T.). The chief item for the Interborough is the extension of the Steinway Tunnel route from Queens westward from Lexington Avenue under Forty-first Street to Seventh Avenue, for which $4,300,000 is asked, and also for the acquisition and construction of storage yards and repair shops in Brooklyn, Queens and the Bronx, $4,250,000. The work planned for the B. R. T. includes $8,200,000 for the subway from the Municipal building south under Nassau and Broad Streets to Whitehall Street and $6,100,000 for the Bushwick-East New York section of the Fourteenth Street-Eastern District Subway line.

Toledo Meeting Jan. 20

Directors of Toledo Railways & Light Company Will Then Ratify Transfer of Property

It appears quite certain now that the board of control of the electric railway system under the Milner cost-of-service ordinance at Toledo, Ohio, will make a selection of commissioner and that the company will be prepared to turn over its property to the new Community Traction Company so that the ordinance may go into effect on Feb. 1.

The matter of the personnel for the new operating company has not been determined, but it will probably be announced immediately following the meeting of the stockholders of the Toledo Railways & Light Company, on Jan. 20, 1921. At that meeting the matter of ratifying the cost-of-service agreement will be taken up and finally passed upon.

NEW PERSONNEL LIKELY

It is expected that Frank R. Coates, president of the Toledo Railways & Light Company, who has been in Toledo in that capacity for more than nine years, will remain as president of both the Community Traction Company and the Rail-Light. That is the only office which may be held in both companies by the same individual. There must be a separation of all other offices.

In the work of separating the properties many difficulties have been encountered. The Doherty interests at Toledo have many diverse lines operating under one holding company and interchanging equipment and labor in various ways.

A method of financing maintenance and improvements in use for the last four years will also cease when the cost-of-service plan goes into effect. During litigation between the city and the company in the federal court Judge John M. Killits set up a fund into which the Rail-Light was compelled to pay weekly 6 per cent of its gross passenger revenues. The fund was called the Craig Fund after its administrator, Captain John Craig. The first payments were made into the fund April 18, 1916, and it has been in operation ever since that time. Fares had advanced twice since that time, but the fund has never been able to catch up with the moneys expended for new cars, track improvements and other service betterments.

CRAIG FUND RESULTS

The federal court will soon issue an order winding up the affairs of this fund. The maintenance and betterments will be automatically cared for in the working of the new plan.

Professor Henry Riggs, of the civil engineering department of the University of Michigan, did not come to Toledo to consult with the street railway board. He merely wrote a letter indorsing two or three candidates who had applied for appointment to the office of commissioner under the new franchise grant.

Wage Reduction Conference Suggested

Detroit United Railway Suggests that Wage Scale Be Reduced in Keeping with Commodity Price Cuts

E. J. Burdick, assistant general manager of the Detroit (Mich.) United Lines, has informed the Amalgamated Association of its intention to move for a reduction in the pay of platform men to be effective on Jan. 1, such reduction to be in line with the lower cost of living now effected. Mr. Burdick explains that the administrative officers have voluntarily submitted to a substantial reduction in their salaries and that forces in other departments have been reduced in numbers. The management has resorted to every possible economy, but owing to an unprecedented decrease in travel the income of the railway has been so reduced that nothing that has been done or can be done will overcome the daily losses that are accumulating. The president of the local division of the Amalgamated has replied to Mr. Burdick with a copy of the resolution adopted at a joint meeting of all the employees affected. This resolution was concluded to the effect that the officers of the divisions are requested to see that the company "observes and lives up to the contracts as the laws of our association require."

THE present scale in Detroit is 70, 73 and 75 cents an hour. The outcome with respect to the proposed wage reduction appears to be uncertain, as the union by its action has closed the door for the time being at least to any conferences. With the knowledge that throughout the country other wage scales have gone down or will go down when factories reopen, it is expected that the railway employees will realize that they cannot remain a favored class at the expense of the car riders whose pay is being cut.

Mr. Burdick's letter to the union follows:

The company's situation is now such, due to the extreme burden of costs under which it is now and has been doing business, that a readjustment of its burden must of necessity be made.

During the period of the war, as you well know, the company was refused any relief by the public authorities, in consequence of which its burdens increased and accumulated, and the recent slight relief afforded is greatly offset by the increase granted in the pay of employees.

To sustain this increase in pay, the management has resorted to every possible economy, but, owing to an unprecedented decrease in travel, its income has been so reduced that nothing that has been done or can be done in that way will overcome the tremendous daily losses that are accumulating.

Forces in other departments have been reduced in numbers and in working hours, as much as seems wise, and the company's administrative officers have voluntarily submitted to a subtantial reduction in their salaries.

While we regret the necessity for such action, it is none the less imperative that a further substantial reduction in the cost of operation be effected, and accordingly we must hereby give you notice of our intention to move for a reduction of the pay of platform men, to be effective Jan. 1, next, such reduction to be in line with the lower costs of living, now effected—say, 20 per cent.

It occurs to us that you may deem it advisable to acquaint your members with this situation, and to discuss the matter with us without delay, in the hope that an amicable agreement may be reached without resort to arbitration.

In the resolution in reply to the company the men say:

Resolved, that we, the motormen and conductors in the employ of the Detroit United Railway System, do hereby instruct the joint officers of our three divisions to wait upon the officers of the company and to inform them that upon the part of their employees we are surprised at the action that they have taken and to point out to them that they have agreements with our respective division associates which specifically provide for the wage and provide when and how it shall be changed and that for the company to attempt to change this wage on Jan. 1, 1921, would be a flagrant violation of the contract that they have with our respective divisions.

The officers of the union are then instructed with respect to the specific clauses in the present agreement between the railway and the men that should be called to the attention of the officers of the railway. The resolution is concluded as follows:

Then call their attention that while the agreement with Division No. 26 does not state any specific date of opening, that it was an understanding which has existed for some time that this agreement shall be opened once a year and has always been opened at the same time that the other divisions' agreements just quoted, and the present scale of wage was agreed to in May, 1920, jointly as was in all these other agreements and that, therefore, any reduction in the wage of any of the membership of these three divisions on Jan. 1 would be a violation of the contract that has existed for years between our respective divisions and this company, and that upon the part of the employees we protest and will not agree to accept any reduction of wage or any change in these agreements so long as they are in force and binding upon membership and the company.

The officers of the joint divisions are requested to carry out the above instructions and to see that the company observes and lives up to the contracts as the laws of our association require.

In a statement which he made Mr. Burdick said that unwarranted statements from whatever source do not and cannot alter the great fact that the Detroit United Railway's receipts have not been, and are not now, sufficient to meet all proper cost obligations and that a material readjustment in the way of decreases in wages and some increase in the rate of fare are both vitally necessary in order for the company to continue serving the people. He said:

Our records are open to competent investigation by anybody before which all of the facts may be brought forth and will be found fully to justify what I have said.

When wages of motormen and conductors were advanced from 50 cents, 55 cents and 60 cents to the present scale of 70 cents, 73 cents and 75 cents—increases ranging from 25 per cent to 40 per cent—in order to meet the growing cost of living, it was patent to all that, facing the same living conditions, other employees had also to be advanced. This was pointed out in the company's letter to the Common Council of May 24 of this year.

To provide the necessary funds the company at that time asked for an increase of 1 cent in the fares, making the rate flat 6 cents, or if more convenient to the public a combination cash and ticket fare producing practically the same financial result.

When in the hearing before Judge Jayne it was agreed to try out a 6-cent cash fare with nine tickets for 50 cents it was done because of an assurance that in or connected with a suit before Judge Jayne a just and lawful rate of fare would be established. The accepted rate was substantially less than we were confident to be necessary to meet all proper and necessary costs of conducting the system. This need existed with all due allowance for a continuing increase in business. That increase has stopped. It has not only stopped but we have gone backward.

Our passenger receipts for the month of December are below those of the same period of last year, and that decrease is getting worse every day. But during this same period of decreased income our expenses, including wages, have been in excess of those of a year ago.

With our income decreasing and with certain fixed charges, such as taxes, that cannot be cut and with other necessary obligations it is clear to all who have made a study of the situation that reductions in salaries and wages of the men cannot go far enough to meet the loss and that even with these reductions in the pay-roll a small raise in the fare is necessary to continue operation. It is impossible to render service much longer under present conditions.

The great reduction in the number of people riding has resulted in some reduction in the amount of service, but the saving through this cannot be made proportionate with the reduction in receipts. We cannot shut down and stop expenses like other lines of business, but we can be stopped for lack of money to go ahead.

As stated in our letter to the motormen and conductors the executive officers of the company have taken a reduction in salaries. Following a conference of department heads Saturday morning, reductions in salaries of all departments were decided upon in order to help through a serious situation. It is, of course, only proper that wages of motormen and conductors—their combined wages consisting of the largest single item of expense—must also come down. Any other action would result in too great a burden on the riding public.

Our situation with respect to the interurban lines is similar to that within the one-fare zone. The fare increases granted by the State Legislature have not resulted in giving the company a sufficient income. While the fare was fixed at 2 cents a mile, the exemption of cities and the territory within 5 miles thereof have brought the average rate per mile to considerable below the 2-cent rate.

In the endeavor to bring about a proper readjustment of the transportation situation we most respectfully ask of the people and those in authority a calm and earnest consideration of the matter. We are doing everything in our power to keep the wheels turning, but I am very frankly stating that a readjustment is needed and is needed speedily. It is not a political but a business problem that confronts all of us.

Utilities Need Funds

Jacob H. Schmuckler, writing for the *Financial World* on the subject "The Interesting Status of Utility Bonds," says "we shall undoubtedly see large public utility flotations for years to come." He regards this as a favorable sign. On the matter of earnings Mr. Schmuckler says the monthly net earnings figures, so far as they are available, indicate improvement compared with corresponding periods last year. In regard to financing for the future the author says:

The public utility properties of this country need a great deal of new funds, and need them badly. These are necessary not only to put present properties in good condition but also to expand them to care for the requirements of the various communities throughout the United States. We shall undoubtedly see large public utility flotations for years to come.

On first blush these flotations may strike us as an unfavorable factor, but in reality they are favorable, if only the money can be raised, for the funds will be used to put the properties on a plane of high operating efficiency and will permit the expansion demanded.

The services rendered by the utility companies are necessities, and once net earnings improve to the point where they will be sufficient to cover interest charges with liberal margins and will enable the properties to be taken care of as required the problem is solved.

$500 Awaits You

This Liberal Reward Is Offered for Solving Seattle Municipal Railway Problem

The Seattle *Daily Times*, the leading newspaper of the city, has established a novel contest, dealing with the problem of municipal operation of the city's railways. The contest provides a prize of $25 each week for the best solution of the present railway situation and suggestion for rehabilitation of the lines presented by a citizen of Seattle.

The weekly prizes will be offered for twelve successive weeks. At the end of that time the author of the best of the twelve weekly prize-winning letters will receive an additional prize of $200. The management of the *Times* is to be the sole judge throughout the contest.

In the event that the final prize winner's plan, complete and unchanged, is adopted and put into effect by the City Council, or other constituted authority, within two months of the announcement of the prize award, an additional $300 will be paid the author of the plan, provided the plan is kept in operation for a period of six continuous calendar months. Furthermore, in the event any other plan submitted in the contest and published by the *Times* other than the plan picked by the *Times* is adopted by the city, as above, a special prize of $100 will be paid the author.

No Seattle newspaper ever before made so ambitious an attempt to poll popular sentiment on a matter of this kind. It is pointed out by the management that this is a "community problem"; that the Mayor and the City Council and the street car executives are all working on it and seeking relief, and it is intimated that some citizen of Seattle, now engaged in public life, may have hit upon a satisfactory solution.

The contest has aroused a great deal of interest by the public. Six to eight letters are published daily in the columns of the *Times*. Some fantastic and impractical solutions have been suggested, but most of them indicate that patrons of the railway have devoted earnest thought to the transportation question. Most of the letters agree that the jitney bus must be eliminated. Many suggest that the fare be left as it is, or reduced, and the expensive transfer abolished or be issued only upon additional payment.

Chicago Traction Commission Report Said to Be Completed

The plans of Mayor Thompson's traction commission for the construction of a subway system in Chicago and the creation of a local transportation district governed by five trustees are reported to have been completed at an executive session of the commission on Dec. 20.

The Mayor is said to have put his unqualified approval upon the eight months' work of the commission's lawyers and engineers. The plans are in the hands of the printer. They are expected to be made public within the next week or two.

It is understood that George W. Jackson, the commission's subway engineer, recommended two subway plans. The one approved by the commission includes two lines radiating diagonally southeast and northwest from the loop district under Ogden Boulevard and Milwaukee Avenue, respectively. The other scheme contemplates the building of 18 miles of subway and underneath Ashland Avenue, which is a north and south street not passing through the loop, to run from Lawrence Avenue on the north to Sixty-third Street on the south, with a main tube under Madison or Washington Street connecting this to the loop.

News Notes

One-Cent Ride Over Bridge.—Shuttle service over the Williamsburg Bridge, New York, at a 1-cent fare is a new plan suggested by Grover A. Whalen, commissioner of plant and structures. The 1-cent fare seems unlikely, but there is possibility that the charge for the trip will be three tickets for 5 cents.

Speakers' Bulletin No. 4 Issued.—The Illinois Committee on Public Utility Information, Chicago, has issued Speakers' Bulletin No. 4, the fourth of a series of printed pamphlets designed to supply information and give suggestions to those who would speak in behalf of the public utilities. Bulletin No. 4 deals with the subject of the "regulation of public service companies—just and reasonable rates."

Service-at-Cost a Real Success.—A unique service-at-cost scheme has been put in operation in Dallas, and according to all reports this plan has been successful. The "rolling stock" consists of non-perishable groceries. "Replacements" of bacon, flour, etc., are in the hands of Conductor Woodson, with Mrs. Woodson assisting in the operation of the business. This co-operative cafe-grocery was opened on Nov. 15 at the East Dallas carhouse. The plan behind it is service-at-cost. The cafe-grocery was established as a result of the insistent demand that employees be relieved of the necessity of patronizing inferior places where high prices prevailed. Purchases are limited to company employees and their families. In discussing the new enterprise Mr. Crampton, superintendent of the safety and efficiency department, said: "The cafe-grocery is operated wholly in the interests of employees. No effort will be spared to make its service of the highest quality and at the most economical cost."

Algiers-Gretna Men Again on Strike.—The conductors and motormen of the South New Orleans Light & Traction Company, New Orleans, La., operating between Algiers, Gretna and several small towns on the upper side of the Mississippi River, have gone on another strike for an increase in wages. This is the second strike of the men in six weeks. On Nov. 1 the men struck, but returned to work on Nov. 24, under a retroactive wage agreement. At that time a committee named by the Jefferson Parish Police Jury investigated the finances of the company to find out if it should be permitted to increase its fares. The decision was not in favor of the company and accordingly it refused to pay the 45 cents an hour which the men are demanding. The employees involved, about seventy in all, have refused a wage scale equivalent to $96 a month, alleging that it will be impossible for the officials to obtain competent men at that price. The new district attorney and the legal adviser of the police jury of Jefferson Parish have been asked to take steps to bring action against the company to forfeit its franchise.

Christmas Bonus in Los Angeles.—Approximately $60,000 was received by trainmen of the Los Angeles (Cal.) Railway as a Christmas bonus. The awards were made on Dec. 15. They marked the first payment under the company's merit system, established last April. The amount of bonus received by each trainman was based on his efficiency record. A rating of 100 per cent or better each month brought a bonus of $5 for that period so that $40 was the maximum for the eight months the merit system had been in operation. All trainmen who had been with the company six months participated, the total number being approximately 1,500. Of these 90 per cent received the full amount. The merit system of the Los Angeles Railway was established by G. J. Kuhrts, general manager. It is known as the Kuhrts plan. Records are kept of every trainman. Demerits are assessed for discourtesy, careless operation and other offences, but they can be counterbalanced by credits which are awarded for commendations.

Programs of Meetings

Central Electric Traffic Association

The Central Electric Traffic Association will hold its annual meeting in Toledo, Ohio, on Jan. 19 and 20.

Central Electric Accounting Association

The Central Electric Accounting Association will hold its meeting in Dayton, Ohio, on Jan. 22, 1921.

Central Electric Railway Association

The Central Electric Railway Association meeting will be held on Jan. 27 and 28. The place has not yet been decided upon and the program is not definitely arranged.

Financial and Corporate

Purchase Vote Jan. 1

Council Accepts Offer of Mackenzie Interests for Sale of Light Plant and Radial Railway

The City Council of Toronto, Ont., has accepted the proposal for the sale of the Toronto Electric Light Company and the Toronto & York Radial, Metropolitan and other railway lines within the city limits. The balance of the properties are acquired on behalf of the city of Toronto and all other Ontario municipalities embraced in the hydro-electric power and radial systems. The necessary by-law providing for $10,000,000 of bonds, being the city's share of the purchase price, will be submitted to the ratepayers at the municipal elections on Jan. 1.

The by-law providing for the raising of $500,000 for the use of the Transportation Commission to purchase and operate motor buses was withdrawn, as it is understood that the necessary legislation has been promised by the Ontario Government without the necessity of obtaining the sanction of the ratepayers.

DINNER TO SIR ADAM

After the Council had adjourned an informal dinner was tendered to Sir Adam Beck by the Council at the King Edward Hotel, when he was presented with a magnificent loving cup. At the dinner Sir Adam Beck predicted that the 1,000,000 hp. which will be the capacity of the Niagara plants when the Chippawa development is completed will be entirely absorbed within a reasonable number of years.

In connection with the railway question, Sir Adam stated that a single fare is to be established on the Scarboro and Mimico divisions of the Toronto & York Radials. Yonge Street through North Toronto is to be improved and the Metropolitan section on that street is to be double-tracked. An up-town terminal for the Hydro-radials is to be acquired at a point near the city hall. Passengers coming into the city from the Scarboro division would be enabled to transfer on the one fare to the proposed fast line to be constructed along the water front on the property of the Toronto Harbor Commission.

It is understood that the city of Toronto alone acquires the plant and properties of the Toronto Electric Light Company and also that section of the Metropolitan Division of the Toronto & York Radial Railway's line lying within the city limits on Yonge Street.

The purchase price of the Toronto Electric Light Company's distribution system within the city is $7,226,295 and the price of the Metropolitan line is $585,000, making a total of $7,811,295, which is to be paid for by the assumption by the city of Toronto of 6 per cent bonds against the property of the Toronto Electric Light Company to the extent of approximately $840,000 and the issue by the city of 6 per cent bonds to the extent of the balance.

The city of Toronto, however, is to transfer to the Hydro-Electric Power Commission the right-of-way and physical assets it now owns with the city on the Kingston road to the Woodbine and on the Lake Shore road from the Humber River to Sunnyside.

It is expected that the necessary by-laws will be at once prepared and submitted to the ratepayers of Toronto at the municipal elections on Jan. 1 next.

All the other properties are acquired by the commission for and on behalf of the city of Toronto jointly with all the other municipalities who now own the Ontario hydro-electric power system of generation, transmission and distribution.

Abandonment Authorized

The Ohio Public Utilities Commission, on Dec. 16, issued an order authorizing the Southeastern Ohio Railroad to abandon its tracks and discontinue its service in Zanesville, Ohio, from Sixth and North Streets in that city to the Mill Run station of the Ohio River & Western Railway, a distance of approximately 1 mile. The order is effective Dec. 31 and follows the application of the company for such authorization.

The finding of the commission was as follows:

1. That said tracks have been in operation for more than five years next preceding the date of the filing of the application herein.
2. That the service upon said division was maintained during the fiscal year ended June 30, 1920, at an actual operating cost of $11,318; that the revenues arising from the operation of said division during said period was $8,533, and that the actual deficit for operating said division during said period was $2,782.
3. That the continued operation of said division would jeopardize the successful operation of remainder of the applicant's system.

$6,234,141 Knoxville Value

Investigating Engineers Report This Amount to Tennessee Commission as Historical Cost

The report on the appraisal of the property of the Knoxville Railway & Light Company, Knoxville, Tenn., prepared in accordance with order of the Tennessee Railroad & Public Utilities Commission, was filed on Dec. 19, 1920.

TWO APPRAISERS FILE JOINT REPORT

The appraisal was made by Albert S. Richey, representing the State, and J. H. Perkins, representing the company. The city of Knoxville also had a representative, W. H. Weiss, but he failed to concur in the report as filed by the other representatives. It is understood that he will prepare a separate report.

OVERHEAD COSTS OF KNOXVILLE RAILWAY & LIGHT COMPANY

	Original Cost Basis		Reproduction Cost Basis	
	Railway, per Cent	Lighting, per Cent	Railway, per Cent	Lighting, per Cent
Engineering and superintendence	6.0	6.0	7.5	7.5
Franchises	0.25	0.25	....	....
Law expenditures	0.50	0.5	1.0	1.0
Interest during construction	5.0	5.0	8.0	8.0
Injuries and damages	0.5	0.5	0.5	0.5
Taxes	0.35	0.35	0.35	0.35
Miscellaneous before construction	5.0	4.0	5.0	4.0
Miscellaneous during construction	2.0	1.0	2.0	1.0
Working capital	$165,000	$160,000	$165,000	$160,000
Cost of financing	$255.508		$533,787	
Development cost on 7 per cent return	$314,268	....	....	......

The engineers representing the State Commission and the company found that the value of the property based on an inventory as of July 1, 1920, was $6,234,141, under the original or historical cost basis, divided $4,203,247 to the railway department and $2,030,894 to the lighting department. Exclusive of unamortised superseded property, which was found to be $554,207, the investment totals $5,679,934, of which $3,738,351 is credited to the railway and $1,941,583 to the lighting department.

On the reproduction cost basis, using prices current during the first six months of this year, with a deduction for accrued depreciation or lack of newness, so called, amounting to $1,967,522, the value determined upon was $10,362,964, of which $6,992,986 was found to be represented by the railway and the balance, $3,369,978, by the lighting department.

STATEMENT OF HISTORICAL VALUE

The historical or investment value found checks within 2.35 per cent of the actual money put into the property by the present owners. The actual expenditures since acquisition Sept. 1, 1905, total $6,087,600, divided as follows: at the time of acquisition, $1,770,950; underlying securities assumed, $1,150,000; property additions from that time to the date of appraisal, $3,166,650. Additions to the physical bases under each of the two methods used were made for the usual overhead expenses in addition to superseded property as shown in above table.

The engineers also found that to bring the property into a state of normal operating efficiency as of July 1, 1920, it would take an additional expenditure of $235,000 in the railway and $45,000 in the light department.

The State Commission in its order had requested that a segregation be made of the renewable or depreciable property to determine the proper allowance for renewals and replacements. The engineers found that the original cost of the renewable property was $4,012,420 and that on the reproduction basis it would be $8,422,596.

REPLACEMENT ALLOWANCE SHOULD VARY

The engineers believed that $150,000, or approximately 3.75 per cent of the cost of renewable property, would be a proper annual allowance for the renewal and replacement reserve. However, they stated that such annual percentage allowance should be varied from time to time so that the reserve may never be greater than 6 per cent nor less than 2.5 per cent of the original investment in renewable property of the company.

Suit for Restoration Brought at Columbus

Pages in the past history of the Columbus Railway, Power & Light Company, Columbus, Ohio, were turned back and aired on Dec. 7, in the courts of Franklin County, when a cross petition was filed in the Augusta Slaymaker suit, which was originally brought some time ago, by the present board of directors of the company.

Unlawful diversion and misuse of corporation funds are charged in the cross petition, which, as in the Slaymaker original petition, is directed against all the old directors of the company, but more specifically against the E. W. Clark Company, the E. W. Clark Management Corporation, Clarence M. Clark and their associates.

The Slaymaker suit sought to compel an accounting from the Clark interests. The case was filed in January, 1919, and is now proceeding before a master commissioner in the county courts. Through the cross petition the present directors of the Columbus Railway, Power & Light Company hope to recover the sum of $3,728,952.

The cross petition avers that at the dictation of the Clarks and their representatives the company tried to surrender its franchise and that this action cost the company $209,032 in revenue because many persons refused to pay fares. Other charges are made in the bill.

Almost coincident with the filing of the cross petition the Columbus Street Railway Home Rule Association, of which former Mayor George S. Marshall is president, announced that steps were being taken toward submitting to the Legislature a bill which would, if passed, terminate so-called perpetual franchises, such as the Columbus company claims to hold with respect to several local lines. The association would have the perpetual franchises terminated at the same time the blanket franchise held by the company expires on March 4, 1926.

Underlying Companies Win

Superior Court Decides Commission May Not Interfere with P. R. T. Rentals to Subsidiaries

The Superior Court of Pennsylvania, as noted briefly in the ELECTRIC RAILWAY JOURNAL for Dec. 18, page 1261, has handed down a decision practically denying the right of the Public Service Commission to concern itself with the question of the rentals paid by the Philadelphia Rapid Transit Company to its subsidiaries.

THE COMMISSION ORDER DENIED

The opinion in the case was written by Judge Head. He denies the order of the commission requiring the underlying companies to file answers to averments made by the United Business Men's Association with regard to the rentals of the underlying companies. The court said:

> The contracts in question cannot be attacked before the administrative body with the avowed end of having the rentals therein provided reduced to such sum as the Public Service Commission may determine should have been the rentals provided for. A very learned argument was advanced by one of the counsel for the intervening appellee to prove that all, or nearly all, of these leases were absolutely void because the makers of them, themselves being lessees, had exceeded their lawful power in fixing the terms of the lease Such an argument might well be addressed to the highest court in the land, and it seems manifest that a decree, striking down these leases on the purely legal grounds advanced in the argument, would be an exercise of the highest judicial power and authority. We are unable to perceive how it can be seriously urged that upon the complaint pending before the commission, that administrative body could be successfully asked to enter a judicial decree of the magnitude and character indicated.
>
> The commission has ample power, without doing violence to any legal principles, to compel the rendition of adequate service at fair rates over the property owned by the appellant companies, and there may come a time soon, without attempting to overstep its power, when it may with propriety take action, the result of which would very seriously affect the rentals under the contracts in question. But, as we view the case no ground is presented here for the action of the commission sought for in the complaint filed.
>
> We are of the opinion the order complained of was unreasonable and unnecessary, and that as to the present appellants the complaint of the intervening appellee (United Business Men's Association) should have been dismissed. A similar order to the one we now enter will be made in each of the other appeals.

CONTRACTS SECURE FROM INTERFERENCE

On the one hand, the court said it was not prepared to accept as sound the broad proposition of counsel for the appellants that the Public Service Commission has no jurisdiction over the underlying companies. On the other hand, the court said that the Public Service Commission, in ascertaining a fair value of the property of the Philadelphia Rapid Transit Company, should not necessarily be obliged to consider the private contracts between the operating company and its lessors, the owners of the property. On this point the court said:

> As between the parties who made them these contracts are as secure from interference as those of other citizens. But the public was no party to those contracts and no stipulation therein contained, for the benefit of one or the other of the parties thereto, can deprive the public of its paramount right to reasonably adequate service at a reasonable rate.

In September, 1919, the Cliveden Improvement Association filed complaint with the Public Service Commission that the Philadelphia Rapid Transit Company was seeking to have its rates of fare increased when such increase was not necessary. It desired the commission to prescribe a 5-cent fare, with universal free transfers in all sections, and that an order be made on the company to set aside certain sums annually for maintenance or renewal of the facilities of the company to enable it to render adequate public service. Further, that the company be ordered to expend a sum of $1,000,000 yearly on extensions, until all of the city had adequate service. An answer was filed by the operating company.

In February, 1920, the United Business Men's Association asked leave to intervene and filed a new complaint alleging inability of the railway to render adequate service at reasonable rates, resulting from the fact that it was but lessee of most of the property it operated and by reasons of terms of underlying companies it was compelled to pay exorbitant rentals to the underlying companies, the real owners. The association asked that the commission inquire into the fairness of these terms of their agreements with the transit company and their leases, and, if necessary, reduce the rentals.

Judge Keller, who dissented, said that the appeals of the underlying companies should be quashed, as the order to answer made by the commission "is not such a finding as may be appealed from."

More Than $1,000,000 for Taxes Alone in Cleveland

Increased taxes are going to take a considerable part of the gross receipts of the Cleveland (Ohio) Railway and of other public utilities operating in Cleveland, according to figures just made public by John A. Zangerle, Auditor of Cuyahoga County.

As a result of an increased rate, approved by the voters at the November election, the Cleveland Railway will have to pay $70,943 more on its real estate and personal property this year than it did a year ago.

This increase will fall upon the Cleveland Railway in spite of the fact that the company's valuation has been reduced more than $4,000,000 by the State Tax Commission. The valuation on which the company will pay its taxes in Cleveland this year is $26,657,850. The total county taxes paid by the company for this year are $649,413. Including the state excise tax of 1.2 per cent, and the federal income tax, the Cleveland Railway's total tax bill for 1920 will exceed $1,000,000.

In all, by reason of the increased tax rate and higher valuations, public utility companies in Cleveland, exclusive of steam railroads, will have to pay $532,783 more taxes on their real estate and personal property during the coming year than they did during the past year. Of this sum the Cleveland Electric Illuminating Company alone will have to pay $231,023.

Only 74 Miles Left

Shore Line System of 246 Miles Reduced Through Abrogation of Leases and Sales

Many changes have been made in the corporate affairs of the Shore Line Electric Railway, Norwich, Conn., under the receivership. These changes, coming singly and at intervals separated sometimes by months, have naturally left some doubts as to the present status of the company.

The road originally consisted of 246.28 miles, both owned and leased. Of these the leased lines, consisting of 107.45 miles, were operated by the receiver for six months and then turned back to the Connecticut Company by annulling the lease.

EFFORT TO RESTORE PART OF LINE

Of the original system the receiver on Dec. 12 was operating 74.17 miles. In the case of 64.66 miles the track material has been sold to be dismantled and about 8 miles have actually been dismantled. An effort is now being made by the people along the line to purchase the track material from the second-hand dealers to whom it was sold and to purchase from the receiver the other part of the property necessary to continue operations on 47.61 miles of track or, to be specific, that portion of the road between New Haven and Chester.

The Shore Line Electric Railway went into the hands of R. W. Perkins as receiver on Oct. 1, 1919, by petition of its stockholders. The same receiver was later appointed under an action brought by the trustee under the mortgage, the two causes being joined. There has been no foreclosure sale, but the property is in process of liquidation. No receiver's certificates have been issued.

The outstanding capital stock at the time of the receivership was $1,000,000; the funded debt, $6,700,000, and the floating debt, $1,600,000, this sum including matured interest and rent unpaid.

P. R. T. Shows Surplus for November

In its report for November, 1920, the Philadelphia (Pa.) Rapid Transit Company shows a total operating revenue of $3,726,376 or 22 per cent over the corresponding month last year. With expenses including payment of full wages for the month the operating income is $1,192,200 against $1,032,844 for November, 1919. After deducting fixed charges the net income amounts to $372,926 and subtracting a 5 per cent return on P. R. T. stock the company shows a surplus of $247,926. In its eleven months' operation the net income decreased 49 per cent over the same period a year ago. In submitting its report the company makes the following comment:

"The November net income $372,926, as shown, is larger than will be the monthly income during the six-month period of the fare authorization to April 30, 1921; the coming winter months, January to March, represent the period of lightest travel and heaviest expense. The net income for November, $372,926, will, it is expected, be increased during the six-month period to April 30, 1921, to a net income of about $1,000,000, nearly all of which amount will be necessary to pay the back wages of the men in the train service."

Net income $858,306, as shown, includes $485,379, net income January-October, inclusive, which was expended in improvements to cars, center exits, etc.

INCOME STATEMENT PHILADELPHIA RAPID TRANSIT COMPANY

Month Ended Nov. 30:		1920	1919	Percentage Change Over 1919
Operating revenue		$3,726,376	$3,055,953	22.0
Operation and taxes (Includes payment of full wage scale for the month)		2,589,132	2,065,139	25.2
Operating income		$1,137,244	$990,814	14.7
Non-operating income		54,956	42,029	30.7
Gross income		$1,192,200	$1,032,844	15.4
Fixed charges		819,273	813,854	0.7
Net income		$372,926	$218,989	70.5
5 per cent return on P. R. T. paid in capital—One month		125,000		
Surplus		$247,926		
Eleven Months Ended Nov. 30:		1920	1919	Percentage Change Over 1919
Operating revenue		$34,917,705	$32,216,937	8.4
Operation and taxes		25,594,733	22,094,180	15.9
Operating incme		$9,322,972	$10,122,756	—7.9
Non-operating income		531,266	483,341	9.9
Gross income		$9,854,238	$10,606,098	—7.1
Fixed charges		8,995,932	8,923,349	0.8
Net income		$858,306	$1,682,748	—49.0
Deferred wage adjustment—Period to Oct. 31	$903,735.84			
5 per cent return on P. R. T. paid in capital—Eleven months	1,375,000.00	2,278,735		
Amount by which gross revenues are insufficient to provide for operating expenses, taxes, fixed charges, and the 5 per cent return upon P. R. T. stock		$1,420,429		

Financial News Notes

Receiver for Vermont Road.—H. J. Volholm, retired merchant and trustee of the Capitol Savings Bank & Trust Company, has been appointed receiver for the Barre & Montpelier Traction & Power Company, Montpelier, Vt., on the petition of the Westinghouse Electric & Manufacturing Company and others. Under the order of the chancellor cars will be run at least until Jan. 3.

South Morgantown Line Taken Over.—The Union Traction Company, recently organized by Morgantown citizens, has taken over the lines formerly operated by the South Morgantown Traction Company and expects to operate such lines in the future. The new company has a capital stock of $50,000. The incorporators were James H. McGrew, A. J. Barlow, Frank Cox and George C. Baker.

Subsidy Defeated at Gloucester.—The outstanding issue of the recent election at Gloucester, Mass., was whether or not the voters would accept or reject a proposition to pay not less than $20,000 annually if a deficit should ensue for operating the Eastern Massachusetts Street Railway between Rocky Neck and Lanesville. This service was cut off on June 20 and jitneys were substituted. The proposition was rejected, 4,492 voting against it and 1,001 voting yes.

Tacoma Municipal Road Still Losing.—The Tacoma (Wash.) Municipal Railway showed a deficit of $4,614, for the month of October, according to a report recently filed by City Comptroller John M. Roberts to the City Council. The road failed to pay operating expenses by $1,566, to which is added charges for interest, depreciation and gross income tax. The deficit during the operation of the line now totals $137,944, of which $29,516 is for this year's operation. The operating revenues for October were $11,624 and the operating expenses were $13,191.

Order Sought to Sell Road.—Judge Mouser has approved a report from George Whysall, receiver of the Marion (Ohio) Suburban Railway, of date of Dec. 6, wherein the receiver asks the court for authority to dispose of the property of the company at the best price obtainable. The court has ordered the receiver to have the property appraised and sold to satisfy a judgment for $329 obtained against the company in the court by Charles W. Leffler, and others, Sept. 11, 1920. The receiver states that in his opinion there is no present possibility of the line being operated, and calls attention to the fact that the City Council by ordinance adopted, June 16, 1920, ordered the tracks removed from the streets.

Traffic and Transportation

Public Must Decide

J. P. Barnes Puts Louisville Traction Problem Squarely Up to People—Plans to Cut Service

Electric railway service in Louisville, Ky., will be drastically curtailed beginning Jan. 1, 1921, unless steps are immediately taken by the city authorities to relieve the financial condition of the Louisville Railway. James P. Barnes, president of the company, has announced that the railway can no longer continue to furnish service of the present quality at a nickel fare, and that a program of retrenchment is imperative to preserve the city's transportation system. He therefore proposes to close the smaller of the two power stations, thus reducing rush-hour service approximately 25 per cent. It is also proposed to restrict the transfer privilege and to reduce general schedules.

Failure on the part of the City Council to cope with the local traction situation is responsible for the company's present plight. Although the granting of a higher fare has been repeatedly urged, the Council has taken no definite action. Three ordinances, providing for a 7-cent fare in one form or another, have been introduced, but there is little prospect of the enactment of a constructive measure in the near future. The Council is apparently seeking to avoid putting itself on record on the question.

Unsuccessful in its efforts to secure a higher fare from the Council, the company has appealed directly to the public. Mr. Barnes has addressed an open letter to the people of the city in which he puts the settlement of the traction situation squarely upon their shoulders. "January 1, 1921, must find your street car service on one road or the other—relief or retrenchment," says Mr. Barnes, and continues, "The decision rests with you through your representatives in the City Council. Which road shall we take?"

In his open letter, published in the Louisville newspapers in the form of an advertisement, Mr. Barnes declares that "the experience of the last five months demonstrates that we cannot continue, on the present basis of operation, to give you even as good service as you are getting now." He names many prominent citizens and nine civic and business organizations as favoring a square deal for the railway. Mr. Barnes' summary of the alternatives which confront the Louisville system is published above.

"RELIEF"

Which road is taken is a matter of vital interest to you. You must make the decision. Twentieth Century sentiment is agreed that the needs of those served by a public utility shall have first consideration. You must decide what is your best interest. Whatever your decision, my efforts always will be directed to giving you the best service we can for the fare paid. But, that you may be fully advised, before you make your decision, I am directing this open letter to you.

The road "Relief" is paved with a higher fare and leads to satisfactory and efficient service, the kind of service a growing community should have. At present that road is blocked, but you, through your representatives in the City Council, can remove the obstruction. Adoption of an ordinance permitting us to charge a higher fare will open that road and it will not be necessary to take the "Retrenchment" route.

If we are compelled to adopt a policy of retrenchment we shall not be able to give you the kind of service we want you to have, or to which you have been accustomed. We will scrupulously observe all franchise requirements and will not neglect the public safety, but it will be necessary for us to effect such economies as will enable us to operate safely within our income.

"RETRENCHMENT"

A policy of "Retrenchment" will require the closing of the Campbell Street Power Station, which, though good of its kind, is not efficient, measured by present-day standards. This will necessitate a reduction in service, because our power supply with the Campbell Street Power Station closed is sufficient to operate only about 75 per cent of the cars now run during rush hours.

Closing the Campbell Street Power Station and the consequent reduction of service will throw out of employment about 200 of our men.

We will be unable to effect the entire operating economy necessary under a policy of retrenchment without largely modifying and restricting the present universal transfer system.

I know this deficient service is not the kind you want. I believe that the great majority of Louisville citizens want the best possible street car service. I am assured by people in all walks of life that this is true. I believe you want us to take the road marked "Relief." I believe you are convinced that the good of your city demands relief for your street car service. These representative citizens among others have assured me that they favor immediate relief for the Louisville Railway Company and have authorized me to use their names in this letter to you.

LOUISVILLE'S PROBLEM AS OUTLINED BY MR. BARNES

Transfer Charge Authorized

The Public Service Commission of Indiana on Dec. 18 authorized the Indianapolis Street Railway to charge 1 cent for each transfer. This transfer charge was made effective Dec. 20, for a period of seventy-one days. It is intimated in the order that further relief will be granted if this does not prove sufficient. The basic 5-cent fare is retained. The railway had petitioned for a 2-cent transfer charge, and hearing on this petition, as well as a supplementary petition in relation to increased charges for track rentals and terminal facilities furnished to interurban companies, were held before the Commission.

Will Continue Service

Connecticut Company Will Not Stop Cars in Waterbury at Present—Fare Reduction Refused

Despite a daily loss of $400 on its Waterbury city lines, the Connecticut Company will continue service in Waterbury for the present, according to Lucius S. Storrs, president of the company. The daily receipts from the local lines during the ten-day trial period agreed upon at a recent hearing before the State Public Utilities Commission were only about $4,000. Connecticut Company officials maintain that at least $4,400 is required to meet the operating expenses of the Waterbury Division. It is expected that an application for further restriction of jitney operation will be received by the Board of Aldermen from the company in the near future.

The Public Utilities Commission has rejected the petition of the Hartford City Council for reduced rates for factory workers, shoppers and insurance employees. The commission has also rejected a petition of the city of New London for a fare lower than the straight 10-cent fare now charged. The orders containing the commission's decision are signed by Chairman R. T. Higgins and Commissioner Joseph W. Alsop. There is attached to each order the following note signed by Commissioner C. C. Elwell, who dissented from his colleagues previously when they approved the fare increase to ten cents:

"I can see no reason at this time for granting a lower rate of fare for the city of Hartford (or for the city of New London) than has been established on other lines of the Connecticut Company and therefore concur in the conclusion denying the petition."

MUST GIVE GOOD SERVICE

While refusing trolley service at lower cost, the commission in its order calls upon the company to give the public satisfactory service. In this connection the commission says: "With the installation of the maximum 10-cent flat fare, however, the respondent is warned and directed to supply adequate and dependable service as far as possible within the ultimate limitation of its physical and financial powers."

The commission states in its references to the Hartford petition that the crucial problem at this time is to establish a temporary maximum rate to enable the company to continue to operate its cars until a more definite and equitable policy is determined, following possible legislative action. The commission states in regard to the New London petition that having prescribed a 10-cent rate for other cities it finds no dominating reason why a distinction should be made in this case.

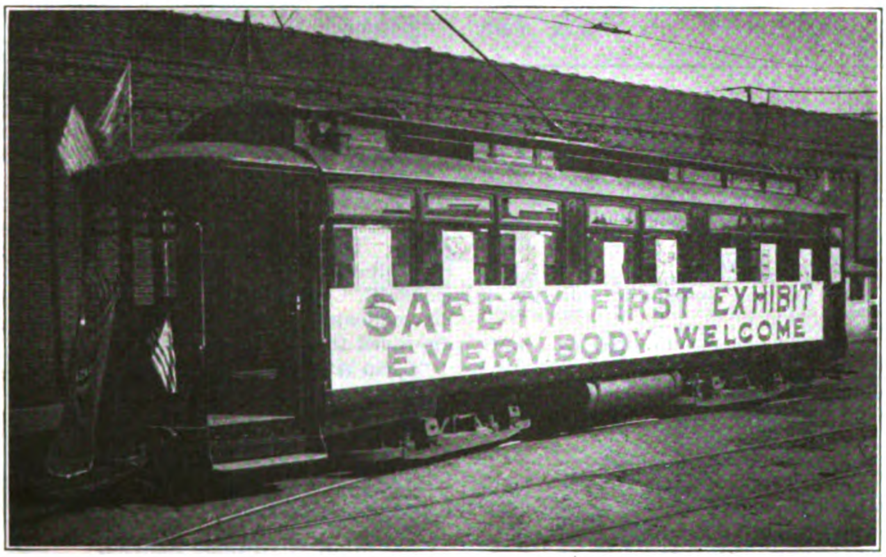
The fare on the Connecticut Company's lines between Hartford and Manchester has been reduced from 30 cents to 20 cents and the short or middle zone has been eliminated. Announcement to this effect was made by the Board of Selectmen of the town of Manchester.

Unique Safety Exhibit

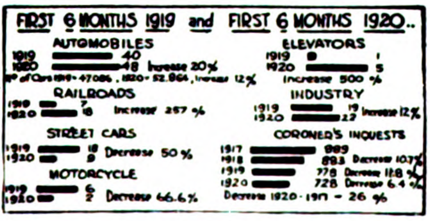
United Railways of St. Louis Equips Special Car to Teach Cost of Accidents

The United Railways of St. Louis, Mo., in an effort to further the "safety first" campaign of the Central Mississippi Valley Division of the National Safety Council, has equipped one of its special cars with an exhibit of artistic posters and other data, prepared for the most part by pupils of St. Louis public schools, on accidents, their causes and results. The exhibit is intended as a pointed warning to pedestrians and vehicle drivers of the uselessness and great economic waste of carelessness.

The seats have been removed from the car and the posters and placards arranged along both sides of a rack extending the length of the car. At the front entrance is a map of St. Louis prepared by the Safety First Bureau of the St. Louis Chamber of Commerce, in which are push-pins and thumbtacks, showing the number and location of accidents during the month of August, 1920. The type of accident is indicated also, the color of the push-pin showing whether the accident was fatal, caused an injury or merely resulted in property damage. At the end of each month a photograph of this map is taken by the Safety Bureau and filed among its records.



SAFETY-EXHIBIT CAR USED IN ST. LOUIS



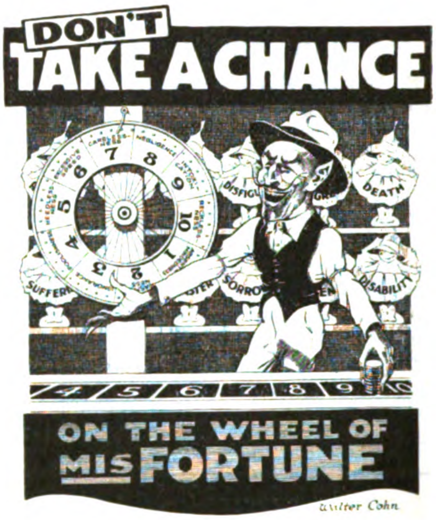
Almost every kind of accident that could happen in traffic is touched on either in the posters or in placards, in all of which gross carelessness is shown as the underlying cause. Employees of the company distribute copies of the city traffic ordinances, rules and regulations and pamphlet warnings to guide the readers safely through the maze of downtown vehicular traffic.

The exhibit was first shown to the public on a dead track in the heart of downtown St. Louis and proved to be of much interest to the public. As long as the car remained there the exhibit was constantly visited by large crowds. Later the exhibit was brought to the vicinity of various public schools, the principal of each school being notified when the car would be near his school. All the principals have arranged to have every child in their schools visit the exhibit. Wherever the car has gone it has aroused a great deal of interest and officials of the Safety First Bureau consider it one of their most effective means to educate the public to the value of the "safety first" idea.

The number of accidents involving the company's cars has shown a marked decrease. During the first six months of 1920 nine persons were killed in electric railway accidents in St. Louis, against eighteen for the same period of 1919. In September, 1919, there were four fatal accidents, two of the victims being automobilists who had head-on collisions with electric cars, while the other two were pedestrians. In September of the present year there was only one fatality, the victim being an automobilist whose car collided with a trolley car.

Just what an accident outside the collision class may mean to the United Railways was strikingly brought home to the employees in a recent memorandum sent by Colonel A. T. Perkins, general manager for the receiver, to H. O. Butler, superintendent of transportation. Colonel Perkins said:

> On the general claim agent's report to me for Oct. 2, covering settlements made on Oct. 1, is the following:
>
> Julius Rohde, $3,250.
>
> This man was a passenger on a rear platform and was thrown from the car as it rounded the curve, conductor having left the rear door open. He is sixty-eight years of age and sustained a fractured skull and a severe injury to the right shoulder and left leg, resulting in a permanent impairment of these members of the body. . . .
>
> The settlement of $3,250 alone will take the net income on the August, 1920, basis, from 2,321,430 passengers. Or, taking it another way, it will take all the net income from 40,625 car hours. If a car should be in the service sixteen hours per day, every day steadily without being in for repairs, it would take it seven years to pay the amount of this settlement.
>
> I suggest you put the above facts before your superintendents, foremen, and supervisors. We cannot keep in our employ men who are going to waste life and property, and who are going to destroy the resources from which their fellow-employees can be paid, in this manner. Our officers must watch this hereafter with the greatest care.



A CAMPAIGN POSTER

DON'T JAY-WALK
STOP LOOK LISTEN
SAFETY FIRST
WAS DADDY HURT MUCH?

INTERIOR OF EXHIBIT CAR

Sweeping changes in the present system of handling traffic on the city streets and dealing with those apprehended for violating the traffic rules and regulations will be recommended to the Board of Aldermen within a short time by City Counselor Charles H. Daues. It is reported that a new traffic ordinance is being prepared for submission to the Board of Aldermen.

Milwaukee Case Remanded

Wisconsin Supreme Court Defines Interurban Service as Service Differing in Kind from City Operation

In a decision handed down on Dec. 14, in the case of the city of Milwaukee vs. the Milwaukee Electric Railway & Light Company, the Supreme Court of Wisconsin defined passenger street car service and passenger interurban service upon a basis of difference in the service rendered while operating within city limits, rather than upon the basis of the origin and destination of the cars.

The decision was on an appeal from an opinion of the Circuit Court of Milwaukee County holding in substance that the defendant company could not operate cars in the city of Milwaukee in connection with its interurban service or deliver freight over its city lines, unless it held franchises for these specific purposes from the city.

The Supreme Court upheld the decision of the Circuit Court that the city of Milwaukee was entitled to an injunction restraining the company from carrying freight across city limits without first obtaining a franchise. Judgment was reversed and the case was remanded for a new or further trial, however, in order to determine whether the company is rendering interurban service within the city as now defined by the Supreme Court, and, if so, on what lines and between what points. The rendering of such a service by the company would presumably necessitate the company obtaining an interurban franchise from the city.

CITY ASKED INJUNCTION

The case originated about three years ago in the contention of the city of Milwaukee that the Milwaukee Electric Railway & Light Company was making a use of the city's streets not warranted by its franchise, in that it was operating an interurban service and carrying freight. The city contended that additional franchises were necessary for these purposes. An agreement not being reached, the city asked for injunctions restraining interurban and freight traffic. These were granted on Jan. 13, 1920, after a trial of the action by the Circuit Court of Milwaukee County. A ninety-day stay of proceedings was granted by the court on Feb. 5, 1920, pending efforts by commercial and civic organizations of the city to obtain an amicable adjustment. When this failed, interruption of interurban traffic was prevented by the State Supreme Court issuing a stay of execution in the case, exercising its right of original jurisdiction. The entire matter was then brought before the Supreme Court for review.

In its original opinion the Circuit Court defined an interurban passenger as one whose passage starts at a point within the city for a destination outside of the city limits or vice versa. Based upon this definition of an interurban passenger, it found that interurban service was rendered wherever an interurban passenger was carried. In this it seems to have followed the reasoning adopted by the Wisconsin Supreme Court in previous similar cases which have come before it.

In the present case, however, the State Supreme Court decided to define passenger street car service and passenger interurban service upon a basis of difference in service rather than upon a basis of the origin and destination of the cars. In defining urban and interurban service the court held as follows:

> Urban surface street car passenger service is the transportation of passengers in suitable cars over the streets of a city operated so as to permit them to enter and leave the cars at reasonable intervals. The initial point from which the car or passenger comes or the point to which they are destined is immaterial. The criterion is the character of the service rendered by the car while on the city streets. If that is an ordinary or reasonable street car service as to fitness of car, rate of speed and frequency of stops for passengers to enter and leave, then while on the city streets such service is street car service though the car may come from or enter interurban service on the same trip.

The court, therefore, concluded:

> The operation upon an urban surface street railway by the owner of the franchise therefor of cars reasonably suitable for street car service, and which give street car service in such manner as the railroad commission may prescribe, or, in the absence of regulations by the commission, give reasonable street car service, does not subject the adjacent property within the city limits to an additional servitude though such cars may start from or be destined for points outside the city limits or be used in strictly interurban service outside of the city limits; and the operation of such cars within the city limits does not require any franchise additional to the urban surface street car franchises.

As was pointed out above, the judgment of the Circuit Court, in so far as it involved the interurban controversy, was reversed and the case was remanded for further trial. This will probably be held within a month from the date of the court ruling.

Service Improvement Sought

Notice has been served on the International Railway and the Buffalo & Lackawanna Traction Company by the City Council of Buffalo, N. Y., that an action will be started to revoke their franchises unless they comply with the city ordinances regulating service and franchise obligations. Among the more important franchise obligations which neither company is complying with is establishment of half hour owl service and ten-minute service throughout the day on all lines. During the war both companies were allowed to curtail unprofitable service.

The matter was brought up in the Council meeting by Frank C. Perkins, the Socialist member of the board, and was adopted, without a vote in opposition.

The City Council has given the two companies no specific date upon which they must start to give service as required by their franchies, but the Corporation Counsel has been authorized to bring suit against the companies to revoke their franchises if proper service is not started within a reasonable period of time.

Seattle Fare Advanced

After Considerable Bickering Emergency Measure Is Put Through Making Rate 8⅓ Cents

By a vote of five to two, the City Council has passed an emergency ordinance providing for the increase of fares on the Seattle Municipal Railway from 6¼ cents to 8⅓ cents, effective in thirty days, or on Jan. 8. Mayor Hugh M. Caldwell has approved the measure.

In the meantime, the payroll for the period ended Dec. 10 was taken care of by payment from the bond interest fund of $250,000. The payroll was $139,000. Payment from this fund prevented the treasurer's office putting the lines on a warrant basis, with a subsequent discount of the warrants from 10 to 15 per cent by the local banks. The situation had become a critical one, with the payroll due, and no funds with which to meet it. Representatives of the union had stated that some of the railway employees had determined not to appear for work unless the warrants could be cashed without discount.

It is possible that the next payroll will be taken care of in a similar manner, although it is considered likely that with the passage of the new fare ordinance, the city treasurer will honor the city's demands, on the assumption that the lines will shortly be on a paying basis.

Persons who bought railway tokens in anticipation of an increase in fare will fail to profit, as the Council has included a provision in the ordinance whereby a new set of tokens will be manufactured. The old tokens will be convertible at the rate of four for three of the new ones.

In order to match the fares on the municipal railway the Seattle & Rainier Valley Railway has filed a new 8⅓-cent fare schedule with the Public Service Commission, to become effective on Jan. 1. The proposed 8⅓-cent fare is effective only within the city limits of Seattle. Transfers to and from the Seattle municipal system are abolished except on cash fare. This is fixed at 10 cents. Under the present schedule, transfers are issued with token fares for the payment of 2 cents additional.

A Small Railway—A Big Job

A transportation stunt performed by the Holyoke (Mass.) Street Railway has only recently come to light though four months have elapsed since its accomplishment. The American Writing Paper Company desired to hold an outing at Riverside Park, about 15 miles from Holyoke, for its employees. At the request of that company the Holyoke Street Railway arranged to transport 6,000 people from Holyoke to the park and return. This entire number was transported from the center of Holyoke and landed in the park within 2½ hours. The first 1,000 arrived there fifty-seven minutes after leaving Holyoke. The job required forty-five fifteen-bench open cars and fifteen semi-convertible cars. With the assistance of the transportation committee of the American Writing Paper Company the crowds were loaded and unloaded with military precision at the rate of 1,000 every ten minutes. On a system operating regularly only about twenty-five cars the handling of the crowd was a real feat in mass transportation. The 6,000 people were handled without interfering with the regular service and without accident of any kind to equipment or passengers. In the words of the American Writing Paper Company the performance was regarded as "a transportation masterpiece" by those who had the good fortune to witness it.

Chamber of Commerce Wants Jitneys Regulated

The special committee appointed by the board of directors of the Chamber of Commerce of Providence, R. I., to investigate the conditions of the jitney service in that city and to ascertain if such service should be regulated, and if so the extent and character of such regulations, has submitted a report recommending that steps be taken to regulate the buses. The report is as follows:

Your committee organized shortly after its appointment and discussed the situation. It was agreed that every member of the committee should independently investigate and report his conclusions at a meeting to be held at the call of the chairman. As a result of this investigation your committee finds:

1. That great necessity exists for the regulation of the jitney service so called in order to protect the safety and convenience of the traveling public of the city of Providence.

2. That such regulations should be made by ordinances or special laws to be passed by the city of Providence.

3. That such ordinances or special laws should provide:

(a) That every person, company or corporation operating a motor vehicle for the transportation of passengers for hire should first file with the City Treasurer a bond with sufficient surety or sureties, based in amount upon the seating capacity of the service of such individual or company to pay all damages to person or property because of the negligent act of the principal named in said bond or his agents, employees or drivers.

(b) That every person operating a jitney as so called should be more than twenty-one years of age and should be obliged to take out a chauffeur's license to be issued only to those who demonstrate their qualifications for the position of driver.

(c) That routes should be established and a time schedule fixed on which the jitney service on such routes should be compelled to operate.

(d) That the enforcement of said ordinances be made a part of the duty of the Police Commissioners of the city of Providence.

Your committee finds that the jitney service as at present operated is extremely dangerous and believes that the public should be safeguarded by the above regulations and others that may be found to be necessary for the same purpose.

By unanimous instruction of the board of directors of the Chamber of Commerce, Clarence A. Cotton, general secretary of the chamber, has transmitted to the City Council a copy of the report of the special committee making recommendations with regard to the condition of the jitney service in Providence. The recommendations contained in the report met with the unanimous approval of the members of the board.

Street Collection in Newark

The Public Service Railway of New Jersey has put into effect a prepaid fare plan to facilitate the handling of passengers at congested points in Newark during the evening rush hour. Agents of the company are stationed at safety isles along Broad Street, in front of railroad stations and at busy points in Market Street. They accept the fare from passengers, issue receipts, and the passengers hand these receipts to conductors in lieu of money. The plan eliminates the handling of money by the conductor, except for transfers, and cars are filled in much shorter time than formerly.

The plan has worked successfully at the company's terminals in Weehawken and Camden. Each receipt will be stamped with the date of its issuance and cannot be used on any other day. If a passenger is unable for any reason to use the receipt after purchasing it he can redeem it at the Public Service terminal. In announcing the new plan the railway used the above advertisement in the Newark papers.

To Street Car Riders

Pay Fares, Get a Receipt
and Save Time

BEGINNING DEC. 10

At heavy traffic points, such as Tube Station, Railroad Stations and Safety Isles

To save time and speed up service during Evening Rush, from 4 to 6:15 Daily

Agents will receive fares before passengers board cars.

Receipts will be issued.

Conductors will accept Receipts in lieu of cash fares.

Change-making delays avoided.

The Get-a-Receipt Plan is working fine at Weehawken and Camden Ferry Terminals

With your co-operation it will SAVE TIME FOR YOU.

Try it, beginning Friday, on your way home.

Receipts good only on date of issue. Unused receipts are redeemable.

Public Service Railway

"AD" EXPLAINING COLLECTION PLAN

Can Legislate Against Buses

According to an opinion submitted by Walter F. Meier, Corporation Counsel, to the City Council of Seattle, Wash., that body now has the right to pass new legislation barring jitney buses from the streets entirely. The report states that the fact that the Superior Court has disposed of the suit against the city by the jitney bus interests clears the way for any action the Council might wish to take, the appeal of the jitneurs to the Supreme Court not constituting a legal bar to further legislation regulating or abolishing the buses, even though the temporary restraining order against the city is still in force.

Councilmen who favor complete prohibition of jitney operation have made no forecast as to what action may be taken by the City Council. In his report, Corporation Counsel Meier informs the Council that if it desires jitneys to continue operation unregulated during the time the appeal to the Supreme Court is pending, it may permit such unregulated operation by refraining from further legislation. On the other hand, if the jitneys are to be regulated, or refused permission to operate at all, there is no legal impediment to the repeal of the present ordinance, and the enactment of an ordinance containing such provisions as may be deemed proper in the premises.

"Readiness to Serve" Rates Suggested

Introduction of the "readiness to serve" principle in connection with the fixing of electric railway rates was suggested by City Attorney P. T. Peterson of Lincoln, Neb., in a brief filed recently with the State Railway Commission. Mr. Peterson took action to oppose an increase in fare by the Lincoln Traction Company from 7 cents to 8 cents, with a 5-cent charge for each transfer. The railway recently petitioned the commission to allow the higher fare as an emergency measure. Hearing on the application began before the commission on Nov. 18.

Mr. Peterson contends that a reduced rate should be allowed by establishing a fare zone with a radius of 1 mile measured from the center of the city. He believes that serious consideration should be given to the matter of a "readiness to serve" charge. This is mentioned in connection with the use of automobiles by persons who seldom use the electric cars. Mr. Peterson asserts that the laboring man who uses railway service every day ought not to have his burden increased in order that the automobile user may have a street car ready on rainy days or days when his machine is in the repair shop. Such a service charge may be worked out, he claims, on a basis of a monthly ticket, to be sold at a reduced price.

Would Raise Zone Rates

The Cortland County Traction Company, Cortland, N. Y., on Nov. 30 asked the Public Service Commission, Second District, for authority to charge a cash fare of 7 cents, and a 6¼ cent ticket fare in each of its zones and to increase the school fare rate from 3 to 4 cents without changes in transfer privileges. The fare is now 5 cents in each zone. Transportation revenues for the past nine months, the company shows, are $83,687. Its operating expenses and taxes amounted to $84,510, showing a deficit in operating expenses and taxes over revenues of $823. The fixed charges amount to $13,288, and the total capital used in the operation of the road on which the company is entitled to a return is $587,791.

Transportation News Notes

Fare Increase Denied.—An application of the South New Orleans Light & Traction Company, Algiers, La., for permission to raise its fare from five cents to 8 cents, has been denied by the police jury of Jefferson parish. The company serves the towns of Algiers and Gretna. The railway's employees recently went on strike for an increase in pay.

Traffic Survey at St. Paul.—The city of St. Paul is planning a comprehensive scheme of expansion for a period of at least ten years ahead. As the zoning system is developed in that city and new districts are made new transportation facilities will be provided. The board planning these improvements will spend $2,000 on a survey of the local transportation requirements.

"Trolley Topics" Revived.—The publication of *Trolley Topics* was resumed on Dec. 15. Hereafter it will appear on the first and the fifteenth of each month. This publication, devoted to the interests of Louisville Railway's employees, makes an appeal for a friendly interest and co-operation "so that a better understanding of our mutual problems may be reached, to the end that the best service may be rendered the public."

Ten-Cent Fare in Sharon.—The Shenango Valley Traction Company, a subsidiary of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, put into effect on Dec. 12 a new schedule of fares as filed with the Public Service Commission of Pennsylvania on Nov. 12. Under the new schedule the cash fare is increased from 7 cents to 10 cents and the ticket rate from six tickets for 40 cents to six tickets for 50 cents, with no charge for a transfer. The lines of the company serve the city of Sharon and the boroughs of Farrell, Wheatland, Sharpsville and West Middlesex, all in Mercer County, Pennsylvania.

Unable to Increase Service.—Preston S. Arkwright, president of the Georgia Railway & Power Company, Atlanta, Ga., has filed with the State Railroad Commission the company's plans for improvements in service required by the commission when it granted the company an increase in fare on its Atlanta lines to 7 cents. At the same time Mr. Arkwright asked that the commission's requirement of a flat increase of 20 per cent in service be modified considerably, stating that the railway is not able to provide the additional equipment required. He further pointed out that the number of passengers hauled by the company was gradually decreasing.

Will Continue 7-Cent Fare.—The Missouri Public Service Commission has granted the request of the United Railways of St. Louis that it be allowed to charge 7 cents for an additional six months. The extension of time will commence Dec. 31, 1920. The ruling applies to lines in St. Louis County and the line to St. Charles as well as to the St. Louis city lines. Rolla Wells, the receiver, in his petition asked that the company be permitted to charge the 7-cent rate until the commission completes a valuation of the company's property. James L. Harrop, chief engineer for the commission, has made the valuation, it is said, but it is being analyzed by company and city engineers. C. E. Smith, consulting engineer of the city of St .Louis, has stated he expects the valuation will finally be settled in court, which will probably require three years.

Will Give Cars "Once Over."—Plans have been mapped out by the International Railway, Buffalo, N. Y., for the systematic overhauling of its equipment. Kenneth R. Lewis, formerly general car inspector of the Hudson & Manhattan Railroad, New York, now superintendent of equipment of the International, has charge of the job. Herbert T. Tulley, president of the International, states that there was no systematic plan for caring for the equipment for some time prior to the time the new management came into control under Thomas E. Mitten. "We have given each car a date for being completely overhauled," said Mr. Tulley. "It will take about two weeks to go through the process. Every car will be inspected as to sills, frames, trucks, wheels and motors and repairs will be made wherever necessary. Cars then will go to the scrub rooms where they will be thoroughly cleaned and then to the paint shops for repainting."

More Time Desired to Install Cars.—Rolla Wells, receiver for the United Railways, St. Louis, Mo., has asked the Public Service Commission to extend until the latter part of next March, the time within which the company must put in service fifty new trail cars. On May 20 last the commission ordered the railway to put the first of fifty new trailer cars in service by the last of November and to continue to put the cars in service at the rate of two each working day until the full quota was in service. Thomas E. Francis, appearing for the receiver, said that the contract to construct the cars was let July 14. A fire on Oct. 11 partly destroyed the plant of company which was building the cars together with a number of cars which were almost completed. Mr. Wells has asked the commission, in addition to extending the time of delivery, to permit the cars to be placed in service at the rate of two a week instead of two a day thereafter.

Jitneys Cause Big Loss.—The Springfield (Mo.) Traction Company is experiencing a serious inroad upon its revenue by unfair jitney bus competition, according to a recent statement by E. C. Deal, general manager of the company. Cash fares for November of this year, he says, fell 54,581 below the same month last year and about the same slump is being experienced up to date this month; in fact a decrease in riding has been noticeable for about six months. This is due to the operation of buses which, the company claims, are improperly routed and thereby are securing business along the car lines while other parts of town suffer for the want of local transportation facilities. The company claims that this unfair jitney bus competition, together with the large wage increase of last June, has reduced the net earnings until the company is in a precarious situation and must take immediate steps to find relief, it being necessary that this relief be realized not later than January 1.

Express Service Pays Well.—Development of the electric express business in the industrial and agricultural territory covered by the Reading Transit & Light Company, Reading, Pa., has proceeded so favorably during the last few years that it has been found necessary to increase the terminal facilities of the Reading Division for this service. Improvements recently completed at the company's property at the foot of Third Street, Reading, at a cost of approximately $5,000, are such that this terminal will be able to take care of increasing business for the next ten years. Nine large double-truck cars and one single-truck car are now used daily to carry on the express business of the Reading Division. In 1917 the equipment consisted of one single-truck car and one combination passenger and express car. Electric freight and express service was put into operation on Oct. 15 on the Lebanon Division of the company. Two trips are made daily between Lebanon and Myerstown, and two between Lebanon and Palmyra. It is planned to extend this service.

City Fare on Interurbans Increased.—Passengers on interurban cars riding into the Public Square of Cleveland, Ohio, will have to pay 10 cents for their ride inside the city limits. This is as a result of the Cleveland City Council authorizing a 10-cent rate of fare to be charged these riders. The Council was told by Street Railway Commissioner Sanders that operation of the interurban cars inside the city limits of Cleveland has been costing the Cleveland Railway $100,000 a year. Several years ago the interurbans obtained passage of an ordinance making it unnecessary for their cars to stop to let off passengers within the city limits. Traffic on the interurban lines, particularly to Akron, Elyria, Lorain and other points west and south of the city is very heavy, and Cleveland Railway officials expect the higher fare to increase the company's receipts very appreciably unless an unexpectedly large number of interurban riders change to the city cars at the city limits. All fares collected on the interurban cars inside the city limits go to the Cleveland Railway.

Personal Mention

Foster Hannaford to Leave Traction Field

Foster Hannaford has tendered his resignation as general manager of the Twin City Rapid Transit Company, Minneapolis, Minn., to take effect on Jan. 1, 1921. On that date Mr. Hannaford will assume the duties of vice-president of the firm of Noyes Brothers & Cutler, a wholesale drug company of St. Paul. Mr. Hannaford's successor with the Twin City Rapid Transit System has not yet been appointed.

Mr. Hannaford is a native of St. Paul. Following his graduation from the Sheffield Scientific School, Yale University, he was employed for two years in the Westinghouse shops in East Pittsburgh, Pa. He then went abroad to round out his technical education, spending a year at the University of Karlsruhe, Germany. Upon his return to the United States he spent a year as superintendent of substations of the Illinois Traction System. He was then appointed chief engineer of the McKinley power station in St. Louis. Later he went to Galesburg, Ill., as operating engineer of the Galesburg Railway, Light & Power Company. He was subsequently made general superintendent of the company. In 1916 he was appointed superintendent of the St. Paul City Railway. Three years ago he became general manager of the Twin City Rapid Transit Company.

New Honor for Mr. May

I. A. May, comptroller of the Connecticut Company, New Haven, Conn., and president of the New England Street Railway Club, has been appointed by Governor Holcomb to be a member of the State Board of Accountancy for a term of three years, succeeding George L. Vannais.

An accountant by profession, Mr. May has earned for himself a reputation as one of the leading authorities on the subject of electric railway accounting. His manual, "Street Railway Accounting," is regarded as the standard on the subject of which it treats. Because of his extensive knowledge of the subject Mr. May has been president of the Connecticut Society of Accountants, ex-president American Electric Railway Accountants' Association and comptroller for the Connecticut Company. He received a C. P. A. degree from the state in 1915.

Mr. Shoup Heads Oil Company

Paul Shoup, president of the Pacific Electric Railway, Los Angeles, Cal., and vice-president of the Southern Pacific Company, has been elected president of the Pacific Oil Company, which has been formed to take over California oil properties of the Southern Pacific. Because of the extensive nature of the Southern Pacific's oil holdings, it was recently decided to segregate the oil and railway properties and to develop the former independently.

Mr. Rolston in Iowa

Resigns as Superintendent of Power, Kansas City Railways, to Join Sioux City Company

William E. Rolston will on Jan. 1 become superintendent of power of the Sioux City (Iowa) Service Company. For the past year Mr. Rolston has served as superintendent of power of the Kansas City (Mo.) Railways, and has been in charge of the extensive reconstruction program of that company's power plant. The department now headed by Mr. Rolston will be combined with the electrical distribution department, and all matters, both generation and distribution, will be handled directly under the supervision of R. W. Bailey, assistant general manager for the Kansas properties, who has jurisdiction over electrical distribution.

W. E. ROLSTON

Before joining the Kansas City Railways in December, 1919, Mr. Rolston was superintendent of power and equipment of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind. He was graduated from the Armour Institute of Technology in 1898. Three years later he joined the Dayton & Troy Electric Railway. During his connection with that company, which lasted five years, he served first as chief engineer of power plant and later as superintendent. In 1906 he became superintendent of power and shops of the Canton-Akron Railway, Akron, Ohio, now included in the system of the Northern Ohio Traction & Light Company.

In the following year Mr. Rolston was appointed superintendent of power and shops of the Cleveland, Southwestern & Columbus Railway, continuing in that position until 1911. He then became general superintendent of the Des Moines (Iowa) City Railway. Later in the same year he was made superintendent of the Inter Urban Railway, Des Moines, in addition to his connection with the city lines. In 1912 Mr. Rolston resigned from these companies to accept the position of superintendent of power and equipment of the Chicago, Lake Shore & South Bend, continuing in that capacity until his appointment at Kansas City.

C. M. Harris Joins Maryland Interurban

C. M. Harris, manager of the railroad shop section, industrial department, Westinghouse Electric & Manufacturing Company, has been appointed vice-president of the Hagerstown & Frederick Railway, Frederick, Md. In addition to operating more than ninety miles of interurban line this company controls and manages several central station properties.

During the past four years Mr. Harris has been in charge of all industrial engineering and commercial sales for the Westinghouse Company, including all steam and electric roads in the United States. Most recently he has assisted in the survey made by the Westinghouse company for the electrification of the main line of the Baltimore & Ohio Railroad between Keiser and Grafton.

Mr. Harris was graduated from Pennsylvania State College in 1901. Shortly thereafter he entered the employ of the Pennsylvania Railroad in the motive power department at Wellsville, Ohio. Leaving the Pennsylvania in the following year, he joined the Baltimore & Ohio as assistant engineer in the motive power department at Baltimore, Md. Two years later he was appointed assistant master mechanic, Mount Clair shops, Baltimore, and in 1906 he was promoted to assistant general superintendent of the motive power department. In 1907 Mr. Harris was appointed mechanical superintendent with charge over all mechanical and electrical work in connection with the building of the union terminal, Washington, D. C.

Mr. Harter Resigns

Russell Harter, assistant to A. C. Blinn, vice-president and general manager of the Northern Ohio Traction & Light Company, Akron, Ohio, has resigned to become vice-president and general manager of the Babcock Ohio Company with headquarters in Cleveland. Mr. Harter entered the employ of the N. O. T. & L. Company as a stenographer in July, 1911. He was later made purchasing agent. Two years ago he was appointed assistant to the general manager.

Board Members Well Qualified

Appointees to Toledo Board of Control Have Public's Confidence—All Active in Civic Affairs—H. C. Truesdall, Chairman

A banker, a manufacturer and an engineer make up the board of control recently appointed by Mayor Cornell Schreiber of Toledo, Ohio, to supervise the carrying out of the new service-at-cost agreement under which the city's traction system is to be operated. Fitness for their work rather than any consideration of a political nature was the chief factor governing their selection. To preserve the non-partisan character of the board it is provided that, while the basic term of the members shall be six years, the first two appointees shall serve for two and six years respectively. Henry C. Truesdall, William W. Knight and David H. Goodwillie, the present members, have already distinguished themselves for their service to the community, and may be said to have the undivided support of the public. Their selection for the important task of bridging the transition from private to quasi-public operation has the approval of the commission which drafted the service-at-cost ordinance and has been well received by the people at large. Operation under the new plan will probably begin Feb. 1.

H. C. TRUESDALL

W. W. KNIGHT

D. H. GOODWILLIE

HENRY C. TRUESDALL is chairman of the board. Mr. Truesdall was appointed for the two-year term. He was born at Monroeville, Ohio, where he attended public school. His higher education was secured at Oberlin College, from which he was graduated with the class of 1894. He later took a law course at the University of Cincinnati, graduating from the college of law of that institution in 1897. He removed to Toledo, where he began the practice of law in conjunction with the firm of Brown, Geddes, Schmettau & Williams. Later he entered the banking business, in which he has been actively engaged for the last six years.

At the present time Mr. Truesdall is president of the Toledo Clearing House Association, vice-president of the Northern National Bank and president of the Union Savings Bank & Trust Company. He is directly interested in several other commercial and industrial enterprises in the city of Toledo and has been an active member of the Chamber of Commerce. Mr. Truesdall was called into conference on several occasions by the Milner commission which drafted the cost of-service ordinance for Toledo, and gave valuable financial advice to the commission.

William W. Knight, appointed for the four-year term, was elected secretary of the board at its organization meeting. Mr. Knight was born in Indianapolis, Ind. He secured his early education in St. Louis, Mo., to which city his parents moved from Indianapolis. After attending Smith Academy in St. Louis, he matriculated at the Sheffield Scientific School, in Yale University, from which he was graduated in 1899 with the degree of Bachelor of Science. Going to Toledo he entered business with the firm of Reynolds Brothers, grain merchants. He remained with that company for five years, and then entered the Bostwick-Braun Company as its secretary. This company is one of the largest dealers in wholesale and retail hardware in this part of the country. Mr. Knight is now the vice-president of the company. He is also a director of the First National Bank of Toledo and of the Rossford Savings Bank, Rossford, Ohio.

Mr. Knight became very popular during the war as chairman of the local Liberty Loan organization, which brought Toledo to its quota first in the list of metropolitan cities on the third, fourth and fifth loans. He was also a member of the commission appointed by Federal Judge John M. Killits to draw up a service-at-cost franchise for the settlement of the city's street railway problem. With Chairman W. L. Milner of the commission he devoted considerable time to the ordinance and is given much credit for the practical, business-like provisions of the franchise measure.

David H. Goodwillie, appointed for the six-year term, has had considerable experience in public positions.

Mr. Goodwillie is a native of Oak Park, Ill. He was graduated from Cornell University as a mechanical engineer with the class of 1908. During the next two years he was assistant sanitary engineer with the American Steel & Wire Company, Chicago. In 1910 he went to Toledo to take charge of the construction of the city filtration plant, and during part of that year and the next he was superintendent of filtration. He was later made superintendent of waterworks for the city. Until 1916 he had an office as a private engineer and was employed on a number of industrial projects in the Toledo district.

On Jan. 1, 1916, Mr. Goodwillie assumed the position of Director of Public Service in the first cabinet of Mayor Schreiber. He served in this capacity until September, 1920, when he took a position as an engineer with the Ford Plate Glass Company at Rossford, a suburb of Toledo.

During his term of office as Director of Public Service he was named chairman of the committee to make a valuation of the railway property of the Toledo Railways & Light Company, and the committee's report is known as "the Goodwillie valuation."

Having finished the preliminary work of organization, the board has started business in earnest. The first important matter to come before it is the selection of a street railway commissioner. More than fifteen persons, many of them residents of other cities, have come forward as candidates for this position.

To aid the board in choosing a commissioner the board has called into consultation Prof. Henry E. Riggs, head of the civil engineering department of the University of Michigan, and has announced that additional applications will be received. Professor Riggs is one of the three men who served on the valuation board which fixed the price of the property of the Toledo Railways & Light Company before the ordinance was drawn by the cost of service commission.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER.
SALESMAN AND PURCHASING AGENT
ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Recession in Price of Cotton Waste

Demand Light, but Supply Is Not Large, with Many Textile Mills Closed—Trolley Cord Prices Firm

As a result of light demand and the persistent downward price trend of raw cotton, which at this writing is quoted at 14½ cents for spot, the expected price drop on cotton waste has materialized. In 100-lb. bales white cotton waste is quoted at 10½ to 14 cents per pound, depending upon grade, in New York at present. Colored cotton waste is worth from 7½ to 12 cents.

Demand continues very light, with some buying from steam railroads, but little or none from electric lines. The supply is not large because of the continued shutdown and curtailed production of many of the textile mills. Were it not for the slump in buying it seems that a considerable scarcity would be felt, but as it is the waste supply is adequate to meet present needs, with deliveries of reasonable quantities from stock.

Trolley and bell cord prices show a firmer tendency at present. Buying is very light with a good supply available. The market on trolley and bell cord has held at from 66 to 85 cents per pound the last two weeks, depending upon the grade and the manufacturer.

Independent Rail Producers Meet Corporation Price

Lackawanna, Bethlehem and Midvale Drop Price $10 per Ton to $47 for Open-Hearth Rails

Announcement of a drop in steel rail prices to the level of the United States Steel Corporation by several of the leading independent producers this week is expected to go a long way toward establishing equipment buying of railroads on a firm basis. The action of the Lackawanna Steel Company, which had been previously quoting $57 a ton on standard T-rails, in reducing its price to $47 per ton for open-hearth steel rails and $45 per ton for bessemer has been followed by several other leading independent producers. The Bethlehem Steel Company, which recently fixed its price at $57 per ton for open-hearth rails covering the first quarter of 1921, has fallen in line, as has also the Midvale Steel & Ordnance Company, it is stated. Other independents are expected to make similar price cuts soon, but with this reduction of $10 per ton by three of the leading independents, it may safely be stated that the independent market for steel rails is now on a level with the Steel Corporation's price, which has all along held at $45 per ton for bessemer and $47 for open-hearth rails. These prices were those mutually suggested by representatives of the government and of the steel interests in March, 1919.

The largest rail inquiry now on the market is from the Pennsylvania Railroad for 200,000 tons. Half of this will go to the corporation, it is expected, and the remainder to the independents now that the price question has been settled. The new price level, following statements that independent steel companies could not produce rails under $57 per ton with profit, has been influenced to some extent, it is thought, by the determination of producers to make substantial wage cuts soon.

Window Glass Stocks Good at Present

With End of Present Production Season Coming in January Popular Sizes May Be Hard to Obtain

The car-window glass market is firm, although buying is somewhat limited. At the same time production is lower than it was in the fall and without doubt it will be still lower by the time the present period of manufacturing is at an end—about Jan. 15, 1921. Between then and the starting of the first period of 1921 blowing, about March 1, it is probable that stocks will be pretty well depleted, especially those of the popular sizes, and these will be hard to obtain. At the present time shipments of reasonable quantities of ordinary sizes and grades may be had from stock to three weeks' time.

There is little chance for any recession in price of car-window glass, especially in view of the demands made by the independent workers for a wage increase of 12 per cent. The meeting last week of the workers of hand-made manufacturing plants adjourned without reaching any decision, it is reported, and there will probably be little production turned out by them before March. This increase, were it granted, would provide sufficient reason for no reduction in price of glass.

Manufacturing is going on still to fill orders placed several months ago, so all present production cannot be turned to current requirements or to stock. A factor which might affect stocks appears from the direction of outside the country. It is probable, however, that only single-strength glass will be brought in, while it is double strength that more directly concerns traction companies. Conditions of gas fuel in Pennsylvania and West Virginia are an added detriment to high production.

Active Demand for Used Equipment

Cars, Trucks, Motors, Etc., Have Rapid Turnover—Locomotives and Express Cars Scarce

Dealers in used electric railway equipment report that a very active market exists for second-hand material at present. Many used-equipment dealers have got out of the electric railway end of the business in the recent past, it is true, but this seems to be due more to specialization along certain lines than to an absence of buying.

Important factors in the existing strong demand are the difference in cost and in the delivery period between new and old material. Financial embarrassment has caused many lines to enter the second-hand market rather than bear the greater cost of new material.

More supplies of all sorts are now available in the second-hand market following the extreme scarcity which developed during the war. One reason for this greater supply has been the standardization movement in equipment and another has been the growth of safety car operation, throwing more double-truck cars and equipment upon the market. Few really desirable cars remain there long, however, because a strong interest is shown in cars that can be equipped with safety appliances and converted to the one-man type. In fact the greater part of the buying in this market at present is said to be for one-man car operation. There is therefore an increasing number of the really old cars for sale, with a consequent decrease in buyers.

Railway motors have a rapid turnover, especially the good interpole types, and the supply is about as plentiful as that of cars. Used car trucks are very scarce and in strong demand. The supply of second-hand express cars is also greatly inadequate, while electric locomotives, in the face of the great demand in which they are held, are virtually unobtainable. So far as can be learned the number of second-hand locomotives available throughout the country recently could be counted on the fingers of one hand. A fair demand for rails has been felt on behalf of replacements, but the greatest volume of orders for used rails has come from the steam roads. Demand for power plant equipment, it is stated, has been steadily lessening with more material coming on the market.

Although a downward tendency to prices is seen in the second-hand equipment market there has been no price change as yet. Prospects for increased business next year are generally thought to be bright. A better buying feeling with traction companies is said to be evident, and with increased revenue making itself felt in many cases there will be more buying of new cars and equipment, with more discarding of old supplies which will yet find a ready market.

Easier Prices on Track Bolts and Spikes

Back Orders Being Reduced and Deliveries Improve Under the Present Quietness of the Market

In line with the lower prices of steel bars which are quoted by independent producers, as the disparity between the U. S. Steel Corporation prices and those of independents further disappears the price of track bolts and spikes has eased off still more. Not all independent producers have fully met the corporation's level, as with the latter at a 2.35-cent base on steel bars it is reported that the base price of some producers is as high as 3.35 cents. The range of independents' prices on standard railroad spikes, $\frac{9}{16}$ in. x 5½ in., is from 4 to 5 cents, and on track bolts from 5½ to 6½ cents, depending upon the quantity.

The U. S. Steel Corporation is reported to have accepted a large order for standard railroad spikes recently at 3.65 cents.

Demand continues to slacken, and with the present quietness of the market manufacturers are mostly working on old orders. These are being reduced, however, and deliveries continue to improve. In some cases orders can be filled from stock but not all producers have been able to accumulate surplus stocks as yet. In these instances deliveries range to a maximum length of six weeks on bolts and four weeks on spikes. Optimism seems to prevail regarding the expected railroad demand in 1921.

Tape Producers See Promising Year Ahead

Present Orders Are Light with Good Deliveries—Slight Reduction in Prices Is Expected Soon

Despite recent declines in tape purchases manufacturers of both friction and compound tape will undoubtedly close the year with a large gain in total business handled over 1919. Deliveries are now easy as in many other lines. An optimistic tone pervades the market with regard to next year's sales, even though inquiries and orders are at present running low. It is felt that the necessities of the coming year will require the placing of substantial orders during the course of the twelve-month period. Some of these commitments may be small and others large, but in the opinion of leading sales executives little reason for pessimism exists.

Some reduction in prices is expected about Jan. 1, but it is hard to see how this can exceed 10 per cent in view of the continuing high cost of labor, fuel, transportation, whiting, sulphur and some other material. Sharp as have been reductions in cotton cost, these have been insufficient seriously to affect the manufacturing expense in friction-tape and rubber-tape production. Overhead costs continue at high levels and taxation burdens show small signs of material lightening. The outlook for immediate business is somewhat uncertain, but it is believed in manufacturing circles that easier prices will stimulate orders somewhat and that as soon as buyers realize the relations of various cost factors to current quotations better trade will be enjoyed.

Power Transformers Still on Long Delivery

Plants Working at Good Capacity and Stocks of High-Cost Materials Are Gradually Being Reduced

Although the demand for transformers is somewhat reduced as regards new orders in comparison with the business of last summer and spring, a substantial output is coming through the manufacturing plants. This class of apparatus appears less susceptible to trade fluctuations than many other products. In one of the larger transformer factories recently visited by a representative of the ELECTRIC RAILWAY JOURNAL practically full-time production was under way.

Raw material is coming into the factories at a better rate than for some time, although it is only within the past two or three weeks that conditions have been so good that output could be pushed without much fear of shortages disturbing production schedules. Even now no great excess of materials of all classes exists. Power transformers are not generally stocked, and deliveries here run from a normal of three to four months up to five or six months, depending largely upon the existence of back orders.

The future course of prices is not well defined as yet, although some of the materials entering into manufacture have been reduced. There are still stocks of raw materials to be worked up which were purchased in good faith at higher levels than prevail today, and there has been little tendency toward reduced labor costs in this field. Transformer manufacturers point out that at no time did prices follow the advance of raw-material costs to their peak, and the increases established were moderate in comparison with many commodities.

No very decided drop in quotations is anticipated for the immediate future. Much study is being given to the materials of transformer manufacture and the problem of obtaining insulating paper of a higher degree of dielectric strength is a live one among designing engineers. In some cases it has become necessary to purchase this material at prices comparable to the cost of the higher grades of writing paper.

Good Volume of Orders for Gear Cases

Deliveries, Though Long, Are Improving —Castings Still Scarce and Sheet Steel Stocks Are Kept Low

Although one or two manufacturers of gear cases report that demand is poor and electric railways are not trying to stock up, the majority of producers are making good sales. Many traction companies have taken the lesson of last winter to heart, it is stated, and are anticipating their needs for gear cases so far as is possible. Even where orders merely represent current needs the volume of buying is said to be a considerable total.

The need of advance orders for gear cases this winter is emphasized by prevailing long deliveries, though the latter situation is improving. Inability to obtain castings has been the chief difficulty in turning out the finished product. Foundries are now quoting better deliveries on castings but the supply is by no means favorable. Sheet steel is plentiful but some of the manufacturers of gear cases say they have purposely avoided stocking this material on the present declining market. Consequently the best delivery of the finished product that can be quoted ranges from forty-five to ninety days on malleable cases and thirty to seventy-five days on sheet steel cases. No orders have been canceled so far as could be learned and virtually no stocks of finished cases of any type exist with manufacturers.

A good volume of orders is yet expected to develop from lines that have only covered their present needs, and with the raw material supply improving and a constantly better attitude of labor evident it is hoped to reduce the time in which shipments can be made. Prices have held steady and among manufacturers there seems to be no indication of lower prices very soon, though sheet steel is lower. Malleable iron still costs the same.

Rolling Stock

Springfield (Mass.) Street Railway, in a fire on Dec. 12 which totally destroyed the carhouse on South Main Street, Palmer, lost four snow plows, three double-truck passenger cars and a work car. The loss is unofficially estimated at $150,000.

Track and Roadway

Phoenix (Ariz.) Street Railway.—The Corporation Commission has granted a two-year extension of time to the Phoenix Street Railway to double track West Washington Street from Seventh to Seventeenth Avenue. The railway asked for a five-year extension, basing its claim on war-time conditions.

Interborough Rapid Transit Company, New York, N. Y.—The White Plains extension of the Interborough Rapid

Transit Company was opened on Dec. 13. Trains of the east side subway and the Third Avenue elevated will use the extension. Transit Construction Commissioner Delaney has pointed out that the opening of this branch provides a ride of 26.19 miles between the northerly terminal and Livonia and Pennsylvania Avenues in Brooklyn.

International Railway, Buffalo, New York.—Construction work soon will be started by the International Railway on the double-tracking of the River road line between the Buffalo city line at Riverside park and the new plant of the Dunlop Tire & Rubber Company, a distance of about 1.3 miles. The new line will serve large industries locating in the River road district which will employ more than 15,000 men before next spring. Permission to construct the line already has been obtained from the town board of Tonawanda and the village of Kenmore.

Tarrant County Traction Company, Fort Worth, Tex.—The traction committee of the Cleburne (Tex.) Chamber of Commerce has secured an agreement with the Tarrant County Traction Company, which operates the interurban between Fort Worth and Cleburne, for improved service on this line. The company will purchase new cars and overhaul the old ones. Several additional cars will be put on and the schedule will be speeded up.

Texas Electric Railway, Dallas, Tex.—J. F. Strickland, Dallas, Tex., president of the Texas Electric Railway, has been asked by residents of Cleburne and Hillsboro to build an interurban line connecting these two points. Such a link would connect the line of the Tarrant County Traction Company, extending from Fort Worth to Cleburne, with the line of the Texas Electric Railway. It is understood that such an extension was being planned when the war came on and caused such financial stringency that the project was abandoned for the time and has not been taken up until now.

Bamberger Electric Railroad, Salt Lake City, Utah.—The running time on the Bamberger Electric Railroad between Ogden and Salt Lake City will be considerably reduced with the completion of the double-tracking between those two cities. This work is now in progress and will be completed soon.

Grays Harbor Railway & Light Company, Aberdeen, Wash.—The action of the City Council in granting permission to the Grays Harbor Railway & Light Company the privilege of temporary planking rather than putting in permanent pavement between tracks on South Aberdeen street has brought a storm of protest from residents of that district. Permission was granted to the railway when representatives appeared before the City Council and stated that it would work a financial hardship to put in permanent paving at this time. Suggestions were made that the company apply for an increase in fare, or that jitneys now operating be prohibited from running over the routes of the railway.

London, Ont.—The City Council of London will consider the question of the construction of a subway at Rectory Street and Engineer Mountain of the Dominion Railway Board will look into the question immediately.

Montreal (Que.) Tramways. — The Montreal Tramways Commission has instructed the Montreal Tramways to replace the track in two sections of St. Catherine Street between University Street and McGill College Avenue, which had been laid close to the sidewalk in a temporary arrangement.

Toronto, Ont.—Works Commissioner R. C. Harris has outlined the following improvement work for 1921: street railway on Bloon Street viaduct from Sherbourne Street to Broadview Avenue at a cost of $185,000, civic railway installation of insulated negative feeder cable, Danforth line, to prevent electrolysis, at a cost of $31,350.

Power Houses, Shops and Buildings

Monongahela Valley Traction Company, Fairmont, W. Va.—Ground has been broken for a new substation at Perry mines in Clarksburg, W. Va., by the Monongahela Valley Traction Company. The station will enable the company to operate three-car trains between this city and Fairmont, where two-car trains are now run.

Springfield (Mass.) Street Railway.—A carhouse of the Springfield Street Railway located in South Main Street, Palmer, was totally destroyed by fire on Dec. 12. Four snowplows, three double-truck passenger cars and a work car were among the contents burned. The cause of the fire is not known. The estimated loss is unofficially given at $150,000.

Northern Ohio Traction & Light Company, Akron, Ohio.—A new freight house built by the Northern Ohio Traction & Light Company in Akron will be occupied Jan. 1. The new building is 120 by 140 ft., two stories high, of concrete and steel construction throughout. The company owns considerable additional frontage adjoining the building and it is the intention to construct additional warehouse and freight facilities at this point.

Interstate Public Service Company, Indianapolis, Ind.—Plans are being made by R. J. Custer, engineer of maintenance of way, at Columbus, Ind., for the Interstate Public Service Company for the construction of general shops and carhouse at Scottsburg, Ind. The new construction work will cost approximately $300,000. All the buildings will be of brick and steel with steel sash and composition roofs. Contract will probably be awarded shortly after the first of the year.

Monongahela Valley Traction Company, Fairmont, W. Va.—Extensive improvements which will make it possible for the company to supply more electric power to its own lines in the Fairmont region and also to other concerns in that vicinity are being made by the Monongahela Valley Traction Company.

Trade Notes

The American Frog & Switch Company, Hamilton, Ohio, has opened a New York office at 149 Broadway in charge of Presley Hamilton and H. F. Whiteman.

The New York Car Wheel Company, Buffalo, N. Y., manufacturer of chilled iron wheels, will build a two-story addition, 34 ft. x 100 ft., to its plant at 15 Forest Avenue.

Frank O. Howard of the sales department of American Steel & Wire Company, North Works, Worcester, Mass., has been appointed general manager of the company's newly opened office at Atlanta, Ga.

The Jackson Railway Signal Company, Manasquan, N. J., has been incorporated with a capital stock of $100,000 to manufacture railway signals and devices. The incorporators are George B. Jackson, J. H. Sickel and J. S. Van Schoick.

The Automatic Reclosing Circuit Breaker Company, Columbus, Ohio, announces the appointment of the W. D. Hamer Company, 508 Traction Terminal Building, Indianapolis, Ind., as its representative in Indiana and western Kentucky.

The Line Materials Company, South Milwaukee, Wis., manufacturer of electric transmission supplies, recently suffered an estimated loss of $40,000 from fire in its assembling shop and office building. Two new concrete shop buildings that were recently erected will serve to keep operations from being curtailed.

G. D. Crain, Jr., 417 South Dearborn Street, Chicago, Ill., publisher, announces that "Crain's Market Data Book and Directory of Class, Trade and Technical Papers," which lists and gives the circulation, rates, type-page sizes, closing dates, etc., of all the business publications of the United States and Canada, is now on the press.

The Air Reduction Sales Company, manufacturer of welding and cutting apparatus, has completed a four-story brick extension with reinforced concrete floors to its plant in Jersey City, N. J. The addition is necessary to provide for increased production of the Airco "A" welding and "D" cutting torches.

New Advertising Literature

Condulets.—Crouse - Hinds Company, Syracuse, N. Y., is distributing bulletin 1000R, on condulets, fixture joint and extensions, effective Nov. 26, 1920.

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